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Dear TOJDE Readers,

Welcome to Volume 21 Issue 4 of TOJDE.

There are 15 articles and a book review in the October 2020 issue of TOJDE. 34 authors from 9 different countries contributed to the issue. These countries are Brazil, Hungary, Iran, Israel, Saudi Arabia, South Africa, Spain, Turkey, and USA.

EXPLORING BLENDED LEARNING RELATIONSHIPS IN HIGHER EDUCATION USING A SYSTEMS-BASED FRAMEWORK authored by Elisabeth McGEE and Prerna POOJARY is the first article. This qualitative phenomenological study explored the perceived relationships that exist within the Complex Adaptive Blended Learning Systems (CABLS) (CABLS) framework in a higher education blended learning environment. The researchers aim to provide all stakeholders with a better understanding of the complex interdependent relationships within the CABLS framework to optimize a collaborative approach to blended learning.

The title of the 2nd article is THE EFFECT OF FLIPPED CLASSROOMS ON L2 LEARNERS' DEVELOPMENT AND RETENTION OF GRAMMATICAL KNOWLEDGE. The authors are Ahmad NOROOZI, Ehsan REZVANI and Ahmad AMERI-GOLESTAN. This quantitative study was conducted within the framework of sociocultural theory to examine the effect of flipped instruction on Iranian English as a foreign language (EFL) learners' development of conditional sentences. Results revealed that the use of flipped model in grammar teaching augmented through feedback in the face-to-face classroom resulted in significant improvement in learning and retention of conditional sentences.

The 3rd article, EVALUATING THE FLIPPED CLASSROOM MODEL THROUGH THE MULTI-COMPLEMENTARY APPROACH, is written by Tarik TALAN and Veli BATDI. This study was carried out to determine the effectiveness of the Flipped Classroom Model (FCM) in an educational setting. For this purpose, a multi-complementary approach (MCA) was used including both quantitative (meta-analysis) and qualitative (thematic). The results of the study showed that FCM had a positive impact on academic success in general.

EFFECT OF INTERACTIVE VIDEO LENGTH WITHIN E-LEARNING ENVIRONMENTS ON COGNITIVE LOAD, COGNITIVE ACHIEVEMENT AND RETENTION OF LEARNING is the title of the 4th article, and the author is Mohammed Kamal AFIFY. This experimental research examined whether long interactive videos can improve students' performance in tests, retention of learning in the long term, and reduce the cognitive load compared to medium and short videos. The results were analyzed and interpreted in the light of cognitive load theory and Cognitive Theory of Multimedia Learning.

Saif MOHAMMED and László KINYO are the authors of the 5th article titled CONSTRUCTIVIST THEORY AS A FOUNDATION FOR THE UTILIZATION OF DIGITAL TECHNOLOGY IN THE LIFELONG LEARNING PROCESS. The authors critically evaluate the utilization of rapidly developing digital technologies within lifelong learning and their role as tools in promoting access to both practical and theoretical knowledge and in facilitating the communication of ideas within a global network, as per the constructivist approach.

The title of the 6th article is DEVELOPMENT OF ONLINE COURSE SATISFACTION SCALE. Fatma BAYRAK, Moanes H. TIBI, Arif ALTUN are the authors. The purpose of this study was to develop a reliable, valid, and practical instrument to measure online students' satisfaction as well as to explore the psychometric and theoretical concerns surrounding the construct validity of existing satisfaction scales. The finalized version of satisfaction scale, consisting of eight items, demonstrated that the scale is suitable for general use.

COMPARING EFL LEARNERS' RESPONSES IN ONLINE AND TRADITIONAL CLASSES: A MIXED METHOD APPROACH is the 7th article. Marjan BANAFSHI, Farzaneh KHODABANDEH and Fatemeh HEMMATI are the authors. The authors first analyzed the effect of Telegram on the vocabulary knowledge of the participants, then compared the participants' responses in IRF (initiation, response, &

feedback) pattern in two different settings (traditional class and the online one). For the second part of the study, the participants' comments were analyzed. The results revealed a significant difference between the two groups, not only in their vocabulary knowledge but also in the way they communicated.

The authors of the 8th article are Sercan BURSA and Tuba CENGELCI KOSE. The title is THE EFFECT OF FLIPPED CLASSROOM PRACTICES ON STUDENTS' ACADEMIC ACHIEVEMENT AND RESPONSIBILITY LEVELS IN SOCIAL STUDIES COURSE. The aim of this study was to investigate the effect of flipped classroom practices on students' academic achievement and responsibility levels in 5th-grade Social Studies course. The researchers found that flipped classroom practices significantly increased the academic achievement and responsibility levels of the students in the experimental group.

Carles DULSAT and Isabel ALVAREZ are the authors of the 9th article. The title of this article is CHANGE AT DISTANCE EDUCATION, WHAT KIND OF RESISTANCE? WHAT IMPROVEMENTS? This descriptive study aimed at training sports technicians in the Spanish state. The results revealed that acceptance of new technologies differed significantly between students with distance education experience. It is also revealed that the online mode allowed learners to apply knowledge immediately although there were difficulties during the first weeks.

The 10th article which is authored by Munevver ESGICE GUNDUZ, Engin KURSUN, Selcuk KARAMAN and Turgay DEMIREL is titled PROBLEMS, EXPECTATIONS, AND AMENDMENTS REGARDING DISTANCE EDUCATION LEGISLATION IN HIGHER EDUCATION INSTITUTIONS IN TURKEY. This qualitative study's goal was to reveal amendments to the Procedures and Principles regarding Distance Education in Higher Education Institutions issued by the Higher Education Institution in Turkey, applications affected by these amendments, and problems and expectations at the system, program, and course levels. The analyses have shown that the amendments to the Procedures and Principles affect especially program and course opening, branching, assignment, and student admission practices.

UNDERSTANDING CULTURAL DETERMINANTS OF MOOCs OFFERING: A CROSS-COUNTRY STUDY is the 11th article authored by Fernanda Francielle de Oliveira MALAQUIAS and Romes Jorge da Silva JUNIOR. The aim of this study was to investigate cultural determinants of MOOCs offering, through a cross-country analysis. The results show that while Individualism presents a significant and positive effect on MOOCs offering; Power Distance, Uncertainty Avoidance and Masculinity dimensions of culture do not present significant effect on MOOCs offering.

The 12th article is written by Emel AKAY and Eylem KORAL GUMUSOGLU. The title is THE IMPACT OF LEARNING MANAGEMENT SYSTEMS ON STUDENTS' ACHIEVEMENT IN LANGUAGE EXAMS. The aim of this mixed methods study was to investigate the relationship between university students' achievement in an English preparatory program and the use of LMS in language learning process. The results revealed that the use of LMS had a much greater impact on midterm exams than the proficiency exam although it had an effect on both. Moreover, participants had mostly positive attitudes towards the use of LMS.

Geesje van den BERG is the author of the 13th article titled CONTEXT MATTERS: STUDENT EXPERIENCES OF INTERACTION IN OPEN DISTANCE LEARNING. The purpose of this case study was to determine first year students' experiences of their learning in order to consider how offering the course online might affect their satisfaction and academic success. Findings confirmed the value of interaction on all levels and pointed towards the challenges in interaction with technology.

The 14th article titled SENSE OF COMMUNITY, PEER FEEDBACK AND COURSE ENGAGEMENT AS PREDICTORS OF LEARNING IN BLOG ENVIRONMENTS is authored by Melih Derya GURER. The aim of this relational study was to investigate the relationship between sense of community, perception of peer feedback, course engagement and learning in a blog-based learning environment. It was found that students' perceived learning, sense of community, peer feedback perceptions and course engagement were at a high level, and in blog environments, students' sense of community, peer feedback perception and course engagement were significant predictors of their learning.

The 15th article, A STUDY ON DIGITAL CITIZENSHIP: PRESCHOOL TEACHER CANDIDATES VS. COMPUTER EDUCATION AND INSTRUCTIONAL TECHNOLOGY TEACHER CANDIDATES, is authored by Filiz ELMALI, Ahmet TEKIN, and Ebru POLAT. The main goal of this mixed-methods study was to determine the digital citizenship perceptions and digital citizenship levels of preschool teacher candidates by comparing them with Computer and Instructional Technologies teacher candidates' perception. The results showed that participants' digital citizenship levels were above average and their digital citizenship perceptions supported this result. However, it was observed that teacher candidates had some misconceptions about digital rights and responsibilities, and digital security.

The last contribution to the issue is a book review. 25 YEARS OF ED TECH written By Martin WELLER is reviewed by Hasan UCAR. As noted by the reviewer, Weller examined 25 technologies over 25 years, starting from 1994 until 2018. Using his personal experiences, reflections from the field and preferences in the selection of these technologies, the Weller prioritizes each year in which the related technology was effective, not the year it emerged. The reviewer believes that even though the choice of "one technology per year" seems to have undervalued some other technologies or technological movements, it appears that there is a need for other publications that should accompany this book.

Hope to meet again in the next issue of TOJDE.

Cordially,
Dr. T. Volkan YUZER
Editor in Chief

EXPLORING BLENDED LEARNING RELATIONSHIPS IN HIGHER EDUCATION USING A SYSTEMS-BASED FRAMEWORK

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ABSTRACT

The adoption of a blended learning approach is increasing among higher education institutions with a significant amount of research that focuses on linear relationships. However, there is limited research on how the blended learning environment functions and interacts as a complex system. There is a need for more research that explores the relationships that exist within a blended learning environment using a system-based framework, such as the Complex Adaptive Blended Learning Systems (CABLS) framework. The purpose of this qualitative phenomenological study was to explore the perceived relationships that exist within the CABLS in a higher education blended learning environment. Interviews were conducted with the learner, teacher, institutional administrators, and learning support staff. A thematic analysis was used to identify themes to better understand stakeholder relationships within the CABLS framework. The results of this study seek to provide all stakeholders with a better understanding of the complex interdependent relationships within the CABLS framework to optimize a collaborative approach to blended learning.

Keywords: Blended learning, higher education, complex adaptive systems, framework, stakeholders, relationships.

INTRODUCTION

Blended learning has expanded in education over the past several years. According to Graham, Woodfield, & Harrison (2013), blended learning is a learning environment that utilizes both "face-to-face and computer-mediated instruction" (p. 4). The blended learning approach is gaining momentum globally and it is evolving into the "new standard" (Graham, Woodfield, & Harrison, 2013; Liu et al., 2016; Smith & Hill, 2019) While blended learning has moved away from traditional classroom teaching theories, it has numerous advantages, some of which include reduced seating time, increased flexibility in student learning, and increased student control in their learning environment (Horn & Fisher, 2017). More institutions are adopting blended learning environments due to the perception that this approach leads to improved student engagement (Garrison & Kanuka, 2004; Graham & Robison, 2007; Manwaring, Larsen, Graham, Henrie, & Halverson, 2017). This educational shift may help students obtain a higher quality learning experience with improved learning outcomes (Garrison & Kanuka, 2004; Garrison & Vaughan, 2013; Graham et al., 2013; Hew & Lo, 2018; Means, Toyama, Murphy, & Baki, 2013; VanDerLinden, 2014).

A system-based perspective can be used to understand and evaluate the complexities of a dynamic ecosystem. Wang, Han, & Yang (2015) proposed the CABLS framework that is grounded in the adaptive systems theory. Complex adaptive systems theory has been used to comprehend the dynamic relationships between non-linear systems (Wang et al., 2015). Complex adaptive systems are described as dynamic systems that

"exchange matter, energy, or information across its boundaries and use that exchange of energy to maintain its structure" (Cleveland, 1994). These subsystems exist on the "edge of chaos" and have the ability to always maintain balance and stability in the midst of chaos (Waldrop, 1992). Complex adaptive systems have five key characteristics: complexity, self-organization, adaptability, dynamism, and the ability to coevolve (Cleveland, 1994). These components keep the system healthy and innovative.

As seen in Figure 1, Wang et al.'s (2015) CABLS framework addresses six interdependent components of a blended learning ecosystem. The framework offers a clear view of the six subsystems (teacher, learner, institution, learning support, technology, and content influence the blended learning environment) that interact with one another in a blended learning environment (Wang et al., 2015). These subsystems function as dynamic units rather than silos of isolation (Wang et al., 2015). The CABLS can give stakeholders a better understanding of the different components of blended learning which may help make the process more effective (Wang et al., 2015). This framework can serve as a guiding force to drive blended learning research and institutional adoption of cohesive blended learning environments.
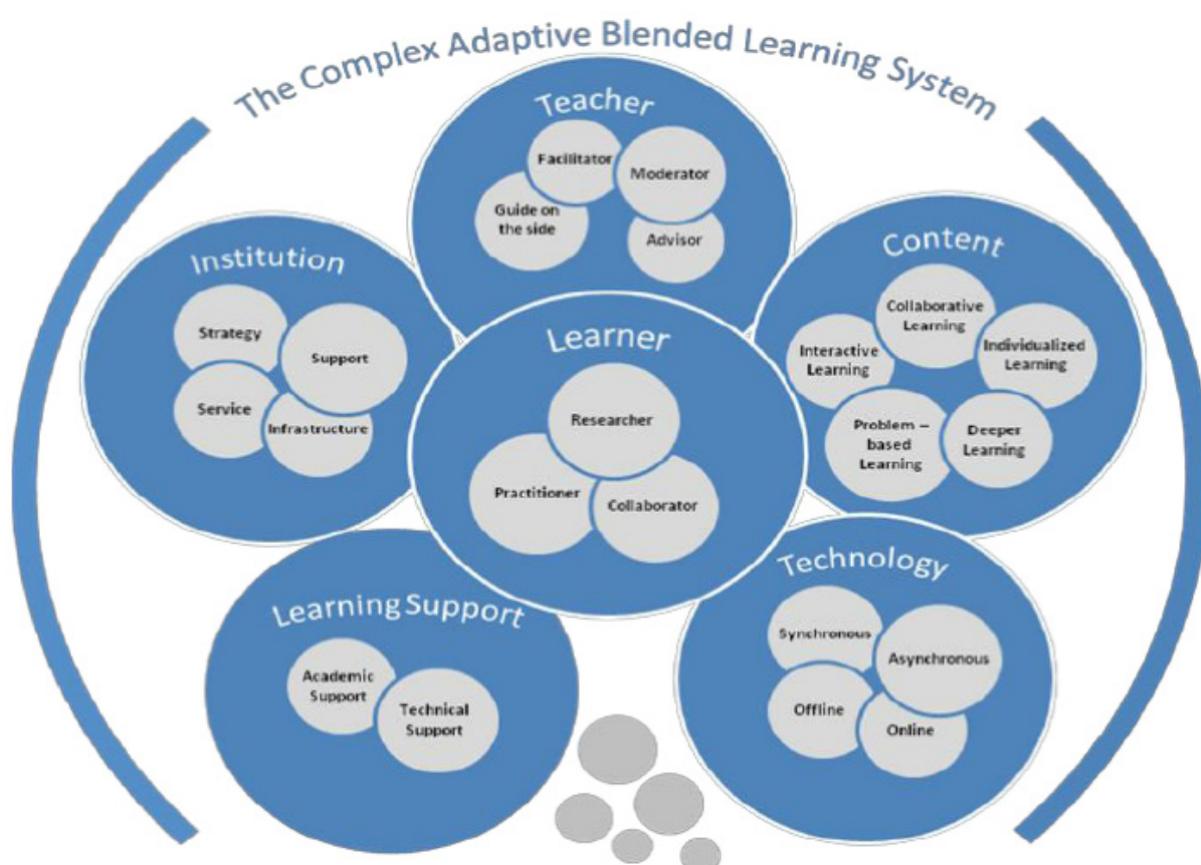
Figure 1. The complex adaptive blended learning system (Used with permission from Wang et al., 2015)

The adoption of a blended learning approach is increasing among higher education institutions, however there is limited research on how a blended learning environment functions as a complex system (Wang et al., 2015). Wang et al. (2015) suggested that future research should focus on the non-linear relationships in blended learning with application of the Complex Adaptive Blended Learning Systems (CABLS) framework to higher education institutions. There is a need for more research focused on how individuals perceive the non-linear relationships using a blended learning framework, such as the Complex Adaptive Blended Learning Systems (CABLS) framework. This gap in the literature presents a need for researchers to explore all six of the inter-dependent components in a higher education environment. Through understanding the webbed roles and relationships within a blended learning environment, stakeholders in higher education institutions and researchers can participate in more collaborative practice and inclusive research.

Blended learning is a widely used model of learning in education. In a systematic review and metanalysis using 56 articles, Liu et al. (2016) found that blended learning, compared to no intervention, had positive effect on learning. In addition, blended learning instruction was found to be as effective or more effective that traditional instruction for knowledge acquisition (Liu et al., 2016). Blended learning also has positive impacts at the course level. Vo, Zu, and Diep (2017) conducted a metanalysis that compared student's performance in a course that utilized a blended learning approach to student performance in a traditional classroom. The results showed that students in STEM disciplines had improved learning outcomes compared to those in a traditional classroom environment (Vo et al., 2017). A blended learning environment leads to positive student outcomes, however little research addresses the dynamic relationships that contribute to these beneficial outcomes.

There are many relationships that exist within a blended learning environment. Numerous research studies have explored linear relationships within the blended learning environment (Boelens et al., 2018; Holmes & Prieto-Rodriguez, 2018; Horn & Fisher, 2017; Thurab-Nkhosi, 2018) however, none have explored the dynamic relationships amongst all of the components involved in the blended learning environment (Wang et al., 2015). In a qualitative study Boelens et al. (2017), explores faculty's perceptions regarding blended learning instruction. In addition to students' perceptions, faculty and staff perceptions have also been explored. In a mixed methods study, Holmes and Prieto-Rodriguez (2018) 46 evaluated how staff and 470 students perceived a blended learning management system. Results showed that both groups felt the LMS was effective and appreciated the interactivity of the LMS tools (Holmes & Prieto-Rodriguez, 2018). However, there were differences in opinion around the accessibility on the online content (Holmes & Prieto-Rodriguez, 2018). Administrator perceptions have also been explored within blended learning research. Thurab-Nkhosi (2018) conducted a qualitative study that explored administer officer's and dean's perceptions of the implementation phase of blended learning. Results showed that leaders should provide a clear vision and strategies for effective blended learning (Thurab-Nkhosi, 2018). While these studies explored several linear relationships within the blended learning environment, no studies were found that addressed all components in Wang et al.'s (2015) CABLS framework.

PURPOSE OF THE STUDY

The purpose of this qualitative phenomenological study was to explore the perceived relationships of a higher education blended learning environment using Wang et al.'s (2015) CABLS conceptual framework. Previous research has focused on linear-relationships in a blended learning environment. This study seeks to address a gap in the research by exploring the complex relationships that exist in a blended environment using multiple stakeholder groups (i.e. teachers, learners, institutional administrators, learning support members) The following central research question was used to guide the studies' direction: How do stakeholders perceive their relationships within the CABLS framework in a higher education health science blended learning environment? The purpose and research question generated the following two research objectives: 1). Explore how stakeholders perceive relationships within the CABLS framework subsystems (i.e. teacher, learner, institution, learning support, technology, and content) in a blended higher education setting. 2). Discover how the CABLS framework may allow stakeholders and researchers to understand the complex, dynamic, and collaborative relationships within a blended learning ecosystem.

METHOD

To meet the stated objectives, a phenomenology approach (Creswell & Creswell, 2017). Phenomenology is used when the researcher seeks to explore the essence of a phenomenon (Creswell & Poth, 2018). This approach focuses on understanding the meaning of an individual's lived experience (Creswell & Poth, 2018). Institutional Review Board (IRB) approval from University of Saint Augustine for Health Sciences (USAHS) was obtained prior to data collection. All participants reviewed, thoroughly understood, and signed an informed consent document that was approved by the IRB. Data and confidential documents were stored in an electronic password protected drop box to which the principal investigator and co-investigator had access to. The participants were made aware of the purpose of the research, the timeline, their rights, and

the confidentiality agreement. The participants agreed to the parameters of the study. The interviews were recorded using either Skype for business, a recorder, or both means. These recordings were transcribed to be further analyzed.

Participant Selection

Participants were selected from USAHS, a higher education institution located in Saint Augustine, Florida. We determined we would interview various stakeholders from this institution due to its adoption of a blended learning approach. The stakeholder groups were derived from the CABLS framework and consisted of: faculty, students, institutional administrators, and learning support. Purposive sampling was used using criterion and snowball strategies (Creswell & Poth, 2018). Criterion sampling was used to select cases that met the criteria for one of the four stakeholder groups (i.e. faculty, students, learning support, institutional administrators). Snowball sampling was used to select participants based off feedback from individuals that know what participants might be 'information-rich' candidates (Creswell & Poth, 2018).

A total of 24 participants were included in the study. In order to explore perceived relationships within each component of the CABLS framework, 6 participants from each stakeholder group were interviewed. According to Guest, Bunce, & Johnson, 2006, the majority of the findings can be collected within 6 interviews, with saturation occurring within 12 interviews. Only 6 interviews were conducted within each stakeholder group due to participant availability.

Faculty were selected that teach blended courses within the master's in occupational therapy program. Students were sampled from the 8th term flexible occupational therapy program cohort. This cohort completed the didactic blended learning coursework, which provided the students with deep insight into their blended learning experiences. The flexible program offers blended and online courses for students to pursue their Master of Occupational Therapy. Students typically complete the online portion of their studies throughout the week and complete the laboratory hands on component on the weekends in a face to face manner. Learning support participants were sampled from technical support and academic support teams within the university (Wang et al., 2015). Institutional administrators were selected that oversaw blended learning programs and processes.

Data Collection and Analysis

Qualitative data was collected using interviews. 45-60 minute semi-structured interview sessions were held for each stakeholder. Interviews were conducted by the principal investigator and the co-investigator with the learner, teacher, institutional administrators, and learning support staff. The interviews were held via web conferencing (Skype) or face-to-face at USAHS. The stakeholder groups were chosen in order to provide the perceptions and experiences needed to answer the research question. The interviews allowed the researchers to explore how the stakeholders perceived their relationships within their blended learning environment. Field notes were taken during the interview process. All interviews were recorded and transcribed for analysis. Interview data was stored in a password protected electronic drop box to which the principal investigator and the co-investigator had access. Interviewees were compensated for their time with a small gift card. The semi-structured interview guide is included in Appendix A. The interview questions were aligned with the subsections of Wang et al.'s (2015) CABLS conceptual framework. The questions were constructed to understand stakeholder's perceptions of the perceived relationships within the framework.

Our data analysis processes used the structured methods from Creswell and Creswell (2017), Creswell and Poth (2018), Moustakas (1994), and Saldaña (2016). The data sources within this study included 24 interviews, transcript documents, field notes, and analytic memos. The data was organized into files using NVivo software. All codes were placed into the NVivo software system with the participant's personal information decoded. Additional files were created for analytic memos and reflexive journals.

Trustworthiness

Throughout the data analysis process, the investigators maintained trustworthiness through achieving the standards of credibility, transferability, dependability, and confirmability (Lincoln & Guba, 1985). This structured process increases confidence in the study's findings (Creswell & Poth, 2018). Credibility was achieved through triangulation and the process of member checking. Triangulation was achieved by including multiple investigators and stakeholder groups in the study. Member checking involved participants reviewing and verifying the accuracy of the interview transcripts. Transferability was achieved by creating a rich and thorough description of the procedures, participants and context within the study. This process allows the reader to determine if the findings can be transferred to other settings. Dependability was achieved through the use of an audit trail. An audit trail serves as a transparent record of raw data, methodological processes notes, and analytic memos. This allows the reader to assess and determine if proper research steps were taken throughout the study. Confirmability was achieved by using a reflexive journal. The researchers kept a journal to document thoughts that reflected upon the researcher's perspective and biases.

Data Analysis and Representation

All data was reviewed multiple times before the initial coding process. In Vivo codes were selected for the initial coding because they represented the actual language of the participants (Saldaña, 2015). According to Ravitch and Carl (2016), a code can be a word or phrase that ties meaning to the data (Ravitch & Carl, 2016). The codes can merge together to form categories or significant statements that organize data into sets based off a similarity within the data (Creswell & Creswell, 2017; Moustakas, 1994; Ravitch & Carl, 2016). Based off the initial coding, significant statements were developed to allow for data to be grouped in categories that summarized the initial codes (Creswell & Creswell, 2017; Moustakas, 1994; Saldaña, 2015). After the data was categorized into significant statements, broader meaning units or themes were developed to represent clusters of data (Creswell & Creswell, 2017; Moustakas, 1994). A theme represents significant concepts within the data sets (Ravitch & Carl, 2016). Themes can be "summary statements, causal explanations, or conclusions" (Rubin & Rubin, 2011, p 193). Finally, a textural description, structural description, and composite description were developed (Creswell, & Creswell, 2017; Moustakas, 1994).

FINDINGS

Themes: Perceived Framework Relationships

Through reviewing the interviews, transcript documents, field notes, and analytic memos, several themes emerged from the data. See Figure 2 for the significant statements and themes for perceived stakeholder relationships.

Theme 1: Collaborative Relationships

Participants expressed that their relationships involved collaboration with the other stakeholders within the CABLS framework. Collaboration centered around curriculum development, problem solving, student learning, and technology selection. Responses for curriculum development included the following signature statements:

- We collaborate together during curriculum development. We are working with the academic leadership for accreditation and what standards we need to meet, and what policies are in place. We are working with learning support, like the librarians and student services, to make sure that we have the right resources, and they have the right resources to help students. We are making sure that we're using the best technology and how that technology can help convey the content better. We're developing the content and revising the content as necessary. We're working with students and thinking about student's reactions prior to learning. I work with the faculty member and the content, and we fill everything out on a blueprint.

Responses for problem solving included statements such as: "When we have issues; when students are kicked out of quizzes or exams. That creates an issue in the classroom, so everyone has to pull together to figure out how to handle the situation". Responses for student learning included statements such as "it should be a partnership where we're supporting each other in our goals, and helping to figure out what works best for the student" and "technology is there and it's beautiful and it's great to use for our anatomy students, but if you just put in the library and say okay students access this, they never will unless you incorporate it as part of what you do with your class". Responses for technology selection include:

- When I come up with a new potential technology that we want to investigate, I need to talk to specific faculty who I believe might find this technology useful for their courses, discuss it with them and get their feedback so that when I evaluate the technology I can have a better idea of what it is that I'm looking for to meet those specific needs and objectives.

Theme 2: Complex Relationships

Participants expressed that they had complex relationships within the CABLS framework. The complex relationships were focused around meeting complex technology needs and having multiple components. Responses for meeting complex technology needs included the following significant statements: "they try to upgrade the technology as much as they can. It's just technology is difficult and trying to keep it updated and upgraded is difficult", "the challenge is dealing with the technology that's not working", and "students have several different types of systems that they're trying to connect with, multiple platforms, operating systems, desktop computers, laptop computers, iPads and things like that". Responses for multiple components included words and phrases such as "we all interact together to help the learner move through the process" and

- I think that the Title IV example is a perfect one because if the content is not developed properly so that students are encouraged and engaged on a weekly basis with such active interactions, then they don't qualify for the Title IV and the program's not eligible. If the technology doesn't measure that then we have no way of determining if that's occurring. If the learner's not engaging in that then they can't receive the Title IV, they get cut off from Title IV. If the learning support is not available to assure we are able to measure, then we don't have a method for tracking it. If the institution isn't compliant with that then, and doesn't have the proper resources in place, then again, we're going to lose that eligibility to the Federal Government. And then finally, the teacher has to track it and assure that it's always documented and available should we be called upon to produce that information.

Theme 3: Dynamic Relationships

Participants expressed that their relationships were dynamic. The dynamic relationships had an emphasis on an evolving nature, innovation, learning experience, and problem solving. Responses that alluded to an evolving nature included the following signature statements: "when it comes to technology, it is always changing", "during my experience in this blended program, there has been so much change", and "continually update".

Responses that focused on innovation included statements such as "because you have to be very open-minded and put yourself out there trying something new", "that students could actively see cutting edge technology that's being used appropriately for the clients that we would service" and "a lot of innovation that's created for blended material". Responses that focused on the learning experiences included significant statements such as "content should be presented in different ways, so the student can be able to interact with the information", and "dynamic learning".

Responses that focused on problem solving included statements such as "there is a lot of troubleshooting involved", "If the learners or the students specifically struggle with using the technology, it doesn't work on their platform, they're using Mac vs. PC, for example", and "I have to go back and work with the technology, or work with the institution, or the learning support to address the specific issues that are brought up".

Theme 4: Interdependent

Participants expressed that their roles and relationships were interdependent. They reported an emphasis on communication and reliance. Responses that addressed communication included the following significant statements: "it is important that we are communicating back and forth, and they understand what the other folks are also experiencing", "with learning support, I knew that if there was a problem, I could call and I could get immediate help, and most of the time they did not leave the phone with me until problem was solved" and "as the student runs into particular issues along the way, they need to have resources they can reach out to". Responses that addressed reliance included "technology, dependability and user-friendly", "The expectation is that the student actually does the work", "the institutional administrator has to provide the framework that encourages you to grow as a student", "I expect the instructor to present the information in a clear way and be available for any questions", and

The infrastructure has to be there. You shouldn't attempt to do this if you don't have the technology to support it. The technology should almost be that, it shouldn't even be on anyone's radar because it's just there. It's one of those things that you really shouldn't think about because you don't have to think about because it's seamless and it's done.

Theme 5: Student-Centered Relationships

Participants expressed that their relationships within the CA- BLS framework were student-centered. These student-centered relationships were centered around best practice, engaging the learner, and student learning outcomes.

Responses for best practice included the following significant statements: "You have to be focused on what's best for the learner" and "stay current with the national guidelines". Responses for engaging the learner included statements such as "make sure that the information enables them to learn more effectively and become more proficient at their particular skills" and "the learner is actually the center of it all". Responses for student learning outcomes included words and phrases such as "we work together to help the learner throughout the process of gaining knowledge and meeting their goals", "I think the common goal is ultimately the learning outcomes of our students" and "common goal is that the student can apply the information from a particular course in real life situations".
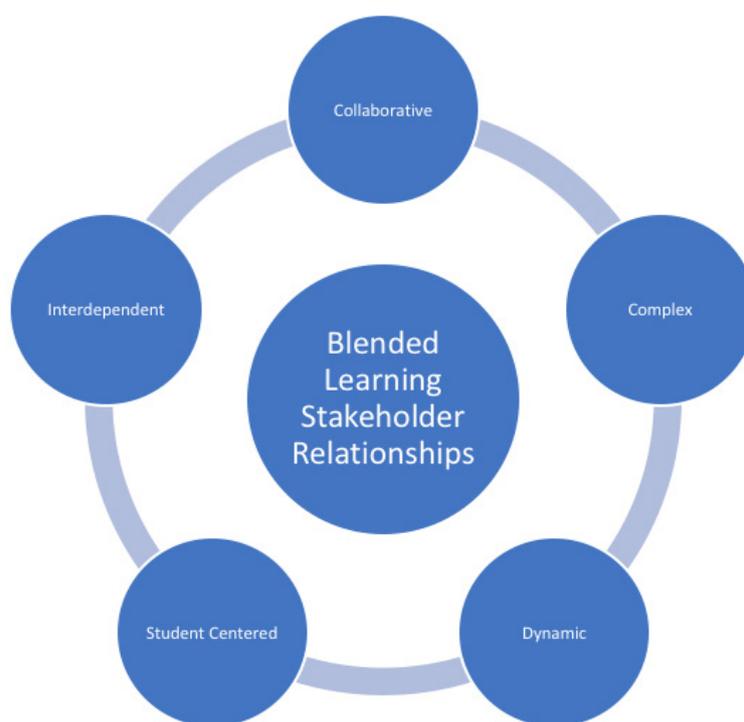
Figure 2. Relationships. This figure displays how stakeholders perceive their relationships of Wang et al.'s (2015) CABLS framework in a high education environment.

DISCUSSIONS AND CONCLUSION

Much of the previous research explored linear relationships between stakeholder groups (Boelens et al., 2018; Holmes & Prieto-Rodriguez, 2018; Horn & Fisher, 2017; Thurab-Nkhosi, 2018), however, none explored the dynamic relationships amongst all of the stakeholder groups in a blended learning environment (Wang et al., 2015). This study focused on exploring the dynamic relationships between different stakeholder groups by developing themes using all stakeholder groups identified in Wang et al.'s (2015) CABLS conceptual framework. Faculty, students, institutional administrators, and learning support members participated in this study to reflect upon their perceived relationships within a higher education blended learning context. Wang et al.'s (2015) CABLS framework was used to use explore the perceptions of stakeholders in a health science higher education setting. The application of the CABLS framework to this context revealed intimate and interdependent relationships that gives insight into the complexities of the blended learning ecosystem. The application of this framework allows for a deeper understanding of how stakeholders perceive meaning within various subsystems and within the entire blended learning system. It is important that all stakeholders have an appreciation of other's roles and how they interact with other components of the framework.

Faculty, students, institutional administrators, and learning support members reflected upon their perceptions of their relationships within the CABLS framework. All stakeholder groups collectively reflected upon how they interacted with the various components of the framework. These components included: the faculty, learner, institutional administrator, learning support, content and technology. Key themes were developed based off the data from all participants reflecting upon their relationships within the CABLS framework. Participants expressed that their relationships were collaborative, complex, dynamic, interdependent, and student-centered. The first theme revolved around participants feeling that collaborative relationships were necessary during curriculum development, problem solving, student learning, and technology selection. It was perceived that a collaborative approach was needed to pull together all stakeholders for input and decision making. Zanin-Yost and Dillen (2019) conducted a study with nursing faculty and librarian support staff and collaboration was also identified as key to support students' academic success. These findings support a collaborative approach from multiple academic stakeholders to ensure a well-developed blended learning environment and positive academic experience.

The second theme centered around participants perceiving the relationships within the CABLS to be complex. Participants perceived that they often had to work with complex technology needs in a blended learning environment. The technologies often had to be properly selected, integrated, updated, and implemented to provide a smooth learning experience. Participants also felt there were multiple moving pieces and multiple stakeholders that were involved in a blended environment. A positive student learning experience often depended upon all of the CABLS components working together in unison. Hamilton (2015) also supported this through the application of a complex systems framework when designing a personized learning community (PLC). Hamilton (2015) explained that there are several components or learning features within a PLC that are dependent upon each other and drive one another. These findings support that the complexities of the blended learning ecosystem need to work together for it to function properly.

Thirdly, participants perceived their relationships with the CABLS framework to be dynamic. There was a perception that a blended learning environment is always evolving and changing. Participants also expressed that there are many innovative approaches and technologies that are used in blended learning. Stakeholders felt that ongoing change allowed for content to be presented in multiple ways to facilitate dynamic learning. The constant exposure to new technologies required stakeholders to take on an open mind to try something new. When a new technology was introduced, stakeholders had to work together to select, implement, and troubleshoot problems. Evenhouse et al. (2017) reported the introduction of a course in blended learning environment can have a challenging transition. Instructors and faculty reported that consistent support as an innovation is introduced increases the chances of adoption and use (Evenhouse et al., 2017). These findings support that a blended learning environment is dynamic and constantly changing, and support and input from stakeholders facilitates positive change.

The fourth theme focused on interdependent relationships. Participants felt that communication was crucial in understanding how all stakeholders are working together in a blended learning environment. Responses confirmed that there was a feeling of reliance on other components of the CABLS framework to create a successful learning environment for the students. It was perceived that faculty, administrators, learning support staff, students, content, and technology had a natural reliance on each other to cultivate a healthy blended learning environment. Stakeholders stressed the multifaceted infrastructure and supportive technology needs to be in place to allow for a seamless learning experience. Kumar and Pande (2017) stated that a blended learning environment is an ecosystem that involves various stakeholders and technology. All of the ecosystem components must function together synchronously to achieve an effective learning platform (Kumar & Pande, 2017). A blended learning environment is a multifaceted ecosystem with intertwined and interdependent relationships.

Finally, all stakeholders perceived that their relationships were student-centered. Stakeholders expressed a responsibility to stay in line with best practice standards to provide an optimal learning experience for the students. Participants felt they had to work together throughout the blended learning process to help students meet their learning goals and course outcomes. NaliakaMukhale and Hong (2017) found that faculty should adopt a student-centered approach to optimize the achievement of student learning outcomes. In addition, Tamim (2018) found that successful teaching strategies in a blended environment should have a focus on "student-centered practices, particularly collaborative projects and student led activities" (p. 70). These findings suggest that a blended learning environment should support a collaborative and student-centered approach.

There were a few limitations of this study and implications for future research. This qualitative study was conducted within a health science higher education institution. The findings cannot be generalized to other populations to the same degree. The faculty and student participants were sampled from a graduate occupational therapy program. There may be limited carry over to other programs. There is the potential for future research to expand beyond this study. Future research could focus on the application of this system-based framework within other institutions or programs that offer a blended learning environment. Researchers could consider using a quantitative research approach that considers multiple variables (i.e. multivariate analysis or regression analysis) to examine the effectiveness of a blended learning environment while considering all components of the CABLS framework. Future research could also explore the roles of the various stakeholders within Wang et al.'s (2015) CABLS framework to gain a deeper understanding of their roles and perceptions within the blended learning environment.

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REFERENCES

Boelens, R., De Wever, B., & Voet, M. (2017). Four key challenges to the design of blended learning: a systematic literature review. *Educational Research Review, 22,* 1–18.

Cleveland, J. (1994). Complexity theory: Basic concepts and application to systems thinking. *Innovation Network for Communities, 27.*

Creswell, J. W. & Creswell, J.D. (2018). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (5th ed.). Thousand Oaks, CA: Sage publications

Creswell, J. & Poth, C. (2017). *Qualitative inquiry and research design: Choosing among five approaches (*4th ed.). Thousand Oaks, CA: Sage publications

Evenhouse, D., Patel, N., Gerschutz, M., Stites, N. A., Rhoads, J. F., Berger, E., & DeBoer, J. (2018). Perspectives on pedagogical change: Instructor and student experiences of a newly implemented undergraduate engineering dynamics curriculum. *European Journal of Engineering Education, 43* (5), 664–678.

Garrison, D. R., & Kanuka, H. (2004). Blended learning: Uncovering its transformative potential in higher education. *The Internet and Higher Education, 7* (2), 95–105.

Garrison, D. R., & Vaughan, N. D. (2013). Institutional change and leadership associated with blended learning innovation: Two case studies. *The Internet and Higher Education, 18*, 24–28.

Graham, C. R., & Robison, R. (2007). Chapter 5: Realizing the Transformational Potential of Blended Learning: Comparing Cases of Transforming Blends and Enhancing Blends in Higher Education. In, Blended Learning: Research Perspectives (pp. 83-110).

Graham, C. R., Woodfield, W., & Harrison, J. B. (2013). A framework for institutional adoption and implementation of blended learning in higher education. *The Internet and Higher Education, 18*, 4–14.

Guest, G., A. Bunce, & L. Johnson. 2006. How many interviews are enough? An experiment with data saturation and variability. *Field Methods, 18,* 59–82.

Hamilton, E. (2015). Advancing a complex systems approach to personalized learning communities: Bandwidth, sightlines, and teacher generativity. *Journal of Interactive Learning Research, 26(*1), 89–104.

Hew, K.F. & Lo, C.K. (2018). Flipped classroom improves student learning in health professions education: A meta-analysis. *BMC Medical Education, 18* (38), 1-12. doi: 10.1186/s12909-018-1144-z

Holmes, K. A., & Prieto-Rodriguez, E. (2018). Student and staff perceptions of a learning management system for blended learning in teacher education. *Australian Journal of Teacher Education, 43* (3), 21–34.

Horn, M. B., & Fisher, J. F. (2017). New faces of blended learning. *Educational Leadership, 74* (6), 59–63.

Kumar, R., & Pande, N. (2017). Technology-mediated learning paradigm and the blended learning ecosystem: what works for working professionals? *Procedia Computer Science,* 122, 1114–1123. doi:10.1016/j.procs.2017.11.481

Lincoln, Y.S., Guba, E.G. (1985). Naturalistic Inquiry. Thousand Oaks, CA: Sage.

Liu, Q., Peng, W., Zhang, F., Hu, R., Li, Y., & Yan, W. (n.d.). The Effectiveness of blended learning in health professions: Systematic review and meta-analysis. *Journal of Medical Internet Research, 18* (1). doi:10.2196/jmir.4807

Manwaring, K. C., Larsen, R., Graham, C. R., Henrie, C. R., & Halverson, L. R. (2017). Investigating student engagement in blended learning settings using experience sampling and structural equation modeling. *The Internet and Higher Education, 35,* 21–33.

Means, B., Toyama, Y., Murphy, R., & Baki, M. (2013). The effectiveness of online and blended learning: A meta-analysis of the empirical literature. *Teachers College Record, 115* (3), 1-47.

Moustakas, C. E. (1994). *Phenomenological research methods.* Thousand Oaks, CA, US: Sage Publications, Inc.

NaliakaMukhale, P., & Hong, Z. (2017). Towards improvement of student learning outcomes: An assessment of the professional development needs of lecturers at Kenyan universities. *Journal of Education and Practice, 8* (12), 151–158.

Ravitch, S. M., & Carl, N. M. (2016). *Qualitative research: Bridging the conceptual, theoretical, and methodological.* Thousand Oaks, CA: Sage Publications.

Rubin, H. J., & Rubin, I. S. (2012). *Qualitative interviewing: The art of hearing* data (3rd ed.). Thousand Oaks, CA: Sage Publications.

Saldana, J. (2016). 3rd ed. *The Coding Manual for Qualitative Researchers.* Thousand Oaks, CA: Sage Publications.

Smith, K., & Hill, J. (2019). Defining the nature of blended learning through its depiction in current research. *Higher Education Research and Development, 38(*2), 383–397.

Tamim, R. M. (2018). Blended Learning for Learner Empowerment: Voices from the Middle East. *Journal of Research on Technology in Education, 50* (1), 70–83.

Thurab-Nkhosi, D. (2018). Implementing a blended/online learning policy on a face-to-face campus: Perspectives of administrators and implications for change. *Journal of Learning for Development, 5(*2), 133–147.

VanDerLinden, K. (2014). Blended learning as transformational institutional learning. *New Directions for Higher Education, 2014* (165), 75–85.

Waldrop, M. M. (1992). *Complexity: The Emerging Science at the Edge of Order and Chaos.* London, UK: Viking Publication.

Wang, Y., Han, X., & Yang, J. (2015). Revisiting the blended learning literature: Using a complex adaptive systems framework. *Journal of Educational Technology & Society,* 18 (2), 380.

Zanin-Yost, A. & Dillen, C. (2019). Connecting past to future needs: Nursing faculty and librarian collaboration to support students' academic success. *Journal of Library Administration, 59* (1), 45–58. doi:10.1080/01930826.2018.1549407

Semi-Structured Interview Guide

This interview guide is aligned with the components (i.e. faculty, learner, institutional administrator, learning support, content and technology) identified in Wang et al.'s (2015) CABLS framework.

- How would you describe your role and responsibilities in blended learning as a
- (faculty member, student, administrator, learning support member)?

- How does your role as a (faculty member, student, administrator, learning support member) interact with the other components of the framework (tell me about your relationships/interactions with the faculty, learner, institutional administrator, learning support, content and technology)?

- Can you describe a blended learning experience in which you interacted with the other components (faculty, learner, institutional administrator, learning support, content and technology) of the framework?

- Can you describe how all the stakeholders (teacher, learner, administrator, and learning support) of the blended learning framework work together to achieve a common goal?

- In your experience, what characteristics does an effective
- (faculty member, student, administrator, learning support member) have in a blended learning environment?

- What expectations do you have for the other components/stakeholders of the framework?

- Would you like to add anything else before we conclude the interview session? Do you have any questions?

THE EFFECT OF FLIPPED CLASSROOMS ON L2 LEARNERS' DEVELOPMENT AND RETENTION OF GRAMMATICAL KNOWLEDGE

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ABSTRACT

The present study was conducted within the framework of sociocultural theory to examine the effect of flipped instruction on Iranian English as a foreign language (EFL) learners' development of conditional sentences. The study benefited from quantitative methodology within which 60 intermediate Iranian male EFL learners who were checked for their language proficiency by an Oxford Quick Placement Test (OQPT) to meet the homogeneity assumption were selected and given a pre- and post-test as well as a delayed post-test on conditional sentences. Half of the learners formed the experimental group and the remaining participants were assigned to the control group. The flipped instruction occurred through WhatsApp and was amplified by face to face discussions on the linguistic materials. Online learning environment armed the learners with the formal instruction of conditional sentences while the in-class time was devoted to tap into meaningful interaction for internalizing the previously-uploaded audio and video grammar tasks. The learners in the control group were provided with direct instruction by using traditional whiteboards. Results revealed that the experimental group, receiving flipped teaching, outperformed the control group that received conventional type of grammar instruction. Moreover, the use of flipped model resulted in significant improvement in learning and retention of conditional sentences. Findings also demonstrated that learners benefited from flipped-taught grammar augmented through feedback in the face-to-face classroom, which acts as the mediator between the teacher and the learners. It can be strongly recommended that teachers can take advantage of flipped instruction in providing effective instruction of language skills and sub-skills and facilitate the learning process for the learners as well.

Keywords: English Language Teaching, Flipped instruction, grammar learning, sociocultural theory

INTRODUCTION

Technology has been the focus of second and foreign language instruction since the 1960s (Blake, 2008; Warschauer & Healey, 1998). Theories such as behaviorist perspective highlighted the application of technology in teaching by directing the scholars' attention toward using computer and mobile (Warschauer

& Healey, 1998). Then, behavioristic approach was rejected in the late 1970s and early 1980s by socio-cognitive view, arguing that teaching language skills takes place in an authentic environment by using a variety of technological tools, instead of visiting the computer lab once a week (Warschauer & Healey, 1998; Kalin, 2012).

The idea of flipped classroom, initially known as inverted classroom, was introduced by Jonathan Bergmann and Aaron Sams in 2007 when they benefited from using video lessons to increase the quality of teaching chemistry. They recorded class lectures and the learners were provided with the online videos to watch and review the teaching contents. The study contributed to significant findings, which inspired the two teachers to further employ it before classes. They argued that flipped teaching provides a warm-up before class when learners come to class knowing exactly what they are expected to do. This pre-existing knowledge enables them to have conscious understanding of the to-be-covered-materials, which may be done collaboratively, individually or online. Such atmospheres foster more active involvement and independence in learning since learners are more focused and responsible of their learning (O'Flaherty, & Phillips, 2015). In other words, they are able to make connections between the learning they did before coming to class and class activities that reinforce their learning (Nielsen, 2012). Flipped instruction is defined as "...an act of delivering an outside-class direct instruction to the individuals in an attempt to have more strategic use of in-class time to further engage in group work, individualized and personalized attention" (Bergmann & Sams, 2014, p. xi). Herman and Banister (2007) showed that direct instruction through lecture is inadequate when it comes to fostering more learners' involvement and their deeper thought (Bligh, 1998). The researchers argued that flipped instruction connects the use of online materials which then practiced through lecture to create active learning that puts the student at the center of learning and the educators become the guides (Burgan, 2006).

Although technology is a beneficial teaching tool, face-to-face instruction is still supported by researchers for information delivery. The challenging point is how face-to-face instruction could be incorporated into technology in order to enjoy the benefits of both a blended learning approach as an instructional technique in the most effective and efficient way (Neumeier, 2005). Although there is no consensus regarding the allocation of online and face-to-face instructional time (Garrison & Vaughan, 2007), Garrison and Kanuka (2004) insisted on the maximum benefit when teachers arrive at the most desirable way to integrate these two instructional components to meet the pedagogic needs of the target curriculum. This integration can eliminate problem of the shortage of time which prevents interactive activities. Traditional classrooms dominated by teachers' lectures cannot take account of learners' engagement (Berman, 2015). Moreover, grammar acquisition necessitates more effective methods to motivate learners in the in the grammar classroom. Teachers suffer from insufficient teacher-student and student-student interaction. Iranian EFL students appear to have difficulty learning a complete range of English materials presented by the teachers (Maleki & Zangani, 2007) regardless of no or less communication in the classroom.

Although some researchers such as Bergmann and Sams (2009), Bishop and Verleger (2013), and Berrett (2012) confirmed the practicality of flipped classrooms, it can be argued that teacher' role in the flipped classroom has not sufficiently been recognized since they moves into the role of the coach or guide, who provide assistance for the learners how to integrate all that information, perform a skill, or interact with others face to face (Berman, 2015; Berrett, 2012), which is a source of concern for teachers. There also seems to be no clear-cut distinction of formal or communicative dimensions of flipped classrooms. This demands more research to uncover the hidden aspects of flipped instruction.

In a recent study, Ekmekci (2017) investigated the impact of flipped instruction on the development of writing skill among Turkish students. More specifically, he compared the effects of flipped and traditional face-toface writing classes on the basis of writing performances. The results of this experimental study showed that flipped writing classes improve students' writing proficiency more than the traditional lecture-based writing instruction.

Similarly, Hung (2015) explored the effects of flipping the classroom on English language learners' academic performance, participation levels, and learning attitudes. Investigating three different formats for flipped teaching, the researcher found that the structured and semi-structured flipped lessons lead to better learning outcomes, foster better learners' attitudes, and result in more effort to the learning process. Moreover, Bauer-Ramazani, Graney, Marshall & Sabieh (2016) attempted to define and describe the flipped learning and

examined the possibilities to promote language acquisition in the context of Teachers of English to Speakers of Other Languages (TESOL). They also reported the possible benefits and challenges of the new method.

Last but not least, the flipped classroom requires the occurrence of learners' autonomy at home using online videos and actively taking part in class for effective discussions. In contrast with second language learners who rely on their own independent learning, foreign language learners might be greatly dependent on teachers' role in doing the tasks. This criterion seems to see foreign language students become pre-accustomed to laid-back learning, which relies on teachers' support rather than being individually involved in the problem-solving tasks (Wang, 2006), which recognized the practical role of flipped teaching and learning (Chambers, 2010; Kong, 2015). This also lies in sociocultural theory (Vygotsky, 1978) which shows that learners are able to self-regulate their learning experiences through meaningful interaction and mediation as well as scaffolded feedback directed toward the learners' zone of proximal development (ZPD) (Lantolf & Throne, 2006). In other words, flipped classroom can be justified and well-supported by sociocultural theory since it suggests facilitating learners' engagement in the classroom that is caused by the instruction they received.

Using instructional materials as an online activity can bring about multiple situations in which development of a grammatical structure may be required. Merely learning the grammatical rules explicitly by formal representation cannot help use grammar effectively (Bergmann & Sams, 2012). As a result, grammar teaching should involve an online activity, which results in the existence of multiple situations bringing about further elucidation of a grammatical structure, an example of which can be conditional sentences. Therefore, inspired by the sociocultural theory, the present study aimed to look into the effect of flipped teaching on the Iranian EFL learners' learning and retention of conditional sentences by addressing the following research questions:

RQ1. Does using flipped instruction have any statistically significant effect on Iranian intermediate EFL learners' learning of English conditional sentences?

RQ2. Does using flipped instruction have any statistically significant effect on Iranian EFL intermediate learners' retention of English conditional sentences?

RQ3. Are there any significant differences between flipped-taught classroom and traditional-taught classroom in terms of their effects on Iranian intermediate EFL learners' learning of English conditional sentences?

RQ4. Are there any significant differences between flipped-taught classroom and traditional-taught classroom in terms of their effects on Iranian intermediate EFL learners' retention of English conditional sentences?

LITERATURE REVIEW

Recent research has sufficiently demonstrated the effectiveness of flipped instruction on the learners' academic gains. Prunuske, Batzli, Howell, and Miller (2012) pointed out that the development of the learners' pre-existing knowledge by online lectures could result in their increased performance on lower-order cognitive learning objectives. Meanwhile, in the classroom they can improve higher-order cognitive capabilities. Furthermore, benefiting from current computer software or mobile apps outside the classroom and exposing the learners to communicative environment inside the classroom enable learners to construct their knowledge through engaged learning activities.

In a quantitative study done by Strayer (2012), exposure to flipped and traditional instruction was examined regarding the learners' language learning achievement. The learners' perceptions about the learning environment were explored as well. The educational benefits of flipped teaching were recognized in the study since significant difference was observed between the flipped and traditional groups. In fact, the learners in the experimental group were reported to be in favor of cooperation in the learning environment fulfilled by flipped instruction in comparison with the control group undergoing the traditional instruction. The study aimed to broaden the scholars' insights regarding the practical use of this technique in paving the way for teachers and learners to perform as productively as possible. Moreover, flipped learning, according to the learners' perceptions, can be more in alignment with the learners' needs of 21st century.

Sahin, Cavlazoglu, and Zeytuncu (2015) took account of college students' achievements in their language courses when they were provided with videos in doing the related tasks of reading comprehension. The researchers encouraged the students to watch videos while reading in order to stimulate their comprehension. They were cordially invited to share their thoughts and have discussion with their peers regarding the videos in order to help them widen their viewpoints concerning the focused reading topic. In addition, the learners' level of self-efficacy increased by fostering their communicative skills, which was in converse with low-leveled self-efficacy learners who underwent traditional learning.

In his longitudinal research, Pence (2016) did a pilot study of a flipped learning with the participation of 70 students. In order to adhere to flipped learning environment, the students were accessed by prerecorded audio podcasts. While the students were in class, they were encouraged to have active learning by discussion on the audio files and directing their attention toward Power Points embedded with animation and diagrams, You Tube videos, and use of cell phones and iPads to conduct online searches related to in-class learning activities. Over the 2-year pilot study, the great level of satisfaction was reported by the students who were armed with the flipped classroom model.

In addition to above-mentioned studies confirming the effectiveness of flipped instruction, it should be theoretically taken into consideration. Flipped Learning intended to render a student-centered classroom through the use of technology causes more opened in-class time for interactive peer activities (Bishop & Verleger, 2013, Gough et al., 2016, Krumsvik & Jones, 2016). Students watching their teacher's instructional videos come prepared to their class and engage in classroom activities. The teacher spearheading collaborative and interactive activities attempts to heighten the relevant subject matter and develop more active students in class (Bergmann & Sams, 2012, Gough et al., 2016). Since flipped learning is placed on the basis of interaction with others and interaction with digital tools, this study utilizes a sociocultural approach to learning as its theoretical basis. One of the primary concepts of sociocultural theory is its claim that the human mind is mediated (Lantolf, 2000). Lantolf believed that Vygotsky (1978) recognized a significant role for what he called 'tools' in humans' understanding of the world and of themselves. Lantolf claimed that Vygotsky advocated that humans do not act directly on the physical world without the intermediary of tools. In Vygotsky's opinion, symbolic tools or signs are artifacts created by humans under specific cultural (culture specific) and historical conditions, and by their very nature they carry with them the characteristics of the culture in question. They are applied as aids in solving problems that cannot be solved in the same way in their absence. In turn, they also have an influence on the individuals who use them in that they bring about previously unknown activities and previously unknown ways of conceptualizing phenomena in the world. Therefore, they are modified as they are passed from one generation to the next, and each generation reworks them in order to meet the needs and aspirations of its individuals and communities.

An important concept in sociocultural theory is known as the ZPD. According to Vygotsky, the zone of proximal development "is the distance between the actual development level as determined by independent problem solving and the level of potential development as determined through problem-solving under adult guidance or in collaboration with more capable peers" (Vygotsky, 1978, p. 86). It includes all of the knowledge and skills that a person cannot understand or perform on their own yet but is capable of learning with sufficient support and guidance. As people are allowed to develop their skills and knowledge, often by observing someone who is more capable than they are, they are able to progressively extend this zone of proximal development. In fact, as Vygotsky (1978) argued, the idea is to move learners from other-regulation (receiving learning support from a more knowledgeable person) to self-regulation (the learners' ability to do the tasks on their own) which shows the effectiveness of target instruction and the learners' development in the learning process. In a flipped classroom the teacher or more competent peers are present to provide learning support or *scaffolding* for performing instructional activities.

Scaffolding as a conceptual tool associated with ZPD accounts for the way that teachers help their students complete instructional tasks activities and entails evaluation, feedback, and tapering off support (Wood et al., 1976). Scaffolding involves a teacher's presence to constantly assess how a student gets along in performing a given task to make sure that the students do not get disoriented and their motivation for completing the task does not wane. To this end, the teacher should simplify the task by lessening the task requirements that the learner needs for completing the task (Wood, Bruner, & Ross, 1976). Teachers can customize their feedback they give to spur learners' continual development, then taper off their support on

the particular learning task in order to empower learners to move on to a level at which they perform the tasks unaided. In the Flipped Classroom, video lectures are viewed as a scaffolding. Since videos should be short and concise, teachers providing the video lectures can condense the instructional content in order to lower the degrees of freedom and requirements of a given subject (Bergmann & Sams, 2014, Murray, et al., 2015). A flipped classroom frees up in-class time to set the ground work for more individual and small group instruction (Yarbro, et al., 2014). This offers the teacher the opportunity to be present in class to help students complete the task by keeping learners' interests unabated and the direction of the task clear, the key objective and focus of scaffolding (Wood, et al., 1976, Pea 2004). The technology in Flipped Learning is leveraged for scaffolding learners.

Recent studies above as well as inspired from sociocultural theory of learning show the significant role of flipped instruction in facilitating the learners' language achievement in different contexts. Thus, flipped teaching and its conscious utilization in the context of foreign language are demanding in order to see how it might affect the learners' development and retention of conditional sentences, which might produce insightful research areas in flipped teaching and learning.

METHOD

Participants

The participants of the study were selected using convenience sampling procedure. To add more value on the adoption of convenience sampling, Mackay and Gass (2005) also believe that researcher can rely on such sampling to appropriately initiate data collection procedures. Moreover, it also assists researchers to save the time, which is another point of dispute for the researchers regarding the selection of the related participants.

The present study was conducted with the participation of 60 students who were studying English in a private language institute named Donyaye Kia Language Institute, in Isfahan to investigate the effect of flipped instruction on their grammar learning. It is noteworthy that the participants were randomly divided into one experimental group (n=30) and one control group (n=30). The participants' age range was between 15 to 25 years old. To make sure about the homogeneity of the participants, they took Oxford Quick Placement Test (OQPT) to select intermediate language learners for the sake of data collection.

Instruments

The following instruments were used in the present study:

Oxford Quick Placement Test (OQPT)

Oxford Quick Placement Test (OQPT) was administered at the beginning of the study to select a homogenous sample in terms of language proficiency. It is noteworthy that the participants of the study were of intermediate level based on the OQPT scoring criteria. As to the purpose of the present study, QOPT includes 60 multiple choice items on vocabulary (30 items) and grammar (30 items). The rationale behind the application of the OQPT was firstly the fact that - compared to the other tests - the participants of the study were believed to be more familiar with the structure of this test. Secondly, this test, as previously mentioned above, can assist the researcher to go for homogenous participants of the study (Allen, 1992).

Researcher-made Grammar Diagnostic Test (Pre-Test)

The validity and reliability The English grammar diagnostic test, which was used as the pre-test of the study, was utilized to test the participants' initial knowledge of conditional sentences. The pre-test consisted of 25 multiple choice questions of conditional sentences from 'Grammar in Use' (2009) book (intermediate level). There was one score for every correct response.

Concerning the reliability measure of the pre-test, a pilot study was conducted with the participation of 20 intermediate learners (from another private institute with similar characteristics of the participants of the

present study) to go for the test score consistency. Reliability coefficient was found to be 0.74 (using KR-21 formula), which seemed to be an acceptable value in terms of consistency of scores as highlighted in Farhady, Jafarpour, and Birjandi (1994). The reliability of the pre-test is shown in Table1.

Table 1. Reliability of Researcher-Made Grammar Diagnostic Test

N	Mean	SD	Variance	Reliability
20	21.54	5.66	44.15	0.74

Researcher-made Grammar Achievement Test (Post-Test)

The validity and reliability In order to investigate the effect of flipped instruction on the learners' development of conditional, the post-test was administered to take the learners' post scores into account and have their achievement investigated after the intervention. The same as the pre-test, it consisted of 25 multiple choice items chosen from 'Grammar in Use' (2009) book of intermediate version and concentrating on the target form, i.e. conditional sentences.

Regarding the reliability coefficient of the post-test, the same participants, who took part in the pilot study for the pre-test, received the post-test to check the consistency of the post-test scores with the application of KR-21 formula. The reliability was measured as 0.76 highlighting a logical amount of consistency measure. Reliability of the post-test is shown in Table 2.

Table 2. Reliability of Researcher-Made Grammar Achievement Test

N	Mean	SD	Variance	Reliability
20	23.12	6.83	47.82	0.76

As to the construct validation of the pre- and post-tests, the researcher checked the test items and finalized them with the consultation of the two Ph.D. holders of TEFL and one expert statistician to meet the validity issue of the test. The face validity of the test was also done by consulting the so-called experts.

Delayed Post-Test

Two weeks after the flipped instruction as the treatment of the study, the delayed post-test of grammar was administered to check the learners' retention on grammar learning. The delayed post-test questions were similar to those of the post-test; however, the items were reshuffled in order to reduce the potential practice effects.

Data Collection Procedures

Initially, the QOPT was administered among the experimental group as well as the participants in the control group to check their homogeneity in terms of their proficiency level and select intermediate learners at Donyaye Kia Language Institute in Isfahan, Iran according to convenience sampling. Prior to the administration of the pre- and post-tests of grammar, a pilot study was conducted to measure the reliability of the grammar pre- and post-tests. After that, the grammar pre-test was administered to diagnose the learners' initial knowledge of conditional sentences. Then, the experimental group received 12 one and a half-hour treatment sessions (both online and face to face) of flipped grammar instruction by WhatsApp, directing the learners' attention to the grammar tasks provided by the teacher. The explanations of the treatment sessions in WhatsApp and inside the classroom are provided in detail as follows.

In WhatsApp environment, the learners were given a complete explanation regarding the purpose of the research in the first session and they were told that they had to stay online at certain times. The teacher invited the participants to hold the online sessions by creating a group and added the selected participants. In order to stimulate the learners' participation, the teacher informed them that they could get bonus to do their best in the WhatsApp group. In fact, WhatsApp was used as a mediator for introducing and providing the related tasks of conditional sentences. The learners were provided with grammar activities to provide a rather direct instruction of target conditional forms through the related audio and video files uploaded for further discussion inside the classroom. The teacher ensured that all the participants were able to parse the tasks and carry them out and expected them to ask for any ambiguities they might feel. WhatsApp probably aimed at providing formal instruction of grammar by presenting various instances of conditional forms to the learners. The teacher provided textual feedback for the learners' questions regarding the tasks. However, the teacher attempted to clarify the conditional sentences by stating the governing rules under conditional statements and encourage the learners to produce their own examples. In this way, input was given directly to the participants regardless of having discussion or interaction on the grammar tasks and challenging the learners, which were fulfilled inside the classroom. It is notable that the grammar tasks were also taken from the learners' workbooks and other supplementary material covered in their syllabus. After each online session, the face to face session of that online class was subsequently provided in the classroom environment to discuss the uploaded material focusing on conditional sentences.

Within the classroom, the teacher started the instruction by making a warm-up and directed the learners' attention to the tasks provided on WhatsApp to initiate the interactional grammar instruction. The learners were expected to have oral interaction with their classmates by sharing their opinions. Warm-up aimed at enhancing the learners' attention to interactively focus on the target forms. The grammar tasks, which were in printed formats as well, also included some instances of conditional sentences that were highlighted, bold, italicized, and underlined, aiming to indirectly activate the learners' noticing of target grammar . In fact, the grammar tasks were those uploaded in WhatsApp. The teacher gave the learners some time to work on the tasks on their own and then share their general understanding of the topic. The teacher attempted to guide the learners to focus on the target tasks by asking a lot of information and clarification questions and involving the majority of participants in the context of the classroom to discuss the matter and simultaneously producing the target conditional sentences regardless of explicitly explaining the rule underlying them. The teacher gave oral corrective feedback on the learners' answers for the purpose of better learning of the conditional sentences.

The learners were also encouraged to have peer interaction while working on the selected tasks of grammar. In fact, by meaningful interaction of participants created by teachers' questioning, the learners' attention was directed to the target grammar forms, which facilitated the production process. In fact, the purpose was to provide an opportunity for the learners to orally interact with their classmates and the teacher, while inspired from the previously-prepared material on the online environment, for the purpose of better and quality grammar learning, as well.

However, no mixture of technology enhanced instruction and face to face learning environments were applied in the control group and they underwent traditional instruction of grammar without benefiting from mobile apps and interactive classroom. In other words, the teacher tried to use whiteboard and initially provide the rules for making conditional sentences proceeded by some examples of them and asked learners to produce their own statements. No attempt was made to challenge the learners' wrong answers and they were merely given positive or negative feedback on their responses.

After 12 sessions of flipped grammar instruction by WhatsApp and classroom learning environment, the participants took the grammar post-test. Two weeks after the administration of the post-test, learners took a delayed-post-test to look into the two groups' retention of grammar learning.

FINDINGS

The First Research Question

The first research question of the study aimed at investigating the learners' scores on the pre- and post-test affected by flipped instruction. Test of normal distribution (see Table 3) was initially carried out to see if the scores of the learners in both groups, i.e. experimental and control learners were distributed normally.

Table 3. Shapiro-Wilk Tests of Normality

	Group EC	Shapiro-Wilk		
		Statistic	df	Sig.
Pretest	Experimental	.956	30	.554
	Control	.925	30	.127
Posttest	Experimental	.932	30	.082
	Control	.977	30	.610
Delayed Posttest	Experimental	.942	30	.116
	Control	.963	30	.492

First of all, tests of normal distribution were run to see if the data were distributed normally. The non-significant sig. values (> .05) of Table 3, the Shapiro-Wilk Table, indicate that the pattern of distribution of the scores was normal for the pre-test, post-test, and delayed post-test of both the experimental and control groups. Therefore, parametric tests could be used to analyze the data. Descriptive statistics for the experimental group are shown in Table 4.

Table 4. Descriptive Statistics for the Pre- and Post-Test of the Experimental Group

	Mean	N	Std. Deviation	Std. Error Mean
Pretest	14.8000	30	2.69801	.54160
Posttest	19.6800	30	3.38100	.68000

The descriptive statistics in Table 4 demonstrates that the EFL learners learning of conditional sentences improved from the pre-test (M= 14.80) to the post-test (M= 19.68). Therefore, the flipped instruction descriptively resulted in improvement in the learners' grammar learning. To inferentially compare the mean scores of the experimental groups in the pre- and post-test, a paired samples t-test was run the results of which are provided in Table 5.

Table 5. Paired Samples T-Test Statistics for the Pre- and Post-Test of the Experimental Group

	Paired Differences							
				95% Confidence Interval of the Difference				Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	
Pretest - Posttest	-4.88000	3.18553	.62631	-6.05406	-3.59594	-7.995	29	.000

Table 5 shows a significant improvement from the pre-test to the post-test (sig (2-tailed) = .000, t= -7.99, df= 29). The mean difference equals - 4.88 and the 95% confidence interval (CI) rests on -6.05 at the lower and -3.59 at the upper bound showing a large effect size (Cohen's d= -1.53). Therefore, the Table indicates that the flipped instruction resulted in significant improvement in the Iranian EFL learners' learning of conditional sentences.

The Second Research Question

The second research question of the study examined the learners' retention of conditional sentences when they were exposed to flipped grammar instruction. In doing so, the learners' responses to the grammar pre-test and delayed post-test are analyzed. Table 6 shows the descriptive statistics for experimental groups' performance on the two occasions.

Table 6. Descriptive Statistics for the Pre-Test and Delayed Post-Test of the Experimental Group

	Mean	N	Std. Deviation	Std. Error Mean
Pretest	14.8000	30	2.69801	.54160
Delayed Posttest	20.2000	30	3.35505	.60041

The descriptive statistics in Table 6 demonstrates that learners' grammar learning improved from the pre-test (M= 14.80) to the delayed post-test (M= 20.20). The descriptive statistics also reported that the learners' mean score is higher on the delayed post-test (M= 20.20,) than on the post-test (M= 19.68) (see Table 4). Therefore, using flipped teaching provided an atmosphere for the learners to improve their retention of conditional sentences. To inferentially compare the mean scores of the experimental groups, Table 7 is provided in the following.

Table 7. Paired-Samples T-Test Statistics for the Pre-Test and Delayed Post-Test of the Experimental Group

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pretest - Delayed Posttest	-5.40000	3.49188	.71438	-6.33963	-3.95011	-7.708	29	.000
Posttest - Delayed Posttest	-.52000	1.35684	.23937	-1.10722	.07741	-1.807	29	.085

Table 7 shows a significant improvement from the pre-test to the delayed post-test (sig (2-tailed) = .000, t= -7.70, df= 29). The mean difference equals -5.40 and the 95% CI rests on -6.33 at the lower and -3.95 at the upper bound showing a large effect size (Cohen's d= -1.54). The statistics, however, showed a non-significant improvement from the post-test to the delayed post-test (sig (2-tailed) = .085, t= -1.80, df= 29). The mean difference equals -.52 and the 95% CI rests on -1.10 at the lower and .07 at the upper bound showing a negligible effect size (Cohen's d= -.38). Therefore, it can be concluded that the flipped instruction resulted in significant improvement on Iranian EFL intermediate learners' retention of English conditional sentences.

The Third Research Question

The third research question of the study looked into the learners' grammar learning concerning the experimental and control groups' performance on the pre- and post-test of grammar after being exposed to flipped and traditional grammar instruction. Therefore, descriptive statistics are initially presented (see Table 8).

Table 8. Descriptive Statistics for the Experimental and the Control Groups' Pre- and Post-Test

	Group EC	N	Mean	Std. Deviation	Std. Error Mean
Pretest	Experimental	30	14.8000	2.69801	.54160
	Control	30	14.7200	2.59189	.51360
Posttest	Experimental	30	19.6800	3.38100	.68000
	Control	30	14.8000	2.77312	.55962

The descriptive statistics in Table 8 highlight the fact that the learners' grammar learning in the experimental group (M= 14.80) was just a little higher than the mean score of the control group (M= 14.72), which showed that the there was a similarity of the pre-test scores in their grammar learning before the treatment sessions It, however, demonstrated that the mean score of learners' grammar learning in the experimental group (M= 19.68) was higher on the post-test than the mean score of the control group (M= 14.80, SD= 2.84), which also delineated that the experimental group, who benefited from flipped-taught classroom, had higher grammar learning than the control group on the post-test and the end of the research. Therefore, it seems that there exists a significant difference between the two groups' grammar learning. In order to compare the students' mean scores in the experimental and the control group, independent samples t-test for both the pre-test as well as the post-test of the two groups was run as in the following.

Table 9. Independent-Samples T-Test for the Pre-Test of the Experimental and Control Groups

	Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	.178	.675	.107	58	.905	.08000	.74500	-1.39798	1.58998
Equal variances not assumed			.107	58	.905	.08000	.74500	-1.41810	1.57890

The Levene's test in Table 9 shows a non-significant sig. value (F= .178, sig. =.675) indicating that the variances of the scores of the experimental and the control group were equal. Accordingly, the independent-samples t-test statistics showed a non-significant difference between the pre-test scores of the experimental and the control groups (sig (2-tailed) = .905, t= .10, df= 58). The mean difference equals .08 and the 95% CI rests on -1.39 at the lower and 1.58 at the upper bound, which highlight the similarity of the two groups' grammar learning before the treatment sessions of the flipped instruction.

Table 10 indicates the groups' performance on the grammar post-test.

Table 10. Independent-Samples T-Test Statistics for the Post-Test of the Experimental and Control Groups

| | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | 95% Confidence Interval of the Difference | |
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference		Lower	Upper
Equal variances assumed	.618	.429	5.605	58	.000	4.88000	.89942		3.09774	6.66226
Equal variances not assumed			5.605	58	.000	4.88000	.89942		3.09670	6.66370

As Table 10 demonstrates, a non-significant sig. value (F= .618, sig. =.429) was observed, which showed that the variances of the scores of the experimental and control group were equal. Accordingly, the independent-samples t-test statistics showed a significant difference between the post-test scores of the experimental and the control groups (sig (2-tailed) = .000, t= 5.60, df= 58). The mean difference equals 4.88 and the 95% CI rests on 3.09 at the lower and 6.66 at the upper bound, which showed a large difference and that the EFL learners in the experimental group outperformed the control group in grammar learning on the post-test. In other words, there was a statistically significant difference between the effect of flipped-taught classroom and traditional-taught classroom on Iranian intermediate EFL learners' learning of English conditional sentences. The results of the delayed post-test are also presented below.

The Fourth Research Question

The fourth research question of the study looked into the EFL learners' retention of conditional sentences by taking into account their grammar scores on the pre-test and the delayed post-test. First, descriptive data are provided in the following Table 11.

Table 11. Descriptive Statistics for the Experimental and the Control Groups' Pre-Test and Delayed Post-Test

	Group EC	N	Mean	Std. Deviation	Std. Error Mean
Pretest	Experimental	30	14.8000	2.69801	.54160
	Control	30	14.7200	2.59189	.51360
Delayed Posttest	Experimental	30	20.2000	3.35505	.60041
	Control	30	14.9200	2.99112	.54412

The descriptive statistics in Table 11 shows the similarity of the learners' grammar score in the experimental group (M= 14.80) and the control group (M= 14.72) on the pre-test. However, as the Table reveals, mean score of the learners in the experimental group (M= 20.20) was higher on the delayed post-test than the mean score of the control group (M= 14.92), highlighting the outperformance of the flipped-taught classroom learners' grammar retention over the control group on the delayed post-test. In order to compare the students' mean scores in the experimental and the control group, independent samples t-test was used as in the following.

Table 12. Independent-Samples T-Test Statistics for the Delayed Post-Test of the Experimental and Control Groups

| | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
								Lower	Upper
Equal variances assumed	1.332	.283	5.760	58	.000	5.28000	.83200	3.42445	7.12555
Equal variances not assumed			5.760	58	.000	5.28000	.83200	3.52290	7.07710

As with Table 12, a non-significant sig. value (F= 1.33, sig. =.283) was calculated, which denoted that the variances of the scores of the experimental and control group were equal. Accordingly, the independent-samples t-test statistics showed a significant difference between the delayed post-test scores of the experimental and the control groups (sig (2-tailed) = .000, t= 5.76, df= 58). The mean difference equals 5.28 and the 95% CI rests on 3.42 at the lower and 7.12 at the upper bound, which reported a large difference and that EFL learners in the experimental group also outperformed the control group in grammar learning on the delayed post-test. In other words, there was a statistically significant difference between the effect of flipped-taught classroom and traditional-taught classroom on Iranian intermediate EFL learners' retention of English conditional sentences.

To sum up the results of the study, using flipped instruction had statistically significant effect on Iranian intermediate EFL learners' learning and retention of English conditional sentences.

DISCUSSION

This study attempted to examine the effect of flipped teaching and learning on the learners' improvement in learning and retention of conditional sentences. Thanks to controlling all variables such as age, pre-existing knowledge and general achievement in English, the findings solely stemmed from the application of the Flipped classroom. As to the findings of the study, by measuring the pre-, post-, and delayed post-test scores of the learners in the experimental and control groups, it was found that the experimental group significantly outperformed the control group after the treatment (i.e. flipped instruction in teaching conditional sentences), demonstrating that integration of technology into the classroom was quite successful in helping the learners to improve their grammar learning (Ekmekci, 2017; Blake, 2008; Warschauer & Healey, 1998). Hence, this study, to a large extent, proved that flipped teaching can be accounted for at the service of teaching grammar by involving the learners into the communicative context and putting them at the center their prior experiences. Moreover, the prevailing atmosphere in the flipped classroom positively impacted learners to display more interest, participation and engagement. The present study found empirical support to results obtained by Bergmann and Sams (2014) and Prunuske et al. (2012), who concluded that using technology and face-to-face instruction can pave the way for the learners to engage in an interactive learning environment and be as an active participant in the language learning process and improve their language skills and sub-skills. Watching videos containing specific content is seen as a source of preparation for in-class activities and discussions because students knew what points were going to be presented in class time. Moreover, concise format of videos enabled students to better retain the information presented in videos and to further feel secure for participating in class activities. The videos were viewed as a tool to for scaffolding the information as the reduction of task requirement and the degrees of freedom were intended to support the students in performing the in-class activities.

From another point of view, flipped instruction could lead to improvement in the learners' grammar knowledge in comparison with the control group, which can be greatly dependent on the Iranian learners' preference to use technology devices and discuss the tasks in the classroom. In fact, the learners' preference to use mobile apps (WhatsApp in this study) and its easy access to the educational materials provided by the teacher and discuss them in the face-to-face classroom instruction seemed to enhance the learners' enthusiasm to perform better than being exposed to traditional learning environment, which resulted in more improvement in grammar learning.

To add more value concerning the effectiveness of flipped teaching, Haung (2015), Berrett, (2012) and Sahin, et al. (2015) suggested that it can provide an atmosphere for teachers to monitor their teaching in the online learning environment (which could be the formal aspect of flipped teaching) while the feedback is given in the classroom to foster more interactive learning atmosphere in order for the teachers and learners to benefit from purposeful classroom involvement (which is probably the communicative aspect of flipped classroom). In fact, as argued by Strayer (2012) and Berman (2015), integration of online instruction into classroom activities can be positively applied in language teaching to direct the learners' attentions to the tasks and give feedback to the learners, assisting the learners to have better concentration on task by developing more interaction in the language classroom, which causes more chances of learners' participation in the learning environment resulting in their success in the learning process (Moranski & Kim, 2016; Bishop & Verleger, 2013).

Results were also indicator of the efficacy of flipped instruction on the learners' retention of grammar learning, which can be in alignment with Pence's (2016) research in which the learners who were armed with flipped instruction could maintain their language achievement during two years. It appears that flipped teaching helped learners of the current study to internalize the conditional sentences by encouraging frequent engagement in the classroom doing the selected tasks cooperatively (Prunuske et al., 2012) by benefiting from both teacher's support as well as peer feedback (Chambers, 2010). When it comes to the learners' retention of the conditional sentences, the teacher attempted to provide a mechanism through which the learners were exposed to conscious grammar learning environment by being able to do their own correction at the end of the treatment sessions, which makes the learning practice to be more consistent (Garrison & Vaughan, 2007).

Finally, it is notable that findings of the present research showed that flipped teaching acted as the mediator between the learners and the teacher by providing a motivating learning environment for the learners. This lies in sociocultural theory of learning (Vygotsky, 1978) that is in favor of arming the learners with scaffolding to self-regulate their language learning process (Lantolf, 2000). Teacher's feedback in the flipped classroom can be found to be successful since it might target the learners' ZPD by helping them to be aware of their probable conversational errors and revise them accordingly through teacher's permanent support (Lantolf & Throne, 2006). Flipped instruction could pave the way for EFL learners to manipulate the learning environment and foster more communication in the classroom (Vygotsky, 1978) to both develop and maintain their grammatical knowledge.

CONCLUSION

A conscious design of connecting video lectures and in-class tasks in flipped learning builds a bridge between home and school as two different social worlds. Flipped Learning enables learners to engage in a more interactive technology-infused and student-centered learning environment. In theory, Flipped Learning enables learners to build skills in collaboration, and using digital tools as resources, yet the research on flipped learning is in its infancy. Moreover, flipped classrooms can be especially promising in language learning contexts, given their potential to promote learner agency and consciousness raising. In fact, our results suggest that flipped instruction can promote classroom interactions that allow learners (a) to assume higher levels of autonomy in learning for longer periods of time and (b) to be more conscious of the grammatical structures taught via flipped clasrooms.

This study was conducted within the framework of sociocultural theory to justify the results of the present research. Quantitative measures of the pre- post- and delayed post-tests found that the students in the experimental group could significantly outperform the control group in their development of conditional

sentences. However, the study also suffered some limitations. Firstly, convenience sampling was used to shoose the participants of the study because true randomization was not possible for the authors. Secondly, the long-term effect of instruction was tested after a two-week interval; future studies can focus on longer retention of learned EFL target forms. Thirdly, the level of English proficiency of the particiapnts of the study was limited to intermediate learners and the treatment only lasted for 12 sessions. Future studies can deal with learners of different levels of proficiency and integrate longer periods of treatment.

To sum up, the role of flipped teaching should be recognized as an appropriate methodology, which seems to be beneficial for both teachers and learners. The study can be of great significance regarding teaching grammar in educational settings such as language institutes. Teachers' awareness of flipped instruction teaching by applying computer software and mobile apps may help them teach grammar as effectively as possible, which demands teacher education to take productive measure in raising the teachers' awareness of flipped teaching. It is also recommended that qualitative research seems to be greatly missed in the literature to put much more value concerning the contributions of flipped teaching in English Language Teaching (ELT). Finally, teachers' and students' perceptions of flipped classroom should be positively directed toward its employment in different learning contexts for it makes the instruction more purposeful and successful.

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REFERENCES

Allen, D. (1992). *Oxford placement test 2 (New edition).* Oxford University Press.

Bauer-Ramazani, C., Graney, J. M., Marshall, H. W., & Sabieh, C. (2016). Flipped learning in TESOL: Definitions, approaches, and implementation. *TESOL Journal*, 7(2), 429-437.

Bergmann, J., & Sams, A. (2009). Remixing chemistry class: Two colorado teachers make vodcasts of their lectures to free up class time for hands-on activities. *Learning & Leading with Technology, 36* (4), 22-27.

Bergmann, J., & Sams, A. (2012). *Flip Your Classroom: Talk to Every Student in Every Class Every Day.* USA: International Society for Technology in Education.

Bergmann, J., Sams, A. (2012). *Flip Your Classroom: Reach Every Student in Every Class Every Day*. International Society for Technology in Education.

Bergmann, J., & Sams, A. (2014). *Flipped learning.* London: Washington & Eurospan.

Berman, R. (2015). *His students were struggling, so he 'flipped' his classroom. XQ: The Super School Project.* Retrieved online November 05, 2015, from http://www.upworthy.com/his-students-were-struggling-so-he-flipped-his-classroom

Berrett, D. (2012). How 'flipping' the classroom can improve the traditional lecture. *Education Digest, 78*(1), 36-41.

Blake, R. J. (2008). *Brave new digital classroom: technology and foreign language learning.* Washington, D.C: Georgetown University Press.

Bishop, J., Dr. Verleger, M. (2013). The Flipped Classroom: A Survey of the Research. *American Society for Engineering Education.* June 23-26, 2013.

Bligh, D. A. (1998). *What's the Use of Lectures?* London: Jossey-Bass.

Burgan, M. (2006). In defense of lecturing. *Change: The Magazine of Higher Learning*, *38*(6), 30-34.

Chambers, A. (2010). Computer-assisted language learning: mapping the territory. *Language Teaching, 43*(1), 113-122.

Ekmekci, E. (2017). The flipped writing clkassroom in Turkish EFL context: A coamparative study on a new model. *Turkish Online Journal of Distance Education*, 18 (2), 151-167.

Farhady, H., Jafarpour, A., & Birjandi, P. (1994). *Testing language skills.* Tehran: SAMT Publications.

Garrison, D. R., & Kanuka, H. (2004). Blended learning: Uncovering its transformative potential in higher education. *Internet & Higher Education, 7*(2), 95-105.

Garrison, D. R., & Vaughan, N. D. (2007). *Blended learning in higher education: framework, principles, and guidelines.* San Francisco, CA: Jossey-Bass.

Gough, E., DeJong, D., Grundmeyer, T., Baron, M., K-12 Teacher Perceptions Regarding the Flipped Classroom Model for Teaching and Learning. *Journal of Educational Technology Systems* 2017, Vol. 45(3), 390-423.

Hung, H. T. (2015) Flipping the classroom for English language learners to foster active learning. *Computer Assisted Language Learning*, 28(1), 81-96.

Herman, T., & Banister, S. (2007). Face-to-face versus online coursework: A comparison of costs and learning outcomes. *Contemporary Issues in Technology Education, 7*(4), 318-326.

Kalin, J. (2012). Doing what comes naturally? Student perceptions and use of collaborative technologies. *International Journal for the Scholarship of Teaching & Learning*, 6(1), 11-27.

Kong, S. C. (2015). An experience of a three-year study on the development of critical thinking skills in flipped secondary classrooms with pedagogical and technological support. *Computers & Education*, *89*, 16-31.

Krumsvik, R.J., & Jones, L. Ø., (2016). Flipped classroom i naturfag: Finnes det en sammenheng mellom omvendt undervisning (flipped classroom) og elevprestasjoner i naturfag? *Norsk Pedagogisk Tidsskrift.* 1-2016, p. 61-73.

Lantolf, J. P. (2000). *Sociocultural theory and second language learning.* Oxford: Oxford University Press.

Lantolf, J. P. (2004). Sociocultural theory and second and foreign language learning: An overview of sociocultural theory. In K. van Esch, and O. St. John (Eds.), *New insights into foreign language learning and teaching.* Frankfurt am Main: Peter Lang.

Lantolf, J. P., & Thorne, S. L. (2006). *Sociocultural theory and the genesis of second language development.* Oxford: Oxford University Press.

Maleki, A., & Zangani, E. (2007). A survey on the relationship between English language proficiency and the academic achievement of Iranian EFL students. *Asian EFL Journal*, *9*(1), 86-96.

Moranski, K., & Kim, F. (2016). 'Flipping' lessons in a multi-section Spanish course: Implications for assigning explicit grammar instruction outside of the classroom. *Modern Language Journal*, 100 (4), 1-23.

Murray, D., Kozniec, T., McGill, T., (2015). Student perceptions of Flipped Learning. *School of Engineering and Information Technology*. Australian Computer Society.

Neumeier, P. (2005). A closer look at blended learning - parameters for designing a blended learning environment for language teaching and learning. *ReCALL, 17*(2), 163-178.

Nielsen, L. (2012). Five reasons I'm not flipping over the flipped classroom. *Technology & Learning*, *32*(10), 46-46.

O'Flaherty, J., & Phillips, C. (2015). The use of flipped classrooms in higher education: A scoping review. *The Internet and Higher Education*, *25*, 85-95.

Pea, R. D. (2004). The Social and Technological Dimensions of Scaffolding and Related Theoretical Concepts for Learning, Education, and Human Activity. *The Journal of the Learning Sciences*, 13(3), 423-451.

Pence, P. L. (2016). Flipping a first-year medical–surgical associate degree registered nursing course: A 2-year pilot study. *Teaching and Learning in Nursing, 11*(2), 52-57.

Prunuske, A., Batzli, J., Howell, E., & Miller, S. (2012). Using online lectures to make time for active learning. *Genetics, 192*(1), 67-72.

Sahin, A., Cavlazoglu, B., & Zeytuncu, Y. E. (2015). Flipping a college calculus course: A case study. *Journal of Educational Technology & Society*, *18*(3), 142-152.

Strayer, J. (2012). How learning in an inverted classroom influences cooperation, innovation and task orientation. *Learning Environments Research*, *15*(2), 171-193.

Vygotsky, L. (1978). *Mind in society: The development of higher psychological process.* Cambridge: MA: Harvard University Press.

Wang, H. (2006). Teaching Asian students online: What matters and why? *PAACE Journal of Lifelong Learning, 15,* 69-84.

Warschauer, M., & Healey, D. (1998). Computers and language learning: An overview. *Language Teaching, 31,* 57-71.

Wood, D., Bruner, J.S. & Ross, G. (1976). The role of tutoring in problem solving. *Journal of Child Psychology and Psychiatry*, 17, 89-100

Yarbro, J., Arfstrom, K., McKnight, K., McKnight, P., (2014). Extension of a review of Flipped Learning. *Creative Commons Attribution.* Retrieved from the Flipped Learning Network website: http://flippedlearning.org/cms/lib07/VA01923112/Centricity/

EVALUATING THE FLIPPED CLASSROOM MODEL THROUGH THE MULTI-COMPLEMENTARY APPROACH

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ABSTRACT

This study was carried out to determine the effectiveness of the Flipped Classroom Model (FCM) in an educational setting. For this purpose, a multi-complementary approach (MCA) was used including both quantitative (meta-analysis) and qualitative (thematic). MCA consists of three parts, the first of which is the pre-complementary information stage. In this context, the data from sixty-four studies were used and it was analysed using CMA and MetaWin software. In addition, the meta-thematic data were obtained by analysing thirty-two qualitative studies of FCM and analysed through content analysis. In the second stage of the MCA, an experimental process took place involving the implementation of FCM. A thematic dimension was added to the second stage and analyses were made through MAXQDA software. In the last stage of the approach, the results of the first two stages were combined to get complementary and general outcomes. The results of the study showed that FCM had a positive impact on academic success in general, thus some recommendations were presented on the use of both FCM and MCA.

Keywords: Flipped classroom model, multi-complementary approach, meta-analysis, meta-thematic analysis, academic achievement.

INTRODUCTION

In recent years, there has been a change observed in the education system, with a move from a teacher-centred behavioural approach towards a student-centred and constructivist approach in which the student is an active participant. The main purpose of this change can be expressed as the student accessing information on his/her own rather than the direct transfer of knowledge from the teacher to the student. The change also relates to the assimilation of knowledge by the student, that is, the structuring and development of knowledge. In this period of change, the student structures information, makes it meaningful, and integrates it with new experiences that allow him/her to participate actively in the learning process. This increases the permanence of learning.

Changes and developments in teaching methods and techniques are also experienced in terms of educational technologies. Educators and researchers who want to use these technologies effectively in an educational setting have started to implement many teaching methods involving the integration of technology into education, supported by the continuing development of such technology. Although not a new concept, FCM is one of these which has been discussed in the context of the blended learning approach, and frequently mentioned in recent times. This learning model, which is a technology-based teaching model, is defined as the application of learning activities such as recollection and comprehension at home, usually online, unlike the traditional ways of learning, and the implementation of high-level learning practices

such as application, analysis, evaluation and creation in a classroom environment (Kara, 2016; Mok, 2014; Rutkowski & Moscinska, 2013). In other words, the transfer of information to the student takes place in the classroom environment, as does the assimilation and retention of knowledge (Bergmann & Sams, 2012; Hung, 2015; O'Flaherty & Philips, 2015).

Using technology-supported models and going out of the classroom environment through the use of the FCM has become increasingly important in recent years, and is seen as an alternative to other teaching strategies. Learning is transferred to the individual learning area where students take responsibility for their own learning (Bishop & Verleger, 2013; Staker & Horn, 2012). Based largely on the traces of structured learning theory, this model has evolved into a structure whereby the student is active and in the centre, and the teacher is supportive and has the role of guiding and controlling, as opposed to his/her traditional teaching role (Aydin, 2016; Talan, 2018). In addition, as the teaching model moves outside the classroom in this learning model, the time and space limitations in teaching are eliminated and, by providing the opportunity to revisit the subject without limits, students are able to come to class prepared for the lesson (Enfield, 2013; Talan, 2018; Thoms, 2012). In the time spent in the classroom, which is extremely valuable in FCM, practices and collaborative activities are carried out as a result of which knowledge retention is reinforced, and deficiencies are eliminated. Therefore, this learning model does not eliminate the education process in the classroom; rather, it establishes cognitive bridges between the in-class process and the out-of-class process, and ensures an uninterrupted execution of the learning process. In this respect, the main purpose of this learning approach, which is appropriate for today's education, can be expressed as the effective and efficient use of the time spent in the classroom (Bergmann & Sams, 2012; Johnson, 2012; Roehl et al., 2013; Tucker, 2012).

FCM supports the goal of combining online learning environments with traditional teaching methods, combining and blending the strong and advantageous aspects of both, and thus making learning more meaningful. FCM is a pedagogical approach which suggests that the student should learn the contents of the course during out-of-class time, while engaging in discussion, problem-solving, implementation, project-based study and thus engaging in active learning during the time in the classroom (Bergmann & Sams, 2012; Johnson, 2012). When we look at the studies conducted on this model, we can see that different tools, methods, practices and approaches are used. However, the features highlighted in the definitions related to FCM are that the model is student-centred, supports effective learning, increases the quality of in-class study time, provides a richer and more flexible learning environment with the technological infrastructure it offers, and is a component of blended learning.

Characteristics such as ensuring students coming to class are prepared in advance, allow interactive and practice-oriented learning, increase teacher-student interaction, allow the active participation of students in the lesson, provide opportunities for teacher guidance, contribute to the development of the self-regulation and self-efficacy of students, and can be seen as the positive aspects of FCM (Bishop & Verleger, 2013; Bosner et al., 2015; Enfield, 2012; Halili & Zainuddin, 2015; Rutkowski & Moscinska, 2013; Sirakaya, 2015; Talan & Gulsecen, 2018). In addition, supporting individual and self-learning at the student's own pace, creating time for active learning activities, encouraging the learner to take responsibility for his/her own learning, allowing collaboration, question-answer and discussion activities, can all be expressed as the other positive aspects of the model (Bergmann & Sams, 2012; Bishop & Verleger, 2013; Chen et al., 2014; Chu & Sun, 2015). In addition, this model allows the use of rich and accessible materials, and enables the creation of permanent learning outcomes (Mason et al., 2013; Turan, 2015). Morgan (2014) also stated that the model contributes significantly to the institution's economic situation by reducing the running costs of educational institutions.

In contrast to these positive aspects provided by FCM with regard to teachers and students, there are also some studies that indicate that there are a number of disadvantages and limitations. These include not having access to technological tools such as computers and the internet for each student, the difficulty of determining whether or not students watch videos, and technical problems experienced during the application can be some of the disadvantages of the model (Aydin, 2016; Bergmann & Sams, 2012; Enfield, 2012; Fraga & Harmon, 2014; Milman, 2012; Yavuz, 2016). In the literature, it is also stated that, if a student is unable to ask questions immediately s/he does not understand the theoretical part of a lesson at home, this may lead to an interruption in the student's learning process (Talan, 2018; Turan, 2015). In addition, the lengthy

and poorly prepared video lessons have been shown by researchers to reduce the motivation of students and reduce their interest (Kara, 2016; Milman, 2012; Yavuz, 2016).

When the literature on FCM is examined, there are studies that indicate that the model increases success in many areas such as social sciences, foreign languages, science, mathematics, health sciences and engineering (Alamri, 2019; AlJaser, 2017; Atwa et al., 2016; Aydin, 2016; Bulut, 2018; Cakir, 2017; Elian & Hamaidi, 2018; Sirakaya, 2015; Thai et al., 2017; Yurtlu, 2018), while there are also studies that show that this model does not cause a significant increase in success, or indicates that no significant differences were observed in comparison with other approaches (Davies et al., 2013; Dixon, 2017; Duffy, 2016; Dusenbury & Olson, 2019; Overmyer, 2014; Voltz, 2016). Encountering differing results in the review of the relevant literature supported the need for carrying out this research. Detailed analysis of FCM was carried out in this research by conducting a meta-analysis and meta-thematic analyses. Using the results obtained, an attempt was made to determine the extent to which FCM has an impact on success.

MULTI-COMPLEMENTARY APPROACH (MCA)

It was thought that this concept encountered in the related body of literature (Bamberger, 2012; Barg et al., 2006; Fink, 2013; Gilgun, 1999; Krathwohl, 1993; Laundry & Banville, 1992; Morse & Chung, 2003; Palak & Walls, 2009; Reich, 2010; Schiffman, 1990; Trochim, Marcus, Mâsse, Moser & Weld, 2008) as a multi/integrated approach (multi-method/mixed method approach/methodological pluralism/integrated approach) does not exactly correspond to the concept adopted in the present study. For instance, certain studies at international area were recorded to conduct mixed method (Esteves & Pastor, 2004; Onwuegbuzie & Dickinson, 2008), however, they were structured in a different way and also the final target is not in the same direction. Hence, in accordance with the MCA approach used in the present study, the single data source is not considered sufficient, the results need detailed explanation and the study is expected to include many stages. Therefore, the use of the concept of "multi-complementary approach" based on the combination of all the results was preferred. In this way, the presentation of both qualitative and quantitative data is possible. In addition to the qualitative method, which comprises the conduct of studies based on sample groups, and which therefore has the quality of being generalizable, the addition of quantitative methods, which have fewer samples but which enables more detailed studies, may contribute to the formation of qualified and extensive studies. On the other hand, it may be indicated that the word "complementary" in the multi-complementary approach gives new meaning to this concept. The difference in terms of this concept, which is actually based on the Gestalt holistic approach is that it provides the presentation of research results obtained in various ways (through different analytical programs involving both qualitative and quantitative data sources) by gathering them under a single roof. Therefore, it is accepted that the concept "multi-complementary" actually serves to explain the new orientation considered, in terms of its lexical meaning.

When the details of the multi-complementary approach are examined, they may be interpreted as the gathering of data accessed through different methods and programs dealing with a common area of interest. In this stage, a multi-complementary approach may be based on constructivist learning theory, the pioneers of which are Piaget, Bruner, Vygotsky, Dewey, Gestalt and Glasersfeld. In research into a topic based on this theory, the interest is in accessing new information by integrating such information with old information. Consequently, the existing information regarding that topic should be accessed by the student. This matter is crucial regarding the authenticity and the originality of the present research. Thus, in the relevant research identified in the body of the literature, analyses involving the examination of the present situation were performed, and no research aimed at determining the shortcomings related to the topic was found. Besides, another aspect of the complementary approach that coincides with the constructivist approach are the opinions of Vygotsky, Bruner, Gestalt and Dewey which are based on pragmatic philosophy. These famous thinkers stated that life is constantly changing, and therefore there is a need to restructure everything. This view is the main basis of the study. Therefore, the individual may not be able to use the information s/he has obtained previously throughout his/her social life, both because the event and situation and the individual him/herself has changed, and may need to reconstruct the information. Thus, the individual forms new schemes, theories and experiences regarding the changing information, and integrates them with the previous ones. The individual who has new experiences forms new schemes and theories, and this process

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is constantly repeated. However, at this point, the important thing for the individual who is faced with new information, in other words who becomes unbalanced, is that s/he identifies the deficiency and mistakes about him/herself, and tries to overcome the problem that has arisen. At this point, understanding that what is important in terms of education is the way to obtain information rather than the information itself becomes apparent (Sonmez, 2008). Therefore, it may be indicated that the multi-complementary approach, which is explained within the scope of this study, and regarding which there is an effort to create awareness, is a crucial and necessary issue, because it is a new approach that deals with how the information aimed at in scientific studies is obtained. At this point, in academic studies, the approaches and methods used while accessing information have to be renewed, and different and creative ideas such as the multi-complementary approach have to be actualized.

Within the scope of this approach, the main aim in the integration of data obtained from different sets of information in order to achieve a whole is to access extensive, qualified, scientific and complementary information. This situation necessitates certain processes. The process concerned is explained in detail in the methods part. On the other hand, the primary aim of the study in terms of a multi-complementary approach is to proceed based on the subgoals of the research concerned in order to achieve the whole. To put it a different way, the complementary scope of the study that ise thought to be achieved is determined by the subgoals of the related research.

THE PURPOSE AND SIGNIFICANCE OF THE RESEARCH

In this study, it was decided to use a multi-complementary approach (MCA), which is not found much in the literature regarding the FCM in a form which includes detailed analyses and evaluations. In order to examine the effectiveness of the FCM in all aspects of the literature, and to reflect on its relationship with success, a detailed analysis like this was required. When the literature on FCM was reviewed, it was found that the existing studies were one-sided, narrow in scope, and without detail. At this point, the aim was to investigate the FCM extensively through the use of the MCA which allows detailed and multiple analyses. The MCA used in the research involved three basic stages. In the first stage, the aim was to review the literature on the topic under consideration and to obtain the *pre-complementary information* that reflects the existing deficiencies; in the second stage, the aim was to obtain the *post-complementary information* which includes complementary applications for the elimination of any deficiencies; and, in the final stage, the aim was to obtain *complementary information*, when the data from both stages are combined and synthesised, and the original ideas and suggestions are presented in this context (Batdi, 2018). It is believed that the results will provide a comprehensive and general overview of the recently-popularised FCM implementations, and that MCA will attract attention in the literature and encourage researchers to conduct studies using these methods. In this study the impact of FCM on academic achievement was examined using studies within the scope of the inclusion criteria, and meta-analytical examinations were carried out with regard to which teaching grades, application process and subject areas the existing studies related to. In addition to quantitative studies related to the effect of the FCM on academic achievement, a meta-thematic analysis that it is a method including the process of reviewing the themes from participants' views of various studies (Batdi, 2019) was conducted, and qualitative findings were obtained. In this respect, it is thought that the contribution of this study to the relevant literature will be original, and that it will contribute to the effective evaluation of the model. In this context, the main purpose of the research is to examine the FCM in the context of the MCA. The research questions that need to be answered in line with this basic objective are as follows:

1. *First stage: in order to obtain pre-complementary information;*
    a. Through document analysis-oriented meta-analytical studies, what is the effect size/effect of FCM on academic achievement?
    b. How effective is the FCM in the context of thematic analysis based on document analysis?

2. *Second stage: in order to obtain pre-complementary information;*
    a. Is there a significant difference between the pre- and post-test scores of students' academic achievement related to FCM?
    b. What are the views of participants on the effectiveness of the FCM in a qualitative context?

3. *Third stage: in order to obtain complementary information;*

    a.   Using the MCA, are the overall results obtained, after combining pre- and post-complementary information, complementary?

    b.   In view of the results obtained, what are the recommendations on the subject with regard to the use of the FCM?

METHOD

This study was carried out to determine the benefits of the FCM in an educational setting and its effectiveness with regard to learning. In order to examine all aspects of FCM, to conduct detailed analyses, and to provide a comprehensive perspective, a wider perspective was required in terms of the method followed. In this respect, it was decided to carry out the research in accordance with the MCA used in the studies by Batdi (2018). MCA is an approach based on a combination of various analyses programs, rich data sources and findings obtained through the use of complementary approaches. There is a system that ensures the systematic and orderly operation of this multi-faceted methodological approach. Specifically, the MCA consists of three basic stages, which allow access to pre-complementary, post-complementary and complementary information (Batdi, 2018). These steps are presented below (Figure 1):
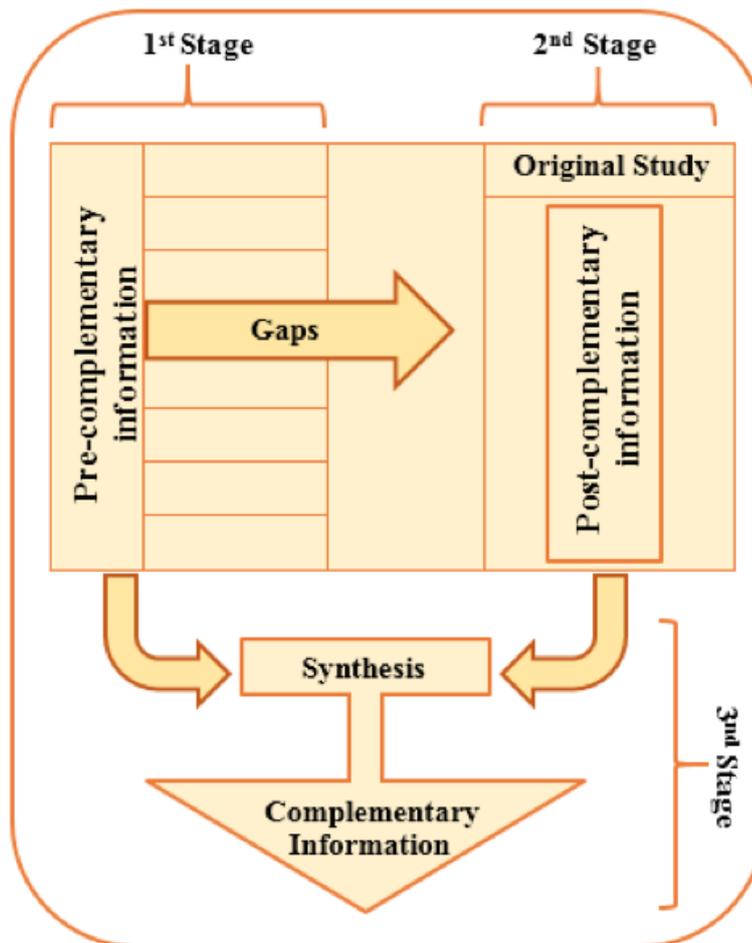
Figure 1. Multi-complementary approach model (Batdi, 2018)

Pre-complementary Information Stage

During this stage, which constitutes the basis of the study, previous studies on the subject are examined using different methods such as meta-analysis, with the aim being to determine the existing deficiencies on the subject (Batdi, 2018). At this stage, the primary objective is to determine the area (period, type of publication, working year, subject area, teaching stage and sample size) that the chosen research covers in the related body of literature. It may be maintained that the data accessed will form the source and basis of the post-complementary stage in the second stage. In this context, meta-analytical and thematic methods were used to obtain pre-complementary information for FCM. In a sense, the meta-analysis, which can also be referred to as document analysis or analysis of analyses (Glass, 1976), is described as a concept which includes a systematic integration of previous research on the same subject which expands the scope by obtaining large samples and, consequently, provides a stronger and more general judgment (Cumming, 2012). At this point, various databases were examined in terms of the academic achievement dimension in order to obtain relevant studies on the FCM.

Literature Search and Inclusion Criteria

In this context, Google Scholar, Academic Search Complete, Education Research Complete, ProQuest Dissertations and Theses Global, ERIC (EBSCO), Springer LINK, Wiley Online Library Full Collection, Science Direct, Higher Education Council (HEC) National Thesis Center, the Web of Science and Scopus (A&I) databases were scanned. *"Flipped learning, flipped classroom, inverted learning, inverted classroom"* were used as keywords in the search process. As a result of this scanning, a total of sixty-four studies, including thirty-seven dissertations and twenty-seven articles, were included in the meta-analytical study. It is interesting that, in terms of their inclusion criteria, most of the studies chosen were theses. However, when the inclusion criteria, which may ease the integration of the findings and lessen the extreme differences between the studies were considered in line with the targets of the research, this was the result. Besides, there is also a national thesis center based in Turkey, where access to Master's and PhD theses on the internet is possible. In this - the Higher Education Council of National Thesis Center - the theses can be archived by the authors of the related database, opened to full-text access over the internet, and submitted for open access. Therefore, the studies accessed through this database relating to the FCM were included in the analysis within the context of inclusion criteria. In some studies, because the effect of the FCM on academic achievement was calculated separately for different courses/classes, the data set was determined as totalling seventy-one items. In meta-analysis studies, in the event of the inclusion of poor-quality studies in the analysis, a situation occurs whereby it is expected that errors will be reflected in the research (Borenstein et al., 2009). Thus, the authors acted in conformity with the inclusion criteria in the meta-analysis, both in order to prevent this situation, and to reduce the number of studies.

Therefore, in the selection of these studies, the criteria, which include descriptive data [sample size (n), arithmetic mean ($\bar{X}$) and standard deviation (SS)] used to examine academic achievement and to calculate the effect size, were taken into consideration. The studies must employ an experimental or quasi-experimental design in which there is a comparison between the use of the FCM and traditional methods. Therefore, this research consists of scientific studies conducted on the use of the FCM. The sample of the study consists of selected studies from theses and articles obtained from the above-mentioned databases between 2013 and 2019, taking into consideration the inclusion criteria.

Selection of the Studies

The reason for the selection of the period between 2013 and 2019 for consideration is the increased prevalence of studies related to the use of the FCM after 2013. Since the paper and congress abstracts did not include adequate statistical data for meta-analysis purposes, they were not included in the analysis. When the search was undertaken was undertaken, titles and abstracts were first read to be sure that the studies were related to the use of FCM. As part of this process, the related documents were saved in a folder while the others were excluded. 350 studies were accessed following the search. It was seen that 89 of the studies accessed were included only as a title, and that the content was not in compliance with the topic of the research.

The decision was therefore made to eliminate them. In the second stage, in the evaluation made regarding convenience, it was decided that 92 of the remaining 261 studies were not appropriate in terms of the aim of the research, and the decision was made to eliminate them. In terms of traditional applications, studies which did not comprise a comparison of the FCM and the success levels of students taught conventionally were not compared were eliminated at this stage. In the next stage, it was determined that the results of 28 studies out of 169 were not adequately presented, that the scores of pre-test and post-tests performed on experimental and control groups were not measured, and these studies were consequently not included in the analysis. Lastly, with 77 studies, it was seen that the statistical data calculated for experimental and control groups were not presented separately, and that these values could not be accessed. It was therefore decided to remove these studies from the analysis. Therefore, 71 effect size comparisons out of 64 studies in total were included (see Figure 2: PRISMA). As in the present study, Cheng et al. (2018) had 55 publications with 115 effect size comparisons they accessed in the meta-analysis study that they conducted on the use of the FCM.

The data obtained in the meta-analysis were analysed using CMA and MetaWin software. The data obtained (meta-analytic) is to be interpreted/discussed according to the effect size classifications of certain pioneers such as Shachar (2002), Cohen, Welkowitz and Ewen, (2000) and Thalheimer and Cook, (2002). In the present study, in terms of the effect size, the classification level of Thalheimer and Cook (2002) was made use of.
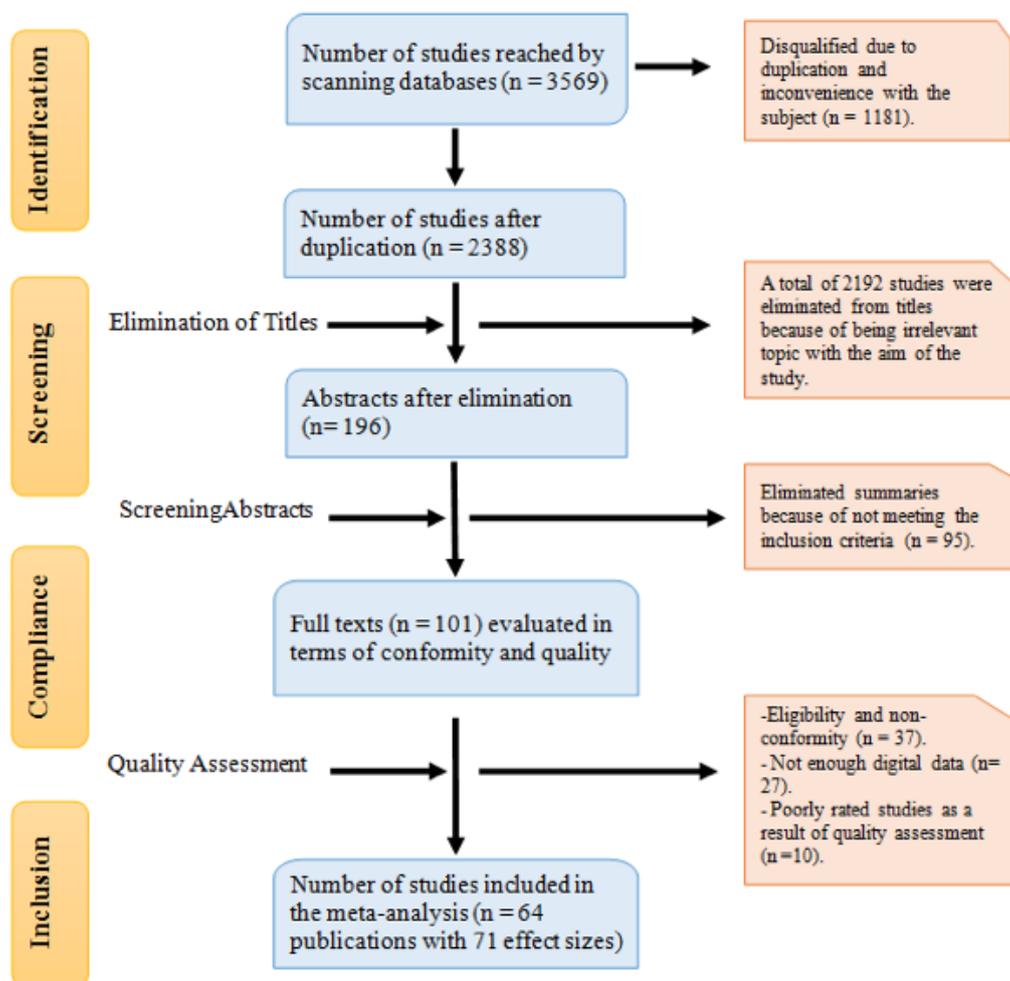
Figure 2. PRISMA flowchart of study selection

Model Choice

In the meta-analysis, the effect size within the studies are measured based on two different models. These models were specified as stable and random effects model. However, different operations are performed for the models chosen, their effect sizes and confidence intervals, in accordance with the property of the research. Whereas it is assumed that all the studies in the meta-analysis share a common effect size in the stable effect model, it is accepted that the real effect size may change in different studies in the random effects model (Borenstein et al., 2010). In other words, in cases where real effect calculations are made with limited populations rather than large ones, the stable effects model should be preferred. Especially in the social sciences and the educational sciences, it is almost impossible to find the preconditions necessary for the stable effects model. Hence, in the random effects model it is accepted that the effect size changes in terms of sample groups and studies. It may be maintained that the effect size changes according to the studies under consideration in terms of factors such as age, educational level and class. Therefore, the random effects model is preferred in such situations. In the present study, the analyses were interpreted using the random effects model.

Coding

In the meta-analysis, the coding operation was performed with the aim of ensuring reliability in the categorization of studies and in the examination of content. Coding is a way of evaluating reliability by revealing the extent of repetition of similar studies as a result of independent efforts. This may also be performed between reliability coders (intercoders) or for the same coder (intracoder) (Wilson, 2009). In the operation conducted between coders, both coders should code studies separate from one another. There is a higher level of authenticity, accuracy and reliability in coding undertaken in this way. In addition, the number of studies should be adequate in order to provide a clearer estimation of reliability throughout the coding process (Card, 2012). Lipsey and Wilson (2001) suggested that it would be adequate if the number of studies is between 20 and 50. A number between these may provide a perception of the interference level of the coding. However, we should also be aware that there are different methods used to measure coding reliability. Three of them take the form of adaptive values, Cohen Kappa or Pearson correlation (Orwin & Vevea, 2009). In the present study, demographic properties such as the publication type, publication year, author names, the conducted level, sample groups of the studies were scanned to be able to realize coding efficiently. These were coded by forming a table in a Word document. Codes (number and letter) were also given to the studies. Two coders performed the same coding separately. The accord between the codings of the coders was determined. Since the correlation between the coders was stated as the degree of reliability for this purpose, that this correlation was found to be high is interpreted as the safety of using these documents as being high. In the present study, the reliability formula [consensus / (consensus + disagreement) x 100] proposed by Miles and Huberman (1994) was used to calculate inter-rater reliability in the meta-analytical dimension. As a result of this calculation, the reliability of the study was found to be 100%.

Effect Size

Effect size is a value used to give information about the difference between two groups or the magnitude or aspect of the relationship between two variables (Borenstein et al., 2009) and regarded as a golden measurement in meta-analysis (Rosenthal, 1995). Hedges' g value was used as a measure of the standardized mean difference in order to estimate the effect size values of the studies in the meta-analysis. This value utilizes degrees of freedom to predict the standard deviation collected from two independent groups. There is also Cohen's d value. However, this value is a slightly more prejudiced estimator (Borenstein et al., 2009). At this point, the values considered in the measurement of effect size within the scope of the research were sample size, pre-test mean, pre-test standard deviation, post-test mean and post-test standard deviation. In the present study, Hedges' g value was preferred, both because it uses the less-biased pooled standard deviation, and because it is weighted in line with the the sample size (Hedges, 1982).

There are three major elements which affect the choice of effect size. The first is that the effect sizes obtained from different studies should be compared with each other in given that they measure the same things. In

other words, effect size should not differ according to the design of the studies (like the sample size or whether common variables are used or not). The second is that effect size estimations should be calculated based on the possible information in the published research reports. In other words, it should not necessitate the re-analysis of raw data. The third issue is that effect size should have good technical characteristics. For instance, sampling distribution should be known so that the variance and confidence ranges can be calculated. Besides, effect size should be interpretable to a large extent. If the effect size is not meaningful naturally, it is generally possible to transform it into another metric for presentation purposes (Borenstein et al., 2009).

Moderator Analysis

Considering the heterogeneity in effect size, an important aspect of meta-analysis is to understand the reasons why effect sizes differ between studies. For this purpose, continuous variables were used, and a moderator analysis was performed (Kelly, Polanin, Jang & Johnson, 2015). It was questioned whether effect dimensions change in terms of teaching grades, application period and subject area. Moderator analyses including fewer than five studies were excluded in order to avoid prejudiced results. A random effects model was used to evaluate the moderators.

Publication Bias

Publication bias poses a threat for the results obtained in the meta-analysis. This is because publication bias is based on the assumption that not all the published works relate to a particular subject. Since studies which have no significant difference or have a weak significance statistically, are not considered appropriate for publication by publishers, it is believed that they have a negative influence on the total effect, or that they are prejudicial to the mean effect size (Kulinskaya et al., 2008). It is thought that this publication bias which may be considered as missing data for a meta-analysis, has a negative influence on the total effect of a meta-analysis. Therefore, publication bias should be considered in meta-analysis studies (Borenstein et al., 2009). There are various methods and ways of improvement with regard to this potential bias. In this sense, consideration of more than one method may reveal a potential bias, which not everyone is aware of. On the other hand, the increase in the amount of proof of possible bias may increase the possibility of achieving satisfactory results (Card, 2012).

As is also indicated in the present research, in terms of the criteria used for the choice of studies included in the analysis, both published and unpublished literature was included in the examination. Thus, Rothstein, Sutton and Borenstein (2006) asserted that the delimitation of studies included in the analysis solely in terms of studies published in refereed journals, raises the possibility of bias. In response to this, unpublished theses were included in the analysis. On the other hand, most literature collecting methods were used, to prevent the possibility that unpublished studies may not be identified because of the dossier drawer problem (Banks, Kepes & Banks, 2012; Rosenthal, 1991). Articles and theses were accessed online and via databases, and studies were accessed by interviewing the authors, when it came to studies the complete data for which could not be accessed. It is probable that the findings of unpublished studies are less reliable, and are therefore less acceptable (Relman, 1980). Therefore, as mentioned above, with the inclusion of such studies in the analysis, proof of the surfacing of possible bias increases. This, in turn, affects persuasiveness and reliability positively. In the present research, Duval and Tweedie's "trim and fill" method (2000) was used in order to determine bias, in addition to the inclusion of unpublished theses in the analysis.

Based on this method, the point estimation in REM for joint workings and the 95% confidence interval is 0.46212. The estimated point value may be determined as 0.21619, using the "trim and fill" property. It was concluded that the research and scanning processes are valid representations of the study universe, when it was seen that there is a minor difference between the observed and the estimated mean effect sizes. Additionally, fail-safe analysis, and some values in the Normal Quantile plot graph, also presented data regarding the reliability of the meta-analysis process. The Normal Quantile Plot graph shown in Figure 3 represents the range in which the set of dots is located.
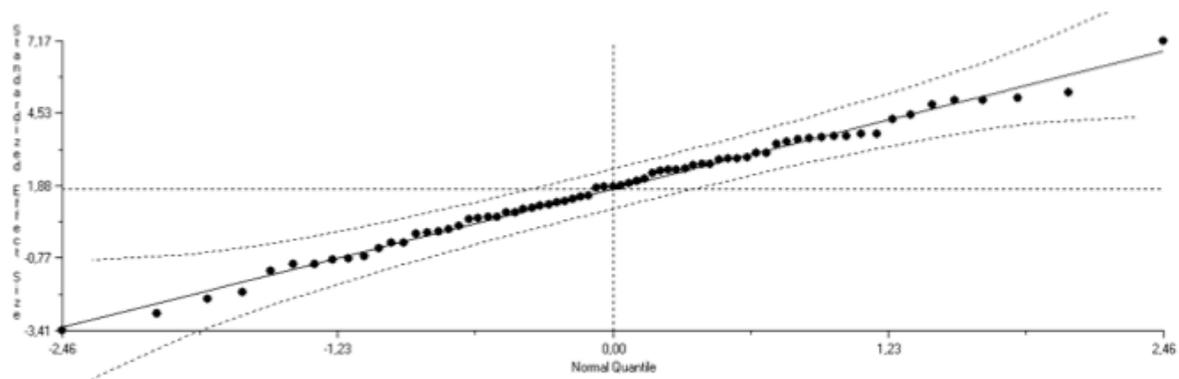
Figure 3. Normal quantile plot

It can be stated that the distribution formed by the set of points in Figure 3 is between the two lines, and the distribution is in the reliable range. Therefore, there is a statistically significant relationship between the studies. Another method by which meta-analysis reliability is evaluated is the calculation of publication bias. Publication bias arises from the inclusion of studies that differ significantly into the analysis, in other words, only when published studies are included in the analysis. At this point, a fail-safe number [fail-safe (FSN)] is calculated, which is considered to minimise or eliminate the publication bias (Rosenthal, 1979). As a result of the analysis conducted in the present study, it was understood that the 5725.2 value for the effect of the FCM on academic achievement would decrease to zero if the study included more analysis. Considering that this value was an extremely high number within the framework of the research, and that too many studies that could not be obtained were needed, it was found that the publication bias had no effect on the significant effect size (Cheung & Slavin, 2011) and therefore the analytical procedures were quite reliable. The consensus between the classical safe N test and Normal Quantile Plot graph shows that there is no publication bias that will pose a serious threat to the validity of the meta-analysis. A similar result was also seen following another study conducted on the same topic (FCM) (Cheng, Ritzhaupt & Antonenko, 2018).

Other methods which complement this information provide access to pre-complementary information and contribute to the internal validity of the research, are thematic (qualitative) investigations. In this context, qualitative studies in the literature on the FCM were reviewed, and thirty-two studies were identified. Studied conducted between the years 2013 and 2019 in both the national and international area, which present qualitative data and which examine the effectiveness of the FCM in terms of academic success and other aspects (personal dimension, learning process, sensory dimension, general contribution, problems and suggestions) were considered. MAXQDA, a computer-aided qualitative data analysis program, was used to analyse these studies. A content analysis method was used to analyse thematic data. This approach, in which data are analysed in depth, is described as accessing concepts and relationships in order to explain the data collected for research purposes (Yildirim & Simsek, 2013). Since some of the studies identified using these criteria in the body of literature were not deemed adequate in qualitative terms, they were eliminated, and a total of 32 relevant studies were obtained. Firstly, the coding of these studies was provided, and then themes were formed by the combination of codes considered to relate to one another. In this way, a brief presentation of the codes and themes obtained based on the opinions of the contributors was acquired. The studies (which took the form of theses), were coded with their numbers given by the thesis centers (ProQuest Dissertations and Theses Global & Higher Education Council). The codes given to the studies were presented with the page number cited, while comments were made in the findings part, and examples were given using direct citations. Themes and codes of the studies were cited in the research, and were coded and indicated in the relevant places in the text. For example, the expression 429617-66 refers to Page 66 of study No. 429617. In order to calculate the reliability of the thematic dimension based on document analysis, the agreement values between data encoders (Cohen Kappa) were examined (Viera & Garrett, 2005). Agreement values calculated for the themes were shown to be between .722 and .868 which indicate that they were at a "good level" (Appendix 1).

Post-complementary Information Stage

In the pre-complementary information stage, the information obtained regarding the state of the research topic in the body of the literature involving inductive methods are aimed at determining the deficiency of this topic as a whole. A post-complementary information stage was conducted in order to pursue a new/original study at the point determined to be deficient/insufficient in line with the state that occurs. This was done in a sense both to take a complementary stage towards the deficiency in this area, and to create an awareness regarding the existence of such a deficiency. In order to determine the impact of the FCM on academic achievement at this stage, teacher candidates studying in the Turkish Language Teaching (n=30) and the Social Sciences Teaching (n=34) departments on in an Information Technologies course at a public university located in South Eastern Anatolia in Turkey, were selected as the study group (Table 1). This aspect of the research took place during the fall semester of the 2018-2019 academic year. In this study, different teaching methods were applied to experimental and control groups. Students in the experimental group learned the theoretical part of the lesson at home within the scope of the FCM and participated in active learning activities in the classroom environment. The students in the control group were taught in line with the current curriculum, and the theoretical part of the course was done in the classroom. They then engaged in active learning activities (homework) at home.

In the research, firstly how the lesson will be taught, student responsibilities, access to necessary sources, and determination of the learning outcomes were determined and activities were then planned in detail. Subsequently, an online learning environment was designed to be used solely with the experimental group as part of the application process. Throughout the research, the FCM was used in the case of the experimental group, and traditional face-to-face learning methods were applied in the case of the control group. The figurative appearance of the experimental model used in the qualitative dimension of the research is presented in Table 1.

Table 1. The figurative presentation of the research model

Groups	Neutrality	Pretest	Method	Posttest
G_1	R	$O_{1.1}$		$O_{1.2}$
G_2	R	$O_{2.1}$	X_1	$O_{2.2}$

The meanings of the symbols used in the model:

G_1: "Control Group" where the lesson is taught using traditional face-to-face learning methods

G_2: "Experimental group" where lessons are taught with FCM

R: Neutrality in the determination of groups

$O_{1.1}$-$O_{2.1}$: Pre-test

X_1: FCM

$O_{1.2}$-$O_{2.2}$: Post-test

As can be seen in Table 1, the study was conducted with two different groups. Before the experimental application, the students sat an achievement test and their knowledge levels were determined. Following the experimental application, the students sat another achievement test and their success in the lessons was determined. The results following the experimental application were evaluated considering the scores of the groups.

In order to measure the achievements of the students and to determine the differences between the achievement levels of the two groups in the study in terms of the pre-test/post-test, semi-experimental research technique with the control group, the reliability and validity analyses which were developed by Talan (2018) were used. An academic achievement test was prepared by taking into consideration the steps of remembering, comprehension and application in terms of Bloom's educational goals. Other steps related to Bloom's educational goals were carried out with regard to the students in the Information Technologies course, mainly through classroom practice and evaluation activities. In this study, the discrimination index of the success test developed was calculated as 0.45 and the mean difficulty value as 0.49. In addition, the KR-20 coefficient of the test was calculated as 0.805. The SPSS-18 package program was used in the statistical analysis of the data obtained with regard to the achievement test.

Operation Process

In the study, different teaching methods were applied on the experimental and control groups. The students in the experimental group learned the theoretical part of the lesson at home within the scope of the DSM and then took part in active learning activities in a classroom environment. The students in this group received different types of educational material (an e-book, video lectures) prepared in relation to the content of the lesson. Using the tools available they had internet access to the theoretical part of the lesson prior to the classroom session through learning management systems. They wrote their thoughts about online and face-to-face courses via forums, and discussed any topics they did not understand. Therefore, each student took part in the lesson by sharing information through forums and through student-student and student-instructor interaction, and they also communicated out of the classroom. In additiopn, every week a mini exam application was made use of regarding the topic under consideration in order to motivate the students about studying before the class, and testing the effectiveness of the course resources. The student who has completed this exam and achieved an adequate level of learning ends the self-learning process regarding the topic. The students in this group were able to ask questions about the topics they did not understand at the beginning of the lesson. In the next stage, the students proceeded by discussing the answers to the mini exams and the related topics of the lesson was taught again. It was determined whether or not there were problematic points through this exam. The instructor performed a mini-presentation of the topic when needed. The issues regarding which confused the students minds were misunderstood by them, were corrected through student discussion, and the intervention of the instructor was almost unnecessary. Accordingly, in the classroom environment, the related activities prepared aimed at a high level of learning on the part of the students were realized in company and under the guidance of the instructor, individually or as a group. Since the time issue has to be measured correctly in the FCM, care was taken not to give the activities as homework and to practice and finalize these activities in the classroom environment. Following the activity, the topics not learned by the students were repeated, and the instructor summarized the topic. The planned format regarding the DSM is as follows:
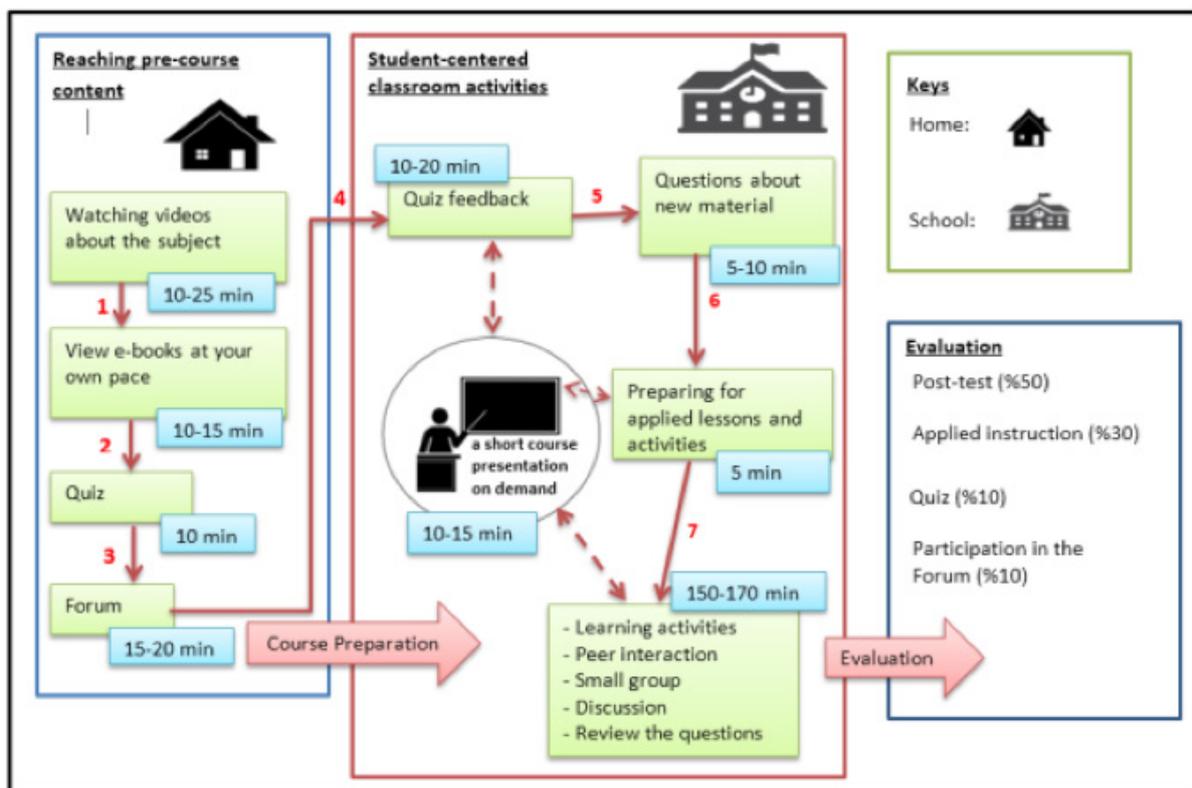

Figure 4. Flipped classroom design (Talan & Gulsecen, 2019)

Since the self-learning and the learning speeds of the students in this group are important, individual students may follow the course content according to their learning speed in any place and time that they like, and to the extent that they find necessary. Each student's system record was examined in order to be sure that s/he watched the video lessons. Students were asked to follow the course contents before coming to the class and to be prepared when they arrived. The students who came to the lesson unprepared were given the chance to follow the course contents before joining in the classroom activities. Care was taken to ensure that video lesson periods were between 10 and 25 minutes, in line with the content of the lesson and the property of the topic, in order to pursue the success of the application and to be accepted by the students. Even though we assume that students can constantly access online materials, the downloading of the weekly course materials (the e-book) and their presentation was done in such a way that they can be printed out. The lesson was taught in line with the curriculum to the students in the control group, and the theoretical part of the lesson was practiced in the classroom; it was ensured that they practiced the active learning activities (in the form of homework) at home. At the beginning of the lesson, the instructor gave the students feedback regarding the activities (homework) of the previous week, and ensured that any deficiencies were remedied. In line with the baby steps principle, the instructor, without any preliminary preparation on the part of the students, presented the topic hierarchically to the students. The content of the topic was presented using traditional methods such as direct instruction, presentation, and question-answer. In the next stage, a mini-exam application was made regarding the topic, and afterwards the teacher provided feedback to the questions. The questions which the students had problems with were answered, and the topics that were not understood or were misunderstood, were corrected. In the remaining time, there was an effort to form an infrastructure regarding the content of the lesson in the computer lab, and sample educational applications aimed at training/ reinforcement were made to help the topic become more distinct and permanent in the students' minds. The points with regard to which learning was not realized were repeated at the end of each lesson, and the topic was summarized by the instructor. The activities (homework) prepared to encourage high-level learning were shared physically (in the form of a printed photocopy) and were realized in out-of-class activities. The delivering of the activities was realized at the end of a one-week period by hand (usb flash memory) in the classroom environment. The students who did not hand in the activities on time, or whose activities were found to be deficient, were warned, and it was ensured that they fulfilled these duties. The instructor and the researcher gave regular feedback regarding the activities of the students. In addition, the students were guided at the points where they had problems regarding the topic or the activities.

In addition to experimental studies, thematic procedures were also employed in order to strengthen the pre/post-complementary data, and to increase the validity and reliability of the study. In this dimension, which was conducted to determine the effectiveness of the FCM, the participants' opinions were sought about the method applied. For this purpose, a semi-structured interview form which was prepared by the researchers and examined by experts, was applied to twenty-seven teacher candidates selected according to the maximum variation sampling within the experimental group, and data were collected. Data were analysed using content analysis by taking into account the action research pattern. Such action research, which combines the research and implementation processes, is defined as an approach that involves collecting and analysing systematic data to identify problems related to an implementation process, or to understand and solve a problem that has already emerged (Yildirim & Simsek, 2013). In addition, action research is also described as systematic research involving practice, and as a systematic research design for solving problems encountered in learning environments or in everyday life, by finding solutions to the problems and putting them into practice (McKay, 1992). Action research involves several stages (Elliott, 1991). Firstly, *the question of the FCM's effectiveness in learning environments was examined.* In this regard, the students who participated in the research were asked various questions about the effectiveness of the FCM to collect data. The available data had to be collected within the framework of a plan, and a plan needed to be made. In accordance with the plan, materials and resources that might be needed during the teaching-learning process were provided. After the preparation and completion of the plan, the *implementation process was carried out.* At the end of this process, the FCM's ability to meet or not meet the relevant expectations might emerge. This part of the research was carried out in line with the stages of action research by providing suggestions based on the data.

In order to ensure the reliability of the research, and to strengthen the defended ideas, direct citations from some student opinions were provided in the text. When these citations were shown, teacher candidates were

coded as S_1 (Student 1), S_2 (Student 2), etc. The data obtained in terms of the reliability of the research were presented as they were, without any interpretation, and the opinions of the field experts were ascertained during the reporting process. In order to ensure the validity of the study, attention was paid to ensuring that the themes and codes were significant and consistent, and were strengthened using different data sources (Miles & Huberman, 1994). In addition, data analysis was performed to determine the agreement between data encoders. Agreement values were calculated, and the range of values was found to be between .720 and .881 that is, "...at a very good level of agreement".

Complementary Information Stage

The ultimate aim of the multi-complementary approach was to integrate the data and findings obtained in the first two stages, and to achieve a complementary result. This stage, which was the final stage of the research, involved the combination of pre-complementary and post-complementary stages. At this point, the aim was to clarify all aspects of the issue by combining the pre-complementary information that identified the current situation with the FCM, and the post-complementary information that played a complementary role in the absence of the situation. At this stage, it was possible to obtain complementary information as a result (Batdi, 2017). The idea of examining a subject from a holistic perspective in the current research was based on the need to make an effort for learners to be more conscious, respectful, fair, creative, productive, healthy, socially aware, and enjoying a social and natural life within the context of a holistic education, instead of just raising well-educated individuals by evaluating learners only in one way, such as the leading names such as Montessori, Steiner, Dewey or Ferrer thought many years ago (Miller, 2005). The matter that we want to emphasize here is that the topic researched using a multi-holsitic approach including much more extensive analyses instead of making unidirectional evaluations, will provide the readers, including other researchers in the field, with studies that present creative and productive ideas with a broader perspective. On the other hand, it can be said that complementary information, which is intended to be achieved in the context of the MCA, can be considered as complementary information for the current study. As a matter of fact, Russell (1912) stated that achieving holistic reality is like a stopover on a long journey, and that the point reached is just one step closer to the holistic reality, not the final point, which brings clarity to this situation. Because the developments and changes in the current technological age bring about changes in the fields of science and research at the same rate, the so-called final point is always the stopover point, and we have yet to reach the 'final point' which is by definition unattainable. However, the latest information obtained under the current conditions should be considered as complementary information for that moment in time, and further studies and research should be carried out. In addition, apart from the synthesis process which occurred during the complementary information stage, suggestions are also put forward based on the results obtained. Therefore, this stage is not a simple combination. Rather, it reveals a new and unique feature. In this respect, it is thought that the present study contains both an original and a comprehensive process and will contribute to the educational evaluation of the model.

FINDINGS

In this part of the study, the findings obtained in the context of the MCA are presented in detail, and interpreted separately. Firstly, meta-analytical and thematic data based on document analysis were given. In the second stage, experimental and thematic findings were included and, in the final stage, commentary on the synthesis stage, in which complementary information was intended to be provided, was included. The statistics showing the education level, type of publication, study year, and the duration of application, sample size and subject area, frequency and percentage values of the meta-analytical examination included in the analysis related to the FCM, are presented in Table 2.

Table 2. The frequency and percentage values of the studies that include data on the impact of fcm on academic achievement scores for categorical independent variables

Variable	f	%	Variable	f	%
Teaching Level			*Year*		
Primary School	4	6.3	2013/2014	5/5	7.8/7.8
Secondary School	10	15.6	2015/2016	9/18	14.1/28.1
High School	13	20.3	2017/2018	13/12	20.3/18.8
University	36	56.3	2019	2	3.1
Other	1	1.6			
Duration of Application (Weeks)			Subject Area		
2-4	12	18.8	Science	18	25.4
5-6	13	20.3	Maths	12	16.9
7-8	13	20.3	Social Sciences	13	18.3
9-18	21	32.8	Foreign Language	19	26.8
Unspecified	5	7.8	Computer	9	12.7
Publication Type			*Sample Size*		
Articles	27	21.9	Small Sample (Between 1-49)	20	29.9
Master's Thesis	14	42.2	Medium Sample (Between 50-99)	33	49.3
Doctoral Thesis	23	35.9	Large Sample (100 And Above)	14	20.9

When Table 2 is examined in terms of teaching grades, it can be seen that the highest number of studies were conducted in universities (56.3%) and the fewest number of studies were conducted in primary schools (6.3%) and secondary schools (15.6%). It can be said that the small degree of implementation of this model in primary and secondary schools is due to the fact that students may not be able to access technological tools such as computers and the internet in their homes. This may also be the reason why students do not watch the videos that they should watch. Table 2 shows that 42.2% of the studies took the form of a Master's thesis, 35.9% doctoral theses, and 21.9% articles. In terms of the distribution by years, 2016 was the year in which the greatest number of studies were conducted with eighteen (28.1%) studies, while the least number of studies were carried out in 2013 (7.8%) and 2014 (7.8%). In addition, two publications were published in 2019 and these studies were included in the analysis. In terms of application times, most studies were conducted over a 9-18 week period (32.8%); and few studies not specifying their application period. Considering the sample size, it was observed that twenty (29.9%) of the studies were performed with a small sample, thirty-three studies (49.3%) with a medium sample, and fourteen studies (20.9%) with a large sample. Finally, it was observed that the highest number of studies was conducted in the field of Foreign Language Education with nineteen (26.8%) studies, followed by Science Education with eighteen (25.4%) studies, and the least number of studies were conducted in the field of Computers (12.7%).

Table 3. The homogeneous distribution value, mean effect size and confidence intervals of the studies included in the meta-analysis according to the effect models related to the academic achievement scores

Model Type	n	Z	p	Q	df	ES	SE	% 95 Confidence Interval	
								Lower Limit	Upper Limit
SEM	71	13.165	0.000	354.326	70	0.346	0.026	0.295	0.398
REM	71	7.502	0.000	88.945	70	0.462	0.062	0.341	0.583

Table 3 shows the distribution values of the studies included in the meta-analysis according to the statistical models. It can be said that the distribution is heterogeneous, seeing that the Q-statistical value (354.326) is greater than the critical value (90.531). Therefore, in the calculations made according to REM, the standard error was calculated as 0.062, the upper limit of the 95% confidence interval was 0.583 and the lower limit was 0.341. The effect size value was calculated as ES=0.462. The medium level of this value, according to the Thalheimer and Cook's (2002) classification, suggests that FCM has a positive effect on academic achievement.

Table 4. Effect size of studies on different dimensions according to academic achievement

| | Variables | N | ES | %95 Confidence Interval | | Q_B | Z | df | p |
				Lower Limit	Upper Limit				
Teaching Level	Primary School	5	1.137	0.489	1.784	5.133	7.677	3	0.162
	Secondary School	11	0.257	-0.166	0.680				
	High School	13	0.450	0.134	0.766				
	University	42	0.443	0.311	0.576				
	Sum	71	0.452	0.337	0.568				
Subject Area	Science	18	0.463	0.237	0.689	0.408	8.103	4	0.982
	Social Sciences	13	0.513	0.178	0.848				
	Foreign Language	19	0.446	0.211	0.682				
	Computer	9	0.509	0.299	0.720				
	Maths	12	0.395	0.035	0.754				
	Sum	71	0.472	0.358	0.586				
Duration of Application	2-4	13	0.744	0.389	1.100	6.960	7.333	4	0.138
	5-6	16	0.243	-0.014	0.501				
	7-8	13	0.384	0.066	0.702				
	9-18	24	0.525	0.335	0.716				
	Unspecified	5	0.307	0.055	0.560				
	Sum	71	0.429	0.314	0.544				

Table 4 presents the effect size of the studies on academic success included in the meta-analysis, obtained in terms of teaching grades, subject area and duration of application. According to this, when the homogeneity test was examined in terms of the *teaching grade*, Q_B was found to be = 5.133 from a X2 table, at 95% significance level, and with 3 degrees of freedom, the X^2 value was found to be 7.815. Since the Q_B statistic value (Q_B=5.133) is smaller than the critical value of X^2 ($X^2(0.95)$=7.815 distribution with 3 degrees of freedom, it can be said that the distribution is homogeneous. Accordingly, it was understood that the overall effect size of the teaching grades (ES=0.452) was medium according to Thalheimer and Cook (2002). In the light of these findings, it can be said that the application of the FCM affects academic achievement positively, but since there is no significant difference (p=0.162), it can be said that academic success has not changed according to the teaching grades. In other words, the fact that no meaningful difference is seen between the grades when the studies of the FCM are evaluated within the context of teaching grades, can be interpreted as the academic success does not change according to the teaching grades.

When the homogeneity test was examined in terms of *subject areas*, the Q_B value was found to be 0.41. The X^2 value was calculated as 9.488 with 4 degrees of freedom at the 95% significance level from the X^2 table. Since the Q_B statistical value is smaller than (Q_B=0.41) X^2, it can be said that the distribution between the effect sizes is homogeneous. Accordingly, the overall effect size was found to be ES=0.472, and this value was medium according to Thalheimer and Cook (2002). In addition, it can be stated that the distribution of effect sizes is homogeneous, and that the impact of the FCM on academic achievement does not change according to subject area (p=0.982).

When the study was examined in terms of *duration of application*, Q_B was found to be 6.960. The X^2 value was calculated as 9.488 with 4 degrees of freedom at the 95% significance level from the X^2 table. Therefore, it is understood that the Q_B statistic value is less than X^2. In this case, it can be stated that the distribution of effect sizes is homogeneous, and that the effect of the FCM on academic achievement does not change in terms of the duration of application (p = 0.138). In this case, it can be said that the level of academic achievement is independent of the duration of application in the courses in which the FCM was used. On the other hand, the overall effect size value is ES=0.429, and this is at a medium level. This finding may be interpreted as the use of the FCM affecting academic achievement positively at a medium level.

The Effectiveness of the FCM within the Scope of the Document Analysis-Based Thematic Review

The themes and codes of the thematic study carried out to complete the data in stages 1a, 1b, 1c, 1d, 1e and 1f obtained as a result of the document analysis, are presented in different forms and models. As a result of the detailed examination, thematic data were grouped under different themes in three models. The effects of the FCM on the personal dimension (Figure 5), the effect on the learning process (Figure 6), the effect on the sensory dimension (Figure 7), the positive aspects of the FCM (Figure 8), the negative aspects of the FCM and suggestions (Figure 9) are presented below.
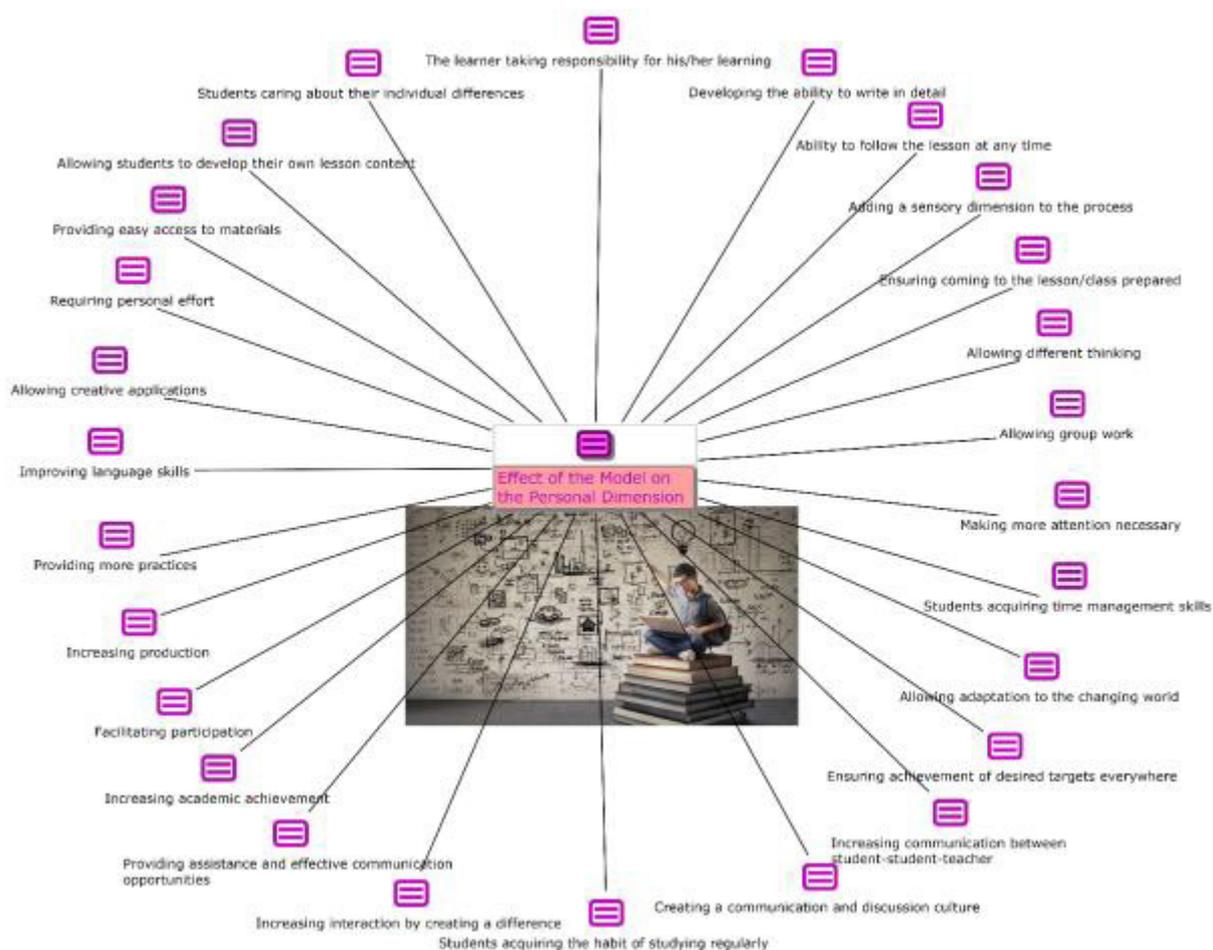
Figure 5. Effect of the model on the personal dimension

In Figure 5, some of the codes expressed in the context of the impact of the FCM on the personal dimension can be expressed as: following the course at any time, allowing creative applications, the learner taking responsibility for his/her own learning, gaining a regular studying habit, requiring personal effort, caring

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about the individual differences of the students, providing time management skills, and allowing adaptation to the changing world. In the context of this theme, - expressions such as *"Doing activities in class allows me to give more importance and pay more attention. Because when I am at home, maybe I can't take it seriously."*, which was cited from the419422-.93 coded study; *"Creative activities, such as the games we play on the internet, have enabled us to use language in different ways"*, which was cited from the 445646-s.60 coded study and *"I think it increases our ability to communicate with our friends and teachers"* which was cited from the 429617-p.70 coded study. These were considered as reference sentences and were used in the creation of codes.
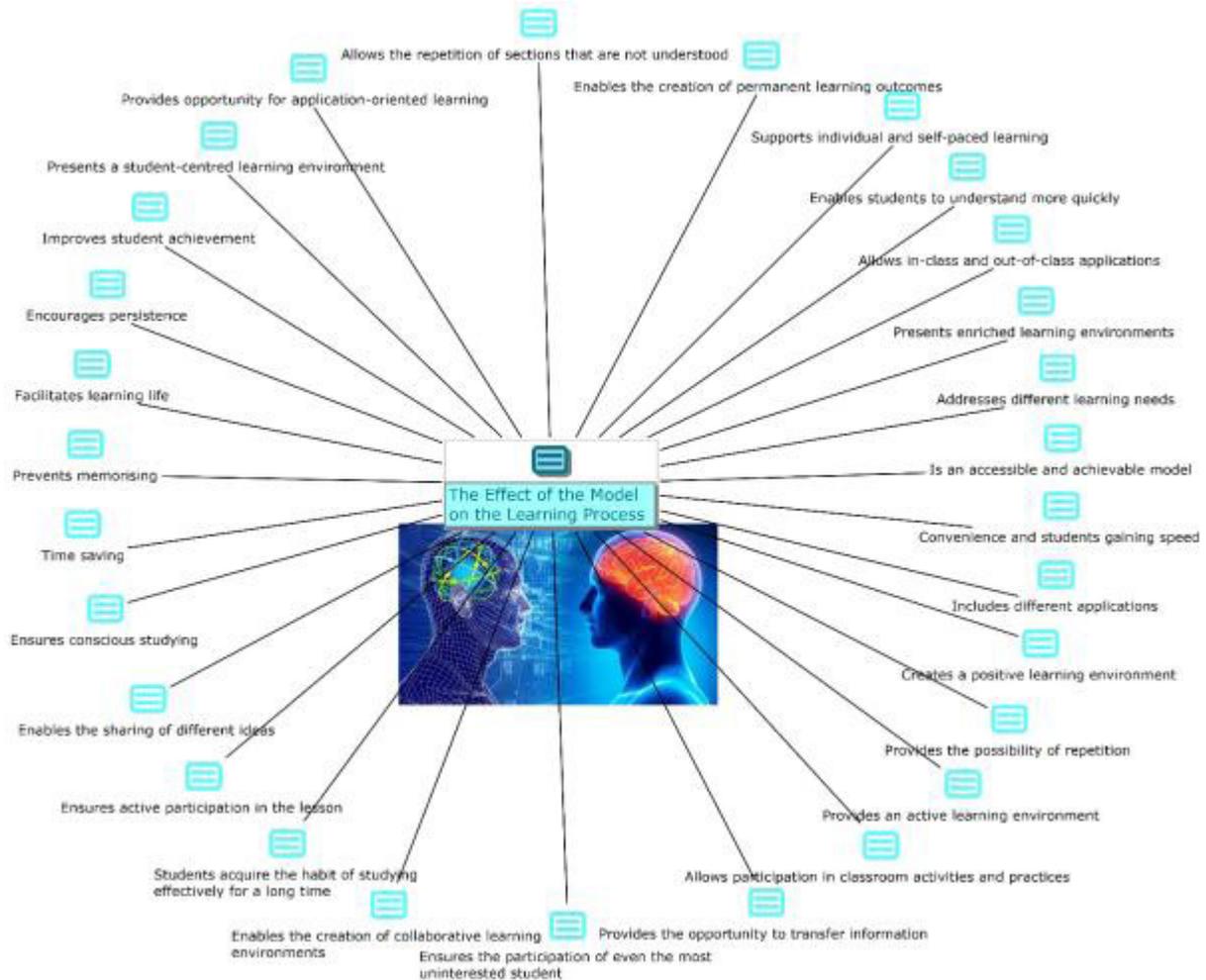
Figure 6. Effect of the model on the learning process

When Figure 6 is examined, it can be seen that codes related to the effect of theFCM on the learning process have been created. Some of the codes generated for this model are specified as "…supporting individual and self-paced learning, allowing in-class and out-of-class applications, presenting enriched learning environments, preventing memorising, providing the possibility of repetition, providing the opportunity to transfer information, creating a positive and active learning environment, ensuring the formation of collaborative learning environments, presenting a student-centred learning environment, providing opportunities for application-oriented learning". Some expressions that are referenced in the creation of related codes can be specified as expressions that are cited from the 429617-66 coded study: *"Some friends have a little more capacity than others, while some understand it at once, while others understand it after three times. Everyone can watch and repeat the video according to himself/herself. Everyone learns at their own pace"* or the expressions cited from the 383901-71 coded study: *"Now, our routine of having a lesson in the classroom and doing homework at home that we repeated regularly every day ended. We are able to follow the lessons at the time and space we determine, and we can do homework and carry out much richer activities in the classroom"* and also

the expressions cited in the 429617-69 coded study: "In other classes, reading and writing exercises are performed, there is not much activity. But in this class, we do activities and practices. We practise on the computer. This makes it more enjoyable and lasting".
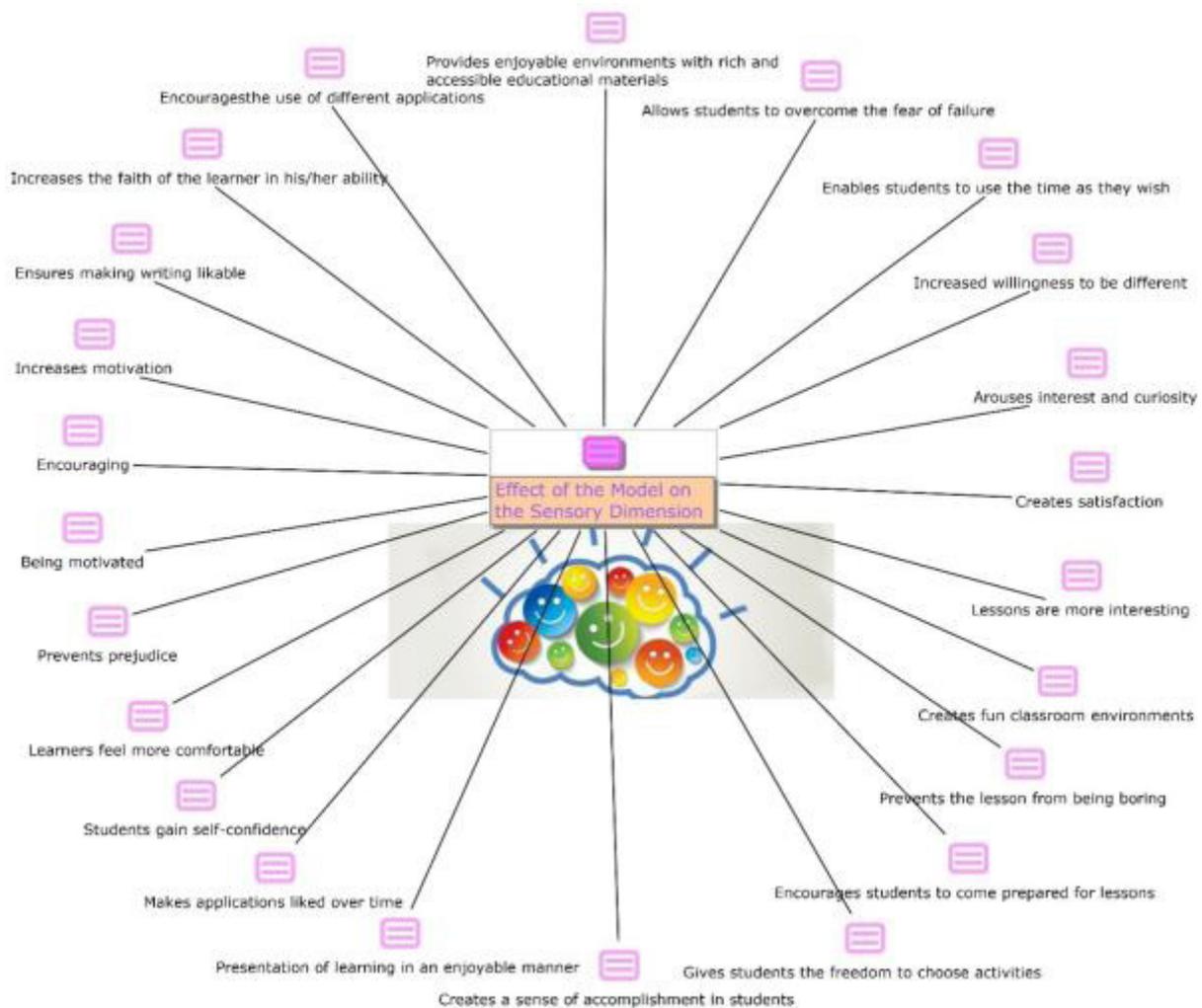
Figure 7. Effect of the Model on the Sensory Dimension

Figure 7 shows the codes expressed in relation to the effect of the FCM on the sensory dimension. Some of these are "…being motivated, encouraged, preventing the lesson from being boring, creating satisfaction, students gaining self-confidence, creating fun classroom environments, increasing the faith of the learner in his/her ability, creating a sense of accomplishment in students and allowing them to overcome the fear of failure". Expressions that were cited from the 383901-72 coded study and which may be referenced to these codes are: *"Thanks to the model, my learning life became easier, and many of my prejudices were broken down. It makes the lesson more fun. I like the videos our teacher has prepared. In fact, I watched them several times. We got rid of the boredom of the textbook"* or the expression cited from the 394794-79 coded study: *"Having different activities, group work, applications increased my motivation".*
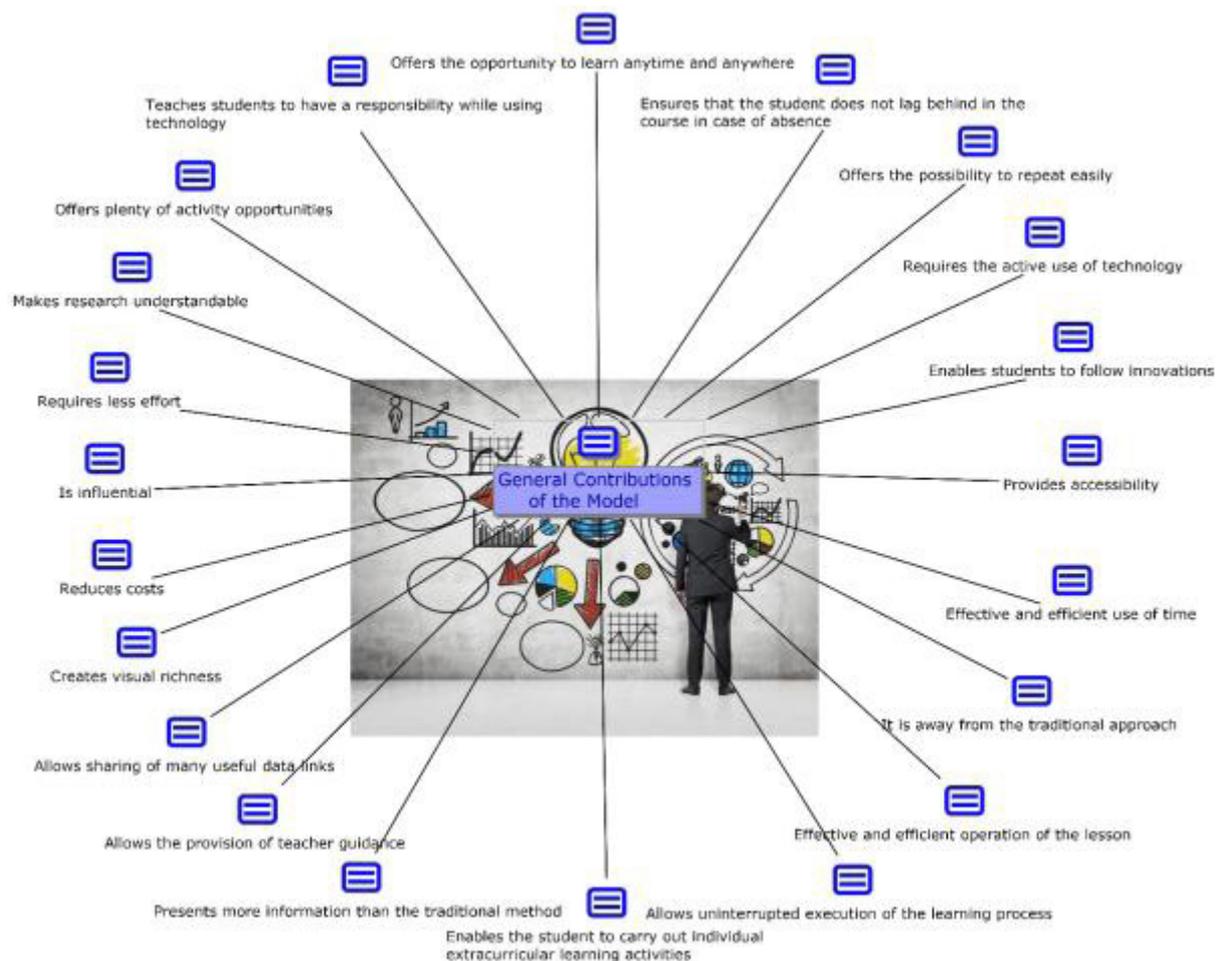
Figure 8. General contributions of the model

Some of the general contributions of FCM can be expressed as: "…effective and efficient use of time, offering the possibility to repeat easily, offering the opportunity to learn anytime and anywhere, requiring active use of technology, offering plenty of activity opportunities, allowing uninterrupted execution of the learning process, providing accessibility, ensuring that the student does not lag behind in the course in case of absence". Related codes were created based on expressions such as: *"We took lessons like this, but they were temporary. I'm pleased with this because it is done in a different way. Even though I was prejudiced at first, it offers more than what the teacher teaches in class. When you hesitate about something, you can access all the visual materials, presentations, audio recordings, videos etc. at any time you want. These have provided permanence"* (419422-91); *"It is advantageous in terms of time. You can progress fast in class. Student-teacher interaction is also high. And visual materials, I think. Normally when presentations are used to teach the lesson in the classroom, it does not attract much attention, but when it comes to using video and sound, it is much better"* (419422-.94); *"The interaction between the home and school enhances our learning. Because we spend our free time learning at home and, at school, we have the opportunity to repeat and practise again. I think this is a very important factor"* (429617-76).

In addition to the positive aspects of the FCM, it is understood that it has some limitations, and these limitations and suggestions for solutions to them are given in Figure 9.
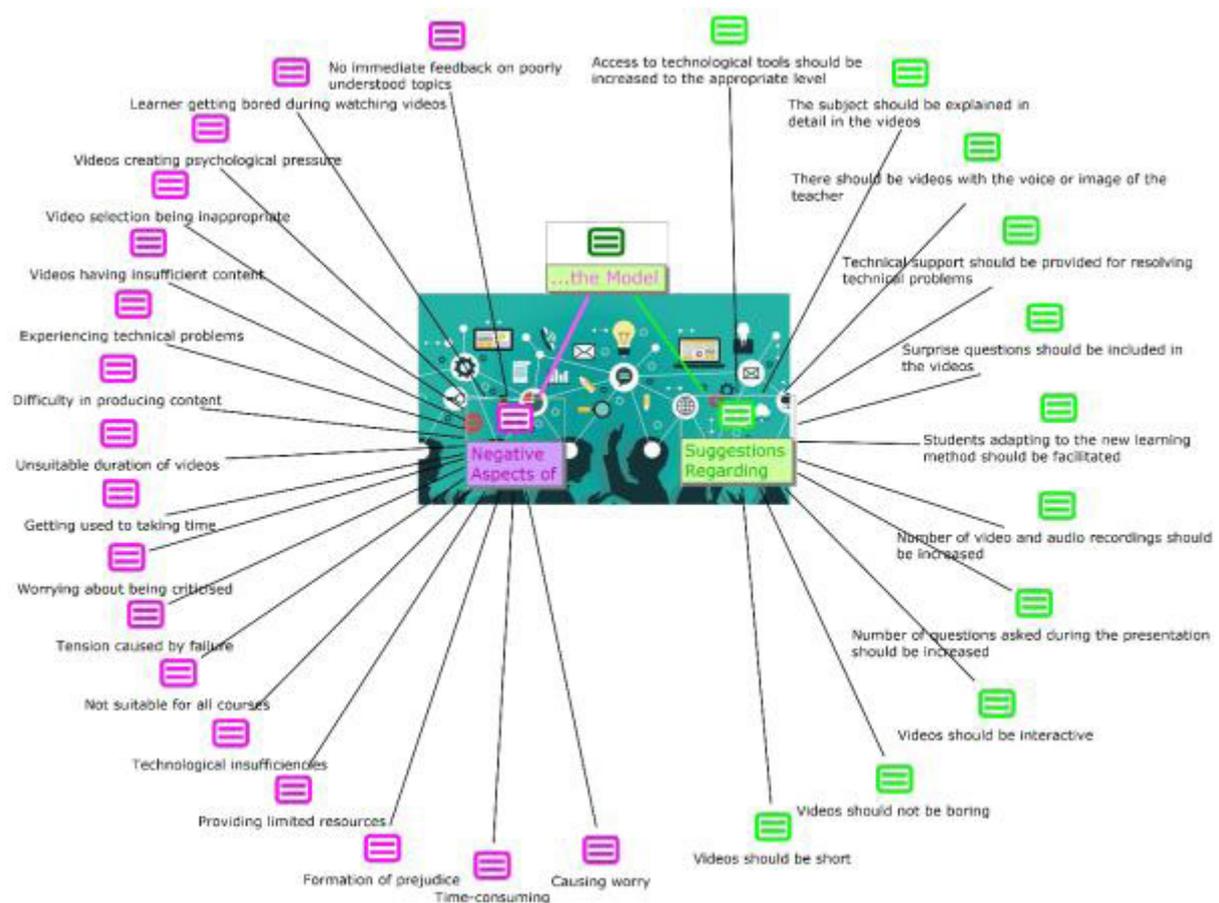
Figure 9. Negative aspects of the model and suggestions

Figure 9 shows the problems encountered in the implementation of the FCM. Some of the most prominent of these codes are "…duration and contents of video being not suitable, no immediate feedback on poorly understood topics, technological insufficiencies, difficulty in producing content, getting used to taking time, providing limited resources, experiencing technical problems and not suitable for all courses". Related codes are based on expressions such as: *"If we don't understand something when we watch a video, we can't ask, but we can ask the teacher at school" (372445-83); "Technical problems may occur in the model. I've had technical problems once. The computer malfunctioned in the lab. …" (429768-62); "Sometimes, the anxiety of forgetting to watch the video caused me to be tense because of the responsibility I felt. There is no such obligation in traditional education, the teacher will explain the topic anyway when you go to school, so you feel relaxed before the class"* (429768-61). However, when the studies were examined in detail, it was seen that some suggestions had been presented regarding the problems mentioned. Some of these suggestions, which could eliminate or reduce the relevant problems, could be expressed as "videos should be short and not boring, access to technological tools should be increased to the appropriate level, technical support should be provided for resolving technical problems, students adaptation to the new learning method should be facilitated". During the creation of the relevant codes, statements cited from the 394794-s.80 and the 424655-p.47 coded studies were taken as references: *"In the videos, the subject should be explained in more detail and attention should be paid not to bore the student". "The questions asked during the presentation can be increased and, in the presentation, it can be advanced by giving the correct answers to the questions. Also, motivation can be increased by giving a mark at the end of the presentation".* These findings show that, despite the limitations that may occur during the use of the FCM in the learning process, it can be used effectively as a learning approach if suitable measures are taken.

Comparison of Pre-test and Post-test Achievement Score Results of Groups after the Experimental Study

In order to determine whether or not there was a significant difference between the pre-test and post-test academic achievement scores of the students in the study group, independent groups t-test was used. The results are shown in Table 5.

Table 5. Comparison of pretest and posttest achievement score results of experiment and control group

Achievement Test	Groups	n	ss	sd	Levene		t	p
					F	p		
pretest	Experiment	34	4.18	2.57				
	Control	30	4.66	2.27	62	0.500	0.482	-0.802	0.426
posttest	Experiment	34	11.68	2.40				
	Control	30	10.27	2.97	62	1.782	0.187	2.095	0.04

When Table 5 is examined, it can be seen that the pre-test achievement scores of the experiment and control groups are close to each other, and no statistically significant difference is observed (t=-0.802; p>.05). In other words, it can be said that the groups were equal prior to the experimental procedure. On the other hand, there were significant differences between the post-test achievement scores of the experimental and control groups (t= 2.095; p<.05). It is understood that the difference was in favour of the experimental group with a rate of 1.41. Therefore, this finding can be interpreted as claiming that the transformed classroom model positively affects the students' academic success in the Information Technology course.

Thematic Findings Obtained from the Opinions of the Participants after the Experimental Study

In this section, the interpretation of the thematic findings obtained from the interviews with the students participating in the FCM is included. With the evaluation of the opinions received, it was observed that two models entitled the positive and negative aspects of the FCM emerged.

Figure 10 shows the themes and codes related to the positive aspects of the FCM. Some of the most prominent codes can be expressed as "time saving, offering more applications, encouraging students to come to class prepared for the lesson, providing educational guidance at any time, ensuring full class participation, allowing students to learn anywhere, allowing repetitions at any time, providing cooperative learning, ensuring that no homework is given" S_8 coded participant, which is one of the sources from which the relevant codes are quoted, stated as follows: *"We come from home having learned lessons, and we learn parts that we don't know at school by doing more practice. We learn parts we do not understand by practising"* and S_1 coded participant stated *"It is more effective for us in terms of saving time, and because we can learn in collaboration with our classmates as a team".* Finally, S_{23} emphasises individual responsibility "The student understands the lesson better. The student learns something by taking responsibility for his/her learning".
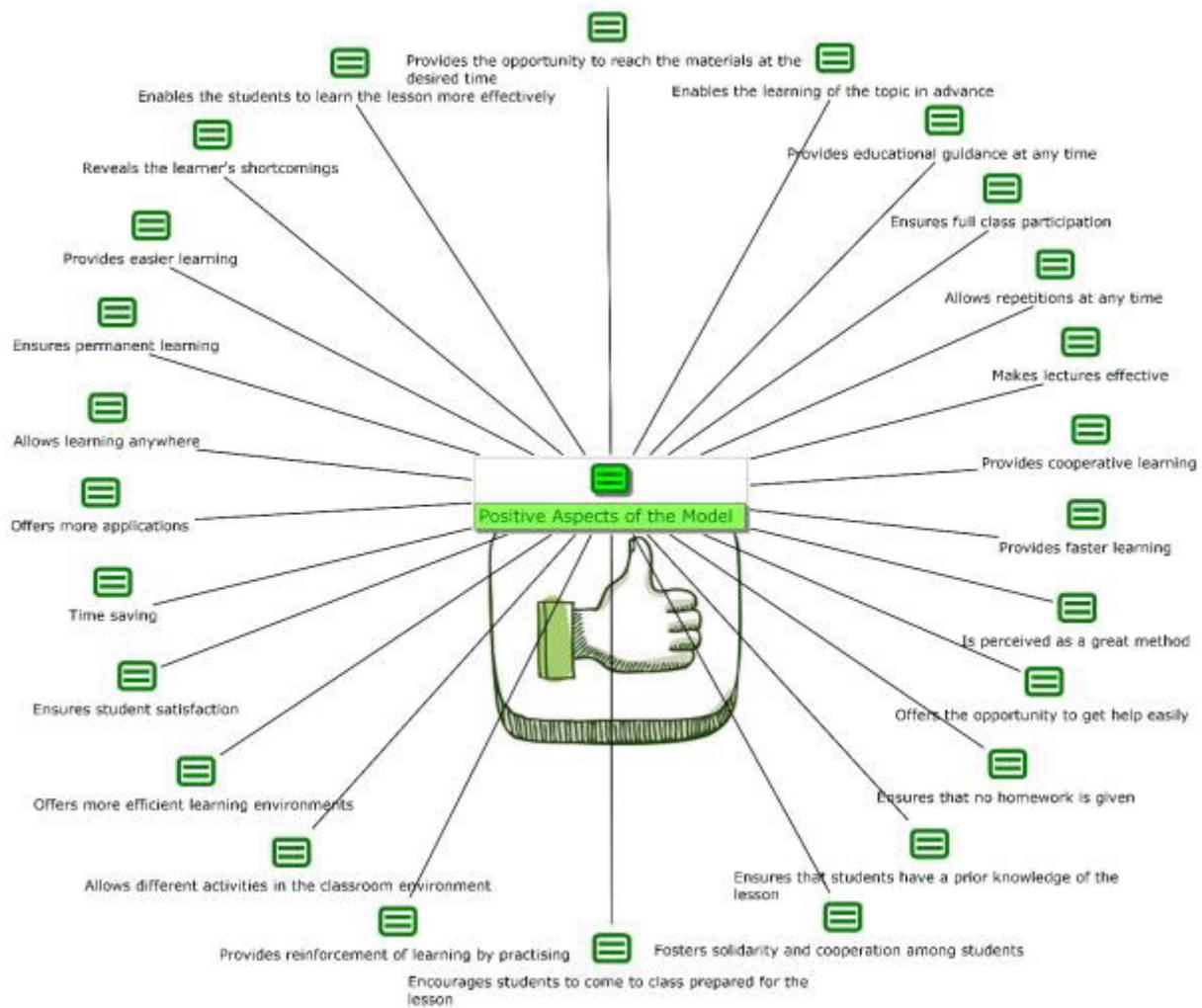
Figure 10. Model for the positive aspects of FCM

Figure 11 shows that different codes are formed as a result of evaluating the opinions expressed by the participants about the negative aspects of the FCM. In this context, it can be stated that some of the negative aspects of the model are coded as "lack of materials required, it is not a substitute for the teacher's role, problems during the implementation stage, unclear parts cannot be learned, videos being not informative enough, changing existing habits being difficult, lack of one-to-one attention with learners, unsuitable for crowded classes". Some of the sources from whom codes related to this model are cited include (S_3): *"It's causing trouble for those who don't have a computer or the internet...and it can affect them negatively"*; (S_5): *"As I learned the lesson at home, for the first time I heard some terms and concepts, and I found them difficult to understand. Since there was no one, it was hard to find the answers. But if we learned the lesson in the school, we would ask the teacher about what we didn't understand"*; (S_{13}): *"The video was not very effective. Some videos were too short. I also had problems with sound sometimes"*.
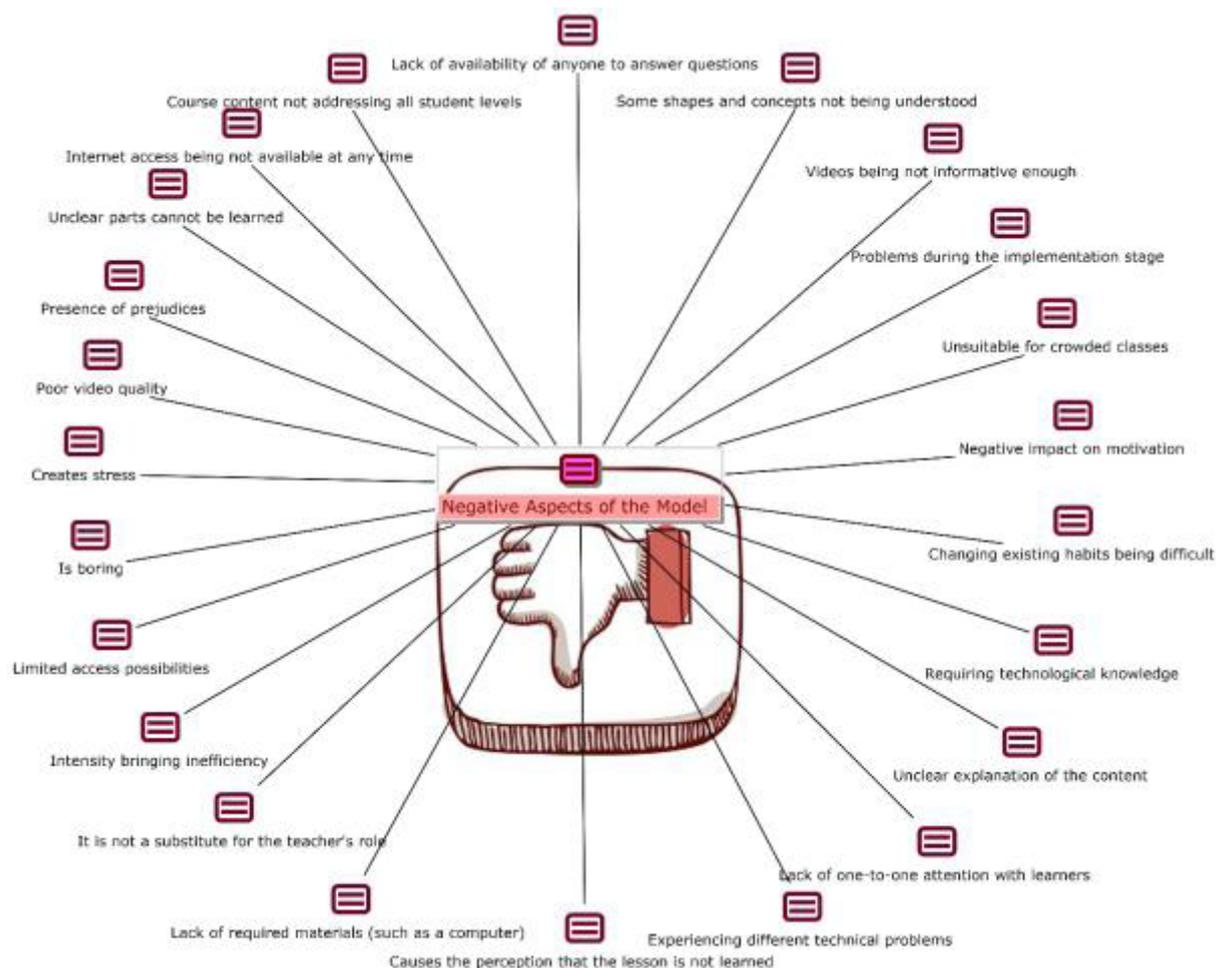
Figure 11. Model regarding the negative aspects of FCM

DISCUSSIONS AND CONCLUSION

This was a comprehensive study conducted to determine the effect of the FCM on academic achievement in order to evaluate the scope of the FCM in the literature in the context of the current research, and to determine how effective the model is in terms of different variables. Operations were performed in line with MCA. First of all, a meta-analytical examination was applied to reveal the current state of the FCM approach in the scientific literature in terms of related research that had been conducted. In this context, in order to determine the impact of the FCM approach on students' academic achievement scores, the studies included in the meta-analysis were analysed. Most studies were conducted at university level (56.3%); frequently in the form of Master's publications (42.2%); in 2016 (28.1%); in a 9-18 weeks application process (32.8%); in 50-99 sample size (49.3%) and in foreign language teaching (26.8%). In the present case, that more studies are performed on the FCM especially at the university level, may be given as the justification for the predominant preference of this method, which foregrounds self-study and ensures the realization of the learning process of the student out of the classroom through online presentations (teachers' sound recordings or online activities that s/he has prepared). Besides, it may also be commented that it is preferred more in the student groups at this level and in this age group (university level) because it includes the practice of in-class student-centered activities, giving more time in the classroom to aid the understanding of hard concepts, answering students' questions, providing the involvement of students in active learning, and establishing a connection with everyday life and therefore inculcates the habit of self-learning (Stone, 2012). On the other hand, as a result of the meta-analysis of studies which included academic achievement scores, it was found that the FCM had a positive medium impact on academic achievement (ES=0.462). This result shows that the FCM has a positive effect on academic achievement. In a doctoral study conducted on this subject, it concluded that the FCM has positive effects in terms of academic success (Wiginton, 2013) and supports

the current research. Besides, in a study where FCM was used in nursing education (Presti, 2016), in a study where 107 pieces of research were accessed through a literature search, it was concluded that the FCM has positive effects. The results obtained both support the result of the present research and indicate that the positive effect of the FCM shows similarity in different areas and in different bodies of literature.

Within the scope of the pre-complementary stage of the research, in addition to meta-analysis, meta-thematic analysis was also carried out, and various themes and codes were created from the results of the studies accessed. At this point, the personal impact of the FCM were found to be improved time management, increasesd individual responsibility, increased preparedness, improved creative skills, communication, language skills, solidarity and cooperation, the enhancement of planned and regular study, easy access to material, adaptation to change and development, improved production and a contribution to academic achievement. Therefore, it is understood that the FCM has a positive effect on the development of different skills on the part of the learner as well as ensuring that the learner achieves a certain level in terms of personal development. It was found that the FCM has similar results in different studies in the related literature. It was found that students accept their own learning responsibilities with the FCM, attend to the lesson more, and participate effectively in the activities/practices during the lesson (Akgun, 2015; Bergmann & Sams, 2012; Staker & Horn, 2012; Tucker, 2012). In addition, in this model, when differences arising from the differing learning speeds of the students are taken into account, it has been determined by different studies conducted on the FCM that equal opportunities are offered in education, and interactive and cooperative learning environments are created (Chen et al., 2014; Chu & Sun, 2015; Halili & Zainuddin, 2015; Rutkowski & Moscinska, 2013; Yavuz, 2016). In addition, it has been found in some studies that the model allows the creation of permanent learning outcomes by enabling the use of rich and accessible materials (Aydin, 2016; Mason et al., 2013; Turan, 2015). The similar and overlapping results of these studies support and strengthen the current study. Additionally, *the effects* of the FCM on the learning process have been shown to be positive in terms of individual speed, permanent learning, preventing memorising, knowledge transfer, cooperative learning, different applications, positive learning environments and applied learning. Looking at the literature, similar findings have been found. In these similar findings, it has been stated that the model prevents learning being monotonous by making learning effective and permanent, making it student-centred and making the learning environment richer (Balikci, 2015; Mason et al., 2013; Sirakaya, 2015; Turan, 2015; Yavuz, 2016). In these studies, it was also stated that, thanks to the model, time was used effectively and efficiently, and that it allowed students to repeat the lesson as much as they wished (Bergmann & Sams, 2012; Fraga & Harmon, 2014; Johnson, 2012; Roehl et al., 2013; Tucker, 2012).

Regarding *the effect* of the FCM on the sensory dimension, it was seen that the model was motivating and encouraging, and that the students achieved a sense of success, a belief in being able to do what was required, and an ability to overcome the fear of failure. They were satisfied with the results and gained self-confidence. At this point, it was concluded in the studies on related subjects that the model saves students from monotony and makes them feel more comfortable by making the classroom process more efficient and fun (Aydin, 2016; Fulton, 2012; Pinto & Little, 2014; Touchton, 2015). In addition, it was found that students were satisfied with the method applied in terms of the FCM, liked the lesson and found it motivating (Davies et al., 2013; Gilboy et al., 2015; Kara, 2016; Morgan et al., 2015; Pinto & Little, 2014; Touchton, 2015), which are consistent and supportive results. This may indicate that the learning outcome may therefore be permanent, since it can be interpreted that the FCM ensures learning by making it enjoyable and therefore making the students willing to participate. Besides, in a study conducted on the FCM in the body of the literature (Aydin & Demirer, 2017), the content analysis and examination of the studies at this point in the body of literature were made. It was also understood at the end of this study that the FCM affected the attitude of the student positively, and it had positive effects on issues such as motivation and student satisfaction.

When the *codes* mentioned with regard to the FCM's general contributions are evaluated, it is understood that the approach gives freedom in terms of time and space, offers repetition according to learning speed and form (flexible learning), provides visually rich materials, and follows an innovative and modern approach removed from traditionalism. All these codes point to the ease of learning with the FCM and the opportunities it offers in terms of learning. Another contribution of the model is that students who indicate that they do not want to waste time going to lectures, use in-class time more effectively and efficiently, and find more

opportunity to practise. Moreover, the fact that students could receive help from each other and access their teachers at any time and easily, both during the class and outside the classroom, has caused them to express a positive opinion of the model. At this point, the teacher acts as a guide and mentor whom they can consult. In this respect, the student has become both more active and central in the learning process, with the teacher taking the role of guide. The results of some studies show that the FCM establishes cognitive bridges between the classroom process and the extracurricular process, and ensures uninterrupted execution of the learning process. They also indicate that the students work in collaboration with their peers under the guidance of their teachers (Aydin, 2016; Sirakaya, 2015; Talan, 2018; Yavuz, 2016). In addition, studies have been encountered stating that the model allows students to learn at their own pace at any time and in any place, thus contributing to flexible learning (Bergmann & Sams, 2012; Mok, 2014), and that it saves on cost, labour and time, provides more opportunity to practise, and encourages students not to lag behind in their school work (Bergmann & Sams, 2012; Kara, 2016; Qader, 2017). As it can also be understood from these results, the student's practice of the content of the lesson the teacher gives as they comprehend it, and his/her use of it in problem solving stages, should be seen as important by the students rather than the content of the course that the teacher teaches. As is indicated in the related study results, thanks to the presented online contents and videos within the scope of the FCM, both time and space limitations are eliminated and economic opportunities can be presented. Besides, it can be ensured that the lessons missed or not completely understood can be watched again and again within the scope of the FCM, reinforced through following and understanding. Consequently, it can be stated that these results support our current research results.

In addition to these positive aspects mentioned with regard to the FCM, it has been determined that there are some *negative aspects and limitations.* In particular, different problems such as technical problems during the use of the application, access to technological tools such as a computer and the internet, and inappropriate video duration and content, have come to the fore. In line with the findings of this study, some other studies have also mentioned similar negative situations with regard to the model. In the relevant literature, among the negative aspects of the FCM, the lack of technical tools, technical problems experienced during the application, and a failure to watch videos before the lesson were seen as necessary to highlight (Boyraz, 2014; Fraga & Harmon, 2014; Strayer, 2012; Turan, 2015). In order to implement the FCM effectively, such negative aspects have to be eliminated. In this respect, it is of the utmost importance that the students have access to technological tools at the appropriate level, and that they are provided with technical support. However, when videos are prepared in an understandable manner of an appropriate length, and when students' learning processes are facilitated, it can be seen that such problems can be eliminated and that the system can be accepted by students (Kara, 2016; Milman, 2012; Talan, 2018; Yavuz, 2016). Furthermore, video content being prepared in accordance with the relevant topic and being more interesting and striking can make the video both more effective and more fun. In addition, it may be suggested that the duration of the course which students have to follow out of class on a daily basis is arranged so as not to be too onerous and bore the student. Since the student will follow the prepared content willingly and fondly as a result, developments in the desired course are more likely to occur at the end of the process.

In the second stage of the study, it was found that there was a significant difference between the experimental and control groups in terms of the post-test scores in favour of the experimental group with regard to the effect of the FCM on the academic achievement scores in an Information Technology (IT) course. In other words, it can be said that the FCM is more effective in achieving the learning outcomes in an IT lesson compared to traditional teaching methods.

That the FCM, which focuses on student-centered active learning in the classroom and enables the following of the content online out of the classroom has a positive effect, was proved by different researchers in line with the present experimental results. Hibbard, Sung and Wells (2016) in applying the FCM in chemistry teaching at a college, found that the experimental group of students who realized learning using this learning platform showed better performance than the group taught using traditional methods. Besides, they determined that the students' perceptions regarding the use of the FCM were mostly positive, and that this positive situation increased success by ensuring motivation regarding learning.

At the end of the study, the participants' opinions regarding the FCM were also ascertained. When the findings related to these views were evaluated, it was seen that data similar to the codes identified in the meta-thematic dimension had been obtained. The contributions of the FCM, such as the collaborative environment it provides for learning, repetition, helping each other, participation in the lesson and the opportunity to learn everywhere and anytime, and its negative aspects such as videos being insufficient and not suitable, the requirement for internet access and the lack of instant feedback, means that the results provided by the pre-complementary and post-complementary information overlap completely with each other. Similarly, Nederveld and Berge (2015) attained a result that flipped learning creates a student-centered classroom where they can learn at their own pace while their academic learning levels and paces diverse. Therefore, it can be stated that the results obtained in the first and second stage dimensions of the study overlap. The fact that pre-complementary and post-complementary information achieves similar results in terms of the positive effects of the FCM on success, shows that both dimensions are consistent and support each other. When the literature related to the FCM is examined, there are studies indicating that the model increases success in many areas such as the social sciences, science, medicine, engineering and mathematics (AlJaser, 2017; Atwa et al., 2016; Cakir, 2017; Elian & Hamaidi, 2018; Foldnes, 2016; Hew & Kwan, 2018; Saglam, 2016; Thai et al., 2017; Turan, 2015), and some other studies indicate that there is no significant increase in success (Dixon, 2017; Duffy, 2016; Overmyer, 2014; Touchton, 2015; Voltz, 2016). In this sense, the consistency, coherence and similarity of the results of the studies both among themselves and with the related literature, is noteworthy.

The complementary dimension of the research includes pre-complementary and post-complementary results within the scope of the research supporting each other. In this context, the ES value for the FCM being at 0.462 level as a result of meta-analysis in the pre-complementary information, the value of ES being positive in terms of sub-dimensions such as level, subject areas and application times, and the determination of the impact of the FCM's personal dimension with titles such as learning process, sensory dimension, general contributions, positive/negative aspects and suggestions in meta-thematic examinations, explains the summary of the first stage of the research and their complementing each other. On the other hand, the complementary results of the research have been achieved with the creation of positive and negative codes for the model in line with the participatory views from a thematic point of view, and with the findings that there was a significant difference in favour of the experimental group's post-test achievement scores after the FCM application. These results are in the same direction as the results in the first stage means that the pieces are brought together to complete a whole picture with regard to the research. The pre-complementary findings of the present research show that the FCM affects academic success positively in the meta-analysis dimension, and that with the meta-thematic findings, the positive effects of the FCM are again predominant. When the post-complementary findings were examined, it was understood that the experiment group's success scores, where the FCM was used in the experimental dimension, were higher than those in the control group. That the positive codes regarding the model were at the forefront, after the participator opinions were asked for in thematic terms, shows that the FCM contributions were at a significant level in this stahe as they were in other stages. The results which were consistent with one another, supported and supplemented each other, following the examination of the effectiveness of the FCM in the two stages, and with four different types of analysis, contributed equally to the reliability of the research. In this context, with the integration of the results from both stages of the research, the deficiencies in one stage are eliminated, and completion is achieved, and the research will have a strong and comprehensive structure that includes rich data. In our current research, as stated in the suggestions presented for the more effective use of the FCM, the adaptation of learners to technology-supported applications in the age of technology can provide unlimited convenience when it comes to learning. For this reason, the contents of the applications to be used should be prepared according to the level of the student, and the number of students in the class should be arranged accordingly, in order to ensure that students use the technology efficiently. Furthermore, researchers are advised to use MCA to broaden the scope of their study, increase the richness of data, and achieve consistent and reliable results. This research is thought to contribute greatly to the literature as a result of its originality.

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REFERENCES

Akgun, M., & Atici, B. (2017). The effect of flipped classroom on learners' academic achievements and views. Kastamonu Education Journal, 25(1), 329-344.

Alamri, M. M. (2019). Students' academic achievement performance and satisfaction in a flipped classroom in Saudi Arabia. International Journal of Technology Enhanced Learning, 11(1), 103-119.

Al-Harbi, S. S., & Alshumaimeri, Y. A. (2016). The flipped classroom impact in grammar class on EFL Saudi secondary school students' performances and attitudes. English Language Teaching, 9(10), 60-80.

AlJaser, A. M. (2017). Effectiveness of using flipped classroom strategy in academic achievement and self-efficacy among education students of Princess Nourah Bint Abdulrahman University. English Language Teaching, 10(4), 67-77.

Atwa, Z. M., Din, R., & Hussin, M. (2016). Effectiveness of flipped learning in physics education on Palestinian high school students' achievement. Journal of Personalized Learning, 2(1), 73-85.

Aydin, G. (2016). Ters yuz sinif modelinin universite ogrencilerinin programlamaya yonelik tutum, oz-yeterlik algisi ve basarilarina etkisinin incelenmesi [The investigation of the effect of flipped classroom model on undergraduate students' attitude, self-efficacy and academic achievement towards programming]. (Master's Dissertation). DokuzEylul University, Izmir, Turkey. Available from the Council of Higher Education, National Dissertation Center, Dissertation ID:463358.

Aydin, B., & Demirer, V. (2017). A comprehensive analysis of the studies conducted in the framework of flipped classroom model. Educational Technology Theory and Practice, 7(1), 57-82.

Aydin, B. (2016). Ters yuz sinif modelinin akademik basari, odev/gorev stress duzeyi ve ogrenme transferi uzerindeki etkisi [The effects of flipped classroom model on academic achievement, homework/ task stress level and transfer of learning]. (Master's Dissertation). SuleymanDemirel University, Isparta, Turkey. Available from the Council of Higher Education, National Dissertation Center, Dissertation ID:429768.

Balikci, H. C. (2015). 'Flipped Classroom' modeliyle hazirlanan derse iliskin ogrenci goruslerinin ve ders basarilarinin degerlendirilmesi [Evaluation of the success of the lectures prepared with 'Flipped Classroom' model and students' opinion]. (Master's Dissertation). AfyonKocatepe University, Afyonkarahisar, Turkey. Available from the Council of Higher Education, National Dissertation Center, Dissertation ID:398596.

Banks, G. C., Kepes, S., & Banks, K. P. (2012). Publication bias: The antagonist of meta-analytic reviews and effective policymaking. Educational Evaluation and Policy Analysis, 34(3), 259–277. DOI: 10.3102/0162373712446144.

Batdi, V. (2018). Egitimde yeni bir yonelim: mega-coklu butuncul yaklasim ve beyin temelli ogrenme [A new trend in education: Mega-multi complementary approach and brain based learning]. IKSAD Publishing.

Batdi, V. (2017). Smart board and academic achievement in terms of the process of integrating technology into instruction: a study on the McA. Croatian Journal of Education, 19(3), 763-801. DOI: 10.15516/cje.v19i3.2542.

Batdi, V. (2019). Meta-tematik analiz [Meta-thematic analysis]. In V. Batdi (Ed.), Meta-tematik analiz: ornek uygulamalar [Meta-thematic analysis: sample applications]. (pp. 10-76). Ankara: Ani Publication.

Bergmann, J., & Sams, A. (2012). Flip your classroom: Reach every student in every class every day. International Society for Technology in Education.

Bergstresser, M. B. (2018). Teaching students with dyslexia using the flipped classroom method. (Doctoral Dissertation). Northcentral University, USA.

Bishop, J. L., & Verleger, M. A. (2013). The flipped classroom: A survey of the research, In ASEE National Conference Proceedings, Atlanta, GA (Vol. 30, No. 9, pp. 1-18).

Borenstein, M., Hedges, L.V., Higgins, J.P.T., Rothstein, H.R. (2009). Introduction to metaanalysis. West Sussex, UK: John Wiley & Sons Ltd. ISBN: 978-0-470-05724-7

Borenstein, M., Hedges, L. V., Higgins, J. P. T., & Rothstein, H. R. (2010). A basic introduction to fixed-effect and random-effects models for meta-analysis. Res. Syn. Meth., 1, 97-111.

Boyraz, S., (2014). Ingilizce ogretiminde tersine egitim uygulamasinin degerlendirilmesi [Evaluating flipped classroom/education method in English teaching]. (Master's Dissertation). AfyonKocatepe University, Afyonkarahisar, Turkey. Available from the Council of Higher Education, National Dissertation Center, Dissertation ID: 372445.

Bosner, S., Pickert, J., & Stibane, T., (2015). Teaching differential diagnosis in primary care using an inverted classroom approach: student satisfaction and gain in skills and knowledge, BMC medical education, 15(1), 1-7.

Bulut, C. (2018). Tersyuz sinif modelinin EFL ogrenicilerinin gramer basarimlari uzerindeki etkisi: Sadece tersine cevirme degil, (Halihazirda) olanla butunlestirme [Impact of flipped classroom model on EFL learners' grammar achievement: Not only inversion, but also integration]. (Master's Dissertation). Yeditepe University, Istanbul, Turkey. Available from the Council of Higher Education, National Dissertation Center, Dissertation ID:508187.

Card, N. A. (2012). Applied meta-analysis for social science research. New York: The Guilford Press.

Cashin, M. (2016). The effect of flipped classrooms on elementary students' reading scores. (Doctoral Dissertation). Northcentral University, USA.

Chao, C. Y., Chen, Y. T., & Chuang, K. Y. (2015). Exploring students' learning attitude and achievement in flipped learning supported computer aided design curriculum: A study in high school engineering education. Computer Applications in Engineering Education, 23(4), 514-526.

Charles-Ogan, G., & Williams, C. (2015). Flipped classroom versus a conventional classroom in the learning of mathematics. British Journal of Education, 3(6), 71-77.

Chen, Y., Wang, Y., & Chen, N. S. (2014). Is FLIP enough? Or should we use the FLIPPED model instead?. Computers & Education, 79, 16-27.

Cheng, L., Ritzhaupt, A. D., & Antonenko, P. (2018). Effects of the flipped classroom instructional strategy on students' learning outcomes: a meta-analysis. Educational Technology Research and Development, 66(5), 1069-1086. https://doi.org/10.1007/s11423-018-9633-7.

Cheung, A. C., & Slavin, R. E. (2013). The effectiveness of educational technology applications for enhancing mathematics achievement in K-12 classrooms: A meta-analysis. Educational research review, 9, 88-113.

Chu, L., & Sun, S. H. (2015). The application of flipped classroom in pediatric physical therapy, Physiotherapy, 101, e252.

Cohen, J., Welkowitz, J., & Ewen, R.E. (2000). Introductory statistics for the behavioral sciences. Orlando: Harcourt Brace College Publishers.

Clark, K. R. (2013). Examining the effects of the flipped model of instruction on student engagement and performance in the secondary mathematics classroom: An action research study. (Doctoral Dissertation). Capella University, USA.

Crawford, T. H. (2017). Flipped learning influence on active learning and assessments in the postsecondary hospitality classroom: An action research study. (Doctoral Dissertation). Capella University, USA.

Cumming, G. (2012). Understanding the new statistics: Effect sizes, confidence intervals, and metaanalysis. New York: Routledge.

Cakir, E. (2017). Ters yuz sinif uygulamalarinin fen bilimleri 7.sinif ogrencilerinin akademik basari, zihinsel risk alma ve bilgisayarca dusunme becerileri uzerine etkisi [The effect of flipped classroom on 7th grade students' academic achievement, cognitive risk taking skills and computational thinking skills in science education classroom]. (Master's Dissertation). Ondokuz Mayis University, Samsun, Turkey. Available from the Council of Higher Education, National Dissertation Center, Dissertation ID:456600.

Davies, R. S., Dean, D. L., & Ball, N. (2013). Flipping the classroom and instructional technology integration in a college-level information systems spreadsheet course. Educational Technology Research and Development, 61(4), 563-580.

Dixon, K. (2017). The effect of the flipped classroom on urban high school students' motivation and academic achievement in a high school science course. (Doctoral Dissertation). Liberty University, USA.

Duffy, C. M. (2016). The impact of flipped learning on student achievement in an eighth grade earth science classroom. (Doctoral Dissertation). Wilkes University, USA.

Dusenbury, M., & Olson, M. (2019). The impact of flipped learning on student academic performance and perceptions. The Collegiate Aviation Review International, 37(1), 19-44.

Duval, S., & Tweedie, R. (2000). Trim and fill: A simple funnel-plot–based method of testing and adjusting for publication bias in meta-analysis. Biometrics, 56(2), 455–463.

Ekmekci, E. (2014). Harmanlanmis ogrenme odakli tersten yapilandirilmis yazma sinifi modeli [Flipped writing class model with a focus on blended learning]. (Doctoral Dissertation). Gazi University, Ankara, Turkey. Available from the Council of Higher Education, National Dissertation Center, Dissertation ID:356650.

Elian, S. M., & Hamaidi, D. A. H. (2018). The effect of using flipped classroom strategy on the academic achievement of fourth grade students in Jordan. International Journal of Emerging Technologies in Learning (iJET), 13(02), 110-125.

Elliott, J. (1991). Action research for educational change. Bukhingam: Open University Press.

Enfield, J. (2013). Looking at the impact of the flipped classroom model of instruction on undergraduate multimedia students at CSUN. Techtrends: Linking Research & Practice to Improve Learning, 57(6), 14-27.

Erdem Cavdar, O. (2018). Tersyuz sinif yaklasiminin geleneksel Ingilizce dersi ile butunlestirilmesi [Integrating flipped classroom approach into traditional English class]. (Master's Dissertation). Karadeniz Technical University, Trabzon, Turkey. Available from the Council of Higher Education, National Dissertation Center, Dissertation ID:508195.

Esteves J., & Pastor J. (2004). Using a multimethod research approach to research enterprise systems implementations. Electronic Journal of Business Research Methods (EJBRM), 69-81.

Fadol, Y., Aldamen, H., & Saadullah, S. (2018). A comparative analysis of flipped, online and traditional teaching: A case of female Middle Eastern management students. The International Journal of Management Education, 16(2), 266-280.

Files, D. D. (2016). Instructional approach and mathematics achievement: an investigation of traditional, online, and flipped classrooms in College Algebra. (Doctoral Dissertation). Central Florida University, USA.

Foldnes, N. (2016). The flipped classroom and cooperative learning: Evidence from a randomised experiment. Active Learning in Higher Education, 17(1), 39-49.

Fraga, L. M., & Harmon, J. (2014). The flipped classroom model of learning in higher education: An investigation of preservice teachers' perspectives and achievement. Journal of Digital Learning in Teacher Education, 31(1), 18-27.

Fulton, K. (2012). Upside down and inside out: Flip your classroom to improve student learning. Learning & Leading with Technology, 39(8), 12-17.

Gilboy, M. B., Heinerichs, S., & Pazzaglia, G. (2015). Enhancing student engagement using the flipped classroom, Journal of Nutrition Education and Behavior, 47(1), 109-114.

Glass, G. V. (1976). Primary secondary and meta-analysis of research. Educational Researcher, 5(10), 3-8.

Gokdas, I., & Gursoy, S. (2018). The effect of flipped classroom model on academic achievement and motivation in maths lesson at primary schools. Mediterranean Journal of Educational Research, 12(26), 159-174.

Guven Demir, E. (2018). Tersyuz sinif modeline dayali uygulamalarin ilkokul 4.sinif ogrencilerinin akademik basari ve planlama becerilerine etkisi [Effect of applications based on flipped classroom on academic achievement and planning skills of 4th grade primary school students]. (Doctoral Dissertation). OndokuzMayis University, Samsun, Turkey. Available from the Council of Higher Education, National Dissertation Center, Dissertation ID:519317.

Halili, S. H., & Zainuddin, Z. (2015). Flipping the classroom: what we know and what we do not. The Online Journal of Distance Education and e-Learning (TOJDEL), 3(1), 28-35.

He, W., Holton, A., Farkas, G., & Warschauer, M. (2016). The effects of flipped instruction on out-of-class study time, exam performance, and student perceptions. Learning and Instruction, 45, 61-71.

Hedges, L. V. (1982). Estimation of effect size from a series of independent experiments. Psychological Bulletin, 92, 490–499. DOI:10.1037/0033-2909.92.2.490.

Heredia, K. (2015). The effects of the flipped classroom model on student academic growth in flipped and traditional community college classrooms. (Doctoral Dissertation). Aurora University, USA.

Hew, K. F., & Lo, C. K. (2018). Flipped classroom improves student learning in health professions education: a meta-analysis. BMC medical education, 18(1), 38.

Hibbard, L., Sung, S., & Wells, B. (2016). Examining the effectiveness of a semi-self-paced flipped learning format in a college general chemistry sequence. Journal of Chemical Education, 93, 24-30. http://digitalcommons.auctr.edu/scpubs/16

Howell, D. (2013). Effects of an inverted instructional delivery model on achievement of ninth-grade physical science honors students. (Doctoral Dissertation). Gardner-Webb University, USA.

Hung, H. (2015). Flipping the classroom for English language learners to foster active learning, Computer Assisted Language Learning, 28(1), 81-96.

Iyitoglu, O. (2018). Ters yuz sinif modelinin Ingilizceyi yabanci dil olarak ogrenen ogrencilerin akademik basarilari, tutumlari ve ozyeterlik inanclari uzerindeki etkisi: Bir karma yontem calismasi [The impact of flipped classroom model on EFL learners' academic achievement, attitudes and self-efficacy beliefs: A mixed method study]. (Doctoral Dissertation). Yildiz Technical University, Istanbul, Turkey. Available from the Council of Higher Education, National Dissertation Center, Dissertation ID:491434.

Johnson, D. (2012). Power up!: Taking charge of online learning, Educational Leadership, 70(3), 84-85.

Kara, C. O. (2016). Tip fakultesi klinik egitiminde ters yuz sinif modeli kullanilabilir mi? [Can flipped classroom model be used in clinical education program of medical faculty?]. (Master's Dissertation). Akdeniz University, Antalya, Turkey. Available from the Council of Higher Education, National Dissertation Center, Dissertation ID:424655.

Karakurt, L. (2018). Lisans egitiminde B1 seviyesi icin yabanci dil olarak Ingilizce ogrenim siniflarina ters-yuz edilmis ve harmanlanmis dilbilgisi ogretimi [Flipped and blended grammar instruction for B1 level EFL classes at tertiary education]. (Master's Dissertation). Hacettepe University, Ankara, Turkey. Available from the Council of Higher Education, National Dissertation Center, Dissertation ID:516091.

Kelly, P. E., Polanin, J. R. Jang, S. J., & Johnson, B. R. (2015). Religion, Delinquency, and Drug Use: A Meta-Analysis. Criminal Justice Review, 40(4), 505-523. DOI: 10.1177/0734016815605151.

Kurt, G. (2017). Implementing the flipped classroom in teacher education: Evidence from Turkey. Journal of Educational Technology & Society, 20(1).211–221.

Lee, A. M. (2016). An examination of student outcomes and student satisfaction in a flipped learning environment: A quasi-experimental design. (Doctoral Dissertation). Nevada University, USA.

Leo, J., & Puzio, K., (2016). Flipped instruction in a high school science classroom. Journal of Science Education and Technology, 25(5), 775-781.

Lipsey, M. W., & Wilson, D. B. (2001).Practical meta-analysis. Thousand Oaks, CA:Sage.

Margosian, K. (2018). Examining the effect of flipped learning on english language learner mathematics achievement. (Master's Dissertation). California State University, USA.

Mason, G. S., Shuman T. R., & Cook, K. E., (2013).Comparing the effectiveness of an inverted classroom to a traditional classroom in an upper-division engineering course, IEEE Transactions on Education, 56(4), 430-435.

McKay, J. A. (1992). Professional development through action research. Journal of Staff Development, 13(1), 18-21.

Millard, E. (2012). 5 Reasons Flipped Classrooms Work, University Business, p.26-29.

Miles, M. B., & Huberman, A. M. (1994).Qualitative data analysis: An expanded sourcebook. Thousand Oaks, California: Sage.

Miller, R. (2005). Philosophical sources of holistic education. Journal of Values Education, 3(10), 33-40.

Milman, N. (2012). The flipped classroom strategy: What is it and how can it be used?. Distance Learning, 9(3), 85-87.

Missildine, K., Fountain, R., Summers, L., & Gosselin, K. (2013). Flipping the classroom to improve student performance and satisfaction. Journal of Nursing Education, 52(10), 597-599.

Mok, H. N. (2014). Teaching tip: The flipped classroom. Journal of Information Systems Education, 25(1), 7-11.

Molnar, K. K. (2017). What effect does flipping the classroom have on undergraduate student perceptions and grades?. Education and Information Technologies, 22(6), 2741-2765.

Morgan, H., McLean, K., Chapman, C., Fitzgerald, J., Yousuf, A., & Hammoud, M. (2015). The flipped classroom for medical students, The Clinical Teacher, 12(3), 155-160.

Mori, Y., Omori, M., & Sato, K. (2016). The impact of flipped online Kanji instruction on written vocabulary learning for introductory and intermediate Japanese language students. Foreign Language Annals, 49(4), 729-749.

Nederveld, A., & Berge, Z. L. (2015). Flipped learning in the workplace. Journal of Workplace Learning, 27(2), 162-172. DOI: 10.1108/JWL-06-2014-0044.

O'Flaherty, J., & Philips, C. (2015). The use of flipped classrooms in higher education: A scoping review. Internet and Higher Education, 25, 85-95.

Olakanmi, E. E. (2017). The effects of a flipped classroom model of instruction on students' performance and attitudes towards chemistry. Journal of Science Education and Technology, 26(1), 127-137.

Onwuegbuzie, A. J., & Dickinson, W. B. (2008). Mixed methods analysis and information visualization: Graphical display for effective communication of research results. The Qualitative Report, 13(2), 204-225.

Orwin, R. G., & Vevea, J. L. (2009). Evaluating coding decisions. In H. Cooper, L. V. Hedges, & J. C. Valentine (Eds.), The handbook of research synthesis and meta- analysis (2nd ed., pp. 177–203). New York: Russell Sage Foundation.

Overmyer, G. R. (2014). The flipped classroom model for college algebra: Effects on student achievement. (Doctoral Dissertation). Colorado State University, USA.

Pinto, C., & Little, G., (2014). Flipped librarians: Assessing our own need to understand our users. The Journal of Academic Librarianship, 2(40), 192-193.

Prefume, Y. E. (2015). Exploring a flipped classroom approach in a Japanese language classroom: A mixed methods study. (Doctoral Dissertation). Baylor University, USA.

Presti, C. R. (2016). The flipped learning approach in nursing education: A literature review. Journal of Nursing Education, 55(5), 252-257. DOI: 10.3928/01484834-20160414-03.

Qader, R. (2017). Donusturulmus sinif egitiminin Ingilizce ogrenimi goren Irakli ogrencilerin yazma becerileri uzerindeki etkileri [The effect of flipped classroom instruction on Iraqi EFL learners' writing skills]. (Master's Dissertation). Gaziantep University, Gaziantep, Turkey. Available from the Council of Higher Education, National Dissertation Center, Dissertation ID:488654.

Relman, A. S. (1980). New reports of medical meetings: how reliable are abstracts? New England Journal of Medicine, 303, 277-278. DOI: 10.1056/NEJM198007313030509.

Roehl, A., Reddy, S. L., & Shannon, G. J. (2013). The flipped classroom: An opportunity to engage millennial students through active learning. Journal of Family and Consumer Sciences, 105(2), 44-49.

Rosenthal, R. (1979). The file drawer problem and tolerance for null results. Psychological Bulletin, 86(3), 638-641.

Rothstein, H. R., Sutton, A. J., & Borenstein, M. J. (2006). Publication bias in meta-analysis, Chapter 1. In H. R. Rothstein, A. J. Sutton, & M. Borenstein (Eds.), Publication bias in meta-analysis: Prevention, assessment and adjustments (pp. 1–7). Chichester, England: John Wiley and Sons, Ltd.

Russel, B. (1912). The philosophy of the truth. Retrieved from https://www.andrew.cmu.edu/user/kk3n/epistclass/russell-rescher.pdf

Rutkowski, J., & Moscinska, K. (2013). Self-directed learning and flip teaching: electric circuit theory case study. 41st SEFI Conference, Leuven, Belgium.

Saglam, D. (2016). Ters-yuzsinif modelinin Ingilizce dersinde ogrencilerin akademik basarilarina ve tutumlarina etkisi [The effect of flipped classroom model on the academic achievements and attitudes of students in English language teaching]. (Master's Dissertation).BulentEcevit University, Zonguldak, Turkey. Available from the Council of Higher Education, National Dissertation Center, Dissertation ID:451810.

Saunders, J. (2014). The flipped classroom: Its effect on student academic achievement and critical thinking skills in high school mathematics. (Doctoral Dissertation). Liberty University, USA.

Segumpan, L. L. B., & Tan, D. A. (2018). Mathematics performance and anxiety of junior high school students in a flipped classroom. European Journal of Education Studies, 4(12), 1-33.

Sengel, E. (2014). Using the "Flipped classroom" to enhance physics achievement of the prospective teacher impact of flipped classroom model on physics course. Journal of the Balkan Tribological Association, 20(3), 488-497.

Sezer, B. (2017). The effectiveness of a technology-enhanced flipped science classroom. Journal of Educational Computing Research, 55(4), 471-494.

Shachar, M. (2002). Differences between traditional and distance learning outcomes: A meta-analytic approach. (Doctoral Dissertation). Touro University, USA.

Sharpe, E. H. (2016). An investigation of the flipped classroom in algebra two with trigonometry classes. (Doctoral Dissertation). Regent University, USA.

Sirakaya, D. A., (2015). Ters yuz sinif modelinin akademik basari, oz – yonetimli ogrenme hazir bulunuslugu ve motivasyon uzerine etkisi [The effect of flipped classroom model on academic achievement, self - directed learning readiness and motivation]. (Doctoral Dissertation).Gazi University, Ankara, Turkey. Available from the Council of Higher Education, National Dissertation Center, Dissertation ID:419422.

Sletten, S. R. (2015). Investigating flipped learning: Post-secondary student selfregulated learning, perceptions, and achievement. (Doctoral Dissertation). North Dakota University, USA.

Staker, H., & Horn, M. (2012). Classifying K-12 blended learning, Innosight Institute. Retrieved from http://files.eric.ed.gov/fulltext/ED535180.pdf

Stone, B. B. (2012, May). Flip your classroom to increase active learning and student engagement. In Proceedings from 28th Annual Conference on Distance Teaching & Learning, Madison, Wisconsin, USA.

Strayer, J. F. (2009). Inverting the classroom: A study of the learning environment when an intelligent tutoring system is used to help students learn. Saarbrucken: VDM Verlag Muller.

Talan, T. (2018). Donusturulmus sinif modeline gore e-ogrenme ortaminin tasarimi ve modelin uygulanabilirliginin degerlendirilmesi [Design of e-learning environment according to flipped classroom model and evaluation of model applicability].(Doctoral Dissertation). Istanbul University, Istanbul, Turkey. Available from the Council of Higher Education, National Dissertation Center, Dissertation ID:534135.

Talan, T., & Gulsecen, S. (2018). Ters-yuz sinif ve harmanlanmis ogrenmede ogrencilerin oz-duzenleme becerilerinin ve oz-yeterlik algilarinin incelenmesi [Evaluation of the students' self-regulation skills and perceived self-efficacy in flipped classroom and blended learning environments]. Turkish Journal of Computer and Mathematics Education (TURCOMAT), 9(3), 547-564. DOI: 10.16949/turkbilmat.403618

Talan, T., & Gulsecen, S. (2019). The effect of a flipped classroom on students' achievements, academic engagement and satisfaction levels. Turkish Online Journal of Distance Education, 20(4), 31-60.

Tarazi, N. (2016). The influence of the inverted classroom on student achievement and motivation for learning in secondary mathematics in the United Arab Emirates: A quasi-experimental study. (Doctoral Dissertation). Northcentral University, USA.

Thai, N. T. T., De Wever, B., & Valcke, M. (2017). The impact of a flipped classroom design on learning performance in higher education: Looking for the best "blend" of lectures and guiding questions with feedback. Computers & Education, 107, 113-126.

Thalheimer, W., & Cook, S. (2002). How to calculate effect sizes from published research articles: A simplified methodology. Retrieved from http://education.gsu.edu/coshima/EPRS8530/Effect_Sizes_pdf4.pdf.

Thoms, C. L. (2012). Enhancing the blended learning curriculum by using the" flipped classroom" approach to produce a dynamic learning environment. In 5th International Conference on Education, Research and Innovation (pp. 2150-2157).

Touchton, M., (2015). Flipping the classroom and student performance in advanced statistics: Evidence from a quasi-experiment, Journal of Political Science Education, 11(1), 28-44.

Tucker, B. (2012). Online instruction at home frees class time for learning, Education Next, 12(1).

Turan, Z. (2015). Ters yuz sinif yonteminin degerlendirilmesi ve akademik basari, bilissel yuk ve motivasyona etkisinin incelenmesi [The evaluation of flipped classroom method and examination of its effects on academic achievement, cognitive load and motivation]. (Doctoral Dissertation). Ataturk University, Erzurum, Turkey. Available from the Council of Higher Education, National Dissertation Center, Dissertation ID:394794.

Vang, Y. V. (2017). The impact of the flipped classroom on high school mathematics students' academic performance and self-efficacy. (Doctoral Dissertation). California State University, USA.

Viera, A. J., & Garrett, J. M. (2005). Understanding interobserver agreement: The kappa statistic. Family Medicine, 37(5), 360-363.

Voltz, E. A. (2016). Is flipped instruction in the string class an effective teaching strategy?. (Doctoral Dissertation). Trevecca Nazarene University, USA.

Webb, M., & Doman, E. (2016). Does the flipped classroom lead to increased gains on learning outcomes in ESL/EFL contexts?. CATESOL Journal, 28(1), 39-67.

Wilson, D. B. (2009). Systematic coding. In H. Cooper, L. V. Hedges, & J. C. Valentine (Eds.), The handbook of research synthesis and meta-analysis (2nd ed., pp. 159–176). New York: Russell Sage Foundation.

Wiginton, B. L. (2013). Flipped instruction: An investigation into the effect of learning environment on student self-efficacy, learning style, and academic achievement in an Algebra I classroom. (Doctoral Dissertation). University of Alabama Libraries, USA.

Yavuz, M. (2016). Ortaogretim duzeyinde tersyuz sinif uygulamalarinin akademik basari uzerine etkisi ve ogrenci deneyimlerinin incelenmesi [An investigation into the effects of flipped classroom applications on the academic success and experiences of the students at secondary school]. (Master's Dissertation). Ataturk University, Erzurum, Turkey. Available from the Council of Higher Education, National Dissertation Center, Dissertation ID:429617.

Yildirim, A., & Simsek, H. (2013). Sosyal bilimlerde nitel arastirma yontemleri [Qualitative research methods in social sciences]. Seckin Publishing, Ankara, Turkey.

Yildiz, S. N., Sarsar, F., & Cobanoglu Ates, A., (2017). A literature review of flipped classroom practices, Electronic Journal of Social Sciences, 16(60), 76-86.

Yildiz, D. G. (2016). Effect of the flipped classroom on prospective teachers's academic achievement, metacognitive awareness and epistemological beliefs.Celal Bayar University Journal of Social Sciences, 14(3).405-426.

Yurtlu S. (2018). Fen egitiminde ters yuz sinif modelinin ogrenci basarisina ve goruslerine etkisinin incelenmesi [Effect of the flipped classroom model on student's achievement and views in science education]. (Master's Dissertation). MusAlparslan University, Mus, Turkey. Available from the Council of Higher Education, National Dissertation Center, Dissertation ID:506022.

Zhonggen, Y., & Guifang, W. (2016). Academic achievements and satisfaction of the clicker-aided flipped business english writing class. Journal of educational technology & society, 19(2), 298–312.

APPENDIX

Cappa Values

Personal Dimension				Learning Process				Sensorial Dimension				General Contributions			
	K2				K2				K2				K2		
	+	-	Σ		+	-	Σ		+	-	Σ		+	-	Σ
K1 +	26	2	28	K1 +	28	3	31	K1 +	23	2	25	K1 +	21	1	22
-	3	16	19	-	4	19	23	-	2	16	18	-	2	15	17
Σ	29	18	47	Σ	32	22	54	Σ	25	18	43	Σ	23	16	39
Kappa: .777 p:.000				Kappa: .733 p:.000				Kappa: .809 p:.000				Kappa:.843 p:.000			

NegativeAspects				Suggestions				PositiveAspects				Exp. NegativeAspects			
	K2				K2				K2				K2		
	+	-	Σ		+	-	Σ		+	-	Σ		+	-	Σ
K1 +	17	2	19	K1 +	11	1	12	K1 +	25	4	29	K1 +	23	1	24
-	0	12	12	-	1	7	8	-	3	19	22	-	3	16	19
Σ	17	14	31	Σ	12	8	20	Σ	28	23	51	Σ	26	17	43
Kappa: .868 p:.000				Kappa: .792 p:.000				Kappa: .722 p:.000				Kappa: .809 p:.000			

EFFECT OF INTERACTIVE VIDEO LENGTH WITHIN E-LEARNING ENVIRONMENTS ON COGNITIVE LOAD, COGNITIVE ACHIEVEMENT AND RETENTION OF LEARNING

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ABSTRACT

The importance of using the interactive video has been widely recognized in e-learning courses. However, there are several variables that can affect learners' engagement and their learning through watching digital interactive videos. the main purpose of this study is to examine whether long interactive videos can improve students' performance in tests, retention of learning in the long term, and reduce the cognitive load compared to medium and short videos. An experimental research was conducted on a sample of (63) students of the Faculty of Education at Imam Abdul Rahman University bin Faisal who are registered to study both the courses of Education Technology (EDUM 195N), and Design and Production of Multimedia (EDUM 330N). A three-group experimental design was used. The results were analyzed and interpreted in the light of cognitive load theory and Cognitive Theory of Multimedia Learning. In light of the research findings, the researcher presented a set of recommendations for use in the design and development of content of interactive digital video-based learning environments. The research results can mainly benefit stakeholders and education practitioners, specifically universities, schools, and companies in providing interactive digital video-based learning and training in e-learning and distance learning environments.

Keywords: Distance education, interactive digital video, video-based learning, video length, retention of learning, cognitive load.

INTRODUCTION

Recently, the use of e-learning environments both blended and full online in universities is increasingly becoming popular, where the digital video forms the cornerstone for many of e-courses content. Indeed, the increasing daily use of mobile phones cameras and digital photography cameras has led to the adoption of recording and sharing short videos by both the teachers and students, as well as the creation of a new informative culture of developing and understanding content. Thus, digital video-based learning became an essential part for teaching in different contexts and environments.

The Digital Video (DV) is considered one of the modern technologies. Video-based learning in this context is defined as the learning process through which a specific knowledge is acquired, as well as developing competencies and skills through the systematic assistance provided by the resources of the video (Giannakos, Jaccheri, & Krogstie, 2016). The digital video is characterized by various advantages including the availability and accessibility, display control, editability as well as comments and footnotes insertion, shareability, and simplification of abstract ideas or phenomena which are difficult to conceptualize without learning media, besides the ability of communicating with the viewers at the emotional level and the cognitive level as one of strength points of the digital video. Thereby, thanks to its ability to reach the viewers' emotions, the video can have a strong positive effect on motivating learners towards the effective learning (Razis, Radzuan, & Manan, 2018; Dash, Kamath, Rao, et. al, 2016).

There are two types of the digital video namely the linear video and the interactive video. For achieving the maximum benefit of using the learning environment based on the digital video, teachers and designer trainees

should take three elements into consideration while designing and presenting the interactive video. These elements are reducing the cognitive load, increasing students' engagement, and achieving active learning. And these three elements together in fact form a solid ground to produce and use the interactive video as an effective tool in teaching and learning.

Watching digital lectures or digital video clips is considered an auto-organized process, where various variables may affect students' engagement and their learning through watching the interactive video. These influential variables include the showing of videos, types of videos, sources of videos, and video facilitation (Alpert, & Hodkinson, 2019). Besides, the passing information and controlling the learner via the interactive video may increase the cognitive load and thus increases confusion of learners while learning through watching videos. The length of videos may affect the behavior of learners, specifically their engagement level and watching strategies they are using while watching the content of both long and short videos. Generally, using the interactive video during learning, and students' preference in different video types and its length form an increasingly important topic because the results available of research and studies conducted about this variable are few, while there is a persistent need to know and understand the effect of the interactive video length on improving learning performance and the retention of learning. For this reason, the primary purpose of this study is investigating whether the length of the interactive video affects the cognitive achievement and its retention, besides the cognitive load for university students.

THEORETICAL FREAMWORK

Interactive Digital Video (IDV)

There are two types of digital videos, linear and interactive video. The linear video is watched by the viewers since the beginning till the end in a linear process without stop or interaction of viewers with its content. And this type is closely similar to watching television which is known as visual consumption from television that results in a superficial learning with a short retention term of the acquired learning effects. In this linear type, the absence of the learner's ability to interact with the video is one of its main drawbacks. In that the inability to interact leads to weak cognitive engagement of the viewer which forms a big challenge for learning. When learners do not have control over their learning, their time allotted to learning and their focus decrease, which constitutes a threat for learning (Palaigeorgiou, & Papadopoulou, 2018).

The interactive video is a type which includes interactive aspects such as click to explore, answering questions, clicking hot spots, or answering surveys and voting, besides other various interactive options which urge students to interact with the activity being presented and its content; and this insures that the style of the video in transmitting information is not linear. Thus, the interactive video is the opposite of the narrative linear style of the traditional videos (Petan, et. al., 2014). Shelton at al., (2016) have defined the interactive video that it is the video which includes aids which urge students to interact with the activity and its content, with an appropriate design that meets students' needs (Shelton, et. al., 2016). In the same respect, Meixner (2017) defined the interactive video as a video which relies on hypermedia which in turn combine both the features of non-linear video and a dynamic display of information in the video or in parallel with them (Meixner, 2017).

The interactive video works on segmenting complex ideas into small segments that can be understood which provides the learner with the ability to process it in a fast manner. Besides, it reduces the reading load imposed on learners through presenting content in a visual and engaging way. Basically, interactive videos transform the learning process from a one-way style into a process of exchanging information through enabling the learner to play an active role. Indeed, any linear video can be altered into an interactive video with limitless procedures to generate deeper engagement (Shahrokni, 2018; Green,2016).

The previous studies (Pandey, 2018; Sauli, Cattaneo, & Van der Meij, 2018; Wachtler, Scherz, & Ebner, 2018; Wachtler, Hubmann, Zohrer, et. al, 2016; Petan, et. al., 2014) have revealed a considerable number of the characteristics distinguishing the interactive video as follows:

1. Divisibility into segments and re-usability: The interactive video can be divided into small segments for learning, which means that there is a need to create small connected segments of information, and short videos which present explanations instead of making one whole video to process all the content

and information. In addition, the structure of divisible information allows continuous adaptation easily, and guarantees reusing it according to the learning objective (Petan, et al., 2014).

2. Interactivity: Interactivity enables the viewers to control content and communicate with different parts of the video at all levels. Furthermore, it helps learners build their own knowledge productively. And the active learners can integrate new information in their memory more than passive learners.

3. Dynamic presentation: Dynamic presentation is characterized by being multisensory because it triggers or targets different senses, where movement is used to attract and obtain attention (Baldwin, & Ching, 2017).

4. Understanding evaluation tool: Tools of understanding evaluation of interactive videos allow not only allocating videos for students to watch, but its grace stretches also to enabling students with understanding and assimilating content in the appropriate time through asking question(s) by the teacher to be answered by students before proceeding to the rests of the video. This feature is considered ideal for teachers who want to ensure that their students have really watched the assigned videos, and that they deeply assimilated concepts and information presented through the video content (Staff, 2014).

5. Monitoring and follow-up (Analytics): One of the main and most important features available in platforms of producing and managing interactive videos is analytics. This feature enables teacher to easily know students who watched the video to the end (the assignment), or to ensure that they have assimilated the concept presented. In addition, analytics feature offers important and decisive information about students' success on different levels including misunderstanding points, the level of effort made, persistence, and the time spent by students to accomplish the mission (Blackstock, Edel-Malizia, Bittner, et. al, 2017).

6. Non-linear navigation ability: This feature allows clicking signs that provide complementary and additional information. Besides, it allows learners to proceed and go in different paths within the video (based on learners' choice and the main points of decision) through implementing discharge option technology.

7. Consistency with standards of web-based teaching technologies: This feature is also known as Shareable Content Object Reference Model (SCORM). And this model contributes to presenting interactive videos on all platforms of e-learning systems' management, besides allowing for tracking and following-up learners' progress.

However, among challenges that emerge while using the interactive videos as the main content is how to make learning more interactive and less negative? Researchers who have studied learning through interactive videos have defined interaction in relatively different ways. Still, with regard to most of the previous studies (Shelton, et. al., 2016; Wachtler, et. al, 2016; Delen, et. al., 2014; Merkt & Schwan 2014), it can be stated that the interactive video includes many forms for designing interaction as shown below:

- Video re-watchability or jump forward through its content or its parts or pausing to process content.

- Adding pointers or text phrases, where light is shed on important information either by inserting pointers, signs, or textual naming to direct learners to specific aspects in the video, or through adding comments and explanations in the video by the teacher.

- Embedded questions which are organized into two types: rhetoric questions which mean anticipating what will happen next by students, where students answer the questions before watching the rest of the video which will reveal the related scientific facts; the inductive questions which are used to help students interpret hypotheses, build explanations, and enhance their knowledge.

- internal video links allowing students to navigate within the video in a faster manner through clicking randomly on video progress bar.

- External video links are also supported. They are links to different learning websites which are presented through textual naming on the video. These external links mostly aim to enable students with further exploration of more related topics from other sources apart from those contained in the learning path.

- reflexive pauses, where the video is paused urging students to think expandingly about the learning subject and discuss it with classmates. And with this urging on thinking, students acquire skills of self-organization, and think about how to accomplish a given mission.
- answer pop-up e-questions to direct focus, or to ensure understanding. The interactions in the questions come in the following forms: Button click, fill in the blanks, Single choice assessments, Multiple choice assessments, Drag and drop, and Hotspots**.**

There are various platforms of producing interactive videos such as Edpuzzl (https://edpuzzle.com), HapYak (http://www.hapvak.com), Zaption (https://www.zaption.com), and PlayPosit (https://www.PlayPosit.com). These platforms are available for teachers to use them through the internet in the integrated learning e-courses (Blackstock, et. al., 2017; Staff, 2014). These e-platforms are used to produce and manage the interactive video. And they enable users to search and navigate various video services available directly on famous video show platforms such as YouTube, TED, Vimeo, TeacherTube, and others, besides enabling users to upload their own videos. In addition, there is a tool available for customized drawing through which a specific content can be highlighted in the video with circles or colors. They also allow for dividing learning videos through adding parts or chapters, subsections, or pop-up textual comments, as well as adding interactive questions of different styles, forms, hotspots, or control buttons by teachers.

In the light of these advantages, interactive digital video is considered fundamental in e-learning. This is because it assists learners to understand concepts and complex procedures which cannot be understood through texts or drawings only. Besides, it provides a sensory learning environment which supports the understanding of the learners to recall information in a better way (Fern, Givan, & Siskind, 2011). It is used in many cases in e-learning including clarifying concepts, explaining texts, delivering content and assisting understanding, presenting events, attitudes, and processes. Furthermore, it is used as a tool in training on scientific skills, projects and collaborative learning, on-time formative assessment, in addition to giving feedback to learners. Thus, video-based learning is considered one of the most distinguished and effective learning media which can be integrated with modern teaching strategies including micro teaching, flipped classrooms, or gamification-based learning, and teaching strategies through mobile devices, besides its compliance with the nowadays trends of digital learning. Thus, it works on providing learners with a sensory learning environment that supports them to understand more information and better recall (Palaigeorgiou, Papadopoulou, Kazanidis, 2018; Song, Pusic, Nick, et. al., 2014).

Numerous researchers have studied the effect of using the interactive video on both teaching and learning processes. The findings of the study conducted by (Jill, Wang, & Mattia, 2019) revealed that there was an improvement in students' performance in tests, their engagement, motivation, and their perception. Besides, the results also revealed that videos are considered scaffolds for learning as they provide the appropriate support to students when needed throughout a timeline including study behavior before the lecture, during the lecture, and after the lecture (Rismark, & Sølvberg, 2019). Another study conducted by (Ariffin, & Ismail, 2019) revealed the effectiveness of icon-based and narration-based interactive video as a learning tool for teaching English vocabulary to high school students of the first level in Malesia. The results of the study carried out by (Hung, & Chen, 2018) have also showed that the performance of the students who practiced learning through the interactive video was better at the level of understanding and retention of information more than the others who did not use videos. The video can be used as an appealing teaching source, or in self-directed teaching, or for complementing face-to-face teaching to provide the opportunity of doing exercises and discussions in the classroom (Betrancourt, & Benetos, 2018).

In the same respect of the interactive video merits, the findings of the previous studies revealed that the interactive video does not exhaust students with any extra cognitive load. In another study (Palaigeorgiou, & Papadopoulou, 2018), the findings revealed the fact that the learning environment through the interactive video and tablets together helped students achieve a high level of self-control, self-discipline, self-learning, besides enabling them very successfully to manage the progress of their learning. The study of (Razis, et. al., 2018) has also showed that the learners who have used the interactive video to accomplish missions showed a big improvement in retention of information in their memory; and the grades they achieved in general were higher compared to the other group who did not use the video, while the study stressed that the use of the interactive video, as an interactive tool, played a major role in increasing retention of information in the memory, besides supporting learning.

Video Length and Cognitive Load

Cognitive load is considered one of the main priorities to take into consideration during design and production process of teaching materials, including the digital video. Cognitive load is defined as the amount of information which are stored and processed in the working memory (Sweller, 1994). Cognitive load theory is based on the assumption that the working memory has a limited stocking capacity, and thus a limited processing capacity. Among the fundamentals of the cognitive theory is that specifications of the working memory structure should be taken into consideration while designing teaching materials (Plass, Moreno, & Brunken, 2010; Sweller, Ayres, & Kalyuga, 2011).

Cognitive load theory has specified three different types of the cognitive load for every learning process. These types are intrinsic cognitive load, germane cognitive load, and extraneous cognitive load (Wang, & Antonenko, 2017; Brame, 2016; Paas, Tuovinen, Tabbers, & Van Gerven, 2003). The intrinsic cognitive load is the load imposed by the study subject, and it is relatively leveled by the levels of inter-relations within the study subject. Germane load refers to the required cognitive activity made by the learner to achieve the desired learning outcomes such as the ability to compare, analysis, and interpretation. The main objective of these activities is to enable the learner to understand content in connected ideas. The third type, the extraneous cognitive load means the cognitive effort made by the learner but without achieving the desired learning outcomes. The cause behind this is mostly mal-design or mal-preparation of lessons by teachers. Among the things that cause the extraneous load are giving unclear instructions, or extra and unimportant information which form a burden on learners. As well, this can also be caused by undesired prejudices or stereotypes. Through the definition of cognitive load types, it becomes clear that both of intrinsic load and the extraneous load form an obstacle that hinders learning, while germane load facilitates learning (Plass, et. al., 2010).

In the light of the abovementioned information, it can be stated that designing multimedia materials in the interactive video-based learning environment should be done in a way that contributes to reducing the extraneous load; and rather, teachers should provide cognitive resources to increase processing content through the germane load. Thereby, the main objective from designing teaching materials for learning in the interactive video environment is to reduce the extraneous load to avoid extra cognitive load, and instead maximizing the level of the germane load to guarantee the achievement of the desired learning outcomes by the learners (Kruger, & Doherty, 2016).

Videos are increasingly being used in teaching and training. However, they can lead to facing specific difficulties relating to employees' learning because of the temporary nature of information presented in the video, or because the learner cannot control the speed of the video or the length of the show. These effects can be explained with reference to the cognitive theory of learning through multimedia as presented by (Mayer, 2014, p.72). This theory is based on the thought that information are processed by two channels, auditory and visual, which implies that each channel has a limited capacity and limited processing ability. When a person watches a video, auditory and visual information are processed simultaneously by these two sensory channels. And the problem lays in the continuous flow of information being presented by the video which may result in loading heavy cognitive burden (Sweller, 2010). If information are given in a highly fast way to the learner, without enabling the latter to control the speed of the video and its length, the intrinsic load may rise because both the channels will be loaded (Mayer, Pilegard 2014).

Various studies (Mayer & Moreno, 2003) have investigated the effects resulted from segmenting learning through the video. The findings showed that segmenting reduced the mental effort, made the learning experience easier, and improved knowledge transmission. This can be explained by the fact that segmenting reduces the cognitive load resulting from the passage of information. In the dynamic segmented show, information flow is segmented into small units; and the temporary pauses between these unites provide students with the time needed to cognitively process the presented information in the previous video segment, without the need to deal with a set of new information at the same time (Biard, Cojean, & Jamet, 2018). In the same respect, Rudolph (2017) stated that segmenting focuses on segmenting the parts of the learning multimedia into smaller topics distributed throughout the lesson which allows students to learn one topic before moving to the next one (Rudolph, 2017).

In addition, the cognitive load theory has effects on designing the length of the video. In that using short videos helps reduce the extraneous load and increase the germane load. Indeed, using short videos provides the ability to segment information into small learning units which comply with the limited capacity of the working memory (Slemmons, Anyanwu, Hames, et. al., 2018).

Lessons derived from the cognitive theory of multimedia learning and the cognitive load theory have direct effects on designing, making, and using interactive videos especially while processing the length of the videos that is most appropriate to students (Slemmons, Anyanwu, Hames, et. al., 2018). However, it seems that the practical implementation of these guidelines is limited. Besides, the quantitative and qualitative data which support the most effective way of creating the interactive video and its ideal length are limited too. Thus, this research aims at investigating these factors, namely investigating the effect of length of the interactive video that is most appropriate for learning and the retention of learning, as well as the cognitive load.

Few studies have been conducted about the effect of the interactive video length on some learning outcomes. Risko et al., (2012) have conducted an experiment on a sample of students who used a 60-minute length video. The focus during the experiment was laid on mental stray periods of the learners and their ability of content retention in their memory. The results showed that cases of mental stray of learners were high, and that the percentage of information retention in their memories decreased after they had watched the video (Risko et al., 2012).

Guo et al., (2014) have also studied the length of videos and the time learners spent watching edX videos in the frame of Massive Open Online Courses (MOOC). The researchers analyzed the results of students' video watching where they noticed that the average of watching time for videos which are less than 6 minutes was very close to 100%. And this reflects that learners were watching the whole video. In contrast, they noticed that the longer the video is, the lower interaction of learners becomes, reaching 50% with some videos which have a   length of 9 and 12 minutes, while interaction percentage with videos of 12 to 40 minutes length decreased to 20%. Thus, it can be concluded that the highest percentage of learners' interaction with videos was with the ones of less than 6 minutes length, which reflects that videos of more than 6 to 9 minutes can be a mere waste of effort (Guo, et. al., 2014).

In another study (Slemmons, Anyanwu, Hames, et. al., 2018), the researchers investigated the effect of video length on learning in flipped classrooms environment during two semesters in middle school science classes to determine the ideal video length that can enable effective learning, increase retention and support students' motivation. The results indicated that although the assessment grades that followed short videos directly were a little higher, but there was no big difference between them and the assessment grades that followed one long video. On the other hand, it seemed that retention of learning content in the short term was not affected by the video length, but the percentage of retention for male students and students who suffer from learning difficulties in the long term was higher after watching short videos compared to long videos. And students stated that they were more engaged, more focused, and that they maintained more content retention after watching the short videos.

STATEMENT OF THE PROBLEM AND QUESTION OF RESEARCH

The importance of using the interactive video has been widely recognized in e-learning courses. However, there are several variables that can affect learners' engagement and their learning through watching digital interactive videos including the length of the video. In this regard, there are inconsistent results of previous studies which studied the effect of the video length on improving the learning outcomes of students and the cognitive load. Results of various previous studies revealed that there is some inconsistency about the length of the video appropriate for the interactive video. While some of the previous studies (Risko et al., 2012; Guo, et. al., 2014) revealed the preference of short videos over long ones relating to learning and retention of content, other studies (Slemmons, Anyanwu, Hames, et. al., 2018) saw that retention of learning content in the short term is not affected by the length of the video, and that there is no preference between short videos and medium videos relating to their effect neither on the cognitive load of learners, nor on increasing learners engagement or achieving the active learning. On the other hand, the quantitative data that determine the appropriate length of videos for enhancing genuine learning and student's engagement are limited (Slemmons, Anyanwu, Hames, et. al., 2018).

Based on that, the main research question of this study is whether long interactive videos can improve students' performance in tests, retention of learning in the long term, and reduce the cognitive load compared to medium and short videos? The following sub-questions can be derived from the main question as follows:

Q1: What is the effect of difference in the interactive video length (Short< 6 minutes, Medium 6-12 minutes, and Long > 12 minutes) on cognitive achievement in principles and skills of digital photography?

Q2: What is the effect of difference in the interactive video length (Short< 6 minutes, Medium 6-12 minutes, and Long > 12 minutes) on retention of learning?

Q3: What is the effect of difference in the interactive video length (Short< 6 minutes, Medium 6-12 minutes, and Long > 12 minutes) on learners' cognitive load?

RESEARCH HYPOTHESIS

1. There are statistically significant variances in students' performance in the three experimental groups on the immediate cognitive achievement test due to the difference in the digital interactive video length (short<6M, medium 6-12M, long>12M).

2. There are statistically significant variances in students' performance in the three experimental groups on the cognitive achievement post-test (retention) due to the difference in the digital interactive video length (short<6M, medium 6-12M, long>12M).

3. There are statistically significant variances in students' performance in the three experimental groups on the cognitive load scale due to the difference in the digital interactive video length (short<6M, medium 6-12M, long>12M).

METHODOLOGY

Methodology of the Research and Its Variables

The research includes one independent variable which is the length of the interactive video with three experimental treatments namely short videos less than 6 minutes, medium 6-12 minutes, and long more than 12 minutes. Besides, it includes two dependent variables which are: a) cognitive achievement and learning retention, b) learner's cognitive load. The researcher used the experimental method and the experimental design with three groups, and a post-measurement to measure the effect of the independent variable on the dependent ones as shown below in Figure (1).

Research Sample

The sample of the study was selected deliberately. The number of the selected sample as the research community is 63 students from Education Faculty who are registered to study both the courses of Education Technology (EDUM 195), and the Design and Production of Multimedia (EDUM 330N). The sample was divided based on the experimental design of the research into three groups. Group one contained 22 students, group two 20 students, and group three 21 students.
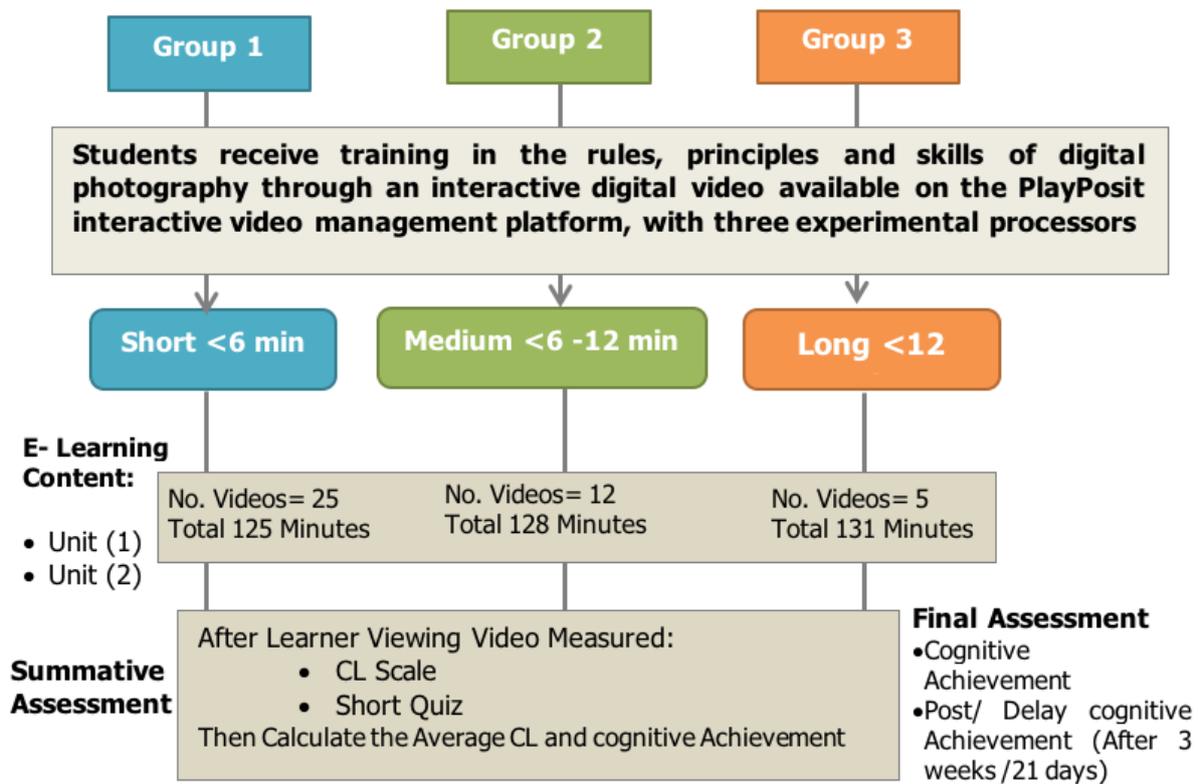
Figure 1. Experimental design for research

Design and Development of the Research Experimental Treatment

The experimental treatment of the research was conducted through preparing an instructional design for digital interactive video-based environment with three treatments and measuring its effect in: a) cognitive achievement and retention of learning, b) the cognitive load of students of Education Faculty.

We designed the experimental treatment and developed it by using (ADDIE) model. The ADDIE model is a systematic instructional design model consisting of five phases: Analysis, Design, Development, Implementation, and Evaluation (Branch, 2009).

Analysis Phase

The following steps were taken.

- Determining the characteristics of learners and their learning needs: The learners are from the Faculty of Education who are registered to study the course of Education Technology (EDUM 195N), and the Design and Production of Multimedia (EDUM 330N). These courses require that students acquire the prerequisite skills to produce necessary digital photographs for teaching activities using photography cameras and smart phone cameras. The acquisition of digital photography skills is considered one of the important desired outcomes for students of Education Faculty considering them 'teachers' and 'designers' of different learning resources. However, the researcher while teaching these courses noticed students' weakness in the performance and practical skills required in digital photography course. This detected weakness can mainly be attributed to shortage of time in face-to-face learning and shortage of practicums which should accompany theoretical lectures. Thereby, there rises a need for training students on practical skills using the interactive video technology and designing a learning environment for this purpose.

- Specifying the general objective: The experimental treatment aimed that students of Education Faculty acquire the principles of digital photography, its rules, techniques, and skills. The behavioral objectives were formulated.

- Specifying the learning content: In light of the learning outcomes mentioned above, the learning content was specified for the experimental treatment material in the two units of Rules of Digital Photography, and its Principles and Skills.

- Specifying the prerequisite priorities for digital video-based environment of learning: The platform of Interactive Video Management PlayPosit was used to design and produce interactive videos, and to manage the learning environment. Each teacher and each student in the experimental groups can access the platform and practice learning activities and their missions according to their experimental group.

Design Phase

At this stage, digital video lessons have been designed and categorized into three experimental treatments. All the experimental treatments are conducted with students who are taking training in digital photography skills through the interactive video-based learning environment which is available on the Interactive Video Management platform PlayPosit. The video length in the first experimental treatment is short<6 minute, the second experimental treatment is medium 6-12 minute, and the third experimental treatment is long > 12 minute. The three experimental treatments have been designed based on the following conditions:

- Allocating an interactive video for each skill or rule of photography, where the video focuses training on practical skills of digital photography. The videos chosen were the ones which are new, high view rates, and free of advertisements.

- Design of interaction in the interactive video contained the following: re-watch the video or jump forward throughout its contents and parts, add comments and explanations on videos, and answer pop-up e-questions to direct focus or to check understanding. The interactive questions were in forms of Fill in the blanks, Single choice assessments, Multiple choice assessments.

- Reducing cognitive load of learners was taken into consideration while designing the interactive videos through using signs to shed light on important ideas, information, and concepts. Besides, key words are used on the screen to focus on the most important elements; and pruning technique was used to remove obstructive information like removing music or complex backgrounds, besides making the video as part of the homework to increase learners' motivation.

- Designing learning activities, its missions, and timeline plans of implementation: Learning activities included two activities.

  - Activity 1 was about taking digital photographs -for educational purposes- at the end of each lesson of the practical lessons aimed for training students on the required skill. Then, students upload it on the learning management system for discussion and see the extent to which the student adhered to the rules of digital photography and its skills in the product.

  - Activity 2 was specified for preparing a teaching presentation of one of the teaching lessons by students in their specialty using photographs they had taken with their own cameras, besides presenting a scenario specifying the desired learning objectives to achieve with the photo parts appropriate for these objectives and specifying their specifications. And these activities should be carried out in accordance with the rules of digital photography and its skills. Also, students were provided with a list of the product evaluation standards (skills of the students in taking digital photographs) to guide them while accomplishing the assigned activities.

Development Phase

- The actual production of learning content through the digital interactive video in light of standards of learning video design mentioned herein in this research is done using PlayPosit platform, which is one of the platforms specified for this purpose. As a result, 42 videos which cover all the elements of teaching content for training on the required skills were grouped in consistency with achieving the purpose from the materials of the three experimental treatments. The videos were distributed on three groups. 25 short videos were specified for the first experimental treatment where the length of each video is less than 6 minutes, with a time total of 125 minutes for all the 25 videos to explain the required learning skills. The second experimental treatment contained 12 medium videos of 6-9 minutes for each with a time total of 128 for all the 12 videos to explain the required learning skills. Finally, 5 long videos of more than 25 minutes for each with a total of 131 minutes were specified for the third experimental treatment to explain the required learning skills.

- Structural evaluation of digital interactive videos: The initial draft was presented to experts and the specialized to ensure its appropriateness for achieving the objectives, the required skills aimed for students, the quality of its technical production, and its consistency. The arbitrators' opinions were analyzed, and necessary modifications were made in light of the structural evaluation. Then, the final version was prepared and made ready for publication on the platform of interactive video management.

Implementation Phase

At this stage, tools and experimental treatments were carried out, where students took the practical training on the practical skills of digital photography through the three experimental treatments of the interactive video-based learning in this research. The students accomplished the practical assignments and the required missions manifesting in designing teaching projects using digital photographs. The implementation of the experiment lasted for 5 study weeks starting from the fifth week until the tenth week of the second semester of the university year 2108/2019, according to the timeline specified for the program courses.

Evaluation Phase

At this stage, the final evaluation of the post-application of measurement tools has been carried out to know the effect of the video showing length (short<6minutes, medium 6-12 minutes, and long more than 12 minutes) on: the cognitive achievement, learners' cognitive load, and then re-application of the post-application of the achievement test after 21 days from the first application to investigate the retention level of learning by students.

Measurement Tools

Cognitive Achievement Test

The researcher prepared the cognitive achievement test to measure knowledge and concepts related to "Basics of Digital Photography, its Techniques and Skills'. The test was formulated in the style of multiple choices, and true or false questions. Instructions of the test were formulated in an easy and clear style to enable students' understanding. The instructions included the test objective, test time, the number of the test items, and how to answer vocabulary questions. The test included 50 questions to be corrected electronically. Each correct answer from true-or-false and multiple-choice questions is graded one point, while incorrect answers are graded 0 point. The total full-mark score of the test mark is 50 points. Face validity of the test was estimated by a group of arbitrators specialized in education technology to ensure the scientific and linguistic appropriateness of its vocabulary for the objectives aimed, and to ensure that it is ambiguity free. Besides, instructions of the test have been reviewed to ensure easy understanding and their formulations. Remarks provided by the arbitrators were taken into consideration during the preparation of the last version of the test. The test was applied on 13 students as an exploratory sample apart from the main research sample to ascertain that its questions and instructions are clear, as well as calculating its stability. The test stability

which was calculated using Cronbach's alpha coefficient recorded (0.94), which is a high value indicating that the test has a high degree of stability qualifying it to be a suitable research tool for the purpose of this research (Appendix 2).

Cognitive Load Scale

The scale's objective was measuring the cognitive load of learners after watching the learning interactive videos. For building the scale, various previous studies which studied measuring the cognitive load have been explored (Josephsen, 2018; Kruger, & Doherty, 2016; Leppink, et. al., 2013, 2014; Paas. et. al. 2003a). The researcher developed the scale prepared by (Leppink, et. al., 2013, 2014) because this scale measures all the three types of the cognitive load namely the intrinsic, extraneous, and the germane cognitive load based on learners' self-evaluation elements after having just finished practicing a certain mental activity. The scale contained 14 vocabulary items which measure the cognitive load, distributed as: 4 vocabulary items (1-4) measure the intrinsic cognitive load, 4 vocabulary items (5-8) measure the extraneous cognitive load, 5 vocabulary items (9-13) measure the germane cognitive load, and the 14th vocabulary item to measure the overall cognitive load. To calculate the way of scoring the scale's grades, all items of the scale are presented to examinee learners after having just finished practicing a mental effort activity (lecture or discussion session, training on skills, learning via multimedia, or learning via watching videos). The examinee learners answer each item of the scale's items on a graded measurement (0-10), where 0 means that the item does not absolutely apply to the examinee learner, and 10 means that the item totally apply to the examinee learner.

The face validity of the scale was applied by presenting it to a group of arbitrators to obtain their opinion about the scale. The arbitrators pointed out some required modifications in terms of linguistic formulation of some expressions. The pointed expressions were modified as required by the arbitrators. Besides, the internal consistency was calculated through calculating correlation coefficients between the grades of the exploratory sample (13 students) for every item of the scale, and their grades on the scale as a whole. The values of correlation coefficient ranged from 0.58 to 0.91 which is a function value at 0.05. In addition, correlation coefficient between every dimension of the scale and the scale in the overall was calculated. The values of correlation coefficient for the three dimensions of the scale are (0.76, 0.78, 0.82) for the intrinsic, extraneous, and the germane dimension respectively. The scale answer time was also calculated. And it showed that the answer time does not exceed 15 minutes with 5 minutes to read instructions thus making a scale answer time of 20 minutes. After calculating the validity and stability of the scale, it became ready in its final version consisting of 14 items. Thus, the overall grade of the scale is 140 points, which is the highest mark, while the lowest mark is 14 grades, and the neutral mark is 70. The overall cognitive load is considered high when exceeding 70, and neutral when the examinee's grade is less than 70 grades (Appendix 3).

Statistical Analysis

The statistical treatment of data was conducted using SPSS program version 20. The researcher used the suitable statistical methods to achieve the study results as follows: Pearson's correlation coefficient to measure the internal consistency of the measurement tools, Cronbach's alpha coefficient to measure the stability of the scale, arithmetic averages, and standard deviations as a descriptive statistics of data which reflects students' performance on measurement tools, and One-way Variance Analysis (ANOVA) test to calculate the effect of the interactive video length (Short < 6 minutes, medium 6-12 minutes, and long more than 12 minutes) on the research variables, and to calculate variance significance between averages of the three experimental groups, besides comparing the averages using Scheffe test.

FINDINGS

Answering the First Question

What is the effect of difference in the interactive video length (Short< 6 minutes, Medium 6-12 minutes, and Long > 12 minutes) on cognitive achievement in principles and skills of digital photography?

One-way Analysis of Variance (ANOVA) was calculated to know the effect of difference in the interactive video length (short < 6minutes, medium 6-12 minutes, and long > 12 minutes) on cognitive achievement, and the findings are as illustrated in Table (1) and Table (2).

Table 1. Arithmetical averages and standard deviations for IDV length (Short <6M, Medium 6-12 M, Long >12M) on the performance of the cognitive achievement test

IDV length Test	Short <6M		Medium (6-12 M)		Long >12M	
	Mean	SD	Mean	SD	Mean	SD
Cognitive Achievement=50	47.23	2.16	35.55	3.15	37.43	2.39

Table 2. ANOVA, Analysis of the one-way variation of the IDV length (Short <6M, Medium 6-12 M, Long >12M) on the performance of the cognitive achievement test

Test	Variable source	Sum of squares	df	Means Squares	"F" value	Significance Indicator
Cognitive achievement=50	Between Groups	1679.98	2	**839.99**	125.38	0.000
	Within Groups	401.96	60	**6.69**		
	Total	2081.93	62			

The results in table (2) indicate that there are statistically significant variances at the fuction value 0.01 between averages of students' grades in cognitive achievemnt test where F value is significant. And this means that the difference in the interactive video length (short<6M, medium 6-12M, and long >12M) has an effect in the test of cognitive achievemnt, which means that the first hypothesis validty is confirmed. To dtermine the place of these variances, Post Hoc and Scheffe methods were used to uncover variances between groups in pairs as shwon in Table (3).

Table 3. The post binary comparisons between the test score averages of the cognitive achievement for the three research groups

Test	Style (I)	Style (J)	Mean deferent (I-J)	Significance Indicator	Size effect (Eta Square η2)
Cognitive achievement =50	Short <6M	Medium (6-12M)	11.68*	0.00	0.807
		Long >12M	9.79*	0.00	
	Medium (6-12 M)	Long >12M	-1.88	0.08	

The results presented in Table (3) reveal that the performance of students who watched the interactive video with short length , short<6M, achieved high results in cognitive achievemnt compared to the perfomance of students who watched the medium video length, medium6-12M, and students who watched long videos, long >12M. Variances with statistical significance were found at the value 0.01 between the performance of the three groups in cognitive achievement in favor of students who watched the short interactive videos, short<6M. On the other hand, no difference occurred between performance in the cognitive test of students who watched the medium interactive videos, medium 6-12M compared to students who watched the long interactive videos, long >12M, thus there are no statistically significant variances between them.

Besides, the effect size was calculated using the equation of Eta (η2). The effect size between the three experimental groups reached 0.807 in performance of cognitive test. This result indicates that there is a big effect size of the independent variable in the variance between the groups relating to its effect on cognitive achievement, and the strong effect of the experimental treatment of short video length, short<6M in cognitive achievement compared to the performance of students who watched videos with medium and long length.

Answering the Second Question

What is the effect of difference in the interactive video length (Short< 6 minutes, Medium 6-12 minutes, and Long > 12 minutes) on retention of learning?

One-way Analysis of Variance (ANOVA) was calculated to know the effect of video length (short<6M, medium 6-12M, and long >12M) in the post-performance of cognitive test on retention of learning. The results obtained are presented in Table (4), Arithmetical averages and standard deviations for IDV length, and Table (5), Analysis of the one-way variation of the IDV length.

Table 4. Arithmetical averages and standard deviations for IDV length (Short <6M, Medium 6-12 M, Long >12M) inn the performance of the post/delayed cognitive achievement test

IDV length Test	Short <6M		Medium (6-12 M)		Long >12M	
	Mean	SD	Mean	SD	Mean	SD
delayed Cognitive achievement (after 21Day/ 3week)=50	47.05	1.36	29.95	2.61	30.52	2.80

Table 5. ANOVA, Analysis of the one-way variation of the IDV length (Short <6M, Medium 6-12 M, Long >12M) on the performance of the delayed cognitive achievement test

Test	Variable source	Sum of squares	df	Means Squares	"F" value	Significance Indicator
Post/delayed Cognitive achievement (after 21Day/ 3week)=50	Between Groups	4045.08	2	2022.54		
	Within Groups	325.14	60	5.419	373.2	0.000
	Between Groups	4370.22	62			

The results in Table (5) indicate that there are statistically significant variances at function value 0.01 between avergaes of students' grades in the performance of the coginitive post-test, where the F values were significant. This means that the difference in the length of the interactive video (short<6M, medium 6-12M, and long>12M) has an effect on the performance of the cognitive post-test for students in retention of learning, which means that the second hypothesis validity is confirmed. To detrmine the place of these variances, Post Hoc post-comparison and Scheffe methods were used to uncover variances place between the groups in pairs as shown in Table (6).

Table 6. The post binary comparisons between the test score averages of the post/ delayed cognitive achievement test for the three research groups

Test	Style (I)	Style (J)	Mean deferent (I-J)	Significance Indicator	Size effect (Eta Square η2)
delayed Cognitive achievement (after 21Day/ 3week)=50	Short <6M	Medium (6-12M)	*17.095	0.**719**	
		Long >12M	*16.522	0.**710**	0.926
	Medium (6-12 M)	Long >12M	-0.574		

The results in Table (6) reveal that the students who watched the short interactive videos, short<6M, achieved higher performance in the cognitive post-test than the performnace of students who watched mmedium 6-12M and long>12M video. Statsitically significant variances were found at value 0.01 between performance of the groups in the cognitive post-test in favor of students who watched the short interactive video, short<6M, while no variance was found between students who watched medium 6-12M and students who watched long>12M in their performance in the cognitive post-test, where there are no statistically significant variances between them.

Besides, the effect size was calculated using the equation of Eta (η2). The effect size between the three experimental groups reached 0.926 in performance of cognitive post-test. This result indicates that there is a big effect size of the independent variable in the variance between the groups relating to its effect on the cognitive post-achievement, and the strong effect of the experimental treatment of short video, short<6M, in retention of learning compared to the performance of students who watched medium and long videos.

Answering the Third Question

What is the effect of difference in the interactive video length (Short< 6 minutes, Medium 6-12 minutes, and Long > 12 minutes) on learners' cognitive load?

One-way Analysis of Variance (ANOVA) was calculated to know the effect of difference in video length (short<6M, medium 6-12M, and long >12M) on cognitive load with its three types (intrinsic, extraneous, and germane) and the overall cognitive load. The results obtained are presented in Table (7) Arithmetical averages and standard deviations for IDV length in performance on the three types of cognitive load scale, and Table (8) Arithmetical averages and standard deviations for IDV length in performance on the cognitive load scale.

Tabel 7. Arithmetical averages and standard deviations for IDV length (Short <6M, Medium 6-12 M, Long >12M) in performance on the cognitive load scale

IDV length Scale	Short <6M		Medium (6-12 M)		Long >12M	
	Mean	SD	Mean	SD	Mean	SD
Intrinsic Load =40 degree	16.41	3.83	28.75	3.89	28.75	3.89
Extrades Load=40 degree	13.77	3.70	29.20	3.47	30.00	3.36
Germane Load =50 degree	19.09	4.28	34.25	5.44	33.24	5.84
All Cognitive Load =140 degree	52.36	11.77	98.55	6.68	97.62	6.13

Figure (2) explains the results presented in Table (7):
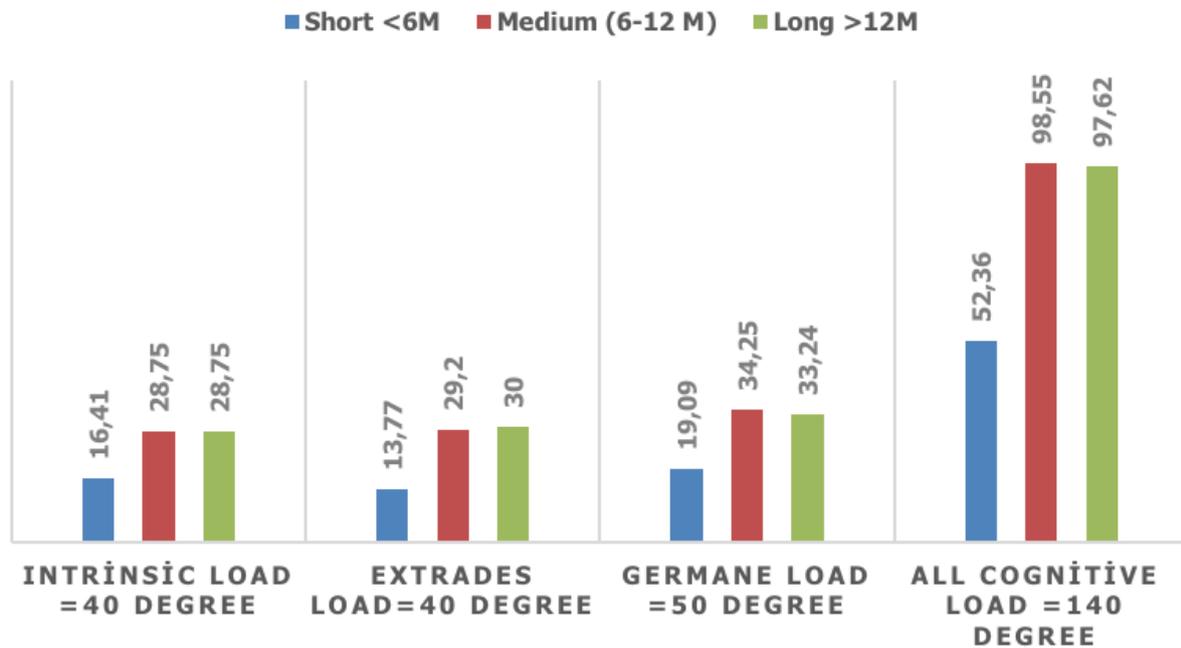
Figure 2. Arithmetical averages and standard deviations for IDV length (Short <6M, Medium 6-12 M, Long >12M) in performance on the cognitive load scale

Table 8. ANOVA, Arithmetical averages and standard deviations for IDV length (Short <6M, Medium 6-12 M, Long >12M) In performance on the cognitive load scale

Scale	Variable source	Sum of squares	df	Means Squares	"F" value	Significance Indicator
Intrinsic Load =40 degree	Between Groups	1979.63	2	989.81	58.32	0.000
	Within Groups	1018.31	60	16.97		
	Total	2997.94	62			
Extrades Load=40 degree	Between Groups	3597.54	2	1798.77	145.2	0.000
	Within Groups	743.06	60	12.38		
	Total	4340.60	62			
Germane Load =50 degree	Between Groups	3079.48	2	1539.74	56.77	0.000
	Within Groups	1627.38	60	27.12		
	Total	4706.86	62			
All Cognitive Load =140 degree	Between Groups	29923.22	2	14961.6	199.1	0.000
	Within Groups	4508.99	60	75.15		
	Total	34432.22	62			

Results in Table (8) indicate that there are statistically significant variances at the function value 0.01 between grades averages of students on the scale of the cognitive load types (intrinsic, extraneous, and germane), and the overall cognitive load. And this means that there is an effect of difference in video length (short<6M, medium 6-12M, and long>12M) in the post-performance on the scale of cognitive load types (intrinsic, extraneous, and germane), and the overall cognitive load, which means that the third hypothesis validity is confirmed. To determine the place of theses variances, Post Hoc comparison and Scheffe methods were used to uncover the place of variances between the groups in pairs as shown in Table (9).

Table 9. The post binary comparisons between the cognitive load scale for the three research groups

Scale	Style (I)	Style (j)	Mean deferent (I-J)	Significance Indicator	Size effect (Eta Square η2)
Intrinsic Load =40 degree	Short <6M	Medium (6-12M)	-12.34*	0.000	
		Long >12M	-11.12*	0.000	0.660
	Medium (6-12 M)	Long >12M	1.23	0.637	
Extrades Load=40 degree	Short <6M	Medium (6-12M)	-15.43*	0.000	
		Long >12M	-16.23*	0.000	0.829
	Medium (6-12 M)	Long >12M	-0.80	0.768	
Germane Load =50 degree	Short <6M	Medium (6-12M)	-15.16*	0.000	
		Long >12M	-14.15*	0.000	0.654
	Medium (6-12 M)	Long >12M	1.01	0.825	
All Cognitive Load =140 degree	Short <6M	Medium (6-12M)	46.186*	0.000	
		Long >12M	-45.26*	0.000	0.869
	Medium (6-12 M)	Long >12M	-0.93	0.943	

Results in Table (9) reveal that the performance of students who watched the interactive video with short length, short<6M achieved higher results in reducing the cognitive load compared to srudents who watched medium 6-12M and long>12M interactive video length. Statistically significant variances were found at the value 0.01 between the performance of the three groups on cognitive load scale in favor of students who watched the short interactive video short<6M. Also, there were statsitically significant variances between students who watched the interactive video with medium 6-12M length and students who watched the long interactive video, long<12M, in their performance on the cognitive load scale, which showed that performance of students with medium length was better than students of long videos.

Besides, the effect size was calculated using the equation of Eta (η2). The effect size between the three experimental groups reached (0.660, 0.829, 0.654, 0.869) for the intrinsic, extraneous, germane, and the overall cognitive load respectively, which are high effect size values on cognitive load. This result indicates that there is a big effect size of the independent variable in the variance between the groups relating to reducing the cognitive load; and this reflects that there is a strong effect of the experimental treatment of short video length, short<6M, in reducing the cognitive load compared to the performance of students who watched medium and long videos.

DISCUSSION

Explaining the Results Related to the Effect of Difference in the Interactive Video Length (Short<6M, Medium 6-12M, and Long >12M) on Students' Performance in the Test of Immediate Cognitive Achievement, and Their Performance in the Post-Test (Delayed Testing) Relating to Retention of Learning.

The results revealed that students who practiced learning trough videos with short length, short<6M achieved higher results in the immediate cognitive achievement, and in the post-test compared to students who watched medium 6-12M and long >12M. On the other hand, the results showed no difference between the students who learnt through medium 6-12M compared to the students who learnt through long>12M videos in their performance in the immediate cognitive achievement test and the post-test. This means that students who learnt trough short videos maintain knowledge, concepts, and skills longer than medium and long video groups, and thus retention of learning is longer.

These findings come in consistency with the results of various previous studies. The findings of the study (Hung & Chen, 2018) showed that students who practiced learning through the short interactive video achieved better performance at the level of understanding and retention of information in the memory. Also, another study (Razis, Radzuan, & Manan, 2018) revealed that learners who used short interactive videos to complete skills showed big improvement in retention of information besides supporting learning compared to the other group who did not use the video in learning. This comes also in compliance with the findings of (Risko et al., 2012) which showed that mental stray cases in students who learnt through long videos were high, while the retention of information was low after watching the long video. The study of (Guo, et al., 2014) also considered making video length more than 6 minutes, that is 6-9 is a mere waste of learner's effort. And this result can be explained as follows:

- Using interactive elements in the interactive video and using short and brief videos could have helped in reducing mental stray, and increased students' engagement and their deep interaction with the training content included in the video. And this was not available with medium and long videos which could have been watched passively by students because the length of the video is medium or long, which may result in watching without interaction of students either by answering questions, or other forms of interaction.

- Also, diversity in practice and re-watching of short videos have an important effect in retention of learning, where the short interactive video helped in continuous students' performance and the continuity of connection between stimuli and responses for a long time which leads in turn to achieving learning and its retention.

- Besides, prevention of interference and conflict between information through short videos which focused on specific skill at a time or on a specific rule of digital photography has an important role in eliminating confusion that may be caused by interference or conflict. This is because students are likely to forget information when there is interference between ideas. Thus, avoiding interference between a set of ideas and another set reduces forgetting, and contributes to remembering and retention of learning; and this was not available with medium and long videos which show a number of varied topics and skills leading to interference and forgetting and thus to the absence of retention for long time.

This result goes in line with the Cognitive Theory of Multimedia Learning which reveals that students are more cognitively active in building learning when they integrate in a meaningful learning process. And this process occurs when learners choose the new information from old stimuli and make effort to complement and integrate them with the previous knowledge they own. And this is what the short interactive video provided to assist in more engagement of learners and their interaction with the learning content. Also, the results are supported by the Theory of Cognitive Processing of Information which assumes that attention of learners is limited, and thus this attention should be directed in a selective manner. Thereby, by providing more rich and engaging media, learners who prefer the interactive video style can satisfy their personal learning needs (Zhang, et. al., 2006). In light of tis theory, we conclude that the short learning video which provides varied interactive learning activities will be more effective in achievement and learning retention by learners.

Explaining the Results Related to the Effect of Difference in the Interactive Video Length (Short<6M, Medium 6-12M, and Long >12M) on the Cognitive Load of Learners

The results revealed that the performance of students who watched short<6M videos was higher in reducing the cognitive load than the performance of students who watched medium 6-12M and long>12M learning videos. Also, there were statistically significant variances between students who learnt through the interactive video with medium 6-12M length and students who learnt through the long interactive video, long>12M, in their performance on the cognitive scale in favor of students who learnt through medium videos.

This result is consistent with the findings of the previous studies which revealed that using short interactive videos does not exhaust students with any extra cognitive load (Hung, & Chen, 2018). This result is also supported by the Cognitive Load Theory which sees that reducing the cognitive load on the working memory facilitates decoding and stocking information which can be achieved by reducing the cognitive load in the visual channel. And this result can be explained as follows:

- Short videos focused on the required information only to make learning happens and remove information which can be exhausting for the working memory, and which students do not need to achieve learning. Besides, unneeded information may cause distraction in learner's focus. And thus, removing them contributed to reducing the extraneous cognitive load resulting from mal-design process of the video. On the other hand, long videos may present too much information which are not needed in the learning objective or not assimilated by the working memory of the learners as their mental capacity is limited. This was proved by the study of Ibrahim et al., (2012) as the pruning process can improve information transmission from the video and long retention in the memory of learners (Ibrahim, et. al., 2012).

- The educational design of short interactive videos took into consideration using chunking or segmenting strategy, which enabled students to interact with short videos, and helped them control new information flow and interact with the core information. This contributed to reducing the intrinsic cognitive load and increased the germane load through focusing on information building process. Segmenting of videos reduces the cognitive load which results from passage of information because it allows having the needed time to process the presented information without having to deal with a new set of information at the same time (Biard, Cojean, & Jamet, 2018; Rudolph, 2017).

- Also, using 'auto-pause' strategy or 'interactive questions' in the interactive video has an effect on increasing learners' interaction with content, which reduced the intrinsic cognitive load for students of the experimental group who used short videos. This is affirmed by the findings of the previous studies about the interaction of students with the video and their engagement in the learning process, and that using short videos reduces the cognitive load for learners (Guo, et al., 2014; Ibrahim et al., 2012). On the opposite, the students during learning through medium and long videos might have been passive viewers who did not watch the video to the end because of being long unlike the short video, which has led the difference in students' performance in favor of students of the experimental group who learnt through short videos compared to groups of medium and long videos, relating to the performance on the scale of the cognitive load types (intrinsic, extraneous, germane) and the overall cognitive load.

CONCLUSION

The results revealed that the performance of students who learnt through short<6M videos achieved better results in the immediate cognitive achievement, and post-cognitive achievement which is retention of learning effects in the long term. They have also achieved better results in reducing the cognitive load compared to the results of students who learnt through medium and long videos. On the other hand, no difference is noticed between the performance in the immediate cognitive achievement test and the posttest for students who watched the medium interactive videos, medium 6-12M, compared to students who watched the long interactive videos, long >12M. Thus there are no statistically significant variances between them. But, there were statsitically significant variances between students of the same two groups, medium 6-12M length videos group and long<12M videos group, in their performance on the cognitive load scale, which showed that the performance of students who learnt through videos with medium length was better than the performance of students of long videos group.

RECOMMENDATIONS

In light of the findings of this research, the researcher presents some recommendations to benefit from while designing the learning environments which are based on the interactive video as follows:

1. It is preferable to use short videos that can reduce the cognitive load on learners, and contribute to retention of learning by learners, besides contributing to creating an appealing learning environment, and increasing students' engagement, as well as providing learning opportunities and retention of learning for a long time.

2. It is better to avoid mal-design of digital video-based learning resources because it can be an extra cognitive burden and extra effort for learners.

3. The adoption of services of learning and training based on the interactive video by stakeholders especially universities, schools and companies, besides the development of the required learning content in the light of designs standards of short interactive videos.

4. Training the members of the teaching body in universities and schools on designing interactive video-based learning environments to design short interactive videos related to the learning content, as well as training them on how to use these videos in the light of design standards, besides providing them with knowledge of how to create and use them.

5. Taking into consideration personal characteristics that urge the adoption of learning and training based on the interactive video, because forming a positive view by these people towards interactive video-based learning, and knowing that the required mental effort will be reduced will lead to positive results, and thus to the actual adoption of this technology in teaching and training.

Besides, the researcher suggests conducting more research studies in the field of training and learning through interactive video-based learning environments to study other variables which this study did not address, including:

1. Comparing the effect of different styles of interactive questions (exploratory questions vs inductive questions) in the interactive video on some of learning outcomes

2. Investigating interactive activities within the interactive video (interactive questions vs hotspots) and their effect on some learning outcomes

3. Studying the relationship between the variables of user interaction with the interactive video (individual vs synchronous with others) on some learning outcomes.

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REFERENCES

Alpert, F., & Hodkinson, C. S. (2019). Video use in lecture classes: current practices, student perceptions and preferences. *Education and Training, 61*(1), 31-45.

Ariffin, S. N. M., & Ismail, M. (2019). Design of the Icon-Based Interactive Video for English Vocabulary Learning. In *Proceedings of the Regional Conference on Science, Technology and Social Sciences (RCSTSS 2016)* (pp. 203-212). Springer, Singapore.

Baldwin, S., & Ching, Y. H. (2017). Interactive Storytelling: Opportunities for Online Course Design. *TechTrends*, *61*(2), 179-186.

Betrancourt, M., & Benetos, K. (2018). Why and when does instructional video facilitate learning? A commentary to the special issue "developments and trends in learning with instructional video". *Computers in Human Behavior*, *89*, 471-475.

Biard, N., Cojean, S., & Jamet, E. (2018). Effects of segmentation and pacing on procedural learning by video. *Computers in Human Behavior*, *89*, 411-417

Blackstock, D., Edel-Malizia, S., Bittner, K., & Smithwick, E. (2017, June). Investigating interactive video assessment tools for online and blended learning. In *International Conference on e-Learning* (pp. 31-39). Academic Conferences International Limited.

Brame, C. J. (2016). Effective educational videos: Principles and guidelines for maximizing student learning from video content. *CBE—Life Sciences Education*, *15*(4), es6.

Branch, R. M. (2009). *Instructional design: The ADDIE approach* (Vol. 722). Springer Science & Bus

Dash, S., Kamath, U., Rao, G., Prakash, J., & Mishra, S. (2016). Audio–visual aid in teaching "fatty liver". *Biochemistry and Molecular Biology Education*, *44*(3), 241-245.

Delen, E., Liew, J., & Willson, V. (2014). Effects of interactivity and instructional scaffolding on learning: Self-regulation in online video-based environments. *Computers & Education*, *78*, 312-320.

Fern, A., Givan, R., & Siskind, J. M. (2011). Specific-to-general learning for temporal events with application to learning event definitions from video. *Journal of Artificial Intelligence Research*, *17*, 379-449.

Giannakos, M. N., Jaccheri, L., & Krogstie, J. (2016). Exploring the relationship between video lecture usage patterns and students' attitudes. *British Journal of Educational Technology*, *47*(6), 1259-1275.

Green, M. (2016). *How to effectively use interactive videos in eLearning?* Retrieved 22nd Jun, 2016 from https://www.brightcarbon.com/blog/effectively-use-interactive-videos-in-elearning/

Guo, P. J., Kim, J., & Rubin, R. (2014, March). How video production affects student engagement: an empirical study of MOOC videos. In *Proceedings of the first ACM conference on Learning@ scale conference* (pp. 41-50). ACM.

Hung, I. C., & Chen, N. S. (2018). Embodied interactive video lectures for improving learning comprehension and retention. *Computers & Education*, *117*, 116-131.

Ibrahim, M., Antonenko, P. D., Greenwood, C. M., & Wheeler, D. (2012). Effects of segmenting, signalling, and weeding on learning from educational video. *Learning, Media and Technology*, *37*(3), 220-235.

Jill, M. D., Wang, D., & Mattia, A. (2019). Are instructor generated YouTube videos effective in accounting classes? A study of student performance, engagement, motivation, and perception. *Journal of Accounting Education*.

Josephsen, J. (2018). Cognitive Load Measurement, Worked-Out Modeling, and Simulation. *Clinical Simulation in Nursing, 23*, 10-15.

Kruger, J. L., & Doherty, S. (2016). Measuring cognitive load in the presence of educational video: Towards a multimodal methodology. *Australasian Journal of Educational Technology*, *32*(6).

Leppink, J., Paas, F., Van der Vleuten, C. P., Van Gog, T., & Van Merrienboer, J. J. (2013). Development of an instrument for measuring different types of cognitive load. *Behavior research methods*, *45*(4), 1058-1072.

Leppink, J., Paas, F., Van Gog, T., van Der Vleuten, C. P., & Van Merrienboer, J. J. (2014). Effects of pairs of problems and examples on task performance and different types of cognitive load. *Learning and Instruction*, *30*, 32-42.

Mayer, R. (2014). *Cognitive theory of multimedia learning*. The cambridge handbook of multimedia learning (2nd ed.), Cambridge University Press (2014), p. 72

Mayer, R. E., & Moreno, R. (2003). Nine ways to reduce cognitive load in multimedia learning. *Educational psychologist*, *38*(1), 43-52.

Mayer, R. , Pilegard, C. (2014). *Principles for managing essential processing in multimedia Learning: Segmenting, pre-training, and modality principles*. The Cambridge Handbook of Multimedia Learning (2nd ed.), Cambridge University Press, Cambridge (2014), pp. 316-344.

Meixner, B. (2017). Hypervideos and interactive multimedia presentations. *ACM Computing Surveys (CSUR)*, *50*(1), 9.

Merkt, M., & Schwan, S. (2014). Training the use of interactive videos: effects on mastering different tasks. *Instructional Science*, *42*(3), 421-441.

Paas, F., Renkl, A., & Sweller, J. (2003a). Cognitive load theory and instructional design: Recent developments. Educational psychologist, 38(1), 1-4.

Paas, F., Tuovinen, J. E., Tabbers, H., & Van Gerven, P. W. (2003b). Cognitive load measurement as a means to advance cognitive load theory. Educational psychologist, 38(1), 63-71.

Palaigeorgiou, G., & Papadopoulou, A. (2018). Promoting self-paced learning in the elementary classroom with interactive video, an online course platform and tablets. *Education and Information Technologies*, 1-19.

Palaigeorgiou, G., Papadopoulou, A., & Kazanidis, I. (2018, June). Interactive Video for Learning: A Review of Interaction Types, Commercial Platforms, and Design Guidelines. In *International Conference on Technology and Innovation in Learning, Teaching and Education* (pp. 503-518). Springer, Cham.

Pandey, A. (2018). *How Can You Use Interactive Videos Effectively In eLearning?* Retrieved March 27th, 2018 from https://www.eidesign.net/can-use-interactive-videos-effectively-elearning/

Petan, A. S., Petan, L., & Vasiu, R. (2014). Interactive video in knowledge management: Implications for organizational leadership. *Procedia-Social and Behavioral Sciences*, *124*, 478-485.

Plass, J. L., Moreno, R., & Brunken, R. (Eds.). (2010). Cognitive load theory. Cambridge University Press.

Razis, S. N. I. M., Radzuan, L. E. M., & Manan, J. (2018). Improving Teaching and Learning Module Through Implementation of Mnemonic Method and Interactive Video for Subject of History Studies. In *Proceedings of the Art and Design International Conference (AnDIC 2016)* (pp. 431-435). Springer.

Risko, E. F., Anderson, N., Sarwal, A., Engelhardt, M., & Kingstone, A. (2012). Everyday attention: Variation in mind wandering and memory in a lecture. *Applied Cognitive Psychology*, *26*(2), 234-242.

Rismark, M., & Sølvberg, A. M. (2019). Video as a Learner Scaffolding Tool. *International Journal of Learning, Teaching and Educational Research*, *18*(1).

Rudolph, M. (2017). Cognitive theory of multimedia learning. *Journal of Online Higher Education*, *1*(2), 1-10.

Sauli, F., Cattaneo, A., & van der Meij, H. (2018). Hypervideo for educational purposes: a literature review on a multifaceted technological tool. *Technology, pedagogy and education*, *27*(1), 115-134.

Shahrokni, S. E. (2018). Using interactive video in learning education. *Teaching English with Technology, 18*(1), 105-115.

Shelton, C. C., Warren, A. E., & Archambault, L. M. (2016). Exploring the use of interactive digital storytelling video: Promoting student engagement and learning in a university hybrid course. *TechTrends*, *60*(5), 465-474.

Slemmons, K., Anyanwu, K., Hames, J., Grabski, D., Mlsna, J., Simkins, E., & Cook, P. (2018). The impact of video length on learning in a middle-level flipped science setting: implications for diversity inclusion. *Journal of Science Education and Technology*, *27*(5), 469-479.

Song, H. S., Pusic, M., Nick, M. W., Sarpel, U., Plass, J. L., & Kalet, A. L. (2014). The cognitive impact of interactive design features for learning complex materials in medical education. *Computers & education*, *71*, 198-205.

Staff, E. (2014). EDpuzzle review: Easy-to-use tool lets teachers quickly turn online video into lessons. *Retrieved April*, *1*, 2016.

Sweller, J. (1994). Cognitive load theory, learning difficulty, and instructional design. *Learning and instruction*, *4*(4), 295-312.

Sweller, J. (2010). Element interactivity and intrinsic, extraneous, and germane cognitive load. *Educational psychology review*, *22*(2), 123-138.

Sweller, J., Ayres, P., & Kalyuga, S. (2011). Measuring cognitive load. In *Cognitive load theory* (pp. 71-85). Springer, New York, NY.

Wachtler, J., Hubmann, M., Zohrer, H., & Ebner, M. (2016). An analysis of the use and effect of questions in interactive learning-videos. *Smart Learning Environments*, *3*(1), 13.

Wachtler, J., Scherz, M. & Ebner, M. (2018). Increasing learning efficiency and quality of students´ homework by attendance monitoring and polls at interactive learning videos. In *Proceedings of EdMedia: World Conference on Educational Media and Technology* (pp. 1337-1347). Amsterdam, Netherlands: Association for the Advancement of Computing in Education (AACE).

Wang, J., & Antonenko, P. D. (2017). Instructor presence in instructional video: Effects on visual attention, recall, and perceived learning. Computers in human behavior, 71, 79-89.

CONSTRUCTIVIST THEORY AS A FOUNDATION FOR THE UTILIZATION OF DIGITAL TECHNOLOGY IN THE LIFELONG LEARNING PROCESS

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ABSTRACT

Lifelong learning, with the help of digital technology, possesses the capacity to offer individual significant advantages to individual learners. This paper examines both the diverse approaches to lifelong learning and the digital tools available to promote these strategies. The paper contains a review of some of the main articles pertaining to the fields of constructivism, digital technology, and the process of lifelong learning. Specifically, the authors intend to critically evaluate the utilization of rapidly developing digital technologies, such as computers, tablets, and mobile devices, within lifelong learning and their role as tools in promoting access to both practical and theoretical knowledge and in facilitating the communication of ideas within a global network, as per the constructivist approach. Hence, this article relies upon a specific definition of lifelong learning and an exploration of the notional foundation of what comprises lifelong learning and the environment in which their knowledge acquisition occurs. Thus, a framework for the present research is established wherein peer-reviewed studies concerning the use of social media by lifelong learners is explored, and extrapolating from the dual tenets of professional development and adult learning theory. Moreover, the authors additionally examine approaches to the notion of PLEs (personal learning environments) and PLNs (personal learning networks) as related to the selection of relevant lifelong learning strategies. The discussion is exemplified by cases ranging from video platforms to blogs and is simultaneously multidisciplinary and spanning diverse fields. Each example has applicability for lifelong learning and represents the characteristics of constructivism and its support within a web-based learning environment. It is thereby suggesting that effective and meaningful strategies supportive of the lifelong learning lifestyle can be achieved via well-designed PLEs and PLNs.

Keywords: Lifelong learning, constructivism, digital technology, personal learning environment, professional learning network.

INTRODUCTION

In recent decades the education system has undergone radical alteration. This is no surprise since formal education has been repeatedly reinvented over the centuries, each time rendering itself responsive to the demands of the period. In contemporary society, characterized as it is by constant and rapid change, formal education has emerged as inadequate in both content and format to satisfy the requirements of its modern society. With the quantity of available information expanding at a seemingly exponential rate, the quality of knowledge transmission appears more than a little deficient. One way in which this failing has begun to be addressed is the growing interest in lifelong learning via a process which combines formal, informal, and non-formal instruction. Lifelong learning, sometimes referred to as career-long learning, reaches beyond mere formal education or training and extends throughout the individual learner's life (Burman et al., 2014).

The need to improve the skills and competencies of the working population has been influenced by two recent global developments, the rapid pace of technological change and globalization. This changing circumstance has led to the need for everyone to incorporate lifelong learning into their career plan as skills should be enhanced, updated, and augmented whenever the opportunity arises. Adapting to change is a skill in itself, but it is rewarded by life being enriched by the prospect of learning new things and the fulfilment that results from the natural desire to learn and evolve (Laal & Salamati, 2012).

Not only is the expertise acquired via formal education no longer sufficient for business needs, but it is also inadequate to meet the demands of wider society. Nowadays, advances in the digital device facilitate ease of access to quality, structured learning in accordance with multimedia and constructivist learning approaches wherein multiple tools permit access to comprehensive content with on-demand availability and no requirement for additional resource provision and organized body or association (Pureta, 2015).

In other words, knowledge exists beyond the confines of the curriculum of specific professions or academic fields, and the objective of lifelong learning is to comprise an addendum to existing formal systems with their inherent and well-established weaknesses, at least until a more satisfactory formal educational system is devised. Moreover, it is crucial to continuing professional development in almost all occupational arenas (Pureta, 2015).

By 2007, the United States Bureau of Statistics was already predicting a 10 million shortfall in the number of workers who would be equipped with appropriate skills in 2010 (Thompson, 2007). In the same year, a reported 40% of employers were expressing acute shortages in skilled labour. It is vital that any worker seeking advancement in their career or socioeconomic mobility acquire new knowledge and expertise. Likewise, businesses in search of an increase in productivity and profits must take steps to acquire a suitably skilled workforce. To achieve these objectives, a new philosophy of learning, founded on principles of extended and continuous knowledge acquisition is required. Hence, it is fair to say that lifelong learning can bestow both social and economic advantages on workers while satisfying the needs of employers too (Johnson, 2010).

ADULT EDUCATION

Adult education constitutes a well-established educational sub-discipline wherein adults participate in organized and extensive learning activities designed to modify their existing "knowledge, attitudes, values, and skills" (Darkenwald & Merriam, 1982).

Despite the large and growing numbers of educational institutions, there remains a shortfall such that many who wish to expand their knowledge and skills find their needs are not fulfilled by these educational establishments. Moreover, the suitability of some formal educational institutions for certain educations is questionable. Certain training needs also appear quite alien to these institutions, and, as a consequence, adult education is frequently committed by the workplace offers training programs organized with the assistance of adult education professionals (Kumar, 2012).

According to Merriam and Caffarella (1999), adult learning is heavily influenced by its socio-cultural setting and is, therefore, best appreciated by an evaluation of this context. The substance of learning, the options available, and the mode through which knowledge is collected are all products of a wider social framework which is specific to each society and shapes the opportunities of individuals who live therein. In

the contemporary digital age, the online community exists, which offers a growing and multiple learning-based opportunities.

Experiential learning, as defined by Kolb (1984), includes all learning experience are not acquired in any formal educational environment. Instead, it involves the practice of reflection concerning commonplace practices in personal and professional life. Thus, Experiential learning constitutes 'making meaning' as derived from actual-life experiences, which necessarily broadens to scope outside both the workplace and formal learning scenarios. Experiential learning could be maximized even in the case 'unintended, unstructured, and opportunistic' (Yardley et al., 2012, p.163).

Social learning theory puts great emphasis on firmly upon so-called communities of practice. This approach is predicated upon the assumption that both learning and thinking are primarily social activities which are framed in accordance with the tools presented in different learning circumstance (Taylor & Hamdy, 2013).

CONSTRUCTIVISM AS A THEORETICAL BASIS FOR LIFELONG LEARNING IN THE ONLINE LEARNING ENVIRONMENT

While there exists a spectrum of learning theories which can be explored in connection with adult learning, the author state that the most relevant theory is constructivism. This approach contends that knowledge construction by the learner can be formed from both their existing knowledge and their social interaction process with their surrounding environment. As with other learning theories of adult learning, constructivism and Adult Learning Theory concur in terms of the tenets and techniques and their methodology regarding the teaching of adults. Hence, in both approaches, authenticity and relevant learning are crucial components. The adoption of a constructivist approach requires the provision of learning experiences which learners regard as pertinent to either their working or non-working lives. Hence, this philosophical stance recognizes that adult learners are motivated by a combination of social, emotional, or occupational needs (Annette, 2010). Moreover, as has been stated by Lambert (2002), constructivist leadership is grounded in the identical principles which inform constructivist learning. Specifically, both adults and children acquire knowledge and skills through a process of "meaning and knowledge construction, inquiry, participation, and reflection" (Lambert, 2002, p.35).

According to Piji Zieber (2009), since adult already possesses substantial knowledge and experience, construction of new understanding and knowledge must be built on this existing body of experience and knowledge. Thus, constructivist learning is closely reflectors real-life problem-solving practices, and constructivist principles can be regarded as being in accord with the general principles of adult education. Both Adult Learning Theory and constructivism have considerable relevance for the present and predicted social media-based communities, communications, and conceptual exchanges.

Billett (1996) emphasizes the value of the workplace as a stimulating environment for learning since it has obvious associations with genuine goal-directed action, provides access to relevant guidance from both observable experts and colleagues in the appropriate context, and involves routine problem-solving which facilitates indexing. Moreover, the workplace setting also acts as a prominent source of implicit reinforcement.

Research into workplace-based learning has proven that what occurs in such scenarios is essentially constructivist, situated learning, often via the process of cognitive apprenticeship. Billett's (1993, 1994) own research conducted concerned workers in the coal industry and other allied industries. The conclusions reached included the observation that in the informal learning environment of the workplace, active learning is a consequence of the combination of learner participation in authentic activities as guided by acknowledged experts and their interaction with other workers. While each learners have their own construction of understanding, which was unique to them, it was nevertheless was moulded by the culture of their workplace. Amongst these community workers, the instruction was esteemed solely for its potential to provide knowledge that they were unlikely to acquire indirectly, otherwise referred to as opaque knowledge.

Nevertheless, it was the quality of the instruction, which was considered the most essential component in their experience. Specifically, workers were unequivocal that their learning experiences must assist their comprehension of the reasons underlying working practices and that this information is presented in a manner which could not be construed as patronizing or demeaning (Billett, 1994). Hart-Landesberg,

Braunger, and Reder's (1992) study investigated the way hospital employees "learn the ropes", reflecting upon the processes through which these workers simultaneously learn and do. This study concludes that workers reflect upon their actions in order to interpret and reevaluate the knowledge they have obtained.

Action is critical to the creation of knowledge since it is through participation in regular work activities that learners are compelled to access higher-order procedural and propositional knowledge. The reiterative experience completes their index of knowledge, and active preoccupation with regular problem-solving underpins their learning. From a constructivist perspective, reinforcement indicates the inner gratification arising from making a wide sense of new stimuli or the adapting of new data to previously established frameworks of knowledge. This diverges significantly from the behavioural stance wherein reinforcement appears to be provided from external sources (Billett, 1994).

When a constructivist paradigm is adopted in the preparation and design of occupational training in the workplace, several features emerge. Workers and managers begin to appreciate that they have diverse and frequently opposed viewpoints about precisely what training is required. This occurs as a result of both parties acknowledging that they have constructed their perceptions of the organization independently. Moreover, an appreciation can, therefore, evolve wherein it is accepted that neither viewpoint is necessarily wrong (Annette, 2010).

According to Annette (2010), constructivism requires that the opinions of each group regarding training are given due consideration. For this to occur, dialogue and discussion are required to an enhanced comprehension of others' understandings of reality can be derived. Consequently, meaningful training programs can emerge to fulfil the necessary needs of the workers.

When job-related training is designed in accordance with a constructivist perspective, it could be fully compatible with both the managers' and the workers' constructions of reality. Taking the Master of Educational Technology "MET" Courses as an example, which are specifically designed courses for graduates to acquire a deep understanding of learning supported by advanced technologies in various organizational settings (The University of British Columbia, 2019). These courses are characterized by their construction around a discussion-based format. Wherein, the role of instructors is to supervise discussions on the forums, but not to interfere in any explicit way. Hence, participants are free to communicate and openly respond to each other, thereby promoting cooperation and enabling learners to generate subject knowledge by paying attention to the opinions expressed by other participants and integrating what they understand within their existing knowledge. This process is rendered authentic by the inclusion as illustrative instances from learners' own examples, experiences, and contexts related to their work (Annette, 2010).

It is vital that any instructional approach supporting lifelong learning acknowledges that each adult learner possesses a learning style which is both characteristics and unique to them (Holmes, 2002). Since all adult learners arrive in the learning environment equipped with a wealth of knowledge and real-life experience, the adult learning environment must constructively utilize this to create an instructional activity that is both worthwhile and effective for the learner.

While constructivist learning theory actively supports the learning characteristics of adult learners, its theoretical foundations do not explicitly advocate any precise learning approach. The strength of the constructivist approach lies in their support of lifelong learning through recognizing the distinguished traits of adult learners (Fosnot, 2005). Constructivism puts stresses on the role of social interaction, reflection, and the incorporation of prior experience in the meaning-making process by the learner (Steffe & Gale, 1995). One underlying assumption in constructivist thought is that real-world problem–solving can be meaningfully practised in a collaborative work setting as an instrument to link existing knowledge and experience with current learning while concurrently facilitating the social construction of knowledge. In this specific way, the primary tenets of constructivism promote the learning styles and characteristics of adult learners, while it does not present any identifiable implementation strategy.

One key element of a learning environment which has been created following socio-constructivist principles is it's the encouragement of collaboration among learners and practitioners in a communal framework (Sze-yeng & Raja, 2010). Furthermore, since constructivist theory advocates self-directed learning, responsibility is relocated "from teacher-directed courses to a negotiated curriculum" (Gunduz & Hursen, 2015). The consequence of this conceptual shift that learners are both empowered in the delineation of their own

learning prerequisites and provided with an appropriate opportunity in which to satisfy these specific needs through adopting effective strategies.

In such an environment, there is an expectation that learners will be proactive in the discussion, reflection, adaptation, evaluation, and engaging within the learning community through social interaction (Sze-yeng & Raja, 2010). Their self-directed conversation with both themselves and their community creates an active experience to acquire meaningful learning. The encouragement and direction supplied by both experts and most professional peers foster learner competence and aptitude for learning, as per Vygotsky's (1978) concept of the 'Zone of Proximal Development'.

Perhaps the most significant feature of the lifelong learner is the capacity for self-direction. In other words, the learner's independence in managing the entire learning process. This requires perspicacity regarding one's predisposition for self-direction and active decision-making, in addition to the ability to own responsibility for the lifelong learning process. From an instructional perspective, this necessitates that learners demonstrate initiative, irrespective of the existence of any formal guidance, and make choices concerning their own learning. Pedagogical approaches which incorporate problem-based, case-based, and team-based learning are proven to enhance self-directed learning skills (Blumberg, 2000).

Using scaffolds in a technology-integrated social constructivist learning environment is assimilated within any given self-directed instructional scheme. By participating in the use of relevant web tools, the students can refine existing skills concerning cooperation, negotiation, interaction, and reflection, and in this way promote their own lifelong learning characteristics (Lamon, Reeve & Scardamalia, 2001). Amongst the associated visual tools itemized by Hyerle (1996) are brainstorming webs, concept mapping, thinking process maps, multimedia, and the World Wide Web, which support knowledge construction.

Web-based platforms such as Wikispace, Moodle, Google docs, and Facebook all serve as sophisticated tools to actualize self-directed learning. These technologies act as primary learning spaces for the promotion of initiative and autonomy in the creation of instructional design knowledge and skills. Hence, for instance, self-driven learning followed by guidance and comments from peers and instructors becomes navigable within a shared learning contract hosted by Google Docs (Sze-yeng & Raja, 2010).

LIFELONG LEARNING

Lifelong learning is extensively known as the continuing process of updating knowledge, competencies, and skills of individuals in the ever-changing world, used for improving their social life (Koper & Tattersall, 2004).

When conceived as a means of continually acquiring new expertise and experience new activities, lifelong learning can be considered to positively impact individual lives through the enhancement of qualities such as the ability to absorb and retain information, creativity, the capacity to the adaptation to new conditions, and learn from past mistakes. Yet, irrespective of its clear advantages in terms of personal growth, lifelong learning also offers a positive route for professional development, guaranteeing autonomous learners have enhanced skills, which will permit them to compete more effectively in the marketplace. Such benefits are invaluable in a contemporary society, which places increasing emphasis on technologies which enable more rapid means of information acquisition (Bizon & Istrate, 2017) ever.

When regarded in a wider, more abstract manner, lifelong learning encompasses all the varieties of activities and experiences which allow individuals to acquire wisdom and edification and to thereby become more prominent members of the community. As an active and effective philosophical approach to the pursuit of knowledge acquisition, lifelong learning has a demonstrable capacity for achieving and accelerating a social transformation. As an educational movement, it promotes the message that it is never too early nor too late to learn. Furthermore, lifelong learning can create systematic changes in social attitudes and values, through upholding the concept remaining open to new ideas, philosophies, skills, behaviours, and attitudes (Kumar, 2012).

Such a conclusion confirms Lamb's work (2005) that refers to lifelong learning as a mechanism through which novel skills and knowledge are acquired, and it can have an influence on the formulation of new opinions. Such a potentially paradigm-shifting process naturally extends well beyond the scope of any mere

classroom-based activity or reading a book related to self-improvement. It requires the making wise decision concerning how an individual prefers to live their life and the resolving of any obstacles which hinder a chosen course of action.

Different Aspects of Lifelong Learning

According to the working report of the Commission of the European Communities (2000) Education does not simply refer to only lifelong learning, but in that official paper, all forms of education were described as follows:

- Formal education occurs within recognized educational institutions and typically results in the awarding of qualifications such as official diplomas and certificates.
- The forms of non-formal education co-exist with the formal system and frequently do not result in any formal qualification. Such learning may occur at the instigation of organizations and take place in the workplace environment, such as trade unions, youth organizations, and political groups. This form of education serves as an adjunct to the formal system of education and can encompass fields as diverse a sport, music, or even preparation for examinations.
- Informal learning regards as an entirely natural aspect of ordinary life since unlike formal education, it can occur in such an unconscious level that the recipients of this learning need no even officially acknowledge that they have acquired new skills or knowledge.

Lifelong learning inevitably denotes both informal and non-formal education. The non-formal learning concept stands apart from schools, colleges, training centres, and other recognized institutions for learning. Typically, the outcomes of non-formal learning rarely carry much value in the market sector. Hence, non-formal education is not regarded as real learning and generally somewhat undervalued (Pureta, 2015).

The Characteristics of the Lifelong Learner

According to Mackeracher (2004), the determining characteristics which define the successful lifelong learner are a capacity for reflective learning and the possession of critical thinking skills. These abilities enable the learner to gain self-reliance through learning how to learn. Consequently, these lead to increasing personal independence and the ability to regulate the learning process actively. In a similar vein, Dunlap (1997) observes that in order to prepare higher education students for the role of lifelong learners, it is essential that the core skills of self-direction, metacognitive awareness, and natural tendency toward learning to be enhanced.

However, it should not be assumed that the necessary fundamentals for success in lifelong learning, such as personal and interpersonal skills, are intrinsic to most workers. Lifelong learning requires self-reliance, motivations, reflection, and interpersonal skills. Above all, learners must adopt a proactive role in their education with particular reference to the knowledge construction as well as sharing of both knowledge and experience (Kerka & Eric Clearinghouse on Adult, 1996).

While the primary skill required for lifelong learning is the ability to efficaciously read and absorb materials, which include exposure to new knowledge. Besides, being possessed of a capacity to interact socially is imperative since knowledge accrued from reading must subsequently be filtered via a process of participation in pertinent projects, peer sharing, and mentorship (Holmes, 2002). Furthermore, the learner must refine the requisite reflective skills in order to smoothly gain a more profound vision and understanding of the newly-acquired knowledge and experience. As a rule, neither the personal nor the interpersonal skills necessary for successful lifelong learning are provided by any contemporary epistemological approaches (Gorard & Selwyn, 2005).

Stauble (2005) argues that lifelong learning equates to a cyclical process wherein it is possible to identify four key pillars, each with e-portfolios, to support them. The first of these pillars concerns Self-awareness emphasizes the existing knowledge, experience, and attitudes of a learner in respect of the education process. Thus, a portfolio comprises a valuable tool whereby a learner can be made aware of their personal progress. The second pillar can be described as self-management or planning for learning objectives that are established

and a strategy for achieving them enacted. At this stage, a portfolio has the advantage of acting as a map for future learning. The third pillar is Meta-learning or the process through which learners comprehend how they learn. It denotes how a learner acquires an awareness of diverse approaches to knowledge acquisition, such as deep versus surface learning, and Rote versus meaningful learning. The variety of different learning styles is also encompassed in this particular pillar. The fourth and final pillar is self-monitoring, or the capacity to evaluate learning, wherein a learner systematically evaluates all elements of their own learning experience and performance. The self-monitoring process equates to the acceptance of responsibility for meaning-construction and correlates with the capacity to engage in reflective and critical thinking.

Despite the apparent significance of these pillars to any successful teaching and learning process, lifelong learning can be chiefly characterized as a reflective cycle. Thus, the portfolio exemplifies the most efficacious context for this refection (Stäuble, 2005).

METHODOLOGY

The methodological stance adopted in the current paper centres on a literature review of pertinent theoretical knowledge in the field of lifelong learning. There are three principal areas which this paper seeks to explore. The first of these comprises an exploration of what lifelong learning is and why we need for. Secondly, this paper examines different approaches to the development of both the personal learning environment (PLE) and the personal learning network (PLN) within the overall context of lifelong learning. Finally, this paper also considers the way in which a constructivist approach enhances our understanding both of the embracing of technology in the lifelong learning process and of the adoption of apposite lifelong learning strategies. The inclusion in this paper of descriptions of multiple search engines, blogs, and social networking sites is intended to be illustrative of the use of such platforms for learning and career development in addition to incorporates statistical information related to adult use of such sites.

Technology as a 21st Century Tool for Learning

In contemporary society, technology has become completely enmeshed with every area of daily life. Countless individuals regularly log on to the Internet to conduct different kinds of tasks, including the checking of e-mails, online banking, job hunting, or simply to surf the net. Technology is now so integral to our commonplace existence that it has become almost impossible to conceive of performing a particular function without access to the Internet or a computer. Moreover, many families have now invested in computer connections and wireless networks in their homes. Internet access is deemed vital necessities as food consumption (Atzori, Lera & Morabito, 2010). Social networking site usage has increased exponentially amongst all age groups, with 89% of young American adults being regular Internet users, while over two-thirds of American Internet users aged 30 to 64 use social networking sites (Pew Research Center, 2014). Even among American adult Internet users over the age of over 65, some 46% regularly engage in social networking (Pew Research Center, 2014). Statistically, Facebook, which newly celebrated the fifteenth years of anniversary, is maintaining its position as one of the most popular social media platforms in the United States. An estimated 69% of American adults claim to have used Facebook at some point, despite the fact that a 2018 Center survey has reported a marked decline in Facebook usage amongst the younger population. Teenagers, in particular, are using Facebook with less frequency. However, age-related disparities in Facebook usage are less pronounced amongst users. Facebook use is equally popular across all age groups. In particular, 68% of fifty to sixty-four-year-olds and almost 50% of the over sixty-fives report using this platform. The only other social platform, which is equivalent and reaches the number of Facebook users, is YouTube, which boasts an adult usage of 73% (Pew Research Center, 2019).

According to psychologists such as Albert Bandura, learning should be regarded as a social activity. Bandura theorizes that learning occurs through a process of modeling in respect of behaviors demonstrated by others. Likewise, Lev Vygotsky postulates that we learn through the process of social interaction (Taylor & Hamdy, 2013; Yardley et al., 2012). While certain social interactions are collaborative, others are competitive. Moreover, some interactions occur among peer groups, whereas others are hierarchical in nature. In addition, interactions can transpire both in real-time and through turn-taking. There is a growing trend for social

interaction among people from a more geographical dispersed distance, whereby technology allows it to show between individuals who are not connected through any means other than a shared field of interest related to their learning. This technological development has been greatly assisted by the advent of social networking platforms (Terry & Yolanda, 2015).

Current social technologies authorize the connecting of users with others in ways that were formerly unthinkable. Furthermore, phenomena of technology-based social media such as blogs, discussion forums, social networking sites, image sharing services, and video sharing services, enable individuals not only to connect with others but also to share learning resources (Kimmons, 2018).

Consequently, technology tools have a distinct application in the arena of lifelong learning, which can be into two principal categories: personal learning environments (PLE) and professional learning networks (PLN). The current paper examines both the different approaches to lifelong learning and the tools available to support it.

Personal Learning Environments

Those processes which are referred to as Personal Learning Environments (PLEs) enable learners to assume responsibility for and control over their own learning. The three core ways in which this occurs are the establishing of personal learning goals, the regulating of the content and process of learning, and the creating of communication between those involved in the learning experience as it evolves (Municipality of Halmstad & the European Commission).

With the advent of technological advances, there is an increasing preference for personal learning environments (PLEs) among leaners. While a PLE is essentially a collection of go-to tools that learners can employ to assist them in their learning tasks, the focus is increasingly placed upon the analysis and evaluation of information. This enables learners to relate to concepts in a variety of ways, which are now feasible only as a result of access to certain widely-available technologies (Jenkins, 2017).

Hence, a learner, while working on a research assignment, can visit multiple websites using a bookmarking tool such as Diigo wherein tags are employed to enable the learner to easily retrieve specific information. In addition, the audio recorder on a smartphone or tablet can efficiently log transient ideas throughout the day. Alternatively, a learner might utilize OneNote Learning Tools to ensure correct grammar usage and transitions between the paragraphs in an assignment (Jenkins, 2017).

Technology can also be used to enable learners to locate and join discussion groups pertaining to their specific fields of learning, while content sharing platforms, such as YouTube and Vimeo, allow anybody to view learning content or to post their own content. These and countless other tools exemplify a personal learning environment in which current technology assists active lifelong learning (Bizon & Istrate, 2017).

Professional Learning Networks

Professional Learning Networks (PLNs) comprise groups who collaboratively participate in learning alongside those who are external to their commonplace community of practice, the aim therein being to enhance teaching and learning in their own system (Brown & Poortman, 2018). According to Faisa (2015), a PLN is a group of connected individuals or professionals who share and exchange ideas and knowledge to increase their mutual appreciation of any given field of their interest. PLNs recognize that experience has the innate potential to be a better teacher than teachers themselves. Thus, even a PLN is most effectively understood from within.

The recognition that networking functions most effectively at the level of teachers has resulted in increasing attention paid by policymakers and educationalists to PLNs as a means to improve education within formal settings (Armstrong, 2015).

Figure 1 presents a graphical conceptualization of PLNs wherein each black dot or white star represents an individual stakeholder, such as a teacher or an academic researcher. The arrows, meanwhile, represent connections and so flows of information or other forms of social capital that occur between professionals. As can be seen from the illustration, there are two types of grouping. The first, as demarcated by dotted circles,

denotes everyday communities of practice, such as individual schools or university departments (Wenger, 1998), whereas the second type of grouping, as signified by the mass of black dots in the diagram's center, constitutes a PLN. Figure 1 illustrates how members of PLN, as represented by white stars, equate those individuals possessing connections which extend beyond the dotted circles of ordinary communities of practice and into the network of individuals placed at the diagram's center. Thus, PLNs can be composed of separate individuals from a range of communities of practice (Brown, 2019).
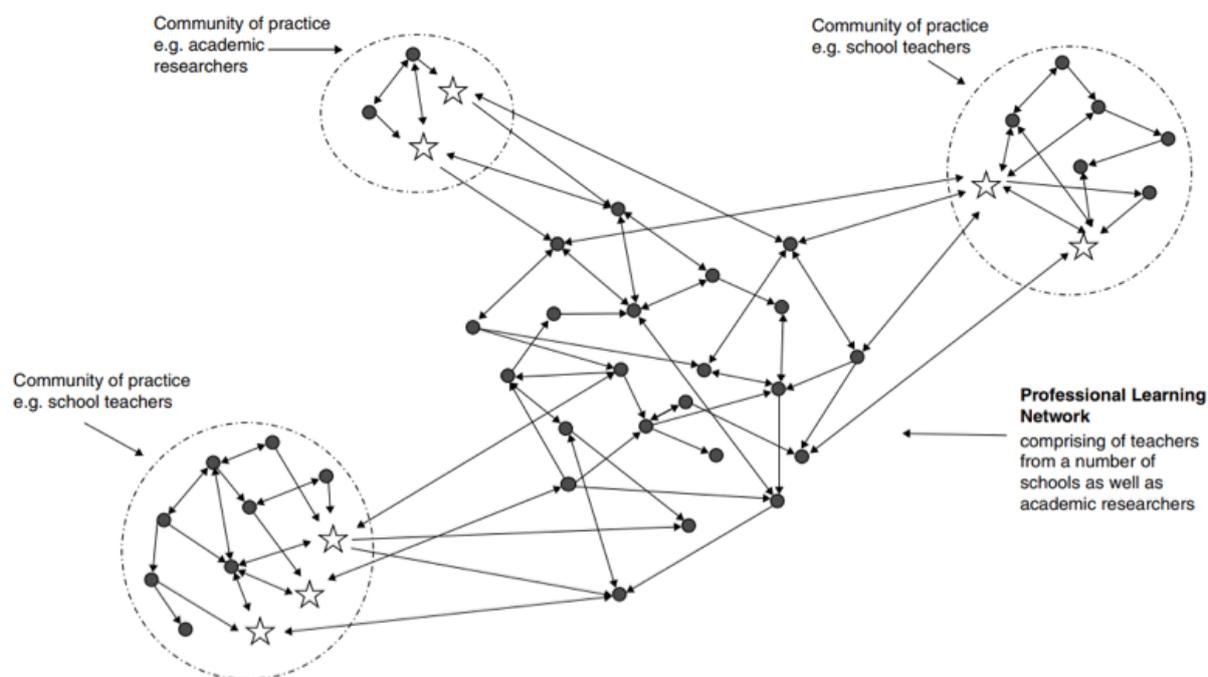
Figure 1. A graphical Depiction of PLNs. (Brown, 2019, p.5)

Despite the increased professional devoted to PLNs, the paucity of research into PLNs and their consequences remains pronounced. Most research into online teacher learning emphasizes the learning experiences of the teachers from within a single network or community of practice or is connected to a specific online platform, such as Twitter (Carpenter & Krutka, 2014; Gesthuizen, 2012; Hur & Brush, 2009; Kelly & Antonio, 2016; Trust, 2015; Visser, Evering, & Barrett, 2014). As with PLNs, teachers participate in these online spaces in order to identify and exchange professional expertise (Carpenter & Krutka, 2015; Trust, 2015; Duncan-Howell, 2010; Forte, Humphreys & Park, 2012), or to establish cooperative relationships with like-minded professionals (Carpenter & Krutka, 2014, Carpenter & Krutka, 2015; Hur & Brush, 2009; Visser et al., 2014). Some studies were examined on how online platforms also possess the potential to shape teacher identities (Barab, Kling & Gray, 2004; Luehmann & Tinelli, 2008).

Ronfeldt, Farmer, McQueen & Grissom (2015) report a beneficial impact on student performance arising from scenarios where teachers within a community of practice, participate in active collaboration with their colleagues. Nevertheless, research into the collaboration between teachers from diverse communities of practice is less well-defined. It is possible, perhaps, that such collaborative activity could result in a valuable cross-pollination of ideas and practices, as per Forte et al. (2012).

Research conducted by Trust, Krutka & Carpenter (2016) observes that teachers who participate in PLNs are enthused by their engagement with others and the potential this offers to satisfy their diverse, holistic needs. Furthermore, all research subjects appeared to acknowledge the social, intellectual, emotional, and identity-related advantages of PLN participation.

Similarly, lifelong learning has also been deemed to enhance career satisfaction, as is confirmed by Afonso et al.'s (2017) research into psychiatrists, which indicates that motivation to remain up-to-date with current

developments in one's field has a strong correlation with career satisfaction. When a given professional field is characterized by fast-paced change, social media platforms might enable practitioners to stay updated and, therefore, simultaneously promote a sense of fulfilment.

The current range of tools can be adopted to create a professional and Personal Learning Environment. Some examples include search engine alerts, personal knowledge managers, RSS feed aggregators, and video sharing services; each of examples tools are explored in a bit more detail.

Video-Sharing Services

Both lectures and hands-on teaching have comprised the educational norm for centuries. Technology now permits video-based or multi-media interactive tools to supplement the standard curriculum, offering an additional format through which education in person can be strengthened (Terry & Yolanda, 2015). Multiple hosting services are currently available, such Web sites and blogs, which permit the uploading of video content and courseware. These services store podcasts and assign them URLs so that other users can access them. The most popular hosting site is YouTube, which is a free multipurpose site. Videos uploaded onto YouTube are both searchable and shareable, enabling the site to be used by both professional and non-specialist audiences. Whilst a member is a prerequisite of the ability to upload videos or to comment on those created by other members, even nonmembers are able to access videos for free watching (Gilton, 2016). Thus, YouTube offers immense potential as a tool for lifelong learning since not only does the site's commenting facility enables users to review and potentially revise the content of the video, but it also permits the sharing of YouTube video content on other online platforms, such as blogs and websites (Topps et al., 2013). Videos can be made available for review or revision by learners following live performance or can simply be employed as sources of advice or suggestions (Fischer et al., 2013). Large universities, including MIT, Harvard, and Stanford, have launched their own YouTube channels through which lecturers can upload educational videos for free worldwide viewing. Hence, Social Media considers an ideal platform for lifelong learning, a modern concept that helps individuals keep their minds sharp and healthy by arousing their curiosity and providing new experiences throughout the entire life (Bizon & Istrate, 2017).

Goleman (1998) emphasizes that emotional intelligence can be closely tied to videos. Gardner's conceptualization of intrapersonal and interpersonal intelligence is alike to Goleman's emotional intelligence. Thus, personal intelligence can be deemed to comprise self-direction, self-reflection, self-motivation, planning, impulse control, independent study, and metacognition, whereas interpersonal intelligence emphasizes activities such as relating, empathizing, cooperating, leading, teaching, connecting with others, resolving conflicts, and social activities. The music incorporated within videos can elicit various emotional reactions, including liking or disliking, and generating excitement or arousal (North & Hargreaves, 1997; Robazza, Macaluso & D'Urso, 1994). Thus, video is a valuable means of establishing a more profound level of communication with learners through the creation of an emotional bond. Similarly, Haridakis & Hanson (2009) have observed that YouTube established direct connections to users' and interpersonal activities since they can share videos with others within their social surroundings, indicating a correlation between offline social activities and interpersonal interaction may affect the YouTube use for a social purpose.

Several academic institutions are already adopting YouTube as a vehicle for the dissemination of knowledge, such as course modules. Thus, Jaffar (2012) observes that 98% of medical students used YouTube videos as an online information resource, with 86% reporting that they have confidence in the platform's capacity to assist their independent learning.

Likewise, Bizon & Istrate's (2017) review of online lifelong learning platforms Based on Social Networks reveals that over 65% of users in their study regard video recordings as an ideal learning medium, following by audio recording and written materials. Roodt & Peier's (2013) research confirms the value of YouTube use in class for illustrative purposes in the classroom context. That particular study indicates that 71% of students believe YouTube video usage raised their attention spans, while over 50% of respondents agreed that YouTube usage was generally beneficial. Overall, 65% of respondents would prefer such videos to be incorporated into their future learning.

Search Engine Alerts

Search engine alerts, such as Google Alerts, are entirely free online software tools which enable users to track selected keywords and expressions in connection with a content change detection and notification service. This search facility is supported by Google, which sends emails to users when new results are indicated. These results include web pages such as Wikipedia, blogs, and newspaper articles (Donchev, 2017). Thus, services like Google Alerts are provided by search engine companies that notify registered users when new relevant content becomes available on the web. In this way, for example, a social studies teacher can be sure to receive any news stories dealing with discrimination if they create a Google Alerts search criteria with the word "discrimination" (Kimmons, 2018).

In addition, there is increasing reliance placed upon the results of internet search engines, particularly when they have arrived by Google search motor. In 2003, Graham & Metaxas's (2003) research into online users concluded that participants trust the information and often adopted an attitude of "Of course it's true, I saw it on the internet", indicating that users frequently regard Google as a source rather than a mere intermediary between themselves and multiple resources. These conclusions have been confirmed by other studies, such as the research conducted by (Lewandowski, Kerkmann, Rummele & Sunkler, 2017).

Over 4.5 billion individuals were regular Internet users as of 2019 (Internet World Stats, 2019), with 90% of adults in the US defining themselves thus in the same year (Clement, 2019). The search for information is acknowledged as one of the primary purposes of using the Internet. In particular, search engines play a primary role in this respect with Google, Yahoo, and Bing being reportedly used by 80% of online users. However, although each search engine employs a slightly different way of ranking content, all these search motor have in common the tendency to produce more results than any individual would be willing to read. Thus, most users focus on the top-ranked results (Allam, Schulz & Nakamoto, 2014).

Purcell, Brenner & Raine's (2012) study of U.S. internet users discovered that 91% of search engine users reported finding appropriate information via search engines. The 73% of them considered most or all the information thus found is accurate and reliable, and that 66% regarded search engines as fair and impartial sources of information (Pew Research Center, 2012). These findings suggest that there is a robust and significant correlation between user confidence in search engines and understanding of search engines as purely algorithmic systems for which reliability and bias issues are irrelevant.

There have been several studies which indicate that problems accrue as a result of variations in the quality of information obtained via search engines. Coupled with the aforementioned, there are concerns over search difficulties, information overload, poor organization, inadequate regulation, inaccuracy, and lack of quality in search engine results. Hence, some Internet users may have a poorly developed ability of judgment the quality of search engine findings. This applies, in particular, to users with more limited literacy skills. Whilst such concerns clearly pre-date the Internet, the impact has perhaps been exacerbated by the breadth of information available online. Besides, there is a perceived tendency for the information retrieved from search engine results to be accorded as an authoritative source. Once more, this misperception of information quality is not a new issue. Finally, it is entirely possible that users can regard the ranking of results in the search engines as indicative of the quality of information, rather than merely pertaining to other factors. Thus, the search engine can be mistakenly seen by the users as it is providing the most reliable or informative websites and content (Allam, Schulz & Nakamoto, 2014).

Social Networking Sites

Technology-based social media have an active contribution to increasing access of people from various ranges of age to learning and probably passed socioeconomic levels throughout the world. As Merriam & Caffarella (1999) observe, the social media age has contributed to the expansion of an environment in which individuals can all, irrespective of their personal demographic or socioeconomic status, can both access learning online and connect across vast geographical distances. Distance learning is a key component of the relationship between social media and lifelong learning. Through facilities such as networking and extensive participation before and after live sessions, social media can expand learning and relationships into a shared space as serve to promote professional growth (Kind et al., 2013). The interactive nature of social media is critical since it facilitates both

the synchronous nature of information dissemination media and its asynchronous character as to manifest in conversations, chat forums and comment facilities. The interactivity allows learners to exchange opinions, ideas, and questions, and goals with actual or virtual peers and mentors, thereby establishing themselves as active partners in the learning process (Terry & Yolanda, 2015).

Social networking sites, such as Facebook, Twitter, and Pinterest, are social spaces in which individuals people engage with friends and family. However, they can also perform an important professional function. Thus, strictly professional social networking sites, such as LinkedIn, allow users to manifest a professional online presence, which is of considerable value in the job-seeking process. Similarly, by creating a Twitter or Pinterest account and follow the posts of other professionals in a specific sphere of interest, users can stay remain up-to-date with relevant developments. Creating a profile and sharing professional expertise on such sites also allows users to share their knowledge in a manner which serves to assist others (Kimmons, 2018).

Since 2003 social networks achieved mainstream status achieved incredible audience figures. This explosive growth in audience number is exemplified by Facebook, in which 200 million worldwide users in April 2009 had raised to 400 million users by March the following year. By November 2010, Facebook's estimated audience exceeded 547 million users. With only 26% of the users residing in the United States, Facebook is a global phenomenon. Twitter usage demonstrates a less dramatic trajectory, rising from 19 million users in March 2009 to 75 million in March 2010, of which 44% reside in the United States (Perez, 2011). The online survey was done by Clement (2019) indicates that as of the second quarter of 2019, global Facebook usage had reached 2.41 billion users, rendering this platform the unequivocal leader amongst social networking sites. In the US alone, there were a recorded 190 million Facebook users by July 2019. The last figures regard to international twitter usage demonstrate 330 million regularly active Twitter users as of the second quarter of 2019.

According to Redecker, Ala-Mutka & Punie's (2010) survey on the Impact of Social Media on Learning in Europe, The European Commission Joint Research Centre contends that there is a growing tendency for the internet to be accessed for educational content. This is evidenced in Eurostat data, which reveals that in 2009 an average 31% of the EU27 population aged 16 to 74 already used the Internet to obtain educational content, up 8% from the figures for 2007. Moreover, the geographical variation was not excessive, ranging between 20% and 50% in most European countries. Since portable devices connected to the internet are increasingly commonplace, these are also being employed as a gateway to learning without being physically linked to any specific time zone or location.

Bizon & Istrate (2017) review of lifelong learning online learning platforms concludes that creating an online community has multiple benefits since over 45% of the respondents in the study claimed they would be happy to employ collaboration tools which enabled course participants and trainers to connect and share ideas.

Blogs

A weblog, usually referred to as a blog, is an online log entry through which writers regularly follow the routine to update content. Readers can make a constructive or critical comment on the post to which authors may choose to respond, asynchronously. The overall result is a reciprocal relationship between writers and readers, manifest as a reading and responding process (Chisolm, 2016).

Hyperlinks to specific texts are frequently incorporated in blogs, thereby permitting readers to instantaneously access the original information referenced in the blog post. This renders possible a more profound exploration of topics touched upon in a blog. Blogging, which references peer-reviewed evidence, such as those connected with journal clubs, morning reports, or conferences, can ensure these references are available to the reader either before, during, or after a specific live session (Chisolm, 2016).

Terry & Yolanda (2015) contend that blogs provide opportunities for lifelong learning through the following nine principals: (1) Links to additional references (2) The summarized perspective of authors regarding recent research or current events (3) Comments and questions supplied by readers which can result in content updates (4) Searchability in terms of content (5) Opportunities for learners and educators to work on identifying knowledge gap and fill it (6) The facility for subscribers and followers receive updates and

links (7) Reminders to educators to learners regarding the need to complete scheduled assignments or to address queries (8) Open access and full availability of multiple settings, via various devices (9) The provision of platforms for reflections and personal improvement.

RSS Feed Aggregators

Really Simple Syndication (RSS) can radically change the way in which online information is consumed, not least in relation to the dynamic content. RSS-enabled websites create a stream of Markup Language (XML) data, which summarizes the site content of the site Areas as diverse as news headlines, stock market data, weather, discussion board postings, or community-specific announcements. Programs called aggregators periodically explore subscribed feeds for updates and then syndicate them directly to the users' desktops. RSS content can be filtered according to customized criteria, and content can be aggregated from across multiple feeds to suit the defined user requirements. RSS offers the benefit of time-efficiency since users no longer have to move through masses of potential online sources to locate relevant content (Lee, Miller & Newnham, 2008).

The inherent complexity concerning the receipt and management of content on social media platforms has been effectively lessened thanks to technologies such as RSS (Really Simple Syndication). This tool has permitted users to address more relevant issues, including self-evaluation, critical reflection, and the delivery of feedback to other users (Lee, Miller & Newnham, 2008).

West, Wright, Gabbitas & Graham (2006) make observations regarding their own use of RSS in conjunction with blogs as a means of encouraging reflective writing and student dialogue throughout a pre-service instructional technology course for teachers. Strongly, Cold (2006) suggests that RSS can be used to enhance student research skills since it facilitates the amassing of multiple sources in one location through targeted searches. Thus, learners can both receive course materials and keep current with new research in their chosen field.

In the author's opinion, RSS and blog aggregates enable blogs with feeds to be organized into discrete interesting domains, both in professional and personal respects. With such a breadth and depth of data available online, such tools refine the information which users actually come to read and avoid significant time-wasting.

The evident absence of familiarity with RSS amongst professional practitioners is indicative of a general lack of knowledge pertaining to the potential benefits offered by this form of technology. Hence, the Pew Internet and American Life Project disclosed that a mere 9% of online users were aware of the capabilities of RSS (Rainie, 2005). The figure for younger adult users was only marginally higher, revealing that just 12% of users aged between eighteen and twenty-nine had a working knowledge of the implications of RSS technology (Lee, Miller & Newnham, 2008).

Significant advances in wireless technology have furthered the expansion of RSS technology. Consequently, as reported by Business Week Online (2006), the number of RSS feed had significantly expanded from a mere 307,000 in January 2004 to more than 13 million by August 2005. This figure is in excess of twenty times greater than the overall number of new feeds for the same period (Glotzbach, Mohler & Radwan, 2009).

Feedly, which is arguably the most successful RSS reader on the global market, has demonstrated a substantial increase in terms of its user base for the period 2013 to 2015 (McDowell, 2015). Furthermore, in December 2017, a Verge online survey highlighted that 80% of respondents were still using an RSS reader, with 68% of those questioned reporting their usage as "religious" (Robertson, 2017). RSS usage statistics for 2019 indicate that 28,962,567 live websites employ RSS (RSS Usage Statistics, 2019).

Glotzbach et al. (2007) conducted a study in which 240 students studying the Internet course at Purdue University were provided with a brief introduction to RSS at the commencement of the semester. It was ascertained that most participants possessed little or no prior knowledge of this subject, even though most were majoring in a computing-related field. Comparisons between the start and end-of-semester tests revealed that participants demonstrated increased knowledge of RSS. Despite this, the minimum weekly usage increased only slightly, indicating a hesitancy to adopt this technology.

Jenssen, Desai & Callahan (2014) conducted a study which revealed that while RSS reader use correlates with elevated familiarity with selected articles, there was no correlation with enhanced understanding. Participants reported satisfaction with the RSS reader due to the fact that it is simple to use, accessible, and assists in their reading activities.

CONCLUSION

Digital technologies such as computers, tablets, and mobile devices are omnipresent, and they provide the easy way with which connections between users indicate their great potential to support lifelong learning outside formal educational contexts (Fischer & Konomi, 2007; Clough et al., 2008). Proponents of lifelong learning are able to access content that allows them to acquire knowledge on both a theoretical and a practical level with content directly related to their specialist interests. This is exemplified by Wikipedia.org, YouTube.com, Academia.edu, Blog, or Google; all of these online platforms provide access to knowledge which can quickly extend lifelong learning (Pureta, 2015).

Constructivist learning principles emphasize the role of social interaction in knowledge construction. Likewise, lifelong learning focuses on the communication of new ideas by speaking and listening to others. This invariably promotes innovation and collective development (European Commission, 2012). The relevance of technology in an interconnected global society is evident. Rapid internet developments are continually challenging the prevailing pedagogy, and it is evident both that technology provides lifelong learning opportunities for technology users and that constructivist learning approaches can comprise a valuable foundation for the use of technology in the lifelong learning process (Huang, 2002; Isaacs, 2013; Afendi & Embi, 2010; Koohang, Riley & Smith, 2009).

To conclude, the specific characteristics of adult learners are promoted by a constructivist approach to learning, and increasingly when technology is employed as a key learning tool. Fosnot (2005) argues that while constructivism does not inevitably decree a particular approach to learning, its central tenets are supportive of lifelong learning since they enable the principal characteristics of adult learning to be recognized.

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REFERENCES

Pew Research Center (2012, March 9). *Search Engine Use 2012*. Retrieved 07 23, 2019, from Pew Research Center Internet & Technology: https://www.pewinternet.org/2012/03/09/search-engine-use-2012-2/

Afendi, H., & Embi A. M. (2010). Constructivism in the design of online learning tools. *European Journal of Educational Studies 2(3)*, 237 -246.

Afonso, P., Ramos, M.R., Saraiva, S., Moreira, C.A., & Figueira, M. I. (2017). Assessing the relation between career satisfaction in psychiatry with lifelong learning and scientific activity. *Psychiatry Research*, 210- 214.

Allam, A., Schulz, J. P., & Nakamoto, K. (2014). The impact of search engine selection and sorting criteria on vaccination beliefs and attitudes: Two experiments manipulating google output. *Journal of Medical Internet Research, 16(4):e100.*

Annette. (2010, October 25). *Can constructivist principals be applied to adult learning?* Retrieved Sep 15, 2019, from http://constructivismetec522.pbworks.com/w/page/1845746/Adult%20and%20Training%20Applications

Armstrong, P. (2015). *Effective partnerships and collaboration for school improvement: A review of the evidence.* London: Department for Education.

Atzori, L., Lera, A., & Morabito, G. (2010). The internet of things: A survey. *Computer Networks, 54(15)*, 2787-805.

Barab, S., Kling, R., & Gray, J. H. (2004). *Designing for virtual communities in the service of learning.* Cambridge, UK: Cambridge University Press.

Billett, S. (1993). What's in a Setting? Learning in the workplace. *Australian Journal of Adult and Community Education, 1 (33)*, 4 -14.

Billett, S. (1994). Situated learning-A workplace experience. *Australian Journal of Adult and Community Education, 2 (34)*, 112 -130.

Billett, S. (1996). Towards a model of workplace learning: The learning curriculum. *Studies in Continuing Education, 1(18)*, 43-58.

Bizon, C., & Istrate, A. (2017). Lifelong learning platforms based on social networks. *Economy Informatics, 17 (1)*, 14 - 24.

Blumberg, P. (2000). Evaluating the evidence that problem-based learners are self-directed learners: A review of the literature. D. E. Hmelo (Ed.) *Problem-based learning: A research perspective on learning interactions* (pp. 199-226). New Jersey: Lawrence Erlbaum Associates Publishers.

Brown, C., & Poortman C. (2018). Introduction. C. B. Poortman (Ed). *Networks for learning: effective collaboration for teacher, school and system improvement.* London: Routledge.

Brown, C. (2019). Exploring the current context for Professional Learning Networks, the conditions for their success, and research needs moving forward. *Emerald Open Research, 1(1)*, 1 - 19.

Burman, N.J., Boscardin, C.K., & Van Schaik, S.M. (2014). Careerlong learning: Relationship between cognitive and metacognitive skills. *Medical Teacher, 36,* 715 - 723.

Carpenter, J. P., & Krutka, D. G. (2014). How and why educators use Twitter: A survey of the field. *Journal of Research on Technology in Education, 46(4)*, 414 - 434.

Carpenter, J. P., & Krutka, D. G. (2015). Engagement through microblogging: Educator professional development via Twitter. *Professional Development in Education, 41(4)*, 707- 728.

Chisolm, M. S. (2016). *Social media in medicine.* New York: Routledge.

Clement, J. (2019, August 9). *Social media & user-generated content.* Retrieved Sep, 11, 2019, from Statista: https://www.statista.com/statistics/268136/top-15-countries-based-on-number-of-facebook-users/

Clement, J. (2019, June 18). *U.S. internet usage penetration 2019, by age group.* Retrieved Sep, 11, 2019, from statista: https://www.statista.com/statistics/266587/percentage-of-internet-users-by-age-groups-in-the-us/

Clough, G., Jones, A., McAndrew, P., Scanlon, E. (2008). Informal learning with PDAs and smartphones. *Journal of Computer Assisted Learning 24*, 359 –37.

Cold, S. (2006). Using Really Simple Syndication (RSS) to enhance student research. *SIGITE Newsletter, 3(1)*, 6– 9.

Commission of the European Communities (2000). *A memorandum on lifelong learning.* Retrieved 7 24, 2019, from http://tvu.acs.si/dokumenti/LLLmemorandum_Oct2000.pdf

Darkenwald, G., & Merriam, S. B. (1982). *Adult education: Foundations of practice.* New York: Harper & Row.

Donchev, D. (2017, June 15). *12 Alternatives to Google Alerts for Tracking Mentions Across the Web.* Retrieved 8 8, 2019, from Social Media Explorer: https://socialmediaexplorer.com/content-sections/tools-and-tips/12-strong-alternatives-google-alerts-track-mentions-across-web/

Duncan-Howell, J. (2010). Teachers making connections: Online communities as a source of professional learning. *British Journal of Educational Technology, 41(2)*: 324–340.

Dunlap, J. C. (1997). *Preparing students for lifelonglLearning: A review of Instructional Methodologies.* Paper presented at the Association for Educational Communications and Technology Annual Meeting, Albuquerque, N.M. Retrieved January 1, 2019, from https://files.eric.ed.gov/fulltext/ED409835.pdf

European Commission. (2012). *The European Higher Education Area in 2012: Bologna process.* Retrieved August 12, 2019, from http://www.ehea.info/media.ehea.info/file/2012_Bucharest/79/5/Bologna_Process_Implementation_Report_607795.pdf

Faisa, l. S. (2015). Personal Learning Network: A powerful Tool for Professional Development. In Annu George, Savithry T.K., Vimal Kumar V., and Jasimudeen S. (Eds), *Paradigm Shift in Libraries: A Festschrift to Rev. Fr. Jose Viruppel (pp. 59-69). Kottayam: Kerala Library Association, 1-13.*

Fischer, G., & Konomi, S. (2007). Innovative socio-technical environments in support of distributed intelligence and lifelong learning. *Journal of Computer Assisted Learning, 23*, 338 –350.

Fischer, J., Geurts, J., Valderrabano, V., & Hugle, T. (2013). The educational quality of YouTube videos on knee arthrocentesis. *Journal of Clinical Rheumatology, 19*, 373 – 376.

Forte, A., Humphreys, M., & Park, T. (2012). Grassroots professional development: How teachers use twitter. *Proceedings from Sixth International AAAI Conference on Weblogs and Social Media.* Dublin, Ireland.

Fosnot, C. T. (2005). *Constructivism: Theory, perspectives, and practice.* New York: Teachers College Press.

Gesthuizen, R. J. (2012). Why build your own PLN? Proceedings from ACEC2012. *Australian Computers in Education Conference.* Perth, Australia.

Gilton, D. L. (2016). *Creating and promoting lifelonglLearning in public libraries.* New York: Rowman & Littlefield.

Glotzbach, R.J., Mohler, J.L., & Radwan, J.E. (2007). RSS as a course information delivery method. *In Proceedings of the ACM SIGGRAPH 2007 educators program.*

Goleman, D. (1998). *Working with emotional intelligence.* New York: Bantam Books.

Gorard, S,. & Selwyn N. (2005). What makes a lifelong learner? *Teachers College Record, 107(6)*, 1193- 1216.

Graham, L., & Metaxas, P. T. (2003). Of course, it's true; I saw it on the internet! critical thinking in the internet era. *Communications of the ACM, 46(5)*, (pp. 71–75).

Haridakis, P. & Hanson, G. (2009). Social interaction and co-viewing with youtube: blending mass communication reception and social connection. *Journal of Broadcasting & Electronic Media, 53(2)*, 317- 335.

Hart-Landesberg, S. Braunger, J. and Reder, S. (1992). *Learning the Ropes: The Social Construction of work-based Learning.* Berkeley, CA: National Center for Research in Vocational Education.

Holmes, A. (2002). *Lifelong learning.* Oxford, U.K: Capstone Publishing.

Huang, H. M. (2002). Toward constructivism for adult learners in online learning environments. *British Journal of Educational Technology, 33*, 27 -37.

Hur, J. W., & Brush, T. A. (2009). Teacher participation in online communities: Why do teachers want to participate in self-generated online communities of K-12 teachers? *Journal of Research on Technology in Education, 41(3)*, 279–303.

Hyerle, D. (1996). *Visual Tools for Constructing Knowledge.* Alexandria, VA: Association for Supervision and Curriculum Development.

Internet World Stats. (2019, October 4). *Internet Usage Statistics*. Retrieved Sep, 10, 2019, from Internet World Stats, Usage and Population Statistics: https://www.internetworldstats.com/stats.htm

Isaacs, L. A. (2013). Social Constructivism and Collaborative Learning in Social Networks: The Case of an online Masters Programme in Adult Learning. *Electronic Thesis and Dissertation Library*, 1–95. Retrieved from http://etd.uwc.ac.za/xmlui/bitstream/handle/11394/5130/Isaacsla_med_edu_2013.pdf?sequence=1

Jaffar, A. A. (2012). YouTube: An emerging tool in anatomy education. *Anatomical Sciences Education, 5(3)*, 158- 164.

Jenkins, J. (2017, February 14). *Personal Learning Environments*. Retrieved 08 01, 2019, from ETSMAGAZINE Education Technology Solutions: https://educationtechnologysolutions.com/2017/02/personal-learning-environments/

Jenssen, P. B., Desai, R. B., & Callahan, M. J. (2014). Randomized Controlled Trial of RSS Reader Use and Resident Familiarity With Primary Literature. *Journal of Graduate Medical Education 6(2)*, 341- 344.

Johnson, R. (2010). *Supporting Life-Long Learning with Constructivist Web-based Instruction.* Retrieved Sep, 20, 2019, from https://rjssqlservernotes.files.wordpress.com/2010/09/constructivism.pdf

Kelly, N., & Antonio, A. (2016). Teacher peer support in social network sites. *Teaching and Teacher Education, 56*, 138-149.

Kerka, S. & C. a. V. E. C. O. H. Eric Clearinghouse on Adult. (1996). *Distance Learning, the Internet, and the World Wide Web.* ERIC Digest: Columbus, OH.

Kimmons, R. (2018). Lifelong learning. Anne O.-L. &. Kimmons (Eds.) *The K-12 Educational Technology Handbook.* EdTech Books.

Kind, T., Patel, P.D., & Lie, D. (2013). Opting into online professionalism. *Paediatrics, 132(5)*, 792 – 795.

Kolb, D. (1984). *Experiential learning.* Englewood Cliffs, NJ: Prentice-Hall.

Koohang, A., Riley, L., & Smith, T. (2009). E-learning and constructivism: From theory to application. *Interdisciplinary Journal of E-Learning and Learning Objects, 5*, 91 -109.

Koper, R., & Tattersall, C. (2004). New directions for lifelong learning using network technologies. *British Journal of Educational Technology, 35*, 689–700.

Kumar, A. (2012). *Philosophical background ofaAdult and lifelong learning.* Retrieved Sep, 25, 2019, from UNESCO: http://aladin.uil.unesco.org/paldin/pdf/course01/unit_03.pdf

Lamb, A. (2005). *Lifelong learning, Information inquiry for teachers.* Retrieved July 15, 2019, from http://eduscapes.com/infooriginal/life.html

Lambert, L. (2002). *The constructivist leader. (2nd revised edition).* New York, NY: Teachers College Press.

Lamon, M., Reeve, R., & Scardamalia, M. (2001). *Mapping the growth of deeply principled understandings in a knowledge-building community.* Seattle, WA: Annual Meeting of the American Educational Research Association.

Lee, M. J.W., , M., Charlynn & Newnham L. (2008). RSS and content syndication in higher education: Subscribing to a new model of teaching and learning. *Educational Media International, 45*, 311– 322.

Lewandowski, D., Kerkmann, F., Rummele, S., & Sunkler, S. (2017). An empirical investigation on search engine ad disclosure. J*ournal of the Association for Information Science and Technology*, 1- 27.

Luehmann, A. L., & Tinelli, L. (2008). Teacher professional identity development with social networking technologies: learning reform through blogging. *Educational Media International, 45(4)*, 323- 333.

Mackeracher, D. (2004). *Making sense of adult learning. (Second Edition).* Toronto: University of Toronto Press.

Laal, M., & Salamati, P. (2012). Lifelong learning; why do we need it? *Procedia - Social and Behavioral Sciences,* 31, 2.

McDowell, G. (2015, March 25). *Is RSS Dead? A Look At The Numbers.* Retrieved October 12, 2019, from WEB CULTURE: https://www.makeuseof.com/tag/rss-dead-look-numbers/

Merriam, S.B., & Caffarella, R.S. (1999). *Learning in adulthood: A comprehensive guide.* San Francisco, CA: Jossey-Bass.

Municipality of Halmstad & The European Commission. (n.d.). *Innovative Methods for award Procedures of ICT Learning in Europe.* Retrieved Sep, 10, 2019, from: http://www.imaile.eu/about/ple-personal-learning-environments/

North, A.C., & Hargreaves, D. J. (1997). Liking, arousal potential, and the emotions expressed by music. *Scandinavian Journal of Psychiatry, 38*, 45– 53.

Gunduz N. & Hursen C. (2015). Constructivism in teaching and learning; Content analysis evaluation. *Procedia - Social and Behavioral Sciences, 191*, 526 – 533.

Perez Latre, F. P. (2011). Social Networks, media and audiences: A literature review. *Communication & Society , 24(1)*, 63- 74.

Pew Research Center. (2014). *Pew Research Center Internet Project January Omnibus Survey.* Retrieved Sep, 01, 2019, from https://www.pewinternet.org/fact-sheet/social-media/

Pew Research Center (2019, April 10). *FACTANK News in The Numbers.* Retrieved October 1, 2019, from pewresearch.org: https://www.pewresearch.org/fact-tank/2019/04/10/share-of-u-s-adults-using-social-media-including-facebook-is-mostly-unchanged-since-2018/

Piji Zieber, E. (2009). *Can constructivist principals be applied to adult learning?* Retrieved Sep 22, 2019, from http://constructivismetec522.pbworks.com/w/page/1845746/Adult%20and%20Training%20Applications

Purcell, K., Brenner, J., & Raine, L. (2012). *Search engine use 2012.* Washington DC. Retrieved from http://pewinternet.org/~/ media/Files/Reports/2012/PIP_Search_Engine_Use_2012.pdf

Pureta, I. (2015). Lifelong learning process using digital technology. *Interdisciplinary Management Research, 11*, 39- 48.

Rainie, L. (2005). *Public awareness of internet terms.* Retrieved Sep, 10, 2019, from Washington, DC: Pew Internet & American Life Project: http://www.pewinternet.org/pdfs/PIP_Data_Techterm_aware.pdf

Redecker, C., Ala-Mutka K., & Punie, Y. (2010). *Learning 2.0 - The impact of social media on learning in Europe: POLICY BRIEF.* Luxembourg: Office for Official Publications of the European Communities.

Robazza, C. Macaluso, C., & D'Urso, V. (1994). Emotional reactions to music by gender, age, and expertise. *Perceptual and Motor Skills, 79(2)*, 939– 944.

Robertson, A. (2017, December 16). *Are you still using an RSS reader?* Retrieved Sep, 12, 2019, from THE VERGE: https://www.theverge.com/2017/12/16/16780356/rss-reader-feedly-news-sources-poll

Glotzbach, R. J., Mohler, J. L. & Radwan, J. E. (2009). Really simple syndication (RSS): An educational approach. *Journal of Interactive Media in Education (3)*, 13.

Ronfeldt, M., Farmer, S.O., McQueen, J.A. K., & Grissom. (2015). Teacher collaboration in instructional teams and student achievement. *American Educational Research Journal, 52 (3)*, 475- 514.

Roodt, S. & Peier, D. (2013). Using youtube in the classroom for the net generation of students. *Issues in Informing Science and Information Technology, 10*, 473-487.

RSS Usage Statistics. (2019, 08). *BuiltWith*. Retrieved Sep, 12, 2019, from Trends, Intelligence and Internet Research: https://trends.builtwith.com/feeds/RSS

Stäuble, B. (3- 4 February 2005). Using concept maps to develop lifelong learning skills: A case study. *The Reflective Practitioner* (p. Proceedings of the 14th Annual Teaching Learning Forum). Perth: Murdoch University.

Steffe, L. P. and J. E. Gale. (1995). *Constructivism in education.* Hillsdale, N.J.: Lawrence Erlbaum.

Sze-yeng, F. & Hussain, R. M. R. (2010). Self-directed learning in a socio-constructivist learning environment. *Procedia Social and Behavioral Sciences, 9*, 1913 -1917.

Taylor , D.C. & Hamdy , H . (2013). Adult learning theories: Implications for learning and teaching in medical education: AMEE Guide No. 83. *Medical Teacher, 35(11)*, 1561 – 1572.

Terry K., & Yolanda, E. (2015). Social media for lifelong learning. *International Review of Psychiatry, 27(2)*, 124 - 132.

The University of British Columbia (2019). *The faculty of Education*. Retrieved Sep, 30, 2019, from Master of Educational Technology: https://met.ubc.ca/courses/#targetText=MET%20courses%20are%20designed%20to,range%20of%20different%20organizational%20contexts.&targetText=To%20assist%20you%20in%20planning,three-year%20projected%20Course%20Calendar.

Thompson, V. (2007). Talent shortage? How to win with what you've got. *Super Vision*, 68(2), 15- 17.

Topps, D., Helmer, J., & Ellaway, R. (2013). YouTube as a platform for publishing clinical skills training videos. *Academic Medicine, 88*, 192 – 197.

Trust, T. (2015). Deconstructing an online community of practice: Teachers' actions in the Edmodo math subject community. *Journal of Digital Learning in Teacher Education, 31(2)*, 73- 81.

Trust, T., Krutka G. D., & Carpenter P. J. (2016). Together we are better: Professional learning networks for teachers. *Computer & Education 102(1)*, 15- 34.

Visser, R. D., Evering, L. C., & Barrett, D. E. (2014). #TwitterforTeachers: The implications of Twitter as a self-directed professional development tool for K–12 teachers. *Journal of Research on Technology in Education, 46(4)*, 396- 413.

Vygotsky, L. (1978). *Mind in Society: The development of higher mental functions*. Cambridge, Mass: Harvard University Press.

Wenger, E. (1998). *Communities of practice: Learning, meaning and identity.* Cambridge, England: Cambridge University Press.

West, R.E., Wright, G., Gabbitas, B., & Graham, C.R. (2006). Reflections from the introduction of blogs and RSS feeds into a pre-service instructional technology course. *TechTrends, 50(4)*, 54– 60.

Yardley, S., Teunissen, P.W. , & Dornan, T. (2012). Experiential learning: Transforming theory into practice. *Medical Teacher, 24,* 161 – 164.

DEVELOPMENT OF ONLINE COURSE SATISFACTION SCALE

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ABSTRACT

Higher education institutions consider student satisfaction to be one of the main factors in determining the quality of their online learning. The purpose of this study was to develop a reliable, valid, and practical instrument to measure online students' satisfaction as well as to explore the psychometric and theoretical concerns surrounding the construct validity of existing satisfaction scales. The study was carried out in 2017–2018 fall and spring with participants consisting of freshmen who took the online course in a state university (N_{fall}=1585; N_{spring}=1206). In this study exploratory factor analysis (EFA) (Study 1-N_{EFA}=921) and confirmatory factor analysis (CFA) (Study 1-N_{CFA}=664; Study 1-N_{CFA}=1206) were performed to assess the construct validity of the scale's measures. As proof of validity, the effect of gender on satisfaction was examined, for which independent sample t-test was performed. For the criterion validity, the relationship between computer and internet self-efficacy and satisfaction scores of the learners was examined. The finalized version of satisfaction scale, consisting of eight items, demonstrated that the scale is suitable for general use. Suggestions for future researchers and practioners are proposed.

Keywords: Online learning, student satisfaction, scale development.

INTRODUCTION

Online learning has grown dramatically during the last decade in most parts of the world. Different reasons account for the increasing growth of online courses and programs. Green (2010) stated that universities and colleges are willing to develop and grow their online learning programs because they can attract more students at a lower cost. In addition, the students themselves are asking for more online courses since they claimed they save money and time when they do not drive to campus, and they are still able to maintain their work schedule while completing their educational goals (Green, 2010). For university and college leaders, student demand is the number one reason for increasing online offerings (Green, 2010). It is also to be stated that the continuous development of information and communication technologies helps in making the online teaching and learning experience smoother.

Despite the popularity of online learning, student satisfaction with online learning remains one of the most important indicators of the quality of online learning experiences (Ilgaz ve Gulbahar, 2015; Yukselturk &

Yildirim, 2008) and for higher education institutions one of the major elements in determining the quality of their online learning programs (Parahoo, Santally, Rajabalee & Harvey, 2016). Student satisfaction with online learning can be related to several factors like online interactions (i.e. student-student, student-instructor, student-content), course quality, assessment, computer/internet self-efficacy, perceived learning and student learning can be affected by student satisfaction with the learning experience (Harsasi & Sutawijaya, 2018; Kirtman, 2009; Turhangil Erenler, 2019; Uusiautti, Maatta & Leskisenoja, 2017; Young & Norgard, 2006). When students are satisfied with their experience of online learning this will determine if they more likely will continue to enroll in other online courses. Knowledge of the factors that influence student satisfaction with online learning can help improve such online courses (Kaufmann, 2015; Kurucay & Inan, 2017; Martin-Rodriguez, Fernandez-Molina, Montero-Alonso & Gonzalez-Gomez, 2015). It is therefore important for faculty members involved in designing, developing and delivering online courses to seek the opinions and perceptions of online students about their successful learning experiences and share this information to advance the knowledge related to online learning.

Researchers have identified several factors that promote student satisfaction and motivation in online learning which include academic challenge and supportive learning activities (An, Kim & Kim, 2008; Chen, 2014; Lister, 2014; Tibi, 2015); timely and explanatory feedback (Britto & Rush, 2013; Sebastianelli, Swift & Tamimi, 2015; Wallace, 2003); regular interaction with the instructor (Lister, 2014; Roper, 2007; Uusiautti et al., 2017); and positive interactions with peers (Kurucay & Inan, 2017; Liaw & Huang, 2013; Lister, 2014; Wallace, 2003). Gil (2008) found that administration, functionality, instruction, and interaction are the most four categories that affected online learning satisfaction. Among those categories, instruction and interaction were found to be the most important factors that have impacts on satisfaction with online learning.

Ralston-Berg, Buckenmeyer, Barczyk and Hixon (2015) investigated student perceptions of online course quality. The study included about 3000 participants taking an online college-level course. The results showed that participants rated clear instructions for getting started and ease of navigation at a high level. Also clearly stated assignment and grading policy were found to be important as one of the specific criteria for student expectations (Ralston-Berg et. al., 2015). Fedynich, Bradley and Bradley (2015) surveyed 249 graduate students to identify positive components that led to their satisfaction in online courses. The results indicated that interaction among students, interaction between the students and the instructor, and the instructor's role has a major impact on student satisfaction (Fedynich, el al., 2015). On the other hand, lowest levels of satisfaction by the research participants was found related to explanatory feedback given by the instructor, the wide range of content provided by the course, and the ample opportunities to interact with one another (Fedynich, el al., 2015). In addition, Jaggars and Xu (2016) investigated the impact of online course design on Student end-of-semester performance in 23 online courses at two community colleges. The results of their research indicated that quality of interpersonal interaction within the online courses relates positively and significantly to student grades. They also found that frequent and effective learner–instructor interaction creates an online learning environment that encourages students to commit themselves to the course and perform at a stronger academic level. Eom and Ashill (2016) investigated 372 responses from students who have completed at least one online course at a university in the United States according to critical success factors that influence quality of online learning. They concluded that instructor-student dialogue, student-student dialogue, and course design significantly affect students' satisfaction and learning outcomes. Research also indicated that perceived usefulness, perceived ease of use and compatibility of the online learning environment improves user's satisfaction of the information system (Chiu, Hsu, Sun, Lin & Sun, 2005; Rios, Elliott & Mandernach, 2018). Sahin and Shelly (2008) stated that student perceptions and needs should be considered central in designing, developing, and delivering online courses.

Research on students' perceptions of online learning quality (Milheim, 2012; Ward, et al., 2010; Young & Norgard, 2006) emphasize that the key factors that affect students satisfaction with online learning are: interactivity (e.g., Croxton, 2014;, instructor variables (e.g., Fedynich et al., 2015; Martin-Rodriguez et al., 2015), course design and content (e.g., Jaggars & Xu, 2016; Lister, 2014; Ralston-Berg et. al., 2015), and technical issues of the online learning environment (e.g., Bolliger, 2004). So far, most research was done with off site learners and/or blended learning students. Yet, which factors would emerge or whether the previous constructs could be replicable in on-site and fully online learning experiences is scare. Therefore, the current

study is, first, designed to develop a fully online (with synchronous and asynchronous modules) on-campus e-learning satisfaction questionnaire; secondly, it was aimed to report validity and reliability scores of the developed questionnaire.

METHODOLOGY

Research Participants

Starting from 2016-2017, a state university at Central Anatolia has started providing online courses to undergraduate students with Turkish Language I and II. These courses were offered by 57 faculty through a learning management system with both synchronous and asynchronous features. These courses were coordinated by 57 departments from various colleges and the Distance Education Research and Application Center. Each department supported the program with their teaching staff and the Center had the role of guiding the process, administering the process, and training the teaching staff for online learning.

The study was carried out in 2017–2018 fall and spring with participants consisting of freshmen who took the online course in a state university. After the completion of the 14-week course in the 2017-2018 Fall and 2017-2018 Spring terms, the scale was distributed to the students via e-mail trough the learning management system. The demographic information of the students who participated in the study is presented in the Table 1 and Table 2. The majority of students who answered the questionnaire (2017-2018 Fall 79%; 2017-2018 Spring 86%) had no previous experience of taking an online course (Table 2).

Table 1. Participants and Performed Statistical Procedures

Course	Study	Term	Study Groups	Performed Statistical Procedures
Turkish Language I	Study I	2017-2018 Fall	N_{total}=1585	
			N_{EFA}= 921	EFA
			N_{CFA}= 664	CFA
Turkish Language II	Study II	2017-2018 Spring	N=1206	CFA

Table 2. Participants according to gender and pre-online course experience

	2017-2018 Fall (EFA)	2017-2018 Fall (CFA)	2017-2018 Spring
Gender	N_{Female}=617	N_{Female}=428	N_{Female}=827
	N_{Male}=304	N_{Male}==236	N_{Male}==279
Has taken an online course before	N_{Yes}=203	N_{Yes}=135	N_{Yes}=170
	N_{No}=718	N_{No}=529	N_{No}=1036

Research Instruments

Two instruments were utilized in order to measure undergraduate students' satisfaction with their online learning experiences. In the following section, these instruments are described in detail.

Online Course Student Satisfaction

The literature was searched and the data collection tools (Alshare, Freeze, Lane and Wen, 2011; Arbaugh, 2000; Bolliger and Halupa, 2012; Eryilmaz, 2012; Gecer and Topal, 2015; Gunawardena, Linder-VanBerschot, LaPointe and Rao, 2010; Gunawardena and Zittle; 1997; Ilgaz, 2008). Prepared to measure the satisfaction structure were examined and a pool of 10 items was formed (Appendix 1). The items are rated in a 5-point Likert type, between 1 - strongly disagree and 5 - strongly agree. Six experts were reached to determine the scope validity of the substances created. Kappa statistics were calculated for each item since

it was suggested to examine the kappa statistics when a small number of experts were reached within the scope validity (Yurdugul and Bayrak, 2012). After determining the Kappa statistics (Fleiss, 1981), it was decided to remove two items (item 5, item8). Both items (item 2, item 10) were found to be inadequate by some of the experts and it was determined that the kappa value was at the limit. Therefore, it was decided to examine the factor loadings of the two items as a result of factor analyzes and the data collection tool was finalized with eight items. The validity and reliability studies of the scale were reported in detail in the title of the findings.

Computer/Internet Self-efficacy

When the studies on satisfaction structure are examined, it is determined that there is a relationship between satisfaction and computer and/or internet self-efficacy (Kirmizi, 2015; Kuo, Walker, Belland, & Schroder, 2013; Kuo, Walker, Schroder, & Belland, 2014; Lim, 2001). Therefore, it was decided that there is a need to look at the relationship between computer and internet self-efficacy and satisfaction scores of the learners for the criterion validity. The adaptation of Online Learning Readiness Scale (Hung, Chou, Chen and Own, 2010) into Turkish was conducted by Yurdugul and Alsancak Sirakaya (2013). For this structure, Cronbach's alpha coefficient was reported as 0.92 and in this study it was calculated as 0.855.

FINDINGS

Study I

Before conducting analyses, data were cleared and skewness values were examined and it was checked whether normality assumption was met. In order to examine the construct validity of the scale, an exploratory factor analysis was conducted with 921 observations randomly chosen in the 2017-2018 Fall term. Maximum likelihood (ML) extraction method was used in exploratory factor analysis. Then, confirmatory factor analysis was performed with the rest of the data (n = 664) in order to test its structure determined by Exploratory Factor Analysis. The results of exploratory and confirmatory factor analysis were reported below.

In 2017-2018 Fall term, a random part of the data was chosen and factor analysis was performed with 921 observations. The KMO value was 0.924 and the Barlett test was significant ($p < 0.05$). Principal component analysis was utilized and it was determined that the extraction values of factors were between 0.501 and 0.786 at acceptable value ranges.

When deciding the number of factors in a questionnaire, Kaiser's criteria, the Scree test and parallel analysis methods were usually utilized (Williams, Onsman, Brown, 2010). Single factor (5.604) was found to be greater than 1 according to Kaiser's criteria. According to the Scree test, the break is observed after one (1) factor. It was also observed that a single factor existed according to parallel analysis (Patil, Singh, Mishra & Donavan, 2017). Based on these results, the OCSS consists of eight items in a single factorial structure, which explained 70,051% of the total variance. The reliability of the scale was tested using both the construct validity (0.949) and the Cronbach Alpha (0.938). Both values were above 0.70 and found to be valid as reported by Nunnully and Berstein (1994). AVE value was calculated as 0.701 (See, Table 3.).

Convergent validity was also examined since the scale was unidimensional in the context of construct validity. For convergent validity, it was determined whether factor loads and average variance extracted (AVE) values were greater than 0.50. As shown in Table 3, it was observed that the standardized factor loads of the scale items ranged between 0.708 and 0.887. In addition, the average variance extracted (AVE) values were found to be greater than 0.50 (Fornell & Larcker, 1981). Based on the findings, one-dimensional scale scores can be said to be valid and reliable.

The CFA was run on the other randomly determined portion of the data gathered in 2017-2018 Fall period. Once the data was cleared, confirmatory factor analysis was performed with 664 observations. The KMO value was 0.929 and the Barlett test was significant ($p < 0.05$). For the confirmatory factor analysis, the recommended number of samples should be 5 or 10 times the number of items (Kline, 2005). Since the number of observations was 664, this proposal was met. In the confirmatory factor analysis, error and fit indexes and proposed modifications were examined. The error and fit indices were found to be appropriate

according to the expected criteria ($X^2_{(32)}$ = 51.964, RMSEA = 0.056, GFI = 0.981; CFI = 0.993; NNFI = 0.988). Accordingly Hu and Bentler (1995, 1999), the fit index values above 0.90 and RMSEA value 0.06 below are considered acceptable.
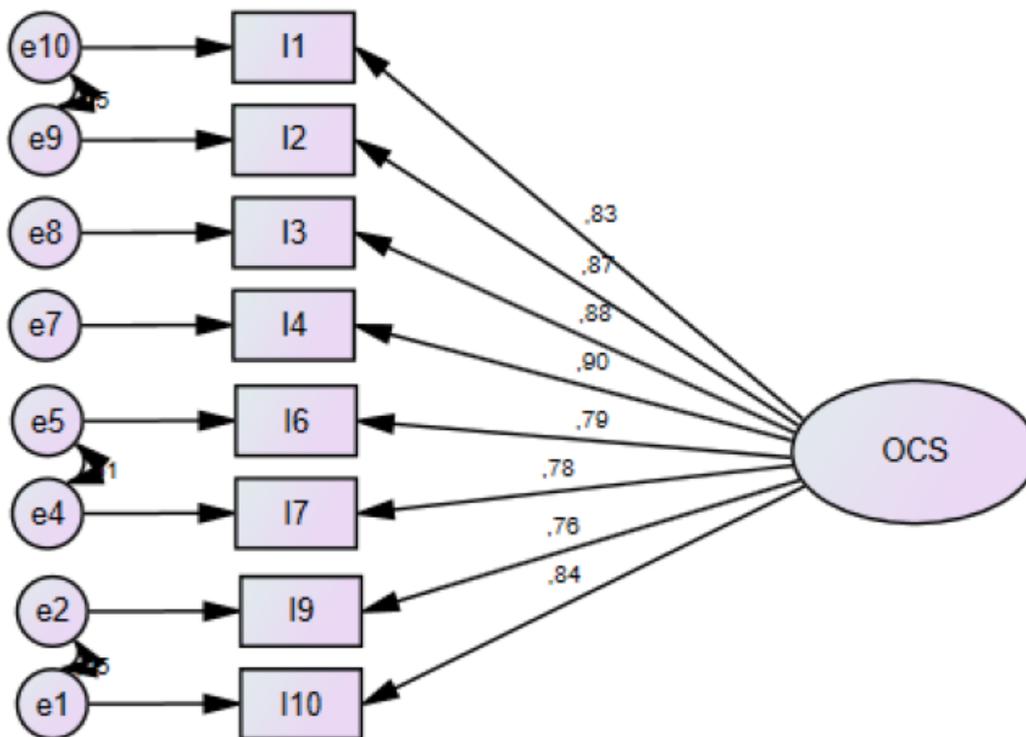
Figure 1. Satisfaction Scale (Standardized Factor Loadings)

The standardized factor loads of the scale items ranged between 0.78 - 0.90 and the t values for these factor loads were significant. In addition, the average variance extracted (AVE) values were found to be greater than 0.50 (Fornell & Larcker, 1981; Hair, Black, Babin, & Anderson, 2009). These values can be taken as evidence of convergent validity for the scale.

To determine the reliability of the scale, both construct reliability and Cronbach's alpha coefficient were calculated (Table 3). Both reliability levels were found to be greater than 0.70 for each dimension (Nunnully and Bernstein, 1994), confirming that the scale had a uni-dimensional structure.

Study II

To examine the construct validity of the scale, another confirmatory factor analysis was performed on the data collected in the 2017-2018 Spring term. After clearing the data, confirmatory factor analysis was performed with 1206 observations. The KMO value was 0.932 and the Barlett test was significant (p <0.05). Based on these values, it was found that the data could be factorized and the recommended number of samples was also met (n = 1206). As a result of the analysis, it was determined that the error and fit indices were also appropriate according to the expected criteria ($X^2(17)$ = 61.272, RMSEA = 0.046, GFI = 0.988; CFI = 0.995; NNFI = 0.992).
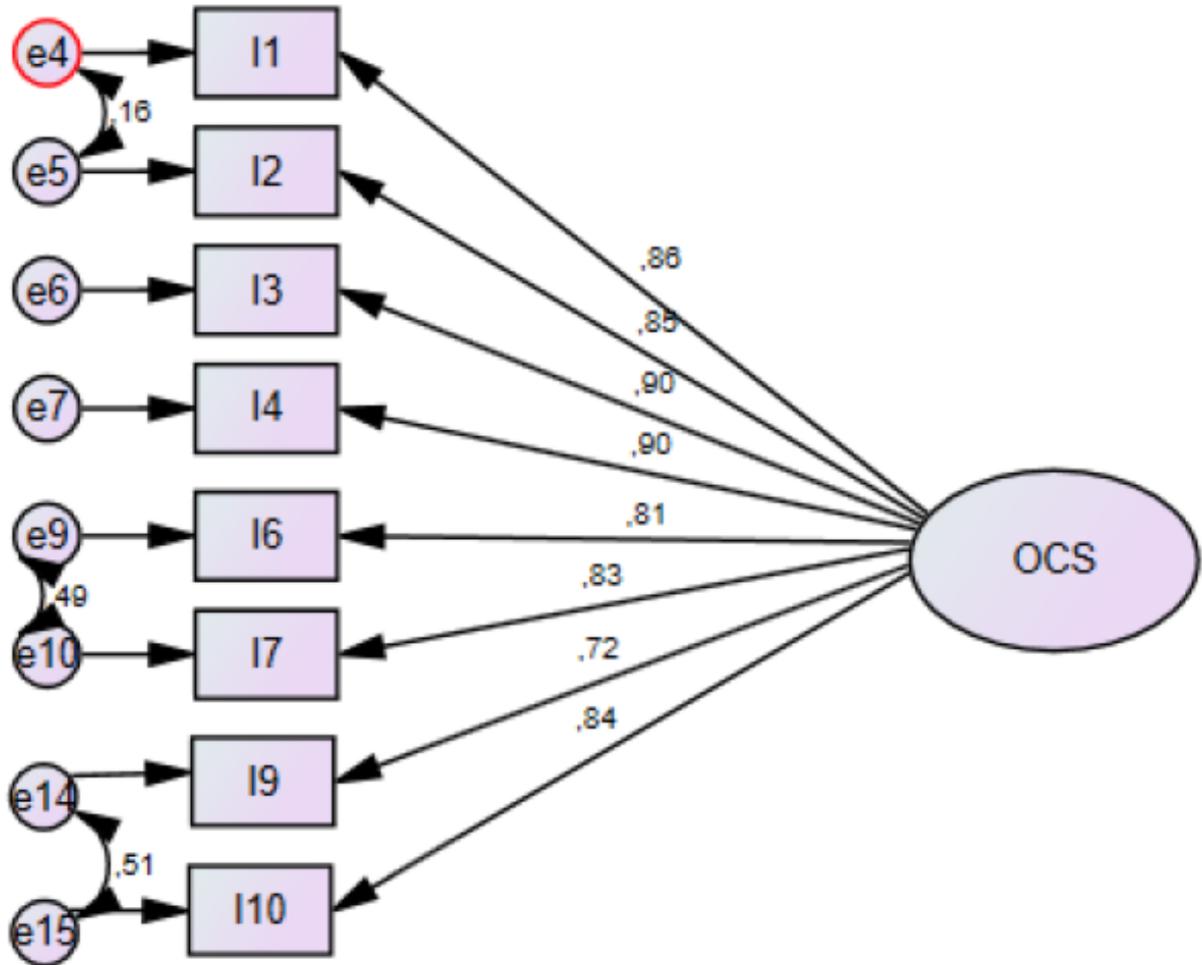
Figure 2. Satisfaction Scale (Standardized Factor Loadings)

The standardized factor loadings of the scale items ranged from 0.72 to 0.90. In addition, it was determined that the average variance extracted (AVE) values were greater than 0.50. These values can be seen as evidence of convergent validity for the scale. Both structural reliability and Cronbach's alpha coefficient were found to be greater than 0.70 (Table 3) (Nunnully and Bernstein, 1994). Based on these findings, it was confirmed that the scale was unidimensional, valid and reliable.

Table 3. Findings of Study I and Study II

	Kappa	Study I								Study II			
		EFA				CFA				CFA			
		Factor Loading	AVE	Croanbach Alpha	Construct Validity	Factor Loading	AVE	Croanbach Alpha	Construct Validity	Factor Loading	AVE	Croanbach Alpha	Construct Validity
Item 1	0.816	0.853				0.83				0.86			
Item 2	0.564	0.842				0.87				0.85			
Item 3	1.000	0.872				0.88				0.90			
Item 4	1.000	0.887				0.90				0.90			
Item 5*	0.129	-				-				-			
Item 6	0.564	0.839	0.701	0.938	0.949	0.79	0.693	0.951	0.947	0.81	0,706	0.952	0,950
Item 7	1.000	0.818				0.78				0.83			
Item 8*	0.129	-				-				-			
Item 9	1.000	0.708				0.76				0.72			
Item 10	0.564	0.864				0.84				0.84			

* Depending on expert opinions, these items were removed from the questionnaire.

It is important to elaborate the test with a number of methods based on evidence collection (Kelecioglu & Sahin, 2014). In this process, it is suggested to examine the group differences and their relationships with different structures along with factor analysis (Cronbach, & Meehl, 1955). From this point of view, although it is stated that gender has an effect on the satisfaction structure and there is a difference in favor of women (Gonzalez-Gomez, Guardiola, Rodriguez, & Alonso, 2012); it is expressed that gender does not have an effect on satisfaction in individuals who grew up in the millennium age (Harvey, Parahoo, & Santall, 2017). Therefore, the gender variable was examined for group comparison and independent sample t-test was performed. As a result of the analysis (Table 4) there was no statistically significant difference observed between the groups (p> 0.05). It can be said that this is evidence for the validity of test scores.

Table 4. The independent sample t-test to show gender differences in satisfaction.

	N	Mean	SD	df	t	p
Female	827	29.157	7.679	1204	-1.283	0.200
Male	379	29.791	8.578			

For the criterion validity, the relationship between computer and internet self-efficacy and satisfaction scores of the learners was also examined. After examining the normality assumption, Pearson correlation coefficient was calculated. Descriptive analysis results are shown in Table 5. It was determined that there was a statistically significant relationship between computer and internet self-efficacy and satisfaction scores of students (r = 0.302, p <0.05, Table 6). This finding is evidence for the validity of the developed scale.

Table 5. Descriptive statistics between satisfaction and Computer/Internet Self-Efficacy Scores

	N	Min Score	Max Score	$\bar{x}$	SD	Skewness	Skewness Standard Error
Satisfaction	1206	8	40	29.357	7.975	-.926	.070
Computer / Internet Self Efficacy	1179	3	15	11.137	2,705	-.812	.071

Table 6. Correlation Matrix between satisfaction and Computer/Internet Self-Efficacy Scores

		Satisfaction
Computer /Internet Self Efficacy	Pearson Correlation	,302**
	p	.000
	N	1179

CONCLUSIONS AND IMPLICATIONS

On-site online experiences are valuable learning experiences for undergraduate students to live through the online learning experiences which would definitely be a part of their professional learning journey; increase their exposure to learning materials regardless of time and space; and, to provide learning materials in various medium to address learners' variability. Thus, we need valid, reliable, and easy-to-administer instruments to report back about how online learning is experienced by undergraduate students. Furthermore higher education institutions consider student satisfaction to be one of the main factors in determining the quality of their online learning (Dziuban, et. Al, 2015; McGorry, 2003).

The purpose of this study was to develop a reliable, valid, and practical instrument to measure online students' satisfaction. The research consists of two studies. In study I, an exploratory factor analysis was conducted with 921 observations randomly chosen in the 2017-2018 Fall term. Then, confirmatory factor analysis was performed with the rest of the data (n = 664) in order to test its structure determined by Exploratory Factor Analysis. Based on the findings, one-dimensional scale scores can be said to be valid and reliable. To examine the construct validity of the scale, another confirmatory factor analysis was performed on the data

(n = 1206) collected in the 2017-2018 Spring term. Based on the findings, it was confirmed that the scale was unidimensional, valid and reliable. The finalized version of satisfaction scale, consisting of eight items, demonstrated that the scale is suitable for general use.

After the factor analysis, different evidences for construct validity were collected. First, the effect of gender on satisfaction was examined. As a result of the analysis, there was no statistically significant difference observed between the groups. The reason for this can be said that the students currently studying at the university are millennium age students. Harvey, Parahoo, and Santall (2017) also reached this conclusion in their research. Secondly, the relationship between computer and internet self-efficacy and satisfaction was examined and a medium level relationship was found. Alqurashi (2016) found a similar result in her literature review. Based on these conclusions, this scale can be used both as a quality indicator in higher education institutions for online learning and to examine undergraduate students' perception of satisfaction in online and blended learning programs.

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REFERENCES

Alshare, K. A., Freeze, R. D., Lane, P. L., & Wen, H. J. (2011). The impacts of system and human factors on online learning systems use and learner satisfaction. *Decision Sciences Journal of Innovative Education, 9*(3), 437-461. doi: https://doi.org/10.1111/j.1540-4609.2011.00321.x

Alqurashi, E. (2016). Self-efficacy in online learning environments: A literature review. *Contemporary Issues in Education Research, 9*(1), 45. doi: https://doi.org/10.19030/cier.v9i1.9549

An, H., Kim, S., & Kim, B. (2008). Teacher perspectives on online collaborative learning: Factors perceived as facilitating and impeding successful online group work. *Contemporary Issues in Technology and Teacher Education, 8*(1), 65-83.

Arbaugh, J. B. (2000). Virtual classroom characteristics and student satisfaction with Internet-based MBA courses. *Journal of Management Education, 24*(1), 32. http://dx.doi.org/10.1177/105256290002400104

Bolliger, D.U. (2004). Key Factors for Determining Student Satisfaction in Online Courses. *International Journal on E-Learning, 3*(1), 61-67. Norfolk, VA: Association for the Advancement of Computing in Education (AACE). Retrieved March 7, 2019 from https://www.learntechlib.org/primary/p/2226/.

Bolliger, D. U., & Halupa, C. (2012). Student perceptions of satisfaction and anxiety in an online doctoral program. *Distance Education, 33*(1), 81-98. doi: https://doi.org/10.1080/01587919.2012.667961

Britto, M., & Rush, S. (2013). Developing and implementing comprehensive student support services for online students. *Journal of Asynchronous Learning Networks, 17*, 29–42.

Chen, S. J. (2014). Instructional design strategies for intensive online courses: An objectivist-constructivist blended approach. *Journal of Interactive Online Learning, 13*(1), 72-86.

Chiu, C., M. Hsu, S. Sun, T. Lin, P. Sun, (2005), Usability, quality, value and e-learning continuance decisions. *Computers & Education, 45*, 399–416. doi: https://doi.org/10.1016/j.compedu.2004.06.001

Cronbach, L. J., & Meehl, P. E. (1955). Construct validity in psychological tests. *Psychological Bulletin, 52*(4), 174-203.

Croxton, R. A. (2014). The role of interactivity in student satisfaction and persistence in online learning. *Journal of Online Learning and Teaching, 10*(2), 314.

McGorry, S. Y. (2003). Measuring quality in online programs. *The Internet and Higher Education, 6*(2), 159-177. doi: https://doi.org/10.1016/S1096-7516(03)00022-8

Eom, S. B., & Ashill, N. (2016). The determinants of students' perceived learning outcomes and satisfaction in university online education: An update. *Decision Sciences Journal of Innovative Education, 14*(2), 185-215. doi: https://doi.org/10.1111/dsji.12097

Eryilmaz, M. (2012). *The effect of hyper media on academic achievement satisfaction and cognitive load of students by using adaptive presentation and adaptive navigation.* (Unpublished doctoral dissertation). Ankara University:Ankara.

Fedynich, L., Bradley, K. S., & Bradley, J. (2015). Graduate Students' Perceptions of Online Learning. *Research in Higher Education Journal, 27*, 1-13.

Fleiss, J. L. (1981). Balanced incomplete block designs for inter-rater reliability studies. *Applied Psychological Measurement, 5*(1), 105-112.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement errors. *Journal of Marketing Research, 18*, 39–50.

Gecer, A. K., & Topal, A. D. (2015). Development of satisfaction scale for e-course: reliability and validity study. J*ournal of Theory & Practice in Education (JTPE), 11*(4), 1271-1287.

Gil, H. (2008). The challenge of the transition from online delivery to online teaching and learning. In K. McFerrin, R. Weber, R. Carlsen, D. A. Williset. (Eds.), *Proceedings of Society for Information Technology and Teacher Education International Conference.* Chesapeake, VA: AACE, 2589-2594.

Gonzalez-Gomez, F., Guardiola, J., Rodriguez, O. M., & Alonso, M. A. M. (2012). Gender differences in e-learning satisfaction. *Computers & Education, 58*(1), 283-290. doi: https://doi.org/10.1016/j.compedu.2011.08.017

Green, K. C. (2010). *The Campus Computing Survey.* Encino, CA: The Campus Computing Project. Retrieved from http://www.campuscomputing.net/2010-campus-computing-survey

Gunawardena, C. N., Linder-VanBerschot, J. A., LaPointe, D. K., & Rao, L. (2010). Predictors of learner satisfaction and transfer of learning in a corporate online education program. *The American Journal of Distance Education, 24*(4), 207-226. doi: https://doi.org/10.1080/08923647.2010.522919

Gunawardena, C. N., & Zittle, F. J. (1997). Social presence as a predictor of satisfaction within a computer-mediated conferencing environment. *The American Journal of Distance Education, 11*(3), 8-26.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2009). *Multivariate data analysis* (7th Edition), Upper Saddle River, NJ [etc.]. Pearson Prentice Hall, New York, NY: Macmillan

Harsasi, M., & Sutawijaya, A. (2018). Determinants of student satisfaction in online tutorial: A study of a distance education institution. *Turkish Online Journal of Distance Education, 19*(1), 89-99. doi: https://doi.org/10.17718/tojde.382732

Harvey, H. L., Parahoo, S., & Santally, M. (2017). Should gender differences be considered when assessing student satisfaction in the online learning environment for millennials?. *Higher Education Quarterly, 71*(2), 141-158. doi: https://doi.org/10.1111/hequ.12116.

Hu, L., & Bentler, P. M. (1995). Evaluating model fit. In R. H. Hoyle (Ed.), *Structural equation modeling: Concepts, issues, and applications* (p. 76–99). Sage Publications, Inc.

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling., 6*, 1–55.

Hung M-L, Chou C, Chen C-H, & Own, Z-Y. (2010) Learner readiness for online learning: Scale development and student perceptions. *Computers & Education, 55*(3):1080–90. doi: https://doi.org/10.1016/j.compedu.2010.05.004

Ilgaz, H. (2008). The contribution of technology acceptance and community feeling to learner satisfaction in distance education [*Uzaktan egitimde teknoloji kabulunun ve topluluk hissinin ogrenen memnuniyetine katkisi]* (Unpublished master's thesis). Hacettepe University, Ankara.

Jaggars, S. S., & Xu, D. (2016). How do online course design features influence student performance?. *Computers & Education, 95*, 270-284. doi: https://doi.org/10.1016/j.compedu.2016.01.014.

Kauffman, H. (2015). A review of predictive factors of student success in and satisfaction with online learning. *Research in Learning Technology, 23*, 1-13.

Kelecioglu, H., & Sahin, S. G. (2014). Validity from Past to Present [Gecmisten gunumuze gecerlik]. *Journal of Measurement and Evaluation in Education and Psychology, 5*(2), 1-11. doi: https://doi.org/10.21031/epod.41706

Kirmizi, O. (2015). The influence of learner readiness on student satisfaction and academic achievement in an online program at higher education. *Turkish Online Journal of Educational Technology-TOJET, 14*(1), 133-142.

Kirtman, L. (2009). Online versus in-class courses: An examination of differences in learning outcomes. *Issues in Teacher Education, 18*(2), 103-116.

Kline, R. B. (2005). *Principles and practice of structural equation modeling* (2nd ed.). New York, NY: Guilford Press.

Kuo, Y. C., Walker, A. E., Belland, B. R., & Schroder, K. E. (2013). A predictive study of student satisfaction in online education programs. *The International Review of Research in Open and Distributed Learning, 14*(1), 16-39. doi: https://doi.org/10.19173/irrodl.v14i1.1338

Kuo, Y. C., Walker, A. E., Schroder, K. E., & Belland, B. R. (2014). Interaction, Internet self-efficacy, and self-regulated learning as predictors of student satisfaction in online education courses. *The Internet and Higher Education, 20*, 35-50. doi: https://doi.org/10.1016/j.iheduc.2013.10.001.

Kurucay, M., & Inan, F. A. (2017). Examining the effects of learner-learner interactions on satisfaction and learning in an online undergraduate course. *Computers & Education*, *115*, 20-37.

Liaw, S. S., & Huang, H. M. (2013). Perceived satisfaction, perceived usefulness and interactive learning environments as predictors to self-regulation in e-learning environments. *Computers & Education, 60*(1), 14-24. doi: https://doi.org/10.1016/j.compedu.2012.07.015

Lim, C. K. (2001). Computer self-efficacy, academic self-concept, and other predictors of satisfaction and future participation of adult distance learners. *The American Journal of Distance Education 15*(2): 41–51. doi: https://doi.org/10.1080/08923640109527083

Lister, M. (2014). Trends in the design of e-learning and online learning. *Journal of Online Learning and Teaching, 10*(4), 671-680.

Martin-Rodriguez, O., Fernandez-Molina, J. C., Montero-Alonso, M. A., & Gonzalez-Gomez, F. (2015). The main components of satisfaction with e-learning. *Technology, Pedagogy and Education, 24*(2), 267-277. doi: https://doi.org/10.1080/1475939X.2014.888370

McGorry, S. Y. (2003). Measuring quality in online programs. *The Internet and Higher Education, 6*(2), 159-177.

Milheim, K. L. (2012). Toward a better experience: Examining student needs in the online classroom through Maslow's hierarchy of needs model. *Merlot Journal of Online Learning and Teaching, 8*(2). Retrieved from http://jolt.merlot.org/

Nunnally, J. C., and I. H. Bernstein (1994). *Psychometric Theory*, 3rd ed. New York: McGraw-Hill.

Patil Vivek H, Surendra N. Singh, Sanjay Mishra, and D. Todd Donavan (2017). Parallel Analysis Engine to Aid in Determining Number of Factors to Retain using R [Computer software], available from https://analytics.gonzaga.edu/parallelengine/.

Parahoo, S. K., Santally, M. I., Rajabalee, Y., & Harvey, H. L. (2016). Designing a predictive model of student satisfaction in online learning. *Journal of Marketing for Higher Education, 26*(1), 1-19. Doi: https://doi.org/10.1080/08841241.2015.1083511

Ralston-Berg, P., Buckenmeyer, J., Barczyk, C., & Hixon, E. (2015). Students' perceptions of online course quality: How do they measure up to the research? *Internet Learning Journal, 4*(1), 38–55.

Rios, T., Elliott, M., & Mandernach, B. J. (2018). Efficient Instructional Strategies for Maximizing Online Student Satisfaction. *Journal of Educators Online, 15*(3).

Roper, A. R. (2007). How students develop online learning skills. *Educause Quarterly, 30*(1), 62-65.

Sahin, I., & Shelley, M. (2008). Considering students' perceptions: the distance education student satisfaction model. *Journal of Educational Technology & Society, 11*(3).

Sebastianelli, R., Swift, C., & Tamimi, N. (2015). Factors affecting perceived learning, satisfaction, and quality in the online MBA: A structural equation modeling approach. *Journal of Education for Business, 90*(6), 296–305. Doi: https://doi.org/10.1080/08832323.2015.1038979

Tibi, M. H. (2015). Improving collaborative skills by computer science students through structured discussion forums. *Journal of Technologies in Education, 10* (3-4), 27-41. doi:10.24059/olj.v22i1.995

Turhangil Erenler, H. H. (2019). A structural equation model to evaluate students' learning and satisfaction. *Computer Applications in Engineering Education*. https://doi.org/10.1002/cae.22189

Uusiautti, S., Maatta, K., & Leskisenoja, E. (2017). Succeeding Alone and Together-University Students' Perceptions of Caring Online Teaching. *Journal of Studies in Education, 7*(2), 48-66. doi: https://doi.org/10.5296/jse.v7i2.11162

Wallace, R. M. (2003). Online learning in higher education: A review of research on interactions among teachers and students. *Education, Communication, and Information, 3*(2), 241-280. doi: https://doi.org/10.1080/14636310303143

Ward, M., Peters, G., & Shelley, K. (2010). Student and faculty perceptions of the quality of online learning experiences. *The International Review of Research in Open and Distributed Learning, 11*(3), 57-77. doi:http://dx.doi.org/10.19173/irrodl.v11i3.867

Williams, B., Onsman, A., & Brown, T. (2010). Exploratory factor analysis: A five-step guide for novices. *Australasian Journal of Paramedicine, 8*(3).

Young, A., & Norgard, C. (2006). Assessing the quality of online courses from the students' perspective. *The Internet and Higher Education, 9*(2), 107-115. doi: https://doi.org/10.1016/j.iheduc.2006.03.001

Yurdugul, H., & Alsancak Sirakaya, D. (2013). The scale of online learning readiness: A study of validity and reliability. *Education and Science, 38*, 391–406.

Yurdugul, H., & Bayrak, F. (2012). Content validity criteria in scale development studies: Comparison of content validity index and Kappa statistics [Olcek Gelistirme Calismalarinda Kapsam Gecerlik Olculeri: Kapsam Gecerlik Indeksi ve Kappa Istatistiginin Karsilastirilmasi]. *Hacettepe University Journal of Education, 2(Special Issue)*, 264-271

Yukselturk, E., & Yildirim, Z. (2008). Investigation of interaction, online support, course structure and flexibility as the contributing factors to students' satisfaction in an online certificate program. *Educational Technology & Society, 11*(4), 51-65.

APPENDIX

ORLS Dimensions and Items

	Turkish	English
Item 1	Donem boyunca ogretmenlerimle etkili bicimde iletisim halinde bulunmaktan memnunum.	I am satisfied to communicate effectively with my teachers throughout the semester.
Item 2	Ogretmenlerimin derse iliskin cesitli egitsel materyallere ulasabilmem konusunda desteginden memnunum.	I am satisfied with the support of my teachers in accessing various educational materials related to the course.
Item 3	Ogretmenlerimin cevrimici ogrenme konusunda hevesli olmasindan memnunum.	I am satisfied that my teachers are enthusiastic about online learning.
Item 4	Cevrimici ortamda ogretmenlerimden geribildirim alabilmekten memnunum.	I am satisfied to receive feedback from my teachers online
Item 5*	Unitelerin belirli bir plan dahilinde acilmasindan memnunum.	I am satisfied that the units have been set up on a specific schedule.
Item 6	Unitelerin sunum sekillerinin tutarli olmasindan memnunum.	I am satisfied that the presentation of the units is consistent.
Item 7	Icerigin sunumunda kullanilan dilin acik ve anlasilir olmasindan memnunum.	I am satisfied that the language used in the presentation of the content is clear and understandable.
Item 8*	Cevrimici sistemin hizindan memnunum.	I am satisfied with the speed of the online system.
Item 9	Cevrimici sistemin kullaniminin kolay olmasindan memnunum.	I am satisfied that the online system is easy to use.
Item 10	Cevrimici ogrenme ortaminda gereksinimlerimin karsilanmasindan dolayi memnunum.	I am satisfied that my needs are met in the online learning environment.

COMPARING EFL LEARNERS' RESPONSES IN ONLINE AND TRADITIONAL CLASSES: A MIXED METHOD APPROACH

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Abstract

The aim of this article was twofold. First, it considered the effect of social networks (Telegram) on the vocabulary knowledge of the participants, then it compared the participants' responses in IRF (initiation, response, & feedback) pattern in two different settings (traditional class and the online one). A group of foreign language learners took the Nelson Proficiency Test and a total of 60 learners were selected to participate in the study. Then they were randomly assigned to an experimental and a control group. After the treatment, the pre-test and post-test results were compared. For the second part of the study, the participants' comments were analyzed quantitatively and qualitatively. The results revealed a significant difference between the two groups, not only in their vocabulary knowledge but also in the way they communicated. This study has implications for both teachers and learners to increase their awareness of the benefits of new opportunities provided by technology in teaching-learning process.

Keywords: Discourse analysis, IRF, online setting, students' response, traditional setting.

INTRODUCTION

Tremendous growth of social networks has had a high impact on the development of the students' learning and social lives (Rithika & Selvaraj, 2013). Social networks have long been used for educational purposes and researchers argue that students are more interested in online environment than traditional setting for learning different skills (Khodabandeh, 2018; Miyazoe & Anderson, 2010). Some researchers believe that online setting is more helpful for learners than traditional one (Khodabandeh, Alian & Soleimani, 2017). Wang (2014) argued that online websites such as Wikis are more useful than traditional classrooms; because they increase students' motivation for learning. In social networks and online environment, students can interact with each other which enhances their learning and their participation (Karayan & Crowe, 1997; Smith & Hardaker, 2000).

The interaction of teachers and students in classrooms should be taken into account very seriously (Mishler, 1975). According to Liu and Le (2012) "Interaction is very important not only for teachers' classroom organization but also for students' language learning" (p.1), so it should be investigated (Allwrigh & Bailey, 1991; Allwright, 1980; Tsui,1995; Liu & Le, 2012; Smith & Higginsb, 2006). It is a fact that interaction with peers facilitates learning. As a matter of fact, social interaction helps people learn more than individual learning (Vygotsky, 1978).

Understanding the patterns of the interactions is very important and has long been under investigation by researchers. For example, Sinclair and Coulthard (1975) stated that classroom discourse is mostly made of three moves; teacher initiation (I), student response (R) and teacher feedback/comment (F) of the student's response (IRF). According to Wells (1999), a great amount of classroom interaction is made up of these three moves (about 70%).

Online interaction is popular in social networks especially Telegram which is a fast and free messaging application. Telegram is a very useful context for learning because it provides motivation and excitement for learners (Badri, 2015). Social networking sites are educational tools because learners can use them to communicate with their peers and share their knowledge (Lee & McLoughlin as cited in Stanciu, Mihai, & Aleca,2012, p.57). Students' interaction in online classes is very different from face-to-face ones (Kearsley, 2000). According to McConnell (2000), the instructor's control is not very much in online classes but learners participate equally in such classes. On the contrary, in face to face classes, the instructor controls most of the conversations of the students. In any case, understanding the patterns of these interactions is very important in both online and traditional classes and have long been under investigation by researchers (Heidari, Khodabandeh & Soleimani, 2018). In order to expand on previous research, this study investigates English foreign language (EFL) learners' interactions in two different contexts of learning (Telegram and traditional classes). Besides, this study is going to compare two different modes of learning vocabulary and to see which group (traditional or Telegram group) perform better in learning new words. Thus, this research is intended to fill the research gap and to examine the following questions:

Q1: Does teaching through social networks have any effect on EFL learners' vocabulary knowledge?

Q2: What are the features of the participants' comments in the virtual classes?

LITERATURE REVIEW

IRF

It is believed that teachers control the interaction in IRF pattern (Sinclair & Coulthard 1975, Cazden 2001). Markee (2000) believes that "teachers maintain control over the moment-by moment content and direction of classroom talk by reserving the right to ask questions. Students are thereby sequentially obligated to respond with answers." (p.71). Some researchers believe that this pattern provides opportunities for both teachers and their students to take turns in the interaction (Nassaji & Wells 2000). For example, the first part of the IRF is not always occupied by the teacher. In some situations, students start this structural pattern. They can obtain the last part that is F, too (Sunderland, 2001). Sometimes, teachers or students deviate from the IRF pattern (Candela 1999; Thornborrow 2002).

Van Lier (1996) states that IRF pattern restricts students and do not allow them to express themselves freely. He further talks about the advantages of the IRF pattern in learning foreign languages because he thinks that this regular pattern does not allow the discourse to be deviated from the main theme (here teaching foreign language) and since the teacher controls the class interactions, so learning will be improved. Rampton (2002) argues that when teachers control the classroom, students' motivation to participate will be decreased. The use of IRF patter decreases the students' motivation by assigning the teacher as the authority in the class (Van Lier,1996).

Online Interaction

Classroom discourse and interaction have been investigated by researchers for many years because understanding the nature of this interaction can affect learning (Cullen, 1998; Rymes,2009; Walsh, 2006). Song and McNary (2011) investigated the students' online communication with the focus on their posts that they launched in online setting. Results of the study showed that the students' posts were different. They posted various kinds of posts such as suggestions, acknowledgement, argument, request and so on. They concluded that the number of posts does not have any impact on the students' advancement. When students take part in online interaction, they can look at others' posts which is an opportunity afforded by online technologies (Gallini & Barron, 2002).

Some researchers examined the number of students' posts in online settings and its relationship with students' progress and they found different results. While some of them believe that the number does have effect on students' success (Kay, 2006; Ramos & Yudko, 2008) others think it does not have any effect on students' grades and their performance (Song & McNary, 2011). Aydin (2014) investigated the EFL learners' interactions with their teachers on Facebook and found out that age, gender and the number of training years affect their behavior in interaction with their teacher. Zeng and Shigenobu (2009) investigated the EFL learners in computer-mediated interaction. They found that the students' language ability improved with cooperation with each other.

Social Networking Sites

Using mobile technology and social networks have become part of the life of most students all around the world and it has had an impact on the process of their learning (Wanger &Wilson, 2005). Language learning through social networks has been studied by researchers (e.g. Firat & Serpil, 2017; Khabiri & Khatibi, 2013; Yousefzadeh, 2012). Greenhow (2011) said that social networking sites support learning and new technologies are very useful for educational goals. In a study conducted by Shabani, Parseh and Gerdabi (2014), using chat in online setting and its impact on vocabulary learning was examined. They found that the group which learnt vocabulary by using chat showed better performance than the group who did not use it. Similarly, Kolokytha, Loutrouki,Valsamidi, and Florou (2015) confirmed that social networks can be used as a learning tool and they provide an environment for discussion outside of the classroom. Doing assignments and sharing them in virtual networks motivate students to do them and get better results (Alian, Khodabandeh & Soleimani, 2017). In line with previous researchers, Heidari, Khodabandeh and Soleimani (2018) confirmed that teaching through social networks especially Telegram provides new opportunities for teaching-learning process because students are eager to communicate within the virtual environments. Teaching through social networks makes learning more interesting for students because it allows them to interact with each other and their teacher more than the participants of the face-to-face classes (Naseri & khodabandeh, 2019).

The Keyword Method

Taking into account the importance of vocabulary knowledge in learning a foreign language, teachers have always tried to find a way to facilitate acquiring it (Kilickaya & Krajka, 2010). One of the best strategies which can enhance learning is using the keyword method which is very popular these days and it is the verbal linkage with visual imagery in the memory process (Rodriguez & Sadoski, 2000). This method was first presented by Atkinson (1975) and his colleagues (Atkinson & Raugh,1975), and has two stages; first, one should find a word (maybe in one's mother tongue) which is acoustically similar to the target word. This word is called the "keyword." Next, to recall the word better, a picture is presented (Hell & Mahn, 1997). The effectiveness of the keyword method has been proved in many studies (e.g., Atkinson, 1975; Shapiro & Waters ,2005; Wyra, Lawson, & Hongi, 2007; Rodriguez & Sadoski, 2000; Sagarra & Alba,2006). Avila and Sadoski (1996) say that the keyword method is one of the most effective methods for remembering

words that increase delayed and immediate recall as well. This method is very popular because it is not only useful in foreign language and vocabulary learning but also in social studies and science (Berkeley, Mastropieri, Marshak, & Scruggs, 2010). Taking into account the effectiveness of social networks and the keyword method in vocabulary learning, this study has combined these two powerful instruments, that is using the keyword method in online classes which has not been done in previous studies to examine if the method is effective in this setting too. As it can be seen, analyzing students' responses in the IRF pattern has not been investigated so far. This study investigates the using keyword method in Telegram, as well. The effectiveness of teaching vocabulary in Telegram through the keyword method has not been investigated by other researchers, too.

METHODOLOGY

Participants

Sixty Iranian Payame Noor University (PNU) students majored in English translation course who were in intermediate level were selected as the samples of this study based on a proficiency test. Then, they were randomly assigned to an experimental and a control group. The participants were both female (30) and male (30) EFL learners and their age ranged between 18-and 22.

Data Collection

In order to collect enough data for this study, a vocabulary learning course was designed. In the traditional classroom the interaction and the dialogues between the teacher and the participants were recorded by a video camera. The interaction in Telegram was through text, so the learners' responses and teacher's questions and all of the interactions remained on the screen for further analysis. The dataset of this study was all students' answers and comments.

Instrumentation

Nelson Test of Proficiency (350A)

This test was used to homogenize the subjects regarding their proficiency level. The test was administered to a group of intermediate learners in Mobarake Payame Noor university to select participants. Those participants (60) whose means were one standard deviation above and below the mean were selected as samples.

Pre-test and Post-test

The participants in both groups took a pre-test (multiple choice items based on vocabulary). It was developed by the researcher and had 40 items. The vocabulary tests which were in the pretest and the posttest were chosen from a book named "504 Absolutely Essential Words". The participants' achievement during the course was tested using a post-test (40 multiple choice developed by the researcher). Like the pretest, the items were selected from the same book.

The Validity

The researcher made tests with the help of another colleague. To be sure about the validity of the tests, a kind of criterion- related validity called concurrent validity was used. These tests and the Nelson test were administered to EFL learners and then correlation between scores obtained on the vocabulary test and the vocabulary section of the Nelson proficiency test were computed. Determining the inter-rater reliability of coding the students' responses was done with the assistance of another rater, who was an EFL instructor, and the interrater reliability was computed through the Pearson's correlation coefficient test. Estimating reliability of the test was done through Cronbach's formula of reliability. The reliability estimate for the test turned out to be 0.77.

Procedure

After dividing the groups and taking a pre-test from the participants, the experimental group received instruction through *Telegram*. The participants of the experimental group checked their cell phones in a special time during the week (3 days a week) and took part in the online class. For this study, 30 new words based on the book entitled "504 Absolutely Essential Words" were taught. These words were sent to the participants in the experimental group. This process continued for one term (12 sessions, 3 days a week, about one month). The control group learned the same vocabularies in the classroom. New vocabulary items were written on the board and then the printed pictures like the ones in the Telegram group were given to the participants. New vocabularies were presented with pictures like figure 1.

For example, for the word 'shriek', the above picture was given to the participants to help them remember it better. Because according to the keyword method, the word 'shriek' is acoustically like 'Shrek' (the green giant) who is screaming. And the meaning of 'shriek' is to scream. In the traditional group, the printed pictures were presented. At the end of the treatment, the participants in both groups took the posttest. Finally, the results of both the pretest and the posttest were compared.

Figure 1. New vocabulary presentation

Regarding the second question of the research, the classroom interaction among the participates was recorded and analyzed. In the traditional classroom, the interaction was video-taped (each class lasted about one hour). Because of avoiding the halo effect, this part of the study was revealed to the participants. The interaction in Telegram was through text, so the participants' responses and the teacher's questions and all of the interactions remained on the screen which were saved in Telegram Chat History for further analysis. Three kinds of exchanges were analyzed in this study; R (TS) pattern refers to the exchange that comprises of only one initiating move from the instructor and a responding move from a student**.** In R (ST), it is the student who makes the initiation and the teacher offers a responding move. Moreover, in R (SS), it is the student who makes the initiation and he/she offers the answer him/herself.

RESULTS

Overview

In this part, the participants' performances on pre- and post-tests are first compared within each group and then between two ones. Moreover, the analysis of the participants' responses within the two groups are presented.

Data Analysis

In order to examine the research questions addressed in the research, the following statistical procedures were conducted: (1) Calculation of the average number of the participants' responses, (2) Shapiro-Wilk test, (3) Q-Q plot, (4) descriptive statistics, (5) Wilcoxon test, and (6) Mann-Whitney U test.

Firstly, the raw data taken from the pre- and post-tests were examined for the assumption of normal distribution via Shapiro-Wilk statistical test and Q-Q plots. Secondly, descriptive statistics were applied to determine the mean score (M) and standard deviation (SD) for the data on pre- and post-tests. Thirdly, Wilcoxon test was applied to examine the differences within the pre- and post-tests in each of the groups. Then, Mann-Whitney U test was used to examine between-group differences in the pre- and post-tests. Finally, the mean number of the responses presented by the participants of the two groups were calculated and examined to see if there were any significant differences between them through independent samples t-test.

Comparing Pre- and Post-tests of the Traditional Group

To compare the pre- and post-tests of the participants of the traditional group, the raw data taken from the related tests were first examined for the assumption of normal distribution. The results were as follows:

Table 1. The Analysis of Pre- and Post-Tests of the Traditional Classroom, Test of Normality

Traditional classroom	Shapiro –Wilk		
	Statistic	df	Sig.
pre-tests	.868	30	.002
post-tests	.960	30	.312

Note. The alpha level for the analysis was set at .05 for test of significance.

Since the observed values for pre-test data (p = .02) and post-test data (p = .01) in the traditional group are less than the critical value at .05 level of significance, these data do not meet the normality assumption.

A check as to whether or not we can assume a normal distribution can be made by drawing a probability plot. The data of pre- and post-tests of the traditional group are compared with the expected scores of the model, in this case a normal distribution. If a normal distribution is the appropriate model, the data will lie approximately on a straight line through the origin. The probability plots for the data of pre- and post-tests have been shown in Tables 1 and 2. The Tables show that a normal distribution cannot be assumed for these data in pre- and post-tests. Table 2 presents the descriptive statistics for pre- and post-tests of the traditional group.

Table 2. The Analysis of Pre- and Post-Tests of the Traditional Classroom, Descriptive Statistics

Traditional classroom	N	Mean	Std. Deviation
pre-tests	30	12.73	5.04
post-tests	30	20.80	5.59

In order to find out if there was any significant difference between pre- and post-tests of the traditional classroom, the participants' performances on pre- and post-tests were compared. In doing so, Wilcoxon Signed Rank Test was employed to investigate the observable variation in the participants' performances. The results were as follows:

Table 3. The Analysis of Pre- and Post-Tests of the Traditional Classroom, Wilcoxon Signed Rank Test

Traditional classroom	pre- and post-tests
Z	-4.150
Asymp. Sig. (2-tailed)	.000

Note. The alpha level for the analysis was set at 0.05 for test of significance.

Table 3 shows that the probability level of pre- and post-tests is .05, which is equal to the significance level of .05. Statistically, it follows that there is a significant difference between pre- and post-tests of the traditional group.

Comparing Pre- and Post-tests of the Online Classroom

To compare the pre- and post-tests of the subjects of the online classroom, the raw data taken from the related tests were first examined for the assumption of normal distribution. The results were as follows:

Table 4. The Analysis of Pre- and Post-Tests of the Online Classroom, Test of Normality

Online classroom	Shapiro –Wilk		
	Statistic	df	Sig.
pre-tests	.929	30	.047
post-tests	.827	30	.000

Note. The alpha level for the analysis was set at .05 for test of significance.

Applying normality analysis, it was revealed that the data on pre- and post-tests of the online group didn't follow normality assumptions. The observed values of pre- and post-tests obtained by Shapiro-Wilk are .01 and .00 which are less than critical value at .05 level of significance and it proved that the distributions were not normal, as it can be seen in Table 4.

The Tables 3 and 4 show that a normal distribution cannot be assumed for the data on both pre- and post-tests of the online group. Table 5 presents the descriptive statistics for pre- and post-tests of the online group.

Table 5. The Analysis of Pre- and Post-Tests of the Online Classroom, Descriptive Statistics

Online classroom	N	Mean	Std. Deviation
pre-tests	30	14.06	4.24
post-tests	30	26.60	3.85

Also, Wilcoxon Signed Rank Test was employed to investigate the observable variation in the participants' performances. The results were as follows:

Table 6. The Analysis of Pre- and Post-Tests of the Online Classroom, Wilcoxon Signed Rank Test

Online classroom	pre- and post-tests
Z	-4.787
Asymp. Sig. (2-tailed)	.000

Note. The alpha level for the analysis was set at 0.05 for test of significance.

Table 6 shows that the probability level of pre- and post-tests is .00, which is less than the significance level of .05. Statistically, it follows that there is a significant difference between pre- and post-tests of the online group.

Comparing Pre-tests of the Traditional Group and the Online Group

To compare the pre-tests of the participants of the traditional classroom and the online classroom, the raw data taken from the related tests were first examined for the assumption of normal distribution. The results were as follows:

Table 7. The Analysis of Pre-Tests of the Traditional Classroom and the Online Classroom, Test of Normality

pre-tests	Shapiro –Wilk		
	Statistic	df	Sig.
Traditional classroom	.868	30	.002
Online classroom	.929	30	.047

Note. The alpha level for the analysis was set at .05 for test of significance.

Applying normality analysis, it was revealed that the data on pre-tests of the traditional group and the online one didn't follow normality assumptions. The observed values of pre-tests obtained by Shapiro-Wilk are .02 and .01 which are less than critical value at .05 level of significance and it proved that the distributions were not normal, as it can be seen in Table 7.

The probability plots for the data on pre-tests of the two groups are shown in Tables 5 and 6. The Tables show that a normal distribution cannot be assumed for these data on pre-tests. Table 8 presents the descriptive statistics for pre-tests of the traditional group and the online one.

Table 8. The Analysis of Pre-Tests of the Traditional Classroom and the Online Classroom, Descriptive Statistics

pre-tests	N	Mean	Std. Deviation
Traditional classroom	30	12.73	5.04
Online classroom	30	14.06	4.24

Also, Mann-Whitney U Test was employed to investigate the observable variation in the participants' performances. The results were as follows:

Table 9. The Analysis of Pre-Tests of the Traditional Group and the Online Group, Mann-Whitney U Test

Traditional classroom– Online classroom	pre-tests
Mann-Whitney U	348.000
Wilcoxon W	813.000
Z	-1.515
Asymp. Sig. (2-tailed)	.130

Note. The alpha level for the analysis was set at .05 for test of significance.

Table 9 shows that the probability level of the pre-tests of the two groups is .47 which is larger than the significance level of .05. Statistically, it follows that there is not a significant difference between pre-tests of the traditional group and the online one. In other words, the participants of the two groups had approximately similar performances on pre-tests.

Comparing Post-tests of the Traditional Group and the Online Group

To compare the post-tests of the participants of the traditional group and the online group, the raw data taken from the related tests were first examined for the assumption of normal distribution. The results were as follows:

Table 10. The Analysis of Post-Tests of the Traditional Classroom and the Online Classroom, Test of Normality

post-tests	Shapiro –Wilk		
	Statistic	df	Sig.
Traditional classroom	.960	30	.31
Online classroom	.827	30	.00

Note. The alpha level for the analysis was set at .05 for test of significance.

As Table 10 shows, the observed values of post-tests obtained by Shapiro-Wilk are .01 and .00, which are less than critical value at .05 level of significance and it proved that the distributions were not normal.

Table 11 presents the descriptive statistics for post-tests of the traditional group and the online one.

Table 11. The Analysis of Post-Tests of the Traditional Group and the Online Group, Descriptive Statistics

post-tests	N	Mean	Std. Deviation
Traditional classroom	30	20.80	5.59
Online classroom	30	26.60	3.85

In order to find out if there was any significant difference between post-tests of the traditional classroom and the online classroom, Mann-Whitney U Test was employed. The results were as follows:

Table 12. The Analysis of Post-Tests of the Traditional Group and the Online Group, Mann-Whitney U Test

post-tests	N	Mean	Std. Deviation
Traditional classroom	30	12.73	5.04
Online classroom	30	14.06	4.24

Note. The alpha level for the analysis was set at .05 for test of significance.

Table 12 shows that the probability level of the post-tests of the two groups is .00 which is less than the significance level of .05. Statistically, it follows that there is a significant difference between post-tests of the traditional group and the online one.

Comparing the Feedback Frequencies of the Two Groups

Regarding the participants' feedbacks, their frequencies in each of the eight sessions were accounted within the two groups. The obtained results were as follows:

Table 13. Comparing Pre-tests of the Traditional Classroom and the Online Classroom

Pre-test Group	N	Mean Rank	Sum of Ranks
Traditional classroom	30	27.10	813.00
Online classroom	30	33.902	1017.00
Total	60		

Table 14. Comparing Post-tests of the Traditional Classroom and the Online Classroom

post-tests	N	Mean	Std. Deviation
Traditional classroom	30	20.80	5.59
Online classroom	30	26.60	3.85

Regarding the distribution of the data, the related one were examined for the assumption of normal distribution. The results were as follows:

Table 15. The Distribution of the Data

	Group	N	Mean Rank	Sum of Ranks
Post-tests	Traditional classroom	30	21.43	643.00
	Online classroom	30	39.57	1187.00
Total		60		

Note. The alpha level for the analysis was set at .05 for test of significance.

Applying the normality test, it was proved that the data on the feedback frequencies of the two groups was distributed in a normal way (P>.05).

Table 16 presents the descriptive statistics for the feedback frequencies of the two groups, i.e. the traditional group and the online one.

Table 16. The Frequency and Percentage of Responses in Different Sessions of the Online Classroom

	Session 1		Session 2		Session 3		Session 4		Session 5		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
R (TS)	93	94.89	133	97.08	112	97.39	104	97.02	146	98.64	588	97.39
R (ST)	4	4.08	0	0	2	1.73	3	1.48	0	0	9	1.73
R (SS)	1	1.02	4	2.91	1	0.86	1	1.48	2	1.35	9	1.86
Total	98		137		115		108		148		606	

In order to find whether the participants' responses in the two groups were statistically different or not, the independent samples t-test was used for analyzing the related data. The results were as follows:

Table 17. The Frequency and Percentage of Responses in Different Sessions of the Traditional Classroom

	Session 1		Session 2		Session 3		Session 4		Session 5		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
R (TS)	44	95.65	47	64	52	92.85	49	94.23	146	98.64	58	97.39
R (ST)	2	4.37	1	2	3	5.35	5	93.98	0	0	2	1.73
R (SS)	0	0	2	4	2	4.5	8	5.76	2	1.35	1	1.86
Total	46		50		57		62		148		61	

An independent-samples t-test was conducted to compare the data on the feedback frequencies of the two groups (t (14) = 3.67; P<.05). The magnitude of the differences in the means was very large (eta squared = .49).

DISCUSSION

The first research question in this study was: Do social networks have any effect on Iranian EFL learners' vocabulary knowledge? Regarding this research question, the pre- and post-tests of the two groups were compared. Comparing the post-tests of the two groups, it was revealed that there was a significant difference between the participants' performances after receiving the treatment program in such a way that the participants of the online classroom showed a better performance than their peers in the traditional classroom in terms of vocabulary learning (20.80 vs. 26.60).

Although the participants of the two groups improved on vocabulary learning, this improvement was more salient among the participants of the online group. Based on these findings, it can be concluded that instruction through *Telegram* messenger software was more effective than the instruction in the traditional class. The findings correlate with Basoglu (2010) and Yousefzadeh's (2012) who applied a mobile application and examined it in relation to vocabulary learning; and argued that the mobile application helped the learners remember the words better than non-mobile app group. The findings of the current study are also parallel to Shabani, Parseh, and Gerdabi's (2014) results who investigated the impact of using chat on vocabulary learning and reported the better performance of those participants who were instructed through chat than their peers who were instructed through traditional way. The findings also support Naseri and Khodabandeh (2019) who confirmed that social learning contexts such as Telegram make learning to be more interesting for foreign language learners, and also it allows students to have more exposure with the input or target form and interaction with their peers and teacher. The results of the research are also in line with Khodabandeh, Alian and Soleimani (2017) who believe that online classes help learners get better results than traditional classes.

Regarding the second research question, two kinds of analysis were done. The first one which was presented in the result section was counting and calculating the number and percentage of the participants' Rs and the second one is the qualitative analysis. Analyzing responses presented by the participants of the two groups, revealed that the R(TS) was the most frequent discourse element observed within both groups (93.98 % in the traditional classroom and 97.02 % in the online one). Regarding this discourse element, the participants of the online classroom presented more responses to the teacher's questions than their peers in the other group (588 vs. 250) and this shows that they have been more willing to interact with their teacher and to participate in teaching-learning process. This feature cannot be seen in the traditional classroom maybe because it is a face to face interaction; and the presence of the teacher leads the students, especially the shy students, to be silent. The time limitation can affect this feature as well, because in online group all of the members can launch their answers simultaneously. Some researchers believe that there is a positive relationship between the number of the students' posts in online settings and their progress (Kay, 2006; Ramos & Yudko, 2008).

Regarding R(ST), there were very few situations within the two groups in which students posed a problem or a question that made the teacher reply to the question. Although such situations were more frequent in the online classroom than the traditional one, this frequency was not so noticeable (9 vs. 8). This is also true about the R(SS) element in which students posed a problem or a question and answered to the question themselves. Our finding is inconsistent with the results of the Rashidi and Rafieerad's (2010) study who investigated the classroom discourse in EFL classrooms in Iran and showed that the IRF pattern was observed in the classes. All in all, the frequency of the R element of the IRF structure of the classroom discourse was more dominant within the online group.

The participants' Rs can also be analyzed qualitatively from other perspectives. It was observed that, in the online setting, the teacher could not have an overall and complete control over the class activities. Sometimes the teacher had to interrupt the conversation while it was deviating from the main theme, which was vocabulary learning. The learners chatted about different topics while the teacher was teaching and asking them to answer the question. For example:

> *Teacher: You can guess by this example: (With a loud shriek, she fled from the room).*
> *Reza222: shout*
> *Ghazale: I said first!!!*

M: salamm

SS: I don't know 😭😭😭😭

Lida: scream

………………

Teacher: now….. Make a sentence with campus.

Azita: I met best friend in the campus.

Blue:

Mina: hello

Mina: I'm here

The traditional classroom, on the other hand, was directly under the teacher's control and interrupting deviation was not obvious during the interaction. Therefore, it can be said that probably the setting affects the teaching method that it can affect the way of presenting the method. Van Lier (1996) believed that IRF pattern is effective in learning foreign languages since the regular pattern does not allow the discourse to be deviated from the main theme. He said that teacher's control in classroom improves students' achievements. But the results of this study showed the reverse. While in the online setting the teacher's control was less and the conversation was not relevant to the topic of the study most of the time, the online group showed better performance in learning.

In online setting, the participants had a collaborative learning. Every time the teacher asked them to do something, they did it collaboratively. For instance, when they guessed the meaning of a new word, they commented about their guesses, or when they were asking to make a code for memorizing the words. This is in accordance with Vygotsky (1986).

In the traditional classroom, the IRF pattern was established and the teacher's initiation and the students' responses according to the structure could be seen in the interaction:

Teacher: What's the meaning of shriek?

Student: I don't know.

Teacher: Can you guess by this example, (With a loud shriek, she fled from the room).

Student: loud voice?

But in the online setting, this pattern is disrupted;

Teacher: The first word is shriek.

Reza: hello

Asal: ☺ ☺ ☺

Teacher: What's the meaning of shriek?

Teacher: You can guess by this example: (With a loud shriek, she fled from the room).

Reza222: shout

Sara: cry

Ghazale: voice???

Ghazale: I said first!!!

M: salamm

SS: I don't know 😭😭😭😭

Lida: scream

A concept called 'adjacency pairs' exists in face to face interaction, which means that the utterances are near to each other (Wang, Newlin & Tucker, 2001). The below example from a part of interaction of online class shows it:

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Teacher: What's the meaning of shriek? (Teachers gives an example)
Student: voice??
Student: loud voice?
Student: shouting
Teacher: bravo
Teacher: Make a sentence with shriek, please.
Student: I don't like to shriek when I feel danger
Student: I heard a loud shriek when I was walking in the street

In online chat, this does not exist; and according to Garcia and Jacobs (1999), something that is called 'disrupted adjacency' happens. In all of the sessions some unrelated comments were observed which is one of the features of online classes.

Teacher: now….. Make a sentence with campus.
Azita: I met best friend in the campus.
Blue:
Mina:hello
Mina: I'm here

In the online group, the participants liked responding to each other's comments. Sometimes they confirmed each other, sometimes they joked, and so on. This feature was not dominant in the traditional classroom. When the members of the online group interacted with each other, they couldn't see each other. So, they could not see each other's reactions. In face to face interaction, the speakers could see others' gestures or hand or eye movements or they could express themselves better by using these movements. For example, they could make faces if they did not understand each other. In online setting these features can be expressed by using emoticons.

In the online setting the participants supported and helped each other in learning. For instance, when one member made a new code for the new vocabulary, the other participants expressed their ideas or confirmed or rejected the code. In some occasions they helped each other in guessing words. All in all, the collaborative learning was more obvious among the online group. This collaborative learning can be one of the elements of success among the online group. This can be in accordance with Vygotsky (1978) who believed that children learn better in social environment than individually.

Online chat has some features that make online setting a totally different context from traditional one. In the first setting, there were some bases for taking the turns, which Cameron (2001) talks about and believes that the person who speaks chooses who will be the next speaker or he himself continues. In online chats, the participants continued to send their posts without paying attention to turns. Responses to questions or comments were not according to turns, as well. An initiating response can produce many responses that may or may not be related to the topic under discussion.

CONCLUSION

The purpose of this study was to examine the participants' responses in two different modes of learning (virtual and traditional classrooms) and to see whether there were any differences in their responses. Moreover, this study attempted to compare two different modes of learning vocabulary (traditional and online group) and to examine the effectiveness of these two modes in vocabulary acquisition. The finding of this study shows that the number of responses and the participants' interaction during teaching-learning process were more among the participants of the online classroom than their peers in the other group, i.e. traditional classroom. This study also showed some features of the two classes (traditional and online) which were different in these two settings, like turn taking, using stickers, answering other's comments, adjacency pairs, and the number of comments. Some of the features like the number of comments, unrelated posts, answering others' comments, the stickers, and humor were more dominated in the online classroom.

Comparing pre- and post-tests of the participants of the traditional classroom, it was revealed that there was a significant difference between their performance before and after the treatment program. This was also the case for the participants of the other group, i.e. the online classroom. However, this effectiveness was more salient among the participants of the online classroom. In other words, teaching and learning vocabulary through keyword method may lead to better and more vocabulary learning in virtual or online classes than traditional ones.

Suggestions for Further Studies

The participants of this study were at intermediate level of proficiency. It is possible to conduct such a research with participants at other levels of English proficiency that can be taken into account in future studies. Future studies can focus on the students' feedback in virtual classes especially in story telling courses. Also learners' feedback in traditional and online classes can be compared.

Implications of the Study

This study may have some implications for teachers, and learners. It may help teachers to determine proper procedures and techniques for developing language learners' word learning-strategies and thereby they can become more proficient at other language skills. Regarding the way of presenting the treatment program, the findings revealed the better performance or more effective vocabulary learning of those students who received the intended treatment through telegram messenger software than those students who received it through traditional way, i.e. class attending instruction. This can encourage teachers to enjoy the benefits of new opportunities which have been provided by technology in teaching-learning process.

Limitations and Delimitations of the Study

One limitation encountered during conducting the research was that some students did not have access to Internet and a smart phone. In order to overcome this problem, it was attempted to select those students who had the requirements or those who were able to get them. The low speed of Internet was another limitation of the study which did not allow the participants to download and upload audio messages. Therefore, they preferred to participate in the teaching-learning process by sending text messages. Limited duration of the study was also another limitation and this was because of the nature of Payame Noor university system.

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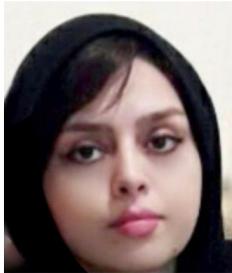
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REFERENCES

Allwright, R. L. (1980). Turns, topics, and tasks: Patterns of participation in language learning and teaching. In D. Larsen-Freeman (Ed.), *Discourse analysis in second language research* (pp.165-187). Rowley, MA: Newbury House.

Allwright, D., & Bailey, D. (1991). *Focus on the language classroom. An introduction To classroom research for language teachers*. Cambridge: Cambridge University Press.

Atkinson, R. C. (1975). Mnemotechnic in second-language learning. *American Psychologist,30*, 821-828.

Atkinson, R. C., and Raugh, M. R. (1975). An application of the mnemonic keyword to the acquisition of Russian vocabulary. *Journal of Experimental Psychology: Human Learning and Memory, 104*, 126-133.

Avila, E. & Sadoski, M. (2006). Exploring new applications of the keyword method to acquire English vocabulary. *Language Learning, 46* (3), 379-395.

Aydin,S. (2014). Foreign language learners' interactions with their teachers on Facebook**.** *System,42,* 155-163.

Badri,A.(2015). The effects of Technology on Idioms: with a Focus on Law Terms (A Study in Payame Noor University, Tehran, Iran). *International journal of educational investigations,2*(8),43-53.

Basoglu, E. B. (2010). A comparison of undergraduate students' English vocabulary learning: Using mobile phones and flashcards. *Educational Technology, 9*(3), 1-7.

Behnam,B., &Pouriran, Y. (2009). Classroom Discourse: Analyzing Teacher/Learner Interactions in Iranian EFL Task- Based Classrooms. *Porta linguarum*, *12*,117-132.

Berkeley, S. L., Mastropieri, M. A., Marshak, L., & Scruggs, T. E., (2010). Mnemonic Strategies: Evidence-Based Practice and Practice-Based Evidence. *Intervention in School and Clinic, 46*(2), 79–86.

Black, S.D., Levin, J.A. & Mehan, H. (1983). Real and non-real time interaction: Unraveling multiple threads of discourse. *Discourse Processes 6*, 59–75.

Cameron. D. (2001). *Working with Spoken Discourse.* London: Sage Publications.

Candela, A. (1999). Students' power in classroom discourse. *Linguistics and Education,10* (2), 139-163.

Carpenter, S., & Olson, K. (2012). Are pictures good for learning new vocabulary in a foreign language? Only if you think they are not. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 38*(1), 92-101.

Cazden, C.B. (2001). *Classroom discourse. The language of teaching and learning.* Portsmouth, NH: Heinemann.

Castro, M.C..(2006). Let's Chat: An analysis of some discourse features of synchronous chat. *Journal of English studies and comparative literature, 9(*1), 77-94.

Chun, D., & Plass, J. (1996). Effects of Multimedia Annotations on Vocabulary Acquisition. *The Modern Language Journal, 80* (2), 183-198

Crystal, D. (2001). *Language and the Internet*, Cambridge University Press, Cambridge.

Cullen, R. (1998). Teacher talk and the classroom context. *ELT Journal, 52*, 179-187.

Edwards, A.D., & Westgate, D.P.G. (1994). Investigating classroom talk. London; Washington D.C.: Falmer Press.

Farahian, M., & Rezaee, M.)2012). A case study of an EFL teacher's type of questions: an investigation into classroom interaction. *Procedia - Social and Behavioral Sciences, 47*, 161–167.

Ellis, R. (1994). *The study of second language acquisition*. Oxford: Oxford University Press.

Firat, M., & Serpil, H. (2017). Comparing the internet usage of pre-service language teachers with teachers of other subjects: Distance learning vs. on-campus learning. *Profile Issues in Teachers Professional Development, 19*(1), 55-72.

Gallini, J.K., & Barron, D. (2002). Participants' perceptions of web-infused environments: A survey of teaching beliefs, learning approaches, and communication. *Journal of Research on Technology in Education, 34*(2), 139-156.

Garcia, A.C. & Jacobs, J.B. (1999). The eyes of the beholder: Understanding the turn-taking system in quasi-synchronous computer-mediated communication. *Research on Language and Social Interaction,32*(4), 337–367.

Gere, C. (2002). *Digital culture*. London: Reaktion Books Ltd.

Gibson, W.J.(2014). Sequential order in multimodal discourse: Talk and text in online educational interaction. *Discourse & Communication*, *8*(1), 63–83.

Greenhow, C., (2011), Online social networks and learning. *On the Horizon, 19* (1), 4-12.

Harmer, J. (1998). *The practice of English language teaching*. London: Longman.

Heidari, J., Khodabandeh, F., & Soleimani, H. (2018). A comparative analysis of face to face instruction vs. Telegram mobile instruction in terms of narrative writing. *JALT CALL Journal, 14*(2), 143-156.

Hell, J. G. V. & Mahn, A. C. (1997). Keyword Mnemonic Versus Rote Rehearsal: Learning Concrete and Abstract Foreign Words by Experienced and Inexperienced Learners. *Language Learning*, *47*(3), 507-546.

Karayan, S., & Crowe, J. (1997). Student perspectives of electronic discussion groups. *THE Journal: Technological Horizons in Education, 24*(9), 69–71.

Kay, R. H. (2006). Developing a comprehensive metric for assessing discussion board effectiveness. *British Journal of Educational Technology, 37*(5), 761-783.

Kearsley, G. (2000). *Online education: Learning and Teaching in Cyberspace*. Belmont, CA: Wadsworth.

Khabiri, M, & Khatibi, M. B. (2013). Mobile-assisted language learning: Practices among Iranian EFL learners. *European Online Journal of Natural and Social Sciences, 2*(2), 176-190.

Khodabandeh, F. (2018). The impact of storytelling techniques through virtual instruction on English students' speaking ability. *Teaching English with Technology, 18*(1), 24-36.

Khodabandeh, F., Alian, J. & Soleimani, H. (2017). The effect of mall-based tasks on EFL learners' grammar learning. *Teaching English with Technology, 17*(2), 29-41.

Kolokytha, E., Loutrouki, S., Valsamidis,S., & Florou,G. (2015).Social media networks as a learning tool. *Procedia Economics and Finance, 19,287*-295.

Liu, J. &, Le, T. (2012). A case study on College English classroom discourse. *International Journal of Innovative Interdisciplinary Research. 2*, 1-9.

Liu, Y. (2008). Teacher-student talk in Singapore Chinese language classrooms: A case study of initiation/response/follow up (IRF). *Asia Pacific Journal of Education*, *28*, 87–102.

Lyle, S. (2008). Dialogic teaching: Discussing theoretical contexts and reviewing evidence from classroom practice. *Language and Education: An International Journal*, *22*(3), 222–240.

McConnell, D. (2000). *Implementing computer supported cooperative learning*. London: Kogan Page Limited.

Markee, N. (2000). *Conversation analysis.* Mahwah, NJ: Lawrence Erlbaum.

McHoul, A. (1978). The organization of turns at formal talk in the classroom. *Language in Society, 7*(2), 183–213.

Mishler, Elliot G. (1975). Studies in dialogue and discourse: II. Types of discourse initiated by and sustained through questioning. *Journal of Psycholinguistic Research* 4(2). 99-121.

Miyazoe,T & Anderson, T.(2010). Learning outcomes and students' perceptions of online writing: Simultaneous implementation of a forum, blog, and wiki in an EFL blended learning setting. *System,38* (3),515.

Molinar, L., Mameli, C., & Gnisci, A. (2013). A sequential analysis of classroom discourse in Italian primary schools: The many faces of the IRF pattern. *British Journal of Educational Psychology*, *83*, 414–430.

Mondada, L. (2007). Multimodal resources for turn-taking: Pointing and the emergence of possible next speakers. *Discourse Studies, 9*(2): 194–225.

Myhill, D. & Dunkin, F. (2005). Questioning learning. *Language and Education* 19(5),415-427

Naseri, E., Khodabandeh, F. (2019). Comparing the impact of audio-visual input enhancement on collocation learning in traditional and mobile learning contexts. *Applied Research on English Language, 8*(3), 383-422. doi: 10.22108/are.2019.115716.1434

Nassaji, H. &. Wells, G. (2000). What's the use of "triadic dialogue"? An investigation of teacher-student interaction. *Applied Linguistics* 21(3), 376-406

Nilsen, M., & Mäkitalo, A. (2010). Towards a conversational culture? How participants establish strategies for coordinating chat postings in the context of in-service training. *Discourse Studies 12*(1), 90–105.

Nunan, D. (1991). Language teaching methodology: A textbook for teachers. New Jersey: Prentice Hall. O'Connor, C., & Michaels, S. (2007). When dialogue is 'dialogic'. *Human Development*, *50,*275–285.

Quinn, C.N., Mehan, H., Levitt, J.A. & Black, S.D. (1983). Real education in non-real time: The use of electronic message systems for instruction. *Instructional Science, 11*, 313–327.

Rains, S. A. (2007). The impact of anonymity on perceptions of source credibility and influence in computer-mediated group communication: A test of two competing hypotheses. *Communication Research, 34,*955–970.

Ramos, C., & Yudko, E. (2008). "Hits" (not "discussion posts") predict student success in online courses: A double cross-validation study. *Computers and Education, 50*(4), 1174-1182. doi: 10.1016/j.compedu.2006.11.003

Rampton, B. (2002). Ritual and foreign language practices at school. *Language in Society, 31*(4), 491-525.

Rashidi, N. & Rafieerad, M. (2010). Analyzing patterns of Classroom Interaction in EFL Classrooms in Iran. *The journal of Asia TEFL,7*(3), 93-120.

Rithika, M., & Selvaraj, S. (2013). Impact of social media on student's academic performance. *International Journal of Logistics & Supply Chain Management Perspectives, 2*(4), 636-640.

Rodriguez, M. & Sadoski, M. (2000). Effects of rote, context, keyword, and context/keyword methods on retention of vocabulary in EFL classrooms. *Language Learning, 50* (2).385-412.

Rymes, B. (2009). *Classroom discourse analysis: A tool for critical reflection.* Cresskill, NJ: Hampton Press.

Sachs, H., Schegloff, E.A. & Jefferson, G. (1974). "A Simplest Systematic for the organization of turn-taking in Conversation", *Language, 50* (4), 696–735.

Sagarra, N., & Alba, M. (2006). The key is in the keyword: L2 vocabulary learning methods with beginning learners of Spanish. *The Modern Language Journal*, *90*(2), 228–243

Seedhouse, P. (1996) Classroom interaction: possibilities and impossibilities. *ELT Journal, 50*(1), 16-24.

Shabani,M.B., Parseh,F., & Gerdabi, A. (2014). The impact of chat on the vocabulary retention of Iranian EFL learners. *International Journal of Language Learning and Applied Linguistics World5,3,*286-305.

Shapiro, A. M. & Waters, D. L (2005). An investigation of the cognitive processes underlying the keyword method of foreign vocabulary learning. *Language Learning, 9* (2), 129-146.

Sinclair, J. & Coulthard, M. (1975). *Towards an analysis of discourse: The English used by teachers and pupils.* London: Oxford University Press.

Smith, D., & Hardaker, G. (2000). e-Learning innovation through the implementation of an Internet supported learning environment. *Educational Technology and Society, 3,* 1–16.

Smith,H & Higginsb,S. (2006). Opening classroom interaction: the importance of feedback. *Cambridge journal of education,36* (4), 485–502.

Song,L. & McNary, S.W. (2011). Understanding Students' Online Interaction: Analysis of Discussion Board Postings. *Journal of Interactive Online Learning,10*(1),1-14.

Stanciu,A., Mihai,F., & Aleca,O. (2012).Social networking as an alternative environment for education. *Accounting and Management Information Systems,11*(1), 56–75.

Sunderland, J. (2001). Student initiation, teacher response, student follow-up: towards an appreciation of student-initiated IRFs in the language classroom. Retrieved from: http://www.ling.lancs.ac.uk/groups/crile/docs/crile55sunderl.pdf

Swan, K. (2002). Building learning communities in online courses: The importance of interaction. *Education, Communication & Information*, *2*(1), 23-49.

Thornborrow, J. (2002). *Power talk. Language and interaction in institutional discourse.* Harlow: Longman.

Trentin, G. (2000). The quality-interactivity relationship in distance education. *Educational Technology, 40*(1), 17-27.

Tsui, A. (1995). *Introducing classroom interaction.* London: Penguin.

Underwood, J. (1989). HyperCard and interactive video. *CALICO, 6*, 7-20.

van Lier, L. 1996. *Interaction in the language curriculum: awareness, autonomy and authenticity.* London: Longman.

Vygotsky LS (1978) *Mind in society: the development of higher psychological processes.* Harvard University Press, Cambridge.

Vygotsky LS (1986) Thought and language. The MIT Press, Cambridge

Walsh, S. (2006). *Investigating classroom discourse.* London: Routledge.

Wang, A.Y, Newlin, Michael.H., & Tucker,T.L. (2001). A Discourse Analysis of Online Classroom Chats: Predictors of Cyber-Student Performance. *Teaching of psychology*,28(3), 222-226.

Wang, Y.C. (2014). Using wikis to facilitate interaction and collaboration among EFL learners: A social constructivist approach to language teaching. *System, 42*, 383-390.

Wanger, E. D., & Wilson, P. (2005). Disconnected: why learning professional need to care about mobile learning. *American Society for Training and Development, 59*(12), 40-43.

Wells, G. (1999). *Dialogic inquiry: Toward a sociocultural practice and theory of education.* Cambridge: Cambridge University Press.

Wyra, M., Lawson, M. J., & Hungi, N. (2007). The mnemonic keyword method: The effects of bidirectional retrieval training and of ability to image on foreign language vocabulary recall. *Learning and Instruction, 17*, 360-371.

Yousefzadeh, M. (2012). Mobile- based learning vs. paper-based learning and collocation words learning. *Journal of Educational and Instructional Studies, 2*(3), 216-220.

Zeng,G. & Shigenobu, T. (2009). Text-based peer–peer collaborative dialogue in a computer-mediated learning environment in the EFL context. *System, 37*(1). 434-446.

THE EFFECT OF FLIPPED CLASSROOM PRACTICES ON STUDENTS' ACADEMIC ACHIEVEMENT AND RESPONSIBILITY LEVELS IN SOCIAL STUDIES COURSE

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ABSTRACT

One of the main objectives of the Social Studies course is to raise individuals with a high level of responsibility. In this direction, many responsibilities are given to the students with the flipped classroom practices known as the replacement of the homework process at home with the theoretical knowledge process in the classroom and increase their academic success. The aim of this study is to investigate the effect of flipped classroom practices on students' academic achievement and responsibility levels in 5th-grade Social Studies course. The research was carried out according to the embedded experimental design which is one of the mixed-method designs. The study group consists of 5th-grade students studying in the 2018-2019 academic year in two different classes designated as experimental and control groups of a public secondary school in the middle socioeconomic level and Social Studies teacher of these classes. The data were obtained with the Student Responsibility Scale, academic achievement test and semi-structured interviews. As a result of the research, it was found that flipped classroom practices significantly increased the academic achievement and responsibility levels of the students in the experimental group. Teachers and students emphasized that e-learning videos had a significant effect on the increase in achievement and responsibility level. It is suggested that the flipped classroom practice can be used to imrove students' responsibility and academic achievement levels.

Keywords: Social studies, flipped classroom practices, responsibility, academic achievement.

INTRODUCTION

Social Studies is a primary and secondary school course that tries to reach its own goals by using the content and methods of social science disciplines. In the literature, the Social Studies course is defined in different ways. Barr, Barth, and Shermis (2013, p.16) define Social Studies as: "a combination of social sciences and humanities for teaching purposes in citizenship education". In another definition that emphasizes citizenship dimension, Social Studies is defined as (Garcia and Michaelis, 2001, p. 9): "a program area that examines human relations and transfers the basic characteristics of cultural heritage to raise responsible citizens in a democratic society". Although there are many definitions of Social Studies, the emphasis on raising citizens, the use of content and methods of social sciences and the holistic approach of social sciences are similar expressions in the definitions. In this way, students' citizenship skills are tried to be developed by using information about daily life and society with the Social Studies course (Savage and Armstrong, 1996). Some of these citizenship skills are; to be active and responsible in democratic life, critical thinking, decision-making, and problem-solving skills developed (Ross, 2006). Social studies course has an important role in classroom learning-teaching processes in achieving these goals.

The learning-teaching process is a stage in which students and teachers interact and sometimes play the role of the learner and the teacher in a changing framework. At this stage, teachers and students experience some changes in knowledge, skills, behaviors, values or attitudes both during and after the process (Arslan, 2007; Saglam & Gungor, 2012). Since 2005, Social Studies course learning-teaching processes are required to proceed in accordance with the constructivist understanding that has developed in the light of the ideas put forward by John Dewey. The learning-teaching process in accordance with constructivist approach; it can be expressed that students are the most important actors of the learning-teaching process, participate actively in the process and reach new information by experiencing their existing knowledge (Chen, 2003). Cooperative learning, large and small group studies, individual or social problems based on problem-solving studies and large and small group class discussions are the main activities of this understanding in the learning-teaching process (Ata, 2006). Some teaching models allow these activities. Blended learning models are one of them.

Blended learning models that combine face-to-face education and online education create rich opportunities for activities within and outside the classroom for the Social Studies course. In recent years, it has become important to benefit from technology support in education and to improve the quantity and quality of materials and applications that can be used for this purpose and to make blended learning gain importance (Yolcu, 2015). There are many models of blended learning. It can be said that the most preferred blended learning model is the flipped model in the practices in schools (Demiralay and Karatas, 2014; El Hajji et al., 2016). Flipped model or flipped learning; it is a displaced form of homework and practical work outside the classroom, with theoretical expression based on knowledge in the classroom (Bergman and Sams, 2012; DeLozier and Rhodes, 2016). In other words, flipped learning is the transfer of information to the large learning group within the classroom with the help of various technologies (Hamdan, McKnight, McKnight and Arfstrom, 2013). According to Boyer (2013), the application process of flipped learning consists of three stages. While one of these stages takes place outside the classroom, the other two stages are implemented inside the classroom. First of all, students gain basic information about the content outside the classroom through videos, news links, and visuals they watch, then they come to class. The practice process in the classroom is carried out in two stages. The first stage is the organization of the information learned. The last stage is the activities performed using this information. In this model, the teacher has the task of preparing e-learning videos and sharing these videos with the students as well as organizing the activities in the classroom (Bergmann and Sams, 2012). Similarly, students have various tasks such as participating in-class activities, participating in-class discussions and group activities, making evaluations and suggestions about videos, producing related products and presenting them to their friends (Formica, Easley and Spraker, 2010; Overmyer; Tucker, 2012). Upon the fulfillment of these tasks, a Social Studies course that is conducted in accordance with flipped learning will increase the participation of students (Chen, 2016; Lazarus, 2018). In addition, re-watching the videos before the exams in flipped classroom practices positively affect students' academic achievement in terms of preparation for exams (Bergmann & Sams, 2012). In addition to this, it is stated that responsibility will develop in students with the use of flipped classroom practices in Social Studies (Evseeva and Solozhenko, 2015; O'Flaherty and Phillips, 2015). It is thought that the increase in the tasks of the students in the classroom and outside the classroom, leaving the control of learning to the student and giving emphasis to the high-level thinking skills in the activities in the classroom (Li, Bailey & Littlejohn, 2017). Responsibility, which is emphasized to develop in students with flipped classroom practices, is defined as follows: "The individual is to adapt, to fulfill his / her duties and to assume the consequences of the effects of his / her action on others, to respect the rights of others and to protect the consequences of his / her behavior" (Sezer, 2008, p.63). On the other hand, the upbringing of students as individuals responsible for their behaviors is important for a Social Studies class where collaborative activities take place (Hintz, 2017). This situation also manifests itself in the 2018 Social Studies Study Program (SSSP) and the textbook. It is often emphasized that responsibility should be given to students as a value in the Social Studies course, in both the study program and the textbook (MoNE, 2018). There are some studies carried out in the Social Studies course in line with the flipped classroom practices (Dursunlar, 2018; Erdogan, 2018; Nayci, 2017). Many of the studies were carried out in other courses and at different educational levels (Carlisle, 2018; Cakir, 2017; Duffy, 2016; Gross, 2014; Guggisberg 2015). As a result of all these studies, it has been demonstrated that the practices performed positively affect the academic achievement of students. In addition, many applied studies have been conducted in other secondary school courses. These studies are as follows; Physical education (Turkcapar, 2011), Computer education (Ceylan,

2015; Kurt, 2012), Mathematics education (Coufal, 2014; Dafoe, 2016; Kinderman, 2015; Larsen, 2013; Martin, 2015; Ramaglia, 2015; Wiley, 2015) and foreign language education (Cashin, 2016; Prefume, 2015). In these studies, it was emphasized that the benefits of flipped classroom practices mostly for teachers and students. However there are no studies that associate flipped classroom practices and values education in the Social Studies course and show the effects of these practices on the academic achievement of 5th-grade students in accordance with mixed research methods. The aim of this study is to investigate the effect of flipped classroom practices on students' academic achievement and responsibility levels in the 5th grade Social Studies course. As part of this overall objective has been sought answers to the following research questions:

1. Is there a statistically significant difference between the academic achievement levels of experimental group and control group students using flipped classroom practices in the 5th grade Social Studies course?

2. Is there a statistically significant difference between the level of responsibility of the experimental group and control group students using flipped classroom practices in the 5th grade Social Studies course?

3. What are the views of teachers and students about the effect of the use of flipped classroom practices on the academic achievement and responsibility level of students in the Social Studies course?

METHOD

Combining the strengths of qualitative and quantitative approaches, mixed patterns are used in social science research to minimize the limitations of each approach (Tashakkori and Teddlie, 2010). In this study, the embedded experimental pattern, one of the mixed method patterns, was used (Creswell and Plano-Clark, 2007). Qualitative and quantitative data in embedded patterns are obtained in two different categories. One of these data has a secondary role and has been collected to support the other set of data. This pattern is particularly suitable for studies where qualitative data are used to explain quantitative data (Creswell and Plano-Clark, 2007). Embedded patterns are divided into embedded experimental patterns and embedded correlational patterns (Creswell and Plano-Clark, 2007). The qualitative data of this study were collected to support the quantitative data obtained for the purposes of the research and to explain these data in depth. Therefore, the research was carried out in accordance with the embedded experimental design. First of all, participants were determined by using academic achievement test and responsibility scale and quantitative pre-test data were collected. Then, the application process was carried out for 10 weeks and then quantitative post-test data were collected. Finally, semi-structured interviews were conducted with the teachers and students in the experimental group and the qualitative support data of the study were obtained. Information on the mixed-method design of the study is given in Figure 1.

Figure 1. Mixed-method design of the study

Participants

The study group consists of group two separate classes of the 5th-grade students and Social Studies teachers of these classes of a public secondary school located in the middle socio-economic level of Eskisehir city center. One of these classes is determined as the control group and the other one as the experimental group. The criterion sampling method which is one of the purposive sampling methods was used in determining the

study group of the study. While determining the study group, some criteria were determined by considering the structure of the study. In this context; the consent of the families of students, the possibility of students to have access to the Internet outside the school via a computer, smart tablet or phone, the socio-economic level of the school's environment (the middle socio-economic level), and the willingness of teachers and students and the school administration to participate in the research are considered criteria. Implementation of this research conducted in the 2018-2019 academic year was carried out within the framework of the 2018 SSP. When this program is examined, it is seen that one of the class levels in which the responsibility value is intensively tried to be gained is the 5th-grade level. In addition, it is thought that an education carried out in order to strengthen some values in students may be more effective in lower age groups in which values begin to take shape (Doganay, 2012). Therefore, the research was carried out with 5th-grade students, who are the lowest age group in which the Social Studies course is applied at the secondary school level.

Practice

In this study, pilot implementation was carried out. This application was carried out in the 5th-grade Social Studies course for 5 weeks from 19 February 2018 to 23 March 2018. Following the pilot implementation, the practice process of the study was started.

Information on the practice process is given in Table 1.

Table 1. Practice Process

Pre Test	Experimental Procedure					Post Test	Semi Structured Interviews
7 January 2019	1. Week 6 February 2019	2. Week 13 February 2019	3. Week 20 February 2019	4. Week 27 February 2019	5. Week 6 March 2019	12 April 2019	15-19 April 2019
	6. Week 13 March 2019	7. Week 20 March 2019	8. Week 27 March 2019	9. Week 3 April 2019	10. Week 10 April 2019		

The researcher prepared a presentation by using the Microsoft Powerpoint program by first benefiting from the related acquisitions in the study program and the content in the textbook and then shot the lecture video using the Adobe Presenter Video Creator program. The videos were edited using the same program and then uploaded to the Edpuzzle system. Before the sharing of the videos with the students, open-ended, multiple-choice or true-false questions were written on the videos using the tools in the Edpuzzle system. Each video, which is 8 to 12 minutes long, has an average of 2 to 4 questions. In addition, various news, visuals and video links about the content were placed on the courses and students were asked various questions to comment on these links. Thus, 25 videos with a total length of 227.44 minutes were shared with the students during the 10-week application period and the student movements were monitored through the Edpuzzle system.

Another study was to prepare student-centered activities in the classroom. In this context, the researcher prepared a total of 26 lesson plans covering all the processes of flipped classroom practices lasting 10 weeks. In accordance with these plans, in the first 8 to 10 minute period of each course the students' questions which they bring into the classroom about learning that takes place outside the classroom, comments and notes were discussed. In the rest of the course, student-centered activities based on a large number of active participation, such as group studies, cooperative learning studies, large and small group discussions, case studies, news reviews, creative writing studies, and problem-solving studies, were organized.

Data Collection and Analysis

The data of the study were collected by academic achievement test, responsibility scale, semi-structured interview, and structured observation. The academic achievement test developed by the researcher covers

11 achievements in the fields of "Science, Technology and Society" and "Production, Distribution and Consumption" in which teaching practice is conducted. For the test, 33 draft questions and statement tables prepared in accordance with Bloom's taxonomy were presented to the opinion of eight experts. Following the expert opinion, the 33-item draft achievement test was applied to 210 5th-grade students in other schools outside the practice schools and item analyzes were performed. For each item, item discrimination coefficient (D) and item difficulty indexes (P) were calculated. Following these analyses, 3 items were excluded from the test and the test consisting of 30 questions was finalized. Finally, the internal reliability of the test was measured in the development of the academic achievement test. The KR-20 (Kuder-Richardson) value was calculated to measure the internal reliability of the 30-item achievement test and was found to be 0.859. This figure indicates a statistically strong level (Fraenkel, Wallen and Hyun, 2011). With the developed academic achievement test, pre-test and post-test data were collected.

The other measurement tool used in the study is the Responsibility Scale for Grade 5 Students developed by Golzar (2006) within the scope of her master's dissertation. This scale, which was developed in one dimension, consists of 24 items and the Cronbach Alpha coefficient was 0.83 for internal consistency. The researcher applied the scale to 192 5th-grade students in schools outside the practice school in order to make validity and reliability analyses of the scale. After the application, the scale of responsibility was verified by the Amos program and Confirmatory Factor Analysis (CFA) was conducted in addition to the internal consistency of the scale. The cohesion statistics obtained by CFA confirmed the structure put forward by Golzar (2006). Then, the internal consistency coefficient (Cronbach's Alpha) of the scale was examined and this value was found to be 0.827. This value is accepted as strong in the literature (Fraenkel, Wallen and Hyun, 2011; Ozdamar, 2010). Pre-test and post-test data were collected from the control group with 29 students and the experimental group with 28 students using this measurement tool.

Qualitative data of the study were collected through semi-structured interviews with teachers and students. Semi-structured interviews allow asking alternative questions, to conduct in-depth interviews and to ask alternative deepening questions against new situations that arise during the interview (Yildirim & Simsek, 2006). The interview questions prepared by the researcher in line with the literature were presented to the opinion of two experts. With the arrangements made in line with the opinions of the experts, the interview questions were made ready for the pilot implementation. After the pilot implementation, semi-structured interview questions were arranged and finalized for the application process. Following the teaching application, interviews were conducted with the Social Studies teacher and 28 students in the experimental group. The data obtained from these interviews were presented using code names.

Finally, in-class activities in the experimental and control groups were followed in accordance with the structured observation form. This observation control form was developed by the researcher in accordance with the literature of flipped classroom practices. This form consists of 12 items, "I agree," "partially agree / partially disagree" or "disagree" is including 3-point Likert-type. The form was finalized after it was used in pilot applications and necessary arrangements were made in the articles. The studies carried out in the experimental and control groups were followed by the observer according to the form.

Before the pre-test and post-test data of the study were analyzed, normality distributions were obtained. For normality distribution, kurtosis, skewness values, and histogram graphs and Shapiro-Wilk tests were examined. Responsibility scale pre-test and post-test data show the normal distribution in both classes. While the post-test scores of the achievement test show the normal distribution in both classes, pre-test scores are distributed normally in the 5/A class and not normally distributed in the 5/C class. SPSS24 program was used to analyze the data and the following tests were performed:

- The Mann-Whitney U test was used for the measurement of the pre-test scores of the academic achievement test of the control and experimental groups, while the Welch test was used for the measurement between the post-test scores.
- Independent samples T-test was used for the measurement between the pre-test scores of the control and experimental group's responsibility scale, and One-Way ANCOVA was used for the measurement between the post-test scores.

In addition to quantitative data, qualitative data were obtained through semi-structured interviews with Social Studies teacher and experimental group students at the end of the study. The interview data were

analyzed inductively with the help of the Nvivo12 qualitative data analysis package program. In an inductive analysis, researchers try to code from all available data and thus create a meaningful whole (Glesne, 2012). In this direction, firstly the interviews were made into written text and uploaded to the Nvivo12 program. Codes and themes were formed from the opinions obtained regarding the effect of teaching practice on academic achievement and responsibility. The themes were reported to support quantitative data.

FINDINGS

Findings Regarding the Effects of Flipped Classroom Practices on Academic Achievement Levels of Students in Social Studies Course

The first of the aims of the study is to reveal the effect of flipped classroom practices on students' academic achievement. For this purpose, quantitative and qualitative data were collected. Firstly, the normality distributions of the data were examined in order to determine which tests should be performed in the analysis of quantitative data. For this, kurtosis-skewness coefficients, Shapiro-Wilk normality test, histogram and box graphs were examined (Karagoz, 2016). Table 2 shows the normality distribution of the pre-test and post-test data of the academic achievement test.

Table 2. Normality distribution values of academic achievement test pre-test and post-test data

		Number of People	Mean	Sd	Skewness	Kurtosis	Shapiro-Wilk
Pre-Test	Control	29	20,2069	5,37	-,352	-,634	,301
	Experimental	28	20,3929	5,76	-1,148	1,022	,003
		Number of People	Mean	Sd	Skewness	Kurtosis	Shapiro-Wilk
Post-Test	Control	29	20,8276	5,52	-,564	-,023	,435
	Experimental	28	25,3929	3,09	-,882	-,904	,085

In a normal distribution, the skewness and kurtosis values are expected to be between -1 and +1 (Huck, 2012; Karagoz, 2016). When the skewness and kurtosis coefficients of the data obtained from the academic achievement test were examined, it was seen that all the data except the pre-test data of the experimental group were in this range. Another test to be considered in testing the normal distribution of data is Shapiro-Wilk or Kolmogorov-Smirnov. Shapiro Wilk test is preferred in cases where the sample group is small and if the significance level of Shapiro-Wilk value is greater than 0.05, it can be said that the data distribution is normal (Kalayci, 2010). In this respect, it is seen that the data except the pre-test data obtained from the experimental group meet the normal distribution condition. For this reason, non-parametric tests were used to measure the academic achievement pre-test scores between the control and experimental groups. Mann-Whitney U test was used to compare the pre-test results of the academic achievement test of both groups. Mann-Whitney U test is one of the nonparametric tests used instead of independent samples t-test in cases where normal distribution cannot be achieved (Ary, Jacobs, Sorensen, and Razavieh, 2010; Kalayci, 2010; Karagoz, 2016). Table 3 shows the comparison of the academic achievement test pre-test performed before the experimental procedure according to the groups. According to these values, no statistically significant difference was found between experimental and control group achievement test scores before the experimental procedure (p = .754> .05).

Table 3. Comparison of academic achievement test pre-test application by groups

Grup	Number of People	Mean Rank	Rank Sum	U	p
Experimental	28	29,70	831,50	386,500	,754
Control	29	28,33	821,50		

After the pre-tests, the experimental process of the study was started. After the 10-week experimental process, the academic achievement test post-test scores of the experimental and control groups were compared. One-way analysis of variance was used to compare the post-test scores of the two groups. In this respect, the assumptions for one-way analysis of variance were tested first. Homogeneity of variances, normal distribution of data, and unrelated sampling are the basic assumptions of analysis of variance (Buyukozturk, 2019; Kalayci, 2010). Firstly, the normality distributions of the data were examined. The post-test data of both groups showed normal distribution. After that, the homogeneity of variances was examined with the Levene test. As a result of this test, it was concluded that the variances were not homogeneous (p = .009 <.05). In order to compare the difference between the means of the groups and to obtain the F value if the variances are not homogeneous, there are two alternative tests for a one-way analysis of variance. These tests are Brown-Forsythe and Welch tests. Both tests are effective in controlling the Type 1 error caused by multiple applications of the same measuring instrument in the same sample. When the two tests are compared, it can be said that the Welch test is more powerful (Field, 2009). For this reason, the Welch test was preferred for intergroup comparisons. The results of this analysis are given in Table 4.

Table 4. Welch test results for academic achievement test post-test comparison between groups

	Stats (F)	sd1	sd2	p
Welch	14,950	1	44,31	.000

According to the data in Table 4, there is a statistically significant difference between the academic achievement test scores of the experimental group and the control group [Welch F (1, 44.31) = 14,950, (p = .000 <.05)]. In the study, since there was only one independent variable (teaching practice) and two groups, descriptive statistics and means plot were examined instead of post-hoc tests to find out which group favored the difference between the means. Descriptive statistics are given in Table 5.

Table 5. Descriptive statistics of academic achievement test post-test comparison between groups

	Number of People	Pre-Test Mean	Post-Test Mean	Sd	sh
Experimental	28	20,23	25,39	3,09	.58
Control	29	20,20	20,82	5,52	1,02
	57	20,21	23,07	5,01	.66

According to the data in Table 5, after the 10-week experimental procedure, the post-test means of the experimental group was 25.39, while the post-test mean of the control group was 20.82. Thus, it is seen that the significant difference between the means of the groups by the Welch test is in favor of the experimental group. If the differences between the means are significant, it is important to include the effect size. Because the effect size is valuable in terms of showing how meaningful the results of the studies are in practice (Ozsoy & Ozsoy, 2013). In this study, Cohen's d value was calculated as the effect size based on the difference of group means and this value was found to be 0.45. This figure reveals that the result obtained has a moderate effect size (Cohen, 1988). The quantitative findings of the study suggest that the flipped classroom practices increase students' academic achievement statistically. Afterward, qualitative data were collected to support quantitative data in accordance with the research pattern. According to the findings obtained from the

qualitative data, almost all of the Social Studies teacher and experimental group students stated that they got higher scores than the trial exams held in the school and that their grades increased in the written exams of the Social Studies course which determined their report scores compared to the first semester. The opinions of the participants, who attribute this increase in academic achievement to some factors within and outside the classroom, are collected in the sub-headings in Figure 2.
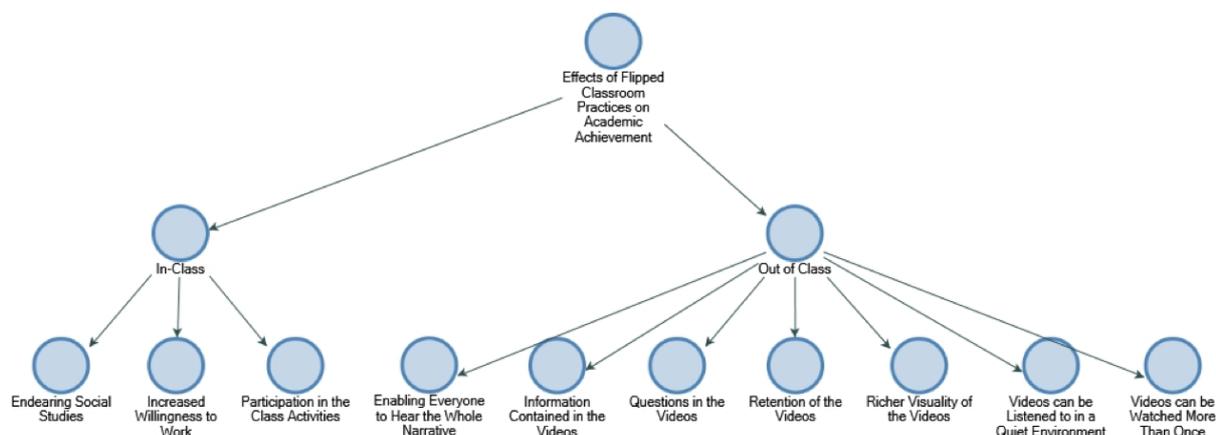
Figure 2. Student views on the effect of flipped classroom practices on academic achievement

When the opinions of teachers and students are examined, it is seen that extracurricular processes are more dominant in terms of increasing academic success. Especially because e-learning videos can be watched more than once and these videos are richer in terms of visuality, it is one of the most expressed opinions of students. Ilker, one of the participants, uses the following statements: *"I think it was good for studying the exams. We listen to the teachers in the classroom, but we have more than one chance to listen. We can listen to the lessons at any time."*

Another aspect of flipped classroom practices that positively affect academic achievement outside the classroom is that the e-learning videos are visually richer. To support this, Ilker uses the following statements: *"When it comes to video, I understand more. I understand a little less when the teachers tell me. I'm intrigued by the photos and so on, it's better to be visual."* Some of the participants explaining how flipped classroom practices positively affect academic achievement state that e-learning videos can be listened to in a quiet environment, enabling everyone to hear the whole narrative. In this context, Cengiz, one of the participants, explains that there are many distractions in the classroom and therefore it is important for him to listen to the lecture in a quiet environment at home*:*

> *"Teacher, I think it's beautiful. I think it would be better if we have this in every lesson. Because doing activities at school and studying at home. There are all kinds of sounds at school. You can hear some things, but you can not hear certain things, but if you do it at home if you have your room at home or in another room even in the room of your parents you can listen to the course quietly. Our teacher used to give us homework. In the classroom s/he was telling the subject, but there was a lot of noise there. Sometimes I was talking during the lesson and sometimes he was talking or she was talking so the lessons were a bit too hard because of the sound."*

Sevgi, one of the participants who emphasized the positive effect of e-learning videos in terms of academic success, stated that thanks to the information contained in the videos, she solved the questions in the test book more easily*: "Our teacher gave me a test book. When I watch these videos, I think of your sentences from the videos here, I can easily finish my test with their help. My test book is over and I'm very relieved."* Some of the students who think that flipped classroom practices increase their academic success think that this increase is due to the learning-teaching processes in the classroom. Many of the participants say that their participation in the class increases thanks to the activities carried out in the classroom and thus their success increases. In this direction, Gozde expresses her thoughts as follows: *"I actively participate in classes now. My grades have improved, and now I'm better attending my classes. My self-esteem is fulfilled. When you watch the videos, the*

way you tell them is beautiful." Thus, qualitative data support the quantitative data that flipped classroom practices positively affect academic achievement.

Findings on the Effects Flipped Classroom Practices on Students' Responsibility Levels in Social Studies Course

In this study, the effect of flipped classroom practices on students' level of responsibility as well as the academic achievement was examined. Accordingly, quantitative and qualitative data were collected. Firstly, the normality distributions of the data were examined in order to determine which tests should be performed in the analysis of quantitative data. For this, kurtosis-skewness coefficients, Shapiro-Wilk normality test, histogram and box graphs were examined (Karagoz, 2016). Table 6 shows the normality distribution of the pre-test and post-test data of the responsibility scale.

Table 6. Normality distribution values of responsibility scale pre-test and post-test data

		Number of People	Mean	SD	Skewness	Kurtosis	Shapiro-Wilk
Pre-Test	Control	29	66,6897	3,46	-,831	,392	,102
	Experimental	28	65,8571	3,79	,040	-,885	,299
		Number of People	Mean	SD	Skewness	Kurtosis	Shapiro-Wilk
Post-Test	Control	29	67,7931	2,95	-,478	-,549	,154
	Experimental	28	69,2143	2,16	-,556	-,469	,05

Pre-test data were collected from the experimental and control groups before starting the teaching practice. When the normality values of these pre-test data collected with the responsibility scale were examined, it was found that normality conditions were met in both groups. For this reason, independent samples t-test, one of the parametric tests, was used for the measurement between the pre-test scores of the responsibility scale of the experimental and control groups before starting the experimental procedure. Independent samples t-test is used to determine the significance of the difference between the means of two independent samples (Buyukozturk, 2019; Huck, 2012; Muijs, 2010). Table 7 shows the comparison of the responsibility scale pre-test scores with independent t-test according to the groups.

Table 7. Responsibility scale pre-test independent samples t-test results for comparison between groups

Group	Number of People	Mean	Sd	df	t	p
Experimental	28	65,85	3,79	55	.83	.391
Control	29	66,68	3,46			

For the comparison in Table 7, the values in the column where the variances are homogeneous are taken into consideration. Because the Levene statistic, which tests the homogeneity of variances, is seen to be homogeneous (p = .452> .05). As a result of this comparison, no statistically significant difference was found between the pre-test scores of the experimental and control groups' responsibility scale before the experimental procedure (p = .391> .05). After the pre-tests, the experimental process was started and then the responsibility scale post-test scores of the experimental and control groups were compared. This comparison was performed by One Way ANCOVA (Covariance Analysis) test. Covariance analysis provides control of one or more variables that are thought to affect the dependent variable while examining the effect of an experimental process (Ary, et al., 2010; Buyukozturk, 2019). In this study, the responsibility scale pre-test data were assigned as the covariant variable. Assumptions tested for covariance analysis are as follows (Buyukozturk, 2019, p.122; Kalayci, 2010, p.16): "Regression coefficients within groups are equal, data distribution is normal and variances are equal, and the groups whose mean values will be compared are

unrelated." First, both groups of data have been identified which exhibit the normal distribution. Thereafter, the regression coefficients were tested for equality. After the ANOVA results to test the equation of regression coefficients, *p* value (p = .895> .05) was found. This result shows that the regression coefficients are equal. Levene test was used to determine the homogeneity of the variance which is the last assumption. Levene test results showed that the variances were homogeneous (p = .136> .05). Thus, covariance analysis was started after assumptions were met. In this context, the pre-test and post-test mean scores of the experimental and control groups and the post-test mean scores corrected according to the pre-tests were examined. These values are given in Table 8.

Table 8. Pre-test and post-test scores of the groups and their corrected mean scores

Group	Number of People	Pre-Test		Post-Test		Adjusted Mean
		Mean	Sd	Mean	Sd	
Experimental	28	65,85	3,79	69,21	2,16	69,23
Control	29	66,68	3,46	67,79	2,95	67,76

According to the values in Table 8, it is seen that there is a difference between the groups' corrected responsibility scale mean scores. In order to determine whether this difference is significant, the covariance analysis was performed. The covariance analysis results are given in Table 9.

Table 9. Comparison of the mean scores of the post-test scores of the responsibility scale of the groups with covariance analysis

Source of Variance	Sum of Square	Sd	Mean Square	F	p
Pre-Test (Reg.)	2,430	1	2,430	.356	.553
Group	30,344	1	30,344	4,44	.040
Error	369,043	54	6,834		
Sum	400,246	56			

According to the results of the covariance analysis in Table 9, there is a statistically significant difference between the post-test corrected mean scores of the responsibility scale of the experimental and control groups [F (1, 54) = 4.44, p = .040 <.05]. According to these values, it can be said that the class variable makes a significant difference between the students' responsibility scale post-test scores (Huck, 2012). In order to determine which group was in favor of the significant difference between the mean scores, a pairwise comparison was performed with the Bonferroni test (Buyukozturk, 2019). Accordingly, a statistically significant difference was observed in favor of the experimental group. Finally, the effect size of the significant difference resulting from the experimental process was calculated. Cohen's *d* value, based on the difference of group means as the effect size, was calculated and this value was found to be 0.264. This value reveals that the result obtained has a small effect size (Cohen, 1988).

The quantitative findings of the study reveal that flipped classroom practices increase students' level of responsibility statistically. Afterward, qualitative data were collected to support quantitative data in accordance with the research pattern. According to the findings obtained from the qualitative data, the Social Studies teacher and most of the students in the experimental group think that flipped classroom practices increase the level of student responsibility. In order to support this opinion the participants use phrases such, *"It affected my level of responsibility well."* (Gizem), *"My responsibilities increased."* (Nadir), *"My responsibilities increased so it affected my responsibility well."* (Sefa). The participants stated that flipped classroom practices affect their level of responsibility in two different ways. These headings are shown in Figure 3.
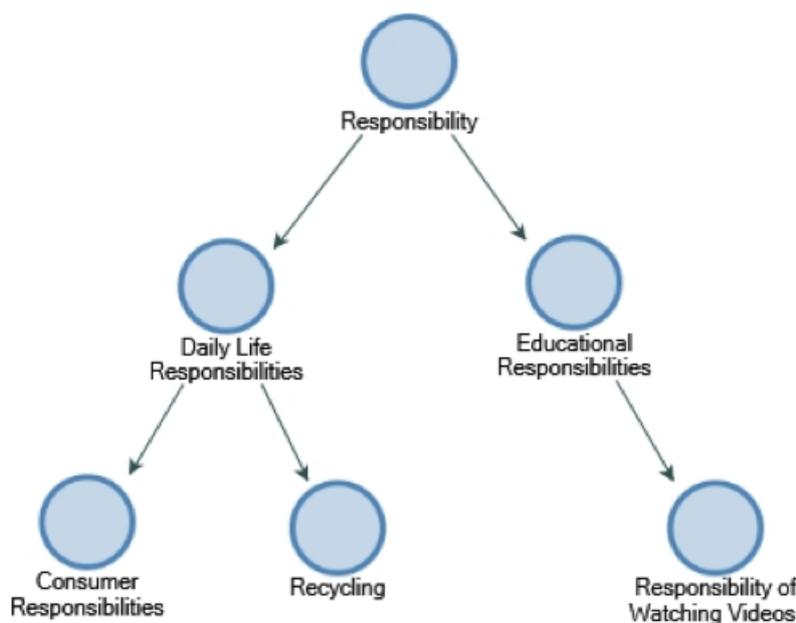
Figure 3. Student views on the effect of flipped classroom practices on the level of responsibility

The majority of the participants emphasized the increase in their educational responsibilities through flipped classroom practices. The Social Studies teacher and most of the participants mentioned the responsibility of watching e-learning videos in the context of educational responsibilities. The Social Studies teacher uses the following statements regarding the positive impact of flipped classroom practices on responsibility: *"Since the child has to watch at home, as the next day at school depends on the things s/he will follow, s/he feels inevitably the need to watch it. I think that this will improve the awareness of responsibility"*. Similarly, among the participants, Sefa stated that their responsibilities increased: *"It affected. I had a responsibility when I was studying. But now I have more responsibility. By watching videos from the Internet and working from books"*. Also, one of the participants, Asli explained how the practices affect her in terms of responsibility by saying: *"The practices affected my understanding of responsibility. I fulfill my duties. By watching the videos I do more of my responsibilities"*. Zafer stated that the level of responsibility increased and his family was positively affected by the practices:

> *"We used to do it from a book. My mother used to say 'Sit at the table and study'. Now when the exam day comes, she says 'Play the videos and watch them'. My responsibility really increased. I used to have a lot of minuses if you see my minus table, there was a lot of minuses. Now we have started to reduce the minuses in making homework. I wish it would always stay that way."*

According to some of the participants, the studies carried out in the classroom in the direction of flipped classroom practices affect their understanding of responsibility for daily life. One of these is consumer responsibilities. One of the participants, Ahmet, stated that he was more willing to fulfill consumer responsibilities along with the activities: *"Teacher, I learned better about the consumer information. For example, when buying something from a store, from now on I will pay more attention to the warranty certificate or the receipt"*. Likewise, Cengiz, one of the participants, states that the flipped class practices carried out positively affected him in terms of consumer responsibilities by saying:

> *"One of them, teacher, it has been more in my life, how can I say, it contributed to my life. For instance, in primary school, I knew the subject of being a conscious consumer as that I just should look at the TSE stamp or look at it if it doesn't have another stamp. We look at the expiration date or something. Now when we go to the store, I warn my parents. We did the shopping last time. At shopping, I said to my mom, 'Look at it, 'Look at that, even I stand by her all the time. I ran after my parents. I made my family even more conscious. It contributed a lot to me."*

DISCUSSIONS AND CONCLUSION

As a result of this study, it was determined that flipped classroom practices increased the academic achievement of students statistically and significantly. This result is consistent with the results of numerous studies in the literature. Some of these studies were carried out in Social Studies course, (Dursunlar, 2018; Erdogan, 2018; Nayci, 2017); while others were conducted in other courses and at different educational levels (Carlisle, 2018; Cakir, 2017; Duffy, 2016; Gross, 2014; Guggisberg 2015). Qualitative data were used to reveal how and in which activities the increase in academic achievement was realized and e-learning videos out of the classroom were found to be effective in this regard. In support of this result, Herreid and Schiller (2013) emphasize the importance of videos that enable students to focus on content in flipped classroom practices and emphasize that such videos will positively affect the classroom process and bring about a student-centered environment. In addition, Hsin and Cigas (2013) showed that video usage increases students' achievement scores, in line with the results obtained in the study. One of the most important features of videos that increase academic success is that they can be watched again in a quiet environment according to learning preferences and stay in the virtual classroom system at all times. In support of this result, Oyola (2016) concluded that flipped classroom practices encouraged the student to learn at home and that re-teaching was facilitated by watching the videos again. In addition to this feature of the videos, the questions included in the videos also positively affected the increase in academic achievement. Similar to this result, Wilson (2016), in his research, tried to reveal the effectiveness of the questions added to the videos he shared in the Edpuzzle application and as a result of the study, the questions added to the videos were found to be effective in improving students' learning.

Another result of flipped classroom practices positively affecting academic achievement is related to the visuality of e-learning videos shared with students. Visually rich educational materials are thought to appeal to more senses and people (Dhandabani, and Sukumaran, 2015). In this study, some of the students said that the visuality of the videos makes the information better understood and remembered and their success increases. There are some studies in the literature that overlap with this result of the research. In one of these studies, Cabi (2018) suggests that videos that guide students in extracurricular studies should be selected or produced with rich content.

The other half of the results of this study are related to the level of responsibility of the students. The first of the results is that in the 5th grade Social Studies course, flipped classroom practices increase students' level of responsibility statistically significant. This result is consistent with the results of some studies in the literature (Gough, 2016; Medone, 2019; Wagner, 2018). In these researches, it has been shown that students' level of responsibility has increased with flipped classroom practices.

The development of students' level of responsibility is divided into two categories as educational responsibilities and responsibilities related to daily life. In particular, most of the students stated that there was an increase in their own educational responsibilities with flipped classroom practices and as a result of this, their level of responsibility improved. This result is consistent with many studies in the literature. In one of these studies, students stated that their responsibilities increased with the use of flipped classroom practices (McCallum, Schultz, Sellke and Spartz, 2015). In another study, Parham (2018) concluded that there was an increase in the responsibilities of the students in terms of acquiring the information in the videos and using this information to participate in the classroom activities with other students. Another result reached in line with the opinions of students who emphasize watching e-learning videos as a part of educational responsibility, regularly watching e-learning videos outside the classroom increases the level of responsibility of students. This result is consistent with the results of other studies in the literature. In parallel with this result, Oyola (2016) found that the students have more responsibilities in flipped classroom practices and especially their tasks at home increase their responsibilities. Similarly, Evseev and Solozhenko (2015) in the work they have done in English class, have concluded that through the tasks the students become more responsible for their learning and have reached higher self-discipline.

In general, it is seen that the results of this research, in which the effect of flipped classroom practices on students' academic achievement and responsibility levels in Social Studies course, are in line with the results of the studies in the literature. From this point of view, it can be said that benefiting from flipped classroom practices in the 5th-grade Social Studies course has a positive effect on students' academic achievement and responsibility levels.

Suggestions

Based on the results, the following suggestions can be made; In order to increase the academic achievement and level of responsibility of students in 5th grade Social Studies course, flipped classroom practices can be utilized, in the Social Studies course, a guide can be prepared with examples of activities that can be used in the classroom for teachers who want to benefit from flipped classroom practices in the Social Studies course. In-service trainings can be provided to improve the technological competence of teachers in order to realize flipped classroom practices in Social Studies education. Research can be conducted to examine the effects of flipped classroom practices on variables such as attitude, interest and participation in the Social Studies course. In addition research can be conducted to examine the effect of flipped classroom practices on students' self-regulation and self-discipline skills.

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REFERENCES

Arslan, M. (2007). Egitimde yapilandirmaci yaklasimlar. [Constructivist approaches in education]. *Ankara University Journal of Faculty of Educational Sciences, 40*(1), 41-61.

Ary, D., Jacobs, L. C., Sorensen, C. and Razavieh, A. (2010). *Introduction to research in education.* Wadsworth: Cengage Learning.

Ata, B. (2006). Sosyal bilgiler egitiminde yansitici sorusturma gelenegi ve olusturmacilik yaklasimi. [The tradition of reflective inquiry in Social Studies and constructivist approach]. *Egitimde Cagdas Yonelimler III: Yapilandirmacilik ve Egitimde Yansimalari Sempozyumu.* Izmir: Ozel Tevfik Fikret Okullari.

Barr, R., Barth, J. L. and Shermis, S. S. (2013). *Sosyal bilgilerin dogasi.* [The nature of the Social Studies]. C. Donmez (Cev.). Ankara: Pegem Akademi.

Bergmann, J. and Sams, A. (2012). *Flip your classroom: Reach every student in every class every day.* Washington, DC: International Society for Technology in Education.

Boyer, A. (2013). The flipped classroom. *Teacher Learning Network Journal, 20*(1), 28-29.

Buyukozturk, S. (2019). *Sosyal bilimler icin veri analizi el kitabi.* [Handbook of the data analysis for social sciences]. Ankara: Pegem Akademi.

Cabi, E. (2018). The impact of the flipped classroom model on students' academic achievement. *International Review of Research in Open and Distributed Learning, 19*(3), 202-221.

Carlisle, C. S. (2018). *How the flipped classroom impacts students' math achievement.* (Doctoral Dissertation). Nashville: Trevecca Nazarene University. Available from ProQuest Dissertations & Theses Global. (2065145464).

Cashin, M. (2016). *The effect of flipped classrooms on elementary students' reading scores.* (Doctoral Dissertation). Arizona: Northcentral University.

Ceylan, V. K. (2015). *Harmanlanmis ogrenme yonteminin akademik basariya etkisi.* [Effect of blended learning to academic achievement]. (Master's Dissertation). Aydin: Adnan Menderes University, Institute of Social Sciences.

Chen, C. (2003). A constructivist approach to teaching; Implications in teaching computer networking. *Information Technology, Learning and Performance Journal, 21*(2), 17-27.

Chen, K. C. (2016). Building a cooperative learning environment in a flipped classroom. *Academy of Educational Leadership Journal, 20*(2), 8-15.

Cohen, J. (1988). *Statistical power analysis for the behavioural sciences.* Hillsdale, NJ: L. Erlbaum Associates.

Coufal, K. (2014). *Flipped learning instructional model: Perceptions of video delivery to support engagement in eighth grade math.* (Doctoral Dissertation). Beaumont: Lamar University.

Creswell, J. W. and Plano Clark, V. L. (2007). *Designing and conducting mixed methods research.* Thousand Oaks, CA: Sage.

Cakir, E. (2017). *Ters yuz sinif uygulamalarinin fen bilimleri 7. sinif ogrencilerinin akademik basari, zihinsel risk alma ve bilgisayarca dusunme becerileri uzerine etkisi.* [The effect of flipped classroom on 7th grade students' academic achievement, cognitive risk taking skills and computational thinking skills in science education classroom]. (Master's dissertation). Samsun: Ondokuzmayis University, Institute of Educational Sciences.

Dafoe, K. R. (2016). *Caring in a flipped mathematics classroom.* (Doctoral Dissertation). Toledo: The University of Toledo.

DeLozier, S. J. and Rhodes, M. G. (2016). Flipped classrooms: A Review of key ideas and recommendations for practice. *Educational Psychology Review, 29*, 141-151.

Demiralay, R. ve Karatas, S. (2014). Evde ders okulda odev modeli. [Flipped classroom model]. *Electronic Journal of Social Sciences*, *3*(3), 333-340.

Dhandabani, L. and Sukumaran, R. (2015, Ocak). Use of multiple intelligences and instructional technologies in learning theory of computation: An experimental case study. *International Conference on Advanced Computing and Communication Systems*, (pp. 1-6). Coimbatore, Hindistan.

Doganay, A. (2012). Degerler egitimi. [Values education]. Ozturk, C. (ed.), In *Sosyal bilgiler ogretimi* (pp. 225-256). Ankara: Pegem.

Duffy, C. M. (2016). *The impact of flipped learning on student achievement in an eighth grade earth science classroom.* (Doctoral Dissertation). Wilkes: Wilkes University. Available from ProQuest Dissertations & Theses Global. (1808509112).

Dursunlar, E. (2018). *Ters yuz sinif modelinin 7. sinif sosyal bilgiler dersi yasayan demokrasi unitesinde ogrencilerin akademik basarisina etkisi* [The effect of flipped classroom on academic success of seventh social studies grade students about living democracy unit]. (Master's Dissertation). Erzurum: Ataturk University, Institute of Educational Sciences.

El Hajji, M., Bouzaidi, E., Drissi, R., Douzi, H. and Khouya, E. H. (2016). New blended learning strategy based on flipped-learning for vocational work-linked training. *Journal of Education and Practice*, *7*(36), 126-130.

Erdogan, E. (2018). *Sosyal bilgiler ogretiminde ters yuz edilmis sinif modelinin kullanimi* [The use of flipped classroom model in social studies teaching]. (Doctoral Dissertation). Ankara: Gazi University, Institute of Educational Sciences.

Evseeva, A. and Solozhenko, A. (2015). Use of flipped classroom technology in language learning. *Procedia-Social and Behavioral Sciences*, *206*, 205-209.

Field, A. (2009). *Discovering statistics using SPSS*. SAGE.

Formica, S. P., Easley, J. L. and Spraker, M. C. (2010). Transforming common-sense beliefs into Newtonian thinking through Just-In-Time Teaching. *Physical Review Special Topics-Physics Education Research*, *6*(2), 1-7.

Fraenkel, J. R., Wallen, N. E. and Hyun, H. H. (2011). *How to design and evaluate research in education*. New York: McGraw-Hill.

Garcia, J. and Michaelis, J. U. (2001). *Social studies for children: A Guide to basic instruction*. Boston: Allyn and Bacon.

Glesne, C. (2012). *Nitel arastirmaya giris*. [Introduction to qualitative research]. (Cev: Ersoy, A. ve Yalcinoglu, P.). Ankara: Ani.

Golzar, F. A. (2006). *Ilkogretim 5.sinif ogrencilerine yonelik sorumluluk olceginin gelistirilmesi ve sorumluluk duzeylerinin cinsiyet, denetim odagi ve akademik basariya gore incelenmesi* [Development of a responsibility scale for 5th grade elementary students and investigating the relationship of responsibility and gender, locus of control, and academic achievement]. (Master's Dissertation). Ankara: Hacettepe University, Institute of Social Sciences.

Gough, E. (2016). *Southwest and south central minnesota K-12 teachers' perceptions regarding the flipped classroom.* (Doctoral Dissertation). Vermillion: University of South Dakota. Available from ProQuest Dissertations & Theses Global. (1818566568).

Gross, A. L. (2014). *The flipped classroom: Shakespeare in the english classroom.* (Master's Dissertation). Fargo: North Dakota State University. Available from ProQuest Dissertations & Theses Global. (1641121557).

Guggisberg, L. S. (2015). *Student perceptions of digital resources and digital technology in a flipped classroom.* (Doctoral Dissertation). North Dakota: North Dakota University. Available from ProQuest Dissertations & Theses Global. (1727452712).

Hamdan, N., McKnight, E. P., McKnight, K. and Arfstrom, K. M. (2013). A *review of flipped learning*. URL: https://flippedlearning.org/wp-content/uploads/2016/07/LitReview_FlippedLearning.pdf. (Date accessed: 19 June 2019).

Herreid, C. F. and Schiller, N. A. (2013). Case studies and the flipped classroom. *Journal of College Science Teaching, 42(5),* 62-66.

Hintz, K. (2017). They are so much more capable than what we really allow: Inclusive beliefs, practices, and textbook use. *The Journal of Social Studies Research*, *41*(4), 275-290.

Hsin, W. J. and Cigas, J. (2013). Short videos improve student learning in online education. *Journal of Computing Sciences in Colleges*, *28*(5), 253-259.

Huck (2012). *Reading statistics and research*. (6. Edition). Boston: Pearson.

Kalayci, S. (2010). *SPSS uygulamali cok degiskenli istatistik teknikleri.* [SPSS applied multivariate statistical techniques]. Ankara: Asil.

Karagoz, Y. (2016). *SPSS 23 ve AMOS 23 uygulamali istatistiksel analizler*. [SPSS 23 and AMOS 23 applied statistical analysis]. Ankara: Nobel.

Kinderman, K. A. (2015). *The flipped classroom: An alternative to teaching models in an elementary classroom.* (Master's Dissertation). Philadelphia: The University of the Arts.

Kurt, M. (2012). *ARCS motivasyon modeline gore harmanlanmis ogretimin ilkogretim 6.sinif bilisim teknolojileri dersinde ogrenci basarisina etkisi.* [The effect of blended learning on sixth grade students' achievement in information technologies lesson based on ARCS motivation model]. (Master's Dissertation). Ankara: Gazi University, Institute of Educational Sciences.

Larsen, A. J. (2013). *Experiencing a flipped mathematics class.* (Master's Dissertation). Burnaby: Simon Fraser University.

Lazarus, S. F. (2018). *Instructional choices, student participation, and the construction of knowledge in a social studies learning environment.* (Doctoral Dissertation). Arizona: Arizona State University. Available from ProQuest Dissertations & Theses Global. (2155434588).

Li, V., Bailey, W. and Littlejohn, R. (2017). Effect of learning-by-teaching in a flipped classroom. *Teaching-as-Research Projects at CU Boulder*, *170*, 1-15.

Martin, A. G. (2015). *The impact of flipped instruction on middle school mathematics achievement.* (Doctoral Dissertation). Texas: Teksas A&M University.

McCallum, S., Schultz, J., Sellke, K. and Spartz, J. (2015). An examination of the flipped classroom approach on college student academic involvement. *International Journal of Teaching and Learning in Higher Education*, *27*(1), 42-55.

MoNE. (2018). *Sosyal bilgiler dersi ogretim programi ilkokul ve ortaokul 4, 5, 6 ve 7. siniflar.* [Primary and secondary school 4th to 7th grades Social Studies curricula.]. Ankara: MoNE.

Medone, L. M. (2019). *Understanding digital native parents' perspectives of flipped classrooms: An exploratory case study.* Unpublished Doctoral Dissertation. San Diego: Northcentral University.

Muijs, D. (2010). *Doing quantitative research in education with SPSS*. Sage.

Nayci, O. (2017). *Sosyal bilgiler ogretiminde ters yuz sinif modeli uygulamasinin degerlendirilmesi* [The evaluation of implementation of flipped class model in the teaching of social studies]. (Doctoral Dissertation). Ankara: Ankara University, Institute of Educational Sciences.

O'Flaherty, J. and C. Phillips. (2015). The use of flipped classrooms in higher education: A scoping review. *Internet and Higher Education, 25*, 85-95.

Overmyer, J. (2012). Flipped classrooms 101. *Principal*, *92*(1), 46-47.

Oyola, M. (2016). *Content planning and delivery in a flipped classroom: A qualitative examination.* (Doctoral Dissertation). Missouri: Missouri Baptist University. Available from ProQuest Dissertations & Theses Global. (1769825896).

Ozdamar, K. (2010). *Paket programlar ile istatistiksel veri analizi 2* [Statistical data analysis with package programs 2]. Eskisehir: Kaan Bookstore.

Ozsoy, S. and Ozsoy, G. (2013). Effect size reporting in educational research. *Elementary Education Online*, *12*(2), 334-346.

Parham, T. (2018). *An action research study of female calculus students' perceptions of the flipped classroom model.* (Doctoral Dissertation). South Carolina: South Carolina University. Available from ProQuest Dissertations & Theses Global. (2071361490).

Prefume, Y. E. (2015). *Exploring a flipped classroom approach in a japanese language classroom: A mixed methods study.* (Doctoral Dissertation). Waco: Baylor University.

Ramaglia, H. (2015). *The flipped mathematics classroom: A mixed methods study examining achievement, active learning, and perception.* (Doctoral Dissertation). Kansas: Kansas State University.

Ross, E. W. (2006). The struggle for the social studies curriculum. Ross, E. W. (Ed.), *The social studies curriculum: Purposes, problems, and possibilities* icinde (s. 17–36). Albany: State University of New York.

Saglam, H. and Gungor, A. (2012). Yapilandirmaci sosyal bilgiler ogrenme ogretme sureci olceginin gelistirilmesi. [Developing Constructivist Social Studies Teaching-Learning Process Scale (CSTLPS)]. *Mehmet Akif Ersoy University Journal of Education Faculty*, *1*(24), 97-112.

Savage, T. V. and Armstrong, D.G. (1996). *Effective teaching in elementary social studies*. USA: Prentice Hall.

Sezer, T. (2008). *Ilkogretim 6. sinif sosyal bilgiler dersinde sorumluluk degerinin ogretimine iliskin ogretmen gorusleri* [The view of teachers about teaching the value of responsibility in social studies lesson in the 6th grade of primary education]. (Master's Dissertation). Ankara: Gazi University, Institute of Educational Sciences.

Tashakkori, A. and Teddlie, C. (2010). *Handbook of mixed methods in social and behavioral research.* Thousand Oaks, CA: Sage.

Tucker, B. (2012). The flipped classroom. *Education Next, 12*(1), 82-83.

Turkcapar, U. (2011). *Harmanlanmis ogrenme ortamlarinin ilkogretim ogrencilerinin psikomotor becerileri kazanma duzeylerine etkisi (futbol ornegi).* [The effect of blended learning environments on primary school students levels of obtaining the psyhomotor abilities (football sample)]. (Doctoral Dissertation*).* Ankara: Gazi University, Institute of Educational Sciences.

Wagner, B. (2018). *The effects of a flipped classroom on student comprehension and perception among second language learners in a bachelor of social work course.* (Doctoral Dissertation). South Karolina: South Carolina University. Available from ProQuest Dissertations & Theses Global. (2068609710).

Wiley, B. M. (2015). *The impact of the flipped classroom model of instruction on fifth grade mathematics students.* (Doctoral Dissertation). Minnesota: University of Minnesota.

Wilson, A. D. (2016). *The flipped approach: The use of embedded questions in math videos*. (Master Dissertation). El Paso: The University of Texas at El Paso. Available from ProQuest Dissertations & Theses Global. (1803639473).

Yildirim, A. and Simsek, H. (2013). *Sosyal bilimlerde nitel arastirma yontemleri*. [Qualitative research methods in the social sciences]. Ankara: Seckin.

Yolcu, H. H. (2015). Harmanlanmis (karma) ogrenme ve uygulama esaslari. [Blended Learning and its Applications Basics]. *The Journal of Academic Social Science Studies*, *33*, 255-260

CHANGE AT DISTANCE EDUCATION,
WHAT KIND OF RESISTANCE? WHAT IMPROVEMENTS?

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ABSTRACT

The study is aimed at training sports technicians in the Spanish state. Currently, most of them are in transitory period. For research, the Theory of Resistance in Innovation has been considered. This theory proposes a functional dimension and a psychological dimension with five factors: (Use, value of the product and risks involved) and (elements associated with traditional beliefs and those related to the image). The context studied was the courses taken by the Royal Spanish Skating Federation. The methodology followed in this research is empirical-analytical with a non-experimental approach. It will be basically a descriptive investigation. For this, an ad-hoc instrument was constructed with quantitative and qualitative response items. Among the results, it is worth highlighting the significant differences existing in students with experience in distance learning in the variable of acceptance of new technologies. In the qualitative part, it is recognized that the online mode allows to apply the knowledge immediately although there are difficulties during the first weeks. The creation of the figure of a tutor is proposed, which will catalyze the introduction to students' courses, facilitating the use of the platform before the start of the course.

Keywords: e-learning, innovation, technicians training, platform, functional factors.

INTRODUCTION

Distance education is increasingly present and accepted within general and regulated education (Bozkurt, 2019). This acceptance and presence is evident in post-compulsory and university education. Compulsory education reinforces the teaching of new technologies. Aspects related to the use of teaching and learning platforms must be included. These post-compulsory teachings contain: special teaching, teaching of training cycles expanding the offer and expanding the possibilities of students to study high school in the Spanish state (Dulsat & Alvarez, 2018). It cannot forgotten that, for continuous and ongoing training, there are MOOCs courses as referents of training in any professional field to expand knowledge or update them.

Callary et al. (2014) studied the seven best national sports training programs among the countries of Canada, France, Germany, Holland, Norway, Switzerland and New Zealand. In this study, it has been proved that the distance teaching of the curriculum is still in its initial phases, as indicated in Table 1. Only one of the seven countries (Canada) offers the entire curriculum as part of its distance-learning courses, the others countries or do not offer it or its virtuality is reserved just for support.

Table 1. Seven best programs International Sport Technicians (Callary et al, 2014).

	Canada	France	Germany	Holand	Norway	Switzerland	New Zealand
Distance education	It's offered throughout the country	Part of the program. There is no alternative to face-to-face classes	Not offered	Not offered	Not offered. Technicians can use Skype in sessions if they see ot necessary.	They have a platform to prepare the modules or as help after the module.	Not offered

Denysova et al. (2018) provide for the introduction of methods to university education in physical education and sports. The use of platforms is compared with the use of the cloud. The advantages of the latter are concluded for both economic and technical reasons. In any case, the platforms present less quality in the programs and it is necessary to present a program with the use of ICTs for the improvement of interactivity (Veselovskaya, 2018).

The Spanish Educational Law of 2006 and the current LOMCE (2013) has been foreseen the possibility that a series of special education courses will be included as part of the formal educational system. Among them, we can find all the sports specialties. Within this study, we are approaching this educational innovation from the perspective of the training organized by the Spanish Federation of Skating (RFEP) for the teaching, at its different levels of sports technicians. This type of training contemplates distance, blended learning and face-to-face modality in their courses both for the entire course as well as in the different areas presented within it. Following Christensen et al. (2008), we would find ourselves in a disruptive innovation as it intends to open new possibilities for enrollment in courses by students that entail the use of new technologies as an element of change in conjunction (Sancho-Vinuesa et al., 2015) based on the MOOC programs in the university field.

The specific sports education of the RFEP are in transitory period pending of the final resolution by which the corresponding category will acquired the regulated status that other sports specialties have already achieved, such as soccer, basketball, athletics or diving (Dulsat & Alvarez, 2019). With the exclusively federative qualifications, the title of coach obtained within this field of sports was only valid within the activities promoted by the different national or autonomic skating federations. The qualifications obtained thanks to the regulated teachings are on the same level as vocational trainings (FP): of middle grade for the first two courses and of a higher level with the third level (MECD, 2007).

The courses of the RFEP present in the areas of its curriculum a face-to-face mode blended learning and virtual ones; these last two with mandatory face-to-face tests according to the current legislation. To do this, the Moodle® platform becomes a facilitator resource for the teaching and learning process. Despite the progressive incorporation of the use of virtual platforms, which facilitate autonomous communities with few practitioners to have trained technicians, it is also necessary to point out the difficulties in the form of resistance among their participants (Area & Gonzalez, 2015) due to these changes in the teaching and innovation that they involve.

THEORETICAL FRAMEWORK

This study focuses on the individual resistances that students generate when they move to a new modality of virtual training (Caruth & Caruth, 2013). These resistances are analyzed and interpreted in terms of their influence with the educational change they produce (Hargreaves et al., 1998; Fullan, 2002). In addition, the concept of resistance is understood as those consubstantial and vital actions (Vargas, 2012) to human nature, which proves its own existence and presents a systemic character (Anderson & Stewart, 1988; Ferreter-i-Mora, 2009). It should be considered that the resistances fulfill a regulating and filter function guaranteeing the system's own stability (Garcia Aretio, 2002) and, with this, they should be considered as normal reactions, coming to believe it necessary to study them from the point of view of rejection towards the change that this training can cause (Rhoda, 2010). Likewise, we assume that any change entails the creation of some type of individual resistances (Nickerson, 2010). The change involves making an issue of the thought constituting

the consolidation of the identity of individuals. Thereby, it is necessary to identify the rules that govern these changes (Popkewitz et al., 2003), as well as to face the resulting innovations.

The literature on the causes behind resistance is multiple and varied, from those that point to three major causes: consumption, product and channel as well as their interactions (Black et al., 2002) but with special attention to the two first (consumption and product) of innovation (Heinze et al., 2017). In this study, we will use the Theory of Resistance in Innovations (Ram & Sheth, 1989) to be able to explore the sources of these resistances towards the formative change presented. This theory establishes two dimensions and five factors that influence the resistances: the Functional Dimension and the Psychological Dimension:

FunctionaFactors

The factors that influence the use of tools have been extensively detailed both at the level of not having used social networks and/or not understanding their use (Lin et al., 2012), as well as having had a negative experience with them (Chen & Hung, 2010) to even end up not knowing how to use communication tools (Hsu & Lin, 2008). Otherwise, among the factors that directly influence the value of the product and its function, we have those related to the difficulty of using communication tools (Hsu & Lin, 2008) due to the fact of experiencing difficulties in obtaining answers (Sun et al., 2012). Finally, regarding the factors associated with risks, we can find what is attributed to security issues (Bertot et al., 2012), legal disputes (Dunn, 2010) and the lack of confidence in technological applications (Chang & Chuang, 2011).

Psychological Factors

Among the factors we find those associated with traditional beliefs such as, the fact of how knowledge is shared (Zhang et al., 2012) because they are potentially recriminated by other users (Wang & Noe, 2010). Othrerwise, the factors that influence the image to a greater or lesser extent include the difficulty of being able to identify the benefits of sharing knowledge (Chiu et al, 2006), the fear of losing power (Wang & Noe, 2010) and the fear of not being recognized at the community level (Sun et al., 2012).

The two dimensions and five factors of Ram and Sheth (1989) have been adapted into four categories for this study, focused on deepening the study of the individual resistances of the students. These four categories answered the following questions:

1. Contextual aspects characterized by sharing the information and presenting the levels of participation (Garcia, et al., 2011). This participation is related to the information given since it is considered that participation cannot be given without having informed of what is to be achieved first. Therefore, it is essential to ensure that communication is as effective as possible because only in a way the uncertainties of the changes can be removed (Fullan, 2002);

2. Users, as they can exert resistances, to a greater or lesser extent, on the training or organization based on trust as well as on the risks perceived (Chaouali et al., 2017; Robertson, 2016;), also violations are taken into account and the fact of receiving support from colleagues (Monereo, 2010);

3. Social Dimension (social norms); and, finally,

4. Attributes of technology (strictly functional elements, ie, connectivity and virtual platforms).

Studies using the Ram and Sheth model (1989) focus on the relationship of consumers with innovations, and they focus on the psychological component that these authors provide in their model. Thus, the main moment of resistance is in the initial stages due to the struggle for autonomy achieved so far and what can be lost by the innovations introduced (Garrido et al., 2018). Besides, it should be considered when innovation is introduced slowly and it becomes necessary to consider the relevance of the behavior in the decisions made and the resistance of consumers towards innovations although it is possible to model mental processing to get adopted the innovations (Claudy et al., 2015). It is possible to define that the strength of the attitude towards a habit is one of the perceptual and cognitive mechanisms found in resistance to innovation, and the change in attitude towards changes contributes to breaking those resistances. Hence, it is necessary for the consumer to obtain more information about innovation. It is essential to get an intentional behavior with which the consumer sets goals and strive to achieve them (Bagozzi, et al., 1999). In addition to studies

related to consumers, we also find some studies focused on the use of mobile banking and the psychological barriers that Ram and Sheth (1989) establish.

The improvements are achieved when the resistances are overcome, being this an objective of both individual and innovative group. This will help us to improve the educational action, but at the same time, we should consider the resistances because the obstacles they pose are, in themselves, a source of improvement for all the participants (Garcia Aretio, 2003). This study presents the following objectives: first, to identify the categories that favor the resistances around this educational change; and, second, to propose possible improvements in the on-line courses with which improve the initial proposals related to the change in the instructional organization of these courses. In this way, the context will be specified, and emphasis will be placed on the existing resistances to the educational change as well as the training innovations as facilitators to the entrance and registration to the courses that the RFEP offers to the future sports technicians and superior sports technicians in the current latent period.

METHOD

This research follows a mixed approach with quantitative and qualitative methodology for a descriptive field research (Creswell, 2014) due to the direct collection of data from the chosen context and thanks to which the necessary information is obtained in order to determine the problem that may exist in the students' body with respect to the object being studied: distance training. The quantitative regarding the data relates the different categories to the field of change for students as well as qualitative in the analysis of the open responses of the questionnaires.

Participants

The context of this sample is the first course of Sports Technicians organized by the Royal Spanish Skating Federation in three different locations within the Spanish territory: Logrono, Madrid and Coruna. The data producing sample N=90 students, belongs to a population of 223 students enrolled in the courses of which only 164 exceeded the theoretical part and could access the part of practical training during which the questionnaire is supplied through the course platform. Therefore, these students become the invited population for this study. In this way, it is achieved that the response rate of the students is of 54.88%. It should be considered that for this group a p=0.75 is obtained, with a margin of error of 3.4% for a confidence level of 95%.

The socio-demographic characteristics of the students were: 53.46% females. For the age range, the students were among the following: 16-25 years (44.7%), 26-35 years (32.7%), 36-45 years (16.9%), and 46-55 years (5.7%). The students' origin for Autonomous Comunity were: 28.7% Galician, Andalucia 12.9%, Basc Country 11.2%, 10% of Madrid, Catalonian 10%, Valecian Community 6%, Asturias 4.4%, Castilian-Leon 4.4%, Aragon 3.1%, Navarra 3.1%, Extremadura 3.1%, and La Rioja 3.1%. The students with distance training experience were: 43.4%. To see the distribution according to the sports specialties in relation to the venues of the face-to-face courses see table 2.

Table 2. Students approved in the course 2013-2014.

	Roller skate	In-line Roller	Artistic Skate	Speed Skate	Total
Coruna	19	0	39	0	58
Logrono	0	17	10	19	46
Madrid	13	0	26	21	60
Total	32	17	75	40	164

Data Collection and Analysis

The instrument used is an online "ad-hoc" questionnaire with four categories. The items of the questionnaire use a descriptive numerical scale of 10 degrees, being the maximum value (1) and the minimum (10), and a second part of qualitative character for the responses on the individual resistances. The particularity of these items is their duality since the open question, of a qualitative nature, is crossed with the quantitative question where the individual resistance is linked to the concept of change.

The Scale

The instrument was validated by five judges chosen for their extensive experience in teaching within distance training. This determination is due to the fact of choosing distance training professionals with specific positions of direction, coordination or general management of courses of the same modality. The validation procedure was the same and the instrument was sent via e-mail and a framework for the criteria of uniqueness, relevance and importance of each of the items, as well as a section for observations.

The analysis of the answers was made using the statistical program SPSS-22 for the quantitative data and QSR-NVIVO 10 for the qualitative ones. The quantitative information was analyzed with the ANOVA to compare the average of more than one parametric group when they met the homoscedasticity test and the Wilcoxon W tests for two samples related to their medians in those cases when this was not fulfilled. The questionnaire of the students presents a level of reliability from the Cronbach alpha statistic of 0.836 as a whole.

FINDINGS

Quantitative Analysis

We present the degrees of the general acceptance of New Technologies as well as the data of Satisfaction of the course in relation to the data dependent on the field of change. In addition, they have been analyzed in terms of gender and experience in distance training (see Table 3). According to the degrees of acceptance of new technologies, we can observe values very close to one, an aspect that shows that students have a high acceptance of new technologies, as well as high level of satisfaction towards the course taken.

Table 3. Degrees of acceptance of new technologies and satisfaction

Degree	Average
Acceptance of new technologies	2.51
Satisfaction	3.81

The quantitative data of the students (table 4) for the four categories show significant differences in the case of the group with experience in distance training as the categories related to new technologies and knowledge acquired are influenced by the change in the training modality while the students without distance training experience do not consider this aspect. We find significant differences in the category of psychological aspects that favor the overcoming of the difficulties as the students with greater degree of acceptance of the new technologies consider that they surpass the difficulties better than those that have less acceptance of the new technologies.

Table 4. Student data analysis.

4 categories		Average	Standard deviation	Gender		Distance training		Degree acceptance of new technologies			Degree of satisfaction		
		Levene	ANOVA	Levene	ANOVA	Levene	ANOVA	Test T-Wilcoxon	Levene	ANOVA	Test T-Wilcoxon	Levene	ANOVA
Acquired knowledge	It. 11	4.65	2.171	.618	.920	.700	.872	.344	.078	---	.050	.210	---
	It. 16	4.73	2.210	.486	.681	279	.326	.738	.053	---	.145	.112	---
	It. 18	4.52	2.304	.325	.945	.413	.014	.100	.458	---	.002	---	.091
Face to face training	It. 13	4.48	2.133	.834	.770	.442	.895	.721	.346	---	.337	.065	---
	It. 19	4.79	2.279	.919	.719	.797	.716	.456	.169	---	.425	.350	---
	It. 21	4.43	2.250	.866	.766	.184	.447	.100	.065	---	.005	---	.105
New technologies	It. 12	4.41	2.646	.102	.954	.590	.841	.264	.692	---	.616	.215	---
	It. 14	4.10	1.900	.712	.533	.199	.006	.661	.504	---	.260	.213	---
Psychological aspects	It. 9	4.58	2.532	.163	.670	.972	.653	.344	.083	---	.047	---	.229
	It. 10	4.60	2.281	.451	.724	.793	.889	.208	.100	---	.023	---	.187
	It. 15	4.93	2.228	.390	.675	.494	.825	.324	.619	---	.255	.139	---
	It. 17	4.44	1.987	.538	.885	.664	.245	.346	.421	---	.354	.660	---
	It. 20	4.19	2.042	.883	.538	.900	.527	.198	.282	---	.021	---	.135
	It. 22	4.31	1.827	.423	.964	.477	.370	.017	---	.000	.327	.069	---

Qualitative Analysis

For the qualitative analysis, the data obtained in the open answer questions presented within the questionnaires of the students is examined by taking into account the following categories: Acquired Knowledge, Face-to-Face Training, Psychological Aspects and New Technologies. Thanks to these results, what is intended is to approach the point of view of the students taking into account all the aspects they have learned as well as the differences between the two training modalities.

Acquired Knowledge

Students were asked how distance learning allows them to apply the knowledge acquired in their working places, how the same knowledge favors or harms training their learning pace and, finally, if they had applied what they have learned in their day to day as sports technicians. The group of participants taken as sample for this research has expressed that they have had the opportunity to apply the knowledge they have acquired: *"I try to apply to myself every day what I learn and I find it interesting. I always give an opportunity to the new things that I learn and I also think that they can improve the training"* (Student, 46). However, we can also find those who express the opposite, referring to the lack of training in the distance modality, resulting in an ineffective communication. The students affirm that with this training they are increasing their knowledge of how to conduct sessions and that the course allows them to apply the knowledge. Those who do not apply it, is due to not being working as sports technicians.

Regarding the learning rhythm of this distance training, the students respond with the denial of both positions, such as: *"Neither harms nor favors"* (Student, 75). However, they consider that it harms when there are missing face-to-face explanations or when doubts are not solved immediately. Most of the students mention a lack of adaptation that might facilitate the understanding of the functioning of this training modality. It should be noted that students feel overwhelmed during the first few days because they cannot understand how the platforms works as well as due to the amount of information: *"As I was not used to distance learning at the beginning I felt a little bit lost"* (Student, 33). To this difficulty should be added the timing, the schedule established to answer questionnaires and to carry out proposed activities because they consider that they do not have time to assimilate the contents before so many activities.

Face-to-face Training

In this category students are asked about the lack of presence in contrast with the rest of the participants, as well as what they miss in this distance training. Regarding the lack of face-to-face training, the positioning of the students is ambiguous and the answers go in both directions: they see it right and wrong. However, in the second position, the justifications are related to the resolution of problems and the lack of explanations from the teaching staff. Moreover, positive elements have been included as the consideration that in a face-to-face course students might have to pay higher fees and that at the same time there is an investment of time and travel expenses that would pose difficulties to opt for it, such as: *"Sometimes it is complicated to perform a distance course, but on the other hand, due to my working situation it is necessary to do it in this way in order to facilitate the development of the learning process"* (Student, 87). The students miss more participation and communication, especially with the teaching staff.

The students recognize that, thanks to the distance learning method, they can immediately apply the acquired knowledge, as they do not have to neglect other aspects of their daily life. However, students request an increase of teaching hours in the face-to-face sessions, especially in those areas specific to sports specialties. In words of the students: *"To be able to share more experiences with classmate and, in my case, there are issues that I have never dealt with and maybe directly explained would be easier for me to understand"* (Student, 63). Without a doubt, the distance modality requires greater self-organization, therefore, a greater personal maturity and freedom of action is necessary.

New Technologies

In this category, two items are analyzed: the first one has been already presented in the quantitative analysis section and the second one refers to the opinion that the use of the platform deserves. The students consider that the use of the platform is difficult, especially during the first days, as in the following case: *"There were things that I could not find. It's a matter of getting to know the platform and then its functioning starts to be easier"* (Student, 13). This difficulty is placed in several aspects as in the organization of information or in personal issues of ignorance and in the lack of practice, being both centers of which the following response can be highlighted: *"It gets more difficult depending on the moments, but it has always been positive. I have only had some problems with some documents and with the deadlines"* (Student, 7). Although they had also highlighted those answers that place the difficulties in external factors of the course, such as connection speed and little connectivity.

Psychological Aspects

In this category we find questions which are specific for each individual and how these aspects may affect their academic performance, responding to the degree of satisfaction of the course and also what is expected from them. For students the questions previously mentioned are focused on the needs and satisfactions during the course, their personal motivations as well as the difficulties encountered. The students place the needs and satisfactions of the course as a positive aspect for their future work. For this reason, there is a close link between the responses of students based on getting the title as well as the knowledge acquired, an aspect that favors motivation and interest, as it can be seen in the following quotation from a student: *"To train in my sport to improve my knowledge and be able continue teaching my students"* (Student, 19).

In this category, we also find answers related to the need to know the teaching staff better as well as to interact with peers. On the other hand, they are also interested in the contents of those areas that have an almost immediate application. Regarding the difficulties, the students consider that they must overcome personal aspects such as effort, self-organization and the availability of time. The areas that most interest them are those that present the greatest difficulties, either due to the extension of the contents or because they demand a high effort from the students.

DISCUSSIONS

The category of Acquired Knowledge is not a reason to generate individual resistances, since the students reach the expectations and needs of the course, although there are significant differences between those with distance training experience and those without it. The students who currently do not work as sports coaches answer that they find it difficult to know if they can apply the knowledge acquired. However, they maintain a high degree of satisfaction with the course (Navimipour & Zareie, 2015).

For students, the learning pace is slower than they would like during the first weeks and this aspect could be considered a generator of resistance for this course modality (Chen & Tat, 2016). This coincides with the barriers to innovation in the individual environment during the implementation phase, and the difficult problems that individuals find (Oumlil & Juiz, 2016). To the above mentioned, we must add the slowness, the timing, the period established to answer questionnaires and the realization of the proposed activities, since students consider that they do not have enough time to assimilate the contents due to the number of areas and training activities.

Another element generating resistances that initially has not been contemplated would be the communication between the participants during the course. Although communication must also be considered as a fundamental element in achieving the implementation of the changes during this previous period (Ferrer, 2015), because innovation and changes in education obtain values of 46.3% where what is new, is better than what is "has changed. Moreover, you get an increase in the consideration of innovation by making it visible, by communicating from different means the changes that are carried out (Semova et al., 2015). This aspect coincides with the studies of Gutierrez et al. (2016) which conclude that in order to minimize obstacles communication should be a priority for those teachers who are committed to the quality of virtual instruction, as well as the study by Kumar & Owston (2016) where the students initial evaluation regarding new technologies is relevant to reduce subsequent barriers.

Within the category, "Face-to-face training", it is highlighted the lack of communication with the other groups of participants – coordination and teaching staff –. At the same time, other advantages besides are perceived such as the low cost that this training requires (Barbera et al., 2016, Jacob & Radhai, 2016). The contribution of audiovisual media also should be taken into account, above all, as the student considers that they are not used largely, although Yilmaz & Keser (2016) assure that their use does not provide benefits for learning while the activities with meaningful learning do. Another possibility is to approach the proposal of Reyes, Jimenez & Soto (2016), where one should provide flexible content and adapt them to the individual needs of each student.

Resistances related to psychological aspects are generated in those cases in which initial expectations are not met. Among the most commented expectations, we can find the obtaining of an official certificate (Barbera et al., 2016). Furthermore, the perception of acquiring little knowledge on the part of the students generates resistances because it would be a minimum use of the course and, to avoid this, teachers can contribute motivating the students (Liaw & Huang, 2013) by providing elements of interaction in this formative modality (discussion forums and assignment of tasks), improving the intrinsic motivation in relation to their perceived satisfaction, as well as the extrinsic motivation understood as utility (Gutierrez et al., 2016). Regarding satisfaction, it coincides with the significance of the relationship between students and contents as a predictor of satisfaction (Kuo et al., 2014). Finally, within these psychological aspects, an element could contribute to the reduction of resistances. This element is the official recognition of the course as well as its recognition beyond the federative scope of the certificate obtained, since it prepares the students to enter the workplace.

Finally, the participants consider New Technologies category as a good tool, although they also believe that it would be necessary to apply some improvements, such as the incorporation of videos, videoconferences or other forms of synchronic communication (Luran et al., 2015). Additionally, this perceived utility is essential to predict the intention of using mobile technologies where teaching practice is perceived as a profession where the changes in day to day need to be considered, and there is a certain resistance to the use of mobile technologies, because they are digital natives, and when they live with them as entertainment; they do not know how to look at the educational side (Sanchez et al., 2017). In general, resistances could be generated both by its complicated beginning and by the use and management of the platform. Although,

as Nova et al. (2017), the digital divide in ICT users is based on the knowledge, they have of ICT and not on the difficulties in accessing the same, and they are perceived difficulties in the use of ICTs due to lack of resources pedagogical that is required for its implementation. Resistance to the use of new technologies among teachers is among other issues may be related to the lack of training they present, although the teacher himself expresses lack of time to be able to train (Mercader, 2019).

CONCLUSIONS

The objective of this study has been twofold: Firstly, we set out to identify those aspects and/or categories that foster resistances and that are related to educational change; a more than significant aspect in the case of students with previous experience in distance training both for the acquisition of knowledge and for the use of new technologies. This is because these students are able to take more advantage of the contents acquired in their sports practice and, on the other hand, because the distance training experience gives students advantages when using the online platform of the course. In relation to the aforementioned, the students with the highest degree of acceptance of the new technologies solve much better the problems that have arisen during the course.

Thus, the categories related to New Technologies and Acquired Knowledge have an important weight in relation to educational change. It should be noted that there are significant differences in the category of Psychological Aspects. These differences are related to the degree of acceptance of new technologies by students, being these the reason why the other psychological factors are susceptible to another variable that should be studied in those cases in which there is a change in the training modality.

The second objective: "Propose possible improvements in the online courses with which to correct the initial proposals of the change in the instructional organization of the courses," for which we highlight the following improvement: pose the figure of the tutor as a catalyst for the training of the students and as facilitator of the use and understanding of the platform. This figure could be one per course hosting a maximum of 30 students. Its first function would be to address the new enrolled students and explain everything that will be found on the platform and how the contents and the different tools are organized. A second proposal would be related to communication between students and teachers using tools present on the platform such as chats, forums or other synchronous and immediate communication tools since that is what the students think is needed. It is necessary to introduce Vila's proposal (2014) that, in order to reduce obstacles to innovation, it advises to raise awareness and raise awareness among the leaders and people in charge of the courses, as well as to establish internal collaborations with teachers and other professionals close to the courses as intense work with the public administrations and official bodies. This could be accompanied by sustaining changes and innovation over time, while reviewing and updating the methods of teaching and assessment, changes that require cooperation between the professionals involved and sharing of knowledge, this leads to the establishment of learning communities (Liesa et al., 2018).

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REFERENCES

Anderson, C. M. & Stewart, S. (1988). *Para dominar la resistencia. Guia practica de terapia familiar.* Buenos Aires: Amorrortu editores.

Area, M. & Gonzalez, C. S. (2015). De la ensenanza con libros de texto al aprendizaje en espacios online gamificados. *Educatio Siglo XXI*, *33*(3), 15-38. http://dx.doi.org/10.6018/j/240791

Bagozzi, R. P. & Lee, K. H. (1999). Consumer resistance to, and acceptance of, innovations. *Advances in Consumer Research, 26,* 218-225. http://acrwebsite.org/volumes/7902/volumes/v26/NA-26

Barbera, E., Gomez, P. & Fernandez, F. (2016). A cross-national study of teacher's perceptions of online learning success. *Open Learning: The Journal of Open, Distance and e-learning*, *31*(1), 25-41. http://dx.doi.org/10.1080/02680513.2016.1151350

Bertot, J., Jaeger, P. & Hansen, D. (2012). The impact of polices on government social media usage: Issues, challenges, and recommendations. *Government Information Quarterly*, *29*(1), 30-40. http://dx.doi.org/10.1016/j.giq.2011.04.004.

Black, N., Lockett, A., Ennew, C., Winklhofer, H. & McKechnie, S. (2002). Modelling consumer choice of distribution channels: an illustration from financial services. *International Journal Of Bank Marketing*, *20*(4), 161-173. http://dx.doi.org/10.1108/02652320210432945

Bozkurt, A. (2019). Intellectual roots of distance education: a progressive knowledge domain analysis. *Distance Education, 40*(4), 497-514. https://doi.org/10.1080/01587919.2019.1681894

Callary, B., Culver, D., Werthner, P. & Bales, J. (2014). An Overview of Seven National High Performance Coach Education Programs. *International Sport Coaching Journal*, *1*(3), 152-164. http://dx.doi.org/10.1123/iscj.2014-0094

Caruth, G. D & Caruth, D. L. (2013). Understanding resistance to change: A challenge for Universities. *Turkish Online Journal of Distance Education*, *14*(2), 12-21. http://tojde.anadolu.edu.tr

Chang, H. & Chuang, S. (2011). Social capital and individual motivations on knowledge sharing: Participant involvement as a moderator. *Information & Management*, *48*(1), 9-18. http://dx.doi.org/10.1016/j.im.2010.11.001

Chaouali, W., Souiden, N. & Ladhari, R. (2017). Explaining adoption of mobile banking with the theory of trying, general self-confidence and cynicism. *Journal of Retailing and Consumer Services*, *35*, 57-67. http://dx.doi.org/10.1016/j.retconser.2016.11.009

Chen, C. & Hung, S. (2010). To give or to receive? Factors influencing members' knowledge sharing and community promotion in professional virtual communities. *Information & Management*, *47*(4), 226-236. http://dx.doi.org/10.1016/j.im.2010.03.001

Chen, W. S. & Tat, A. Y. (2016). An empirical evaluation of critical factors influencing learner satisfaction in blended learning: a pilot study. *Universal Journal of Educational Research*, *4*(7), 1667-1671. http://dx.doi.org/10.13189/ujer.2016.040719

Christensen, C., Johnson, C. W. & Horn, M. B. (2008). *Disrupting Class: How Disruptive Innovation Will Change the Way the World Learns*. New York: Mc Graw Hill.

Claudy, M. C., Garcia, R., & O'Driscoll, A. (2015). Consumer Resistance to Innovation –a behavioral reasoning perspective. *Journal of the Academy of Marketing Science, 43*(4), 528-544. https://doi.org/10.1007/s11747-014-0399-0

Creswell, J. (2014). *Research design. Qualitative, Quantitative and Mixed Methods approaches.* Thousand Oaks, California: SAGE Publications.

Denysova, L., Skynkawk, O. & Usychenko, V. (2018). Cloud technologies in distance learning of specialists in physical culture and sports. *Journal of Physical Education and Sport, 18*(1), 469-472. https://doi.org/10.7752/jpes.2018.s166

Dulsat, C. &Alvarez, I. (2018). Lessons learned froma distance course: "more use could have been be made of it". *Universal Journal of Educational Research, 6*(9), 1921-1927. https://doi.org/10.13189/ujer.2018.060910

Dulsat, C. & Alvarez, I. (july de 2019). Change modality: face to vitual for a course of Spanish Skate Federation: difficulties and opportunities for its implementation. In: Ch. A. Shoniregun (president), *World Congress on Education*, Dún Laoghaire, Irlanda, july, 16th – 18th.

Ferrer, R. M. (2015). La influencia del factor humano, el liderazgo y la cultura de las organizaciones, *Revista Internacional de Investigacion en Ciencias Sociales, 11*(1), 102-114. http://dx.doi.org/10.18004/riics.2015.julio.102-114

Ferreter i Mora, J. (2009). Resistencia. A *Diccionario de filosofia*, 4, 3079-3081. Barcelona: editorial Ariel.

Fullan, M. (2002). *Las fuerzas del cambio. Explorando las profundidades de la reforma educativa*. Madrid: Akal Ediciones.

Garcia Aretio, L. (2002). Resistencia, cambios y buenas practicas en la nueva educacion a distancia. *RIED, Revista Iberoamericana de educacion a distancia*, *5*(2), 9-35.

Garcia Aretio, L. (2003). Innovacion y resistencias. Recuperado de http://e-spacio.uned.es/fez/eserv/bibliuned:20127/innovacion.pdf

Garcia, A. M., Alamo, F. R. & Garcia, F. (2011). Antecedentes de la resistencia al cambio: factores individuales y contextuales. *Cuadernos de Economia y Direccion de la Empresa*, (14), 231-246. http://dx.doi.org/10.1016/j.cede.2011.02.007

Garrido, S. M, Thomas, H. E. & Becerra, L. D. (2018). Tecnologia, ideologia y hegemonia. Repensando los procesos de resistencia socio-tecnica. *Ciencia, Docencia y Tecnologia, 29*(56), 186-207. http://www.pcient.uner.edu.ar/cdyt/article/view/377/338

Gutierrez, E., Gallego, M. J. & Simone, A. (2016). Barriers in computer-mediated communication: typology and evolution over time. *Journal of e-learning and Knowledge Society*, *12*(1), 107-119.

Hargreaves, A., Earl, L. & Ryan, J. (1998). *Una educacion para el cambio*. Barcelona: editorial Octaedro.

Heinze, J., Thomann, M., & Fischer, P. (2017). Ladders to m-commerce resistance: A qualitative means-end approach. *Computers in Human Behavior*, *73*, 362-374. http://dx.doi.org/10.1016/j.chb.2017.03.059

Hsu, C., & Lin, J. (2008). Acceptance of blog usage: The roles of technology acceptance, social influence and knowledge sharing motivation. *Information & Management*, *45*(1), 65-74. http://dx.doi.org/10.1016/j.im.2007.11.001

Jacob, S. & Radhai, S. (2016). Trends in ICT E-learning: Challenges and Expectations. *International Journal of Innovative Research & Development*, *5*(2), 196-201. http://www.i-scholar.in/index.php/IJIRD/issue/view/14394

Kumar, K. L. & Owston, R. (2016). Evaluating e-learning accessibility by automated and student-centered methods. *Education Tech Research Development*, *64*(2), 263-283. http://dx.doi.org/10.1007/s11423-015-9413-6

Kuo, Y. C., Walker, A. E., Schroder, E. E. & Belland, B. R. (2014). Interaction, internet self-efficacy and self-regulated learning as predictors of student satisfaction in online education courses. *The Internet and Higher Education*, *20*, 35-50. http://dx.doi.org/10.1016/j.iheduc.2013.10.001

Liaw, S. S. & Huang, H. M. (2013). Perceived satisfaction, perceived usefulness and interactive learning environments as predictors to self-regulation in e-learning environments. *Computers & Education*, *60*(1), 14-24. http://dx.doi.org/10.1016/j.compedu.2012.07.015

Liesa, E., Castello, M. & Becerril, L. (2018). Nueva escuela, ¿nuevos aprendizajes? *Revista de Estudios y Experiencias en Educacion, 2*(1), 15-29. https://doi.org/10.21703/rexe.Especial2_201815291

Lin, C., Wu, J., & Yen, D. (2012). Exploring barriers to knowledge flow at different knowledge management maturity stages. *Information & Management*, *49*(1), 10-23. http://dx.doi.org/10.1016/j.im.2011.11.001

Luran, A. S., Buenahora, M. L. & Vargas, C. C. (2015). Perspectiva del aprendizaje tradicional y del aprendizaje con comunicacion bidireccional en actividades educativas. *Revista de Investigaciones UNAD*, *14*(1), 253-262. http://dx.doi.org/10.22490/25391887.1468

MECD (2007). *Real Decreto 1363/2007*. Madrid, Ministerio de Educacion, Cultura y Deporte. Disponible en: http://www.boe.es/boe/dias/2007/11/08/pdfs/A45945-45960.pdf

Mercader, C. (2019). Las resistencias del profesorado universitario a la utilizacion de las tecnologias digitales. *Aula Abierta, 48*(2), 167-174. https://doi.org/10.17811/rifie.48.2.2019.167-174

Monereo, C. (2010). ¡Saquen el libro de texto! Resistencia, obstaculos y alternativas en la formacion de los docentes para el cambio educativo. *Revista de Educacion*, *352*, 583-597. http://www.revistaeducacion.educacion.es/re352/re352_26.pdf

Navimipour, N. J. & Zareie, B. (2015). A model for assessing the impact of –learning systems on employees' satisfaction. *Computers in human Behavior*, *53*, 475-485. http://dx.doi.org/10.1016/j.chb.2015.07.026

Nickerson, J. (2010). *Leading change in a Web 2.1 world* (1st ed.). Washington, D.C.: Brookings Institution Press.

Nova, I. Aleman, L. Y. & Gomez, M. G. (2017). Alfabetizacion Socio-Digital y Pedagogia constructivista para superar la Brecha-Digital. *ENSAYOS, Revista de la Facultad de Educacion de Albacete, 32*(1), 33-47. http://www.revista.uclm.es/index.php/ensayos

Oumlil, R. & Juiz, C. (2016). An Up-to-datesurvey in Barriers to Open Innovation, *Journal of Technology, Management & Innovation, 11*(3), 137-152. https://doi.org/10.4067/S0718-27242016000300016

Perez, B. E. (2017). Cursos masivos abiertos en linea, MOOC. Un analisis pedagogico. In: J. M. Anton (Gen. Sec.) *XVIII Encuentro Internacional Virtual Educa,* Bogota, Colombia, june, 13th-16th.

Popkewiz, T. S., Franklin, B. & Pereyra, M. (2003). *Historia cultural y educacion: ensayos criticos sobre conocimiento y escolarizacion*. Barcelona: Ediciones Pomares.

Ram, S. & Sheth, J. (1989). Consumer Resistance to Innovations: The Marketing Problem and its solutions. *Journal of Consumer Marketing*, *6*(2), 5-14. http://dx.doi.org/10.1108/EUM0000000002542

Reyes, A., Jimenez, J. & Soto, D. E. (2016). Personalizacion de contenidos en t-learning a traves de Universal Design for Learning (UDL). *14th LACCEI International Multi-Conference for Engineering, Education and Technology: "Engineering Innovations for Global Sustainability"*. 20-22 july 2016, San Jose, Costa Rica.

Rhoda, J. (2010). Individual resistance to IT innovations. *Communications of the ACM*, *53*(4), 144. http://dx.doi.org/10.1145/1721654.172169

Robertson, N., McDonald, H., Leckie, C. & McQuilken, L. (2016). Examining customer evaluations across different self-service technologies. *Journal of Services Marketing*, *30*(1), 88-102. http://dx.doi.org/10.1108/JSM-07-2014-0263

Sanchez, J. C., Olmos, S. & Garcia, F. J. (2017). Motivacion e innovacion: aceptacion de tecnologias moviles en los maestros en formacion. *RIED. Revista Iberoamericana de Educacion a Distancia, 20*(2), 273-292. http://dx.doi.org/10.5944/ried.20.2.17700

Sancho Vinuesa, T., Oliver, M. & Gisbert, M. (2015). MOOCS en Cataluna: un instrumento para la innovacion en educacion superior. *Educatio XXI*, *18*(2), 125-146. http://dx.doi.org/10.5944/educXXI.13462

Semova, D. J., Aladro, E., Requeijo, P. Segovia, A.I. & Padilla, G. (2015). Innovacion en la ensenanza universitaria a traves de redes colaborativas: caso de estudio aplicado al grado de periodismo, *Profesorado, Revista de curriculum y formacion del profesorado, 19*(3), 361-379. http://www.ugr.es/local/recfpro/rev193COL1.pdf

Vargas, J. (2012). A proposito de la Resistencia como propuesta teorica del estudio historico. *Tiempo y Espacio*, *28*, 7-22. Recuperado de: http://www.ubiobio.cl/miweb/webfile/media/222/Tiempo/2012/%2328.01.pdf

Veselovskaya, J. A., Sidorova, N. V., Kuzina, N. G. & Stolyarova, I. V. (2018). Interactive distance education technologies: physical education and sports educational process quality analysis. *Theory and Practice of Physical Culture, 2*, 12-14. http://www.teoriya.ru/en/node/7942

Villa, A. (2014). La innovacion social en el ambito universitario, *Revista Argentina de Educacion Superior, 8*, 188-210. http://www.revistaraes.net/revistas/raes8_art9.pdf

Wang, S. & Noe, R. (2010). Knowledge sharing: A review and directions for future research. *Human Resource Management Review*, *20*(2), 115-131. http://dx.doi.org/10.1016/j.hrmr.2009.10.001

Yilmaz, F. G. K. & Keser, H. (2016). The impact of reflective thinking activities in e-learning: a critical review of the empirical research. *Computers & Education*, *95*, 163-173. http://dx.doi.org/10.1016/j.compedu.2016.01.006

Zhang, Y., Fang, Y., Wei, K. & Chen, H. (2010). Exploring the role of psychological safety in promoting the intention to continue sharing knowledge in virtual communities. *International Journal of Information Management*, *30*(5), 425-436. http://dx.doi.org/10.1016/j.ijinfomgt.2010.02.003

PROBLEMS, EXPECTATIONS, AND AMENDMENTS REGARDING DISTANCE EDUCATION LEGISLATION IN HIGHER EDUCATION INSTITUTIONS IN TURKEY

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ABSTRACT

This study's goal was to reveal amendments to the Procedures and Principles regarding Distance Education in Higher Education Institutions issued by the Higher Education Institution in Turkey, applications affected by these amendments, and problems and expectations at the system, program, and course levels. To this end, different versions of the Procedures and Principles regarding Distance Education in Higher Education Institutions were examined to determine the existing amendments to the Procedures and Principles and the areas affected by them. Eight individuals who had served as administrators in distance education centers of universities in Turkey for at least three years and who were selected by the purposive sampling method were interviewed to reveal expectations for the Procedures and Principles. This study was based on the qualitative research design. Document review and interview were used as data collection methods. The data were analyzed by content analysis. The analyses have shown that the amendments to the Procedures and Principles affect especially program and course opening, branching, assignment, and student admission practices. Within the scope of the study, distance education executives stated their expectations for issues such as program and course opening and the determination of supervisors, assignment procedures, and taking into account the course student coefficient in the calculation of course fees.

Keywords: Distance education, procedures and principles, distance education policies

INTRODUCTION

Distance education is rapidly becoming widespread in higher education along with technological developments and offers completely new opportunities for learners. The features of distance education, such as providing opportunities for the economy, lifelong learning, and individual learning and being free from the limitations of traditional methods (flexibility, time and space dependency, etc.), are the main factors affecting this spread. Distance education refers to a comprehensive system that uses opportunities of communication technology and educational technology. Distance education is a type of education with many stakeholders, such as teachers, students, managers, policymakers, material developers, and technical support team. Furthermore, distance education centers are centers where all stakeholders work synergistically and create joint projects (Akan, 2012). The effectiveness of distance education institutions increases as these stakeholders within the system become more associated and united. Moore and Kearsley (2011) stated that distance education should be evaluated not only with the history, theory, educational, or organizational design but in a holistic way with the distance operation of the whole system. Aydin (2008) stated that students, instructors, managers, and employees play an essential role in the distance education system and argued that all components of the system and factors outside the system should be examined in detail.

Studies in the field of distance education appear to focus on direct teaching functions such as most in-class activities (Tesolin & Tsinakos 2018) with stakeholders such as distance students (Sahin & Shelley, 2008) and distance educators (Rabinovich, Berthon & Fedorenko, 2017). However, another factor that has a direct effect on processes for distance education practices is legal regulations on to whom, under which conditions, and in what ways distance education will be provided. Legal regulations for distance education legislation are essential for distance education practices since distance education policies guide the development of distance education programs, provide a framework in functioning, and include a number of rules that define roles and responsibilities. While these policies sometimes include some guarantees of quality to improve quality and to make education more effective and efficient, they may sometimes consist of rules such as revealing the priorities, expenses, and investment costs of the institution, limiting the number of students, and limiting the number of courses (Zawacki-Richter and Qayyum, 2019).

Distance education policies established based on a country or an institution affect all components of the distance education system directly or indirectly. In their study conducted on distance education policies at the University of Argentina, Gonzalez and Roig (2018) emphasized that regulations led to the emergence of innovative practices and opened new horizons. Nevertheless, state-funded projects are carried out for distance education policies in Korea, and the legislation is updated every five years (MOE of Korea, 2015a). It appears that these policies play an essential role in the spread of distance education in distance education institutions in Korea (Lee, Lim, & Lim, 2009). However, there are also studies emphasizing that policies adversely affect or slow down the spread of distance education. For example, Lim (2015) argued that the number of student admissions clearly defined by the policies of all institutions providing distance education in Korea, student election policy, and distance education did not support lifelong learning. Kim and Kim (2017) also emphasized that student assessments, qualifications of the teaching staff, curriculum, library and laboratory facilities, and the strict supervision of partnerships with other groups adversely affected the development of distance education. Likewise, access to distance education, price, quality, and information regulations are managed by government policies in China, which leads to the limitation of distance education practices. Nevertheless, Li, Zhang, Yu, and Chen (2014) highlighted the importance of determining the duties and responsibilities of distance education institutions in China by legal regulations. Shortcomings and gaps in distance education policies may also pose obstacles to distance education, lifelong learning opportunities, opportunity to reach more people, and alternative activities and methods (Zhang, Zheng, & Yu, 2012). Muilenberg and Berge (2001) describe the most common problems in distance education under the headings of administrative structure, organizational changes, technical expertise, support and infrastructure, social interaction, payments, technology threat, copyright, evaluation/effectiveness, access, and student support systems. In Turkey Informatics Council Report (2002), it is stated that one of the most important barriers to the widespread of distance education is the inadequacy of the legislation. Thus, Akan (2012) also estimates that the project-based working logic in distance education centers will be replaced by bureaucratic and cumbersome functioning with the current legislation. Thus, distance education centers will be disabled in the medium term.

THE HISTORY OF LEGAL REGULATIONS ON DISTANCE EDUCATION IN TURKEY

In Turkey, distance education studies started to be carried out in a certain order with the publication of the Regulation on Distance Education Based on Inter-university Communication and Information Technologies by the Council of Higher Education in 1999. This regulation ensured standardization at the point of implementation and conducting activities for distance education centers and higher education institutions to which they were affiliated. Afterward, the Informatics National Committee [Enformatik Milli Komitesi] was established on 14.12.1999 to plan educational opportunities and increase the efficiency of education in distance education and informatics fields based on communication and information technologies in higher education institutions. The Committee provides cooperation and coordination between higher education institutions and organizations in the field of informatics and distance education. At the same time, it conducts research, examination, and evaluations in cooperation with universities to increase the efficiency of education and plan educational opportunities in higher education institutions (Official Gazette, 2000).

In 2005, the Council of Higher Education (YOK) Distance Education Commission was established. Afterward, the Council of Higher Education issued the Procedures and Principles regarding Distance Education in Higher Education Institutions in 2013 and took an important step for the implementation of distance education in higher education institutions in Turkey. The legislation structure of distance education programs in higher education institutions was established based on these Procedures and Principles. In 2014, the Council of Higher Education decided to make some amendments to the mentioned Procedures and Principles. The aim of the Procedures and Principles regarding Distance Education in Higher Education Institutions was to determine procedures and principles related to opening distance education programs based on information and communication technologies in higher education institutions and teaching some courses in formal education through distance education. These procedures and principles involve areas in which distance education programs can be opened in higher education institutions, courses to be given through distance education and their credits, the preparation of course materials, the way of conducting examinations, protocols to be made for this purpose between higher education institutions, payments to be made, and other issues related to distance education (YOK, 2014).

THE SCOPE OF THE PROCEDURES AND PRINCIPLES REGARDING DISTANCE EDUCATION IN HIGHER EDUCATION INSTITUTIONS

The issues covered by the Procedures and Principles regarding Distance Education in Higher Education Institutions are presented in Figure 1 under general headings.
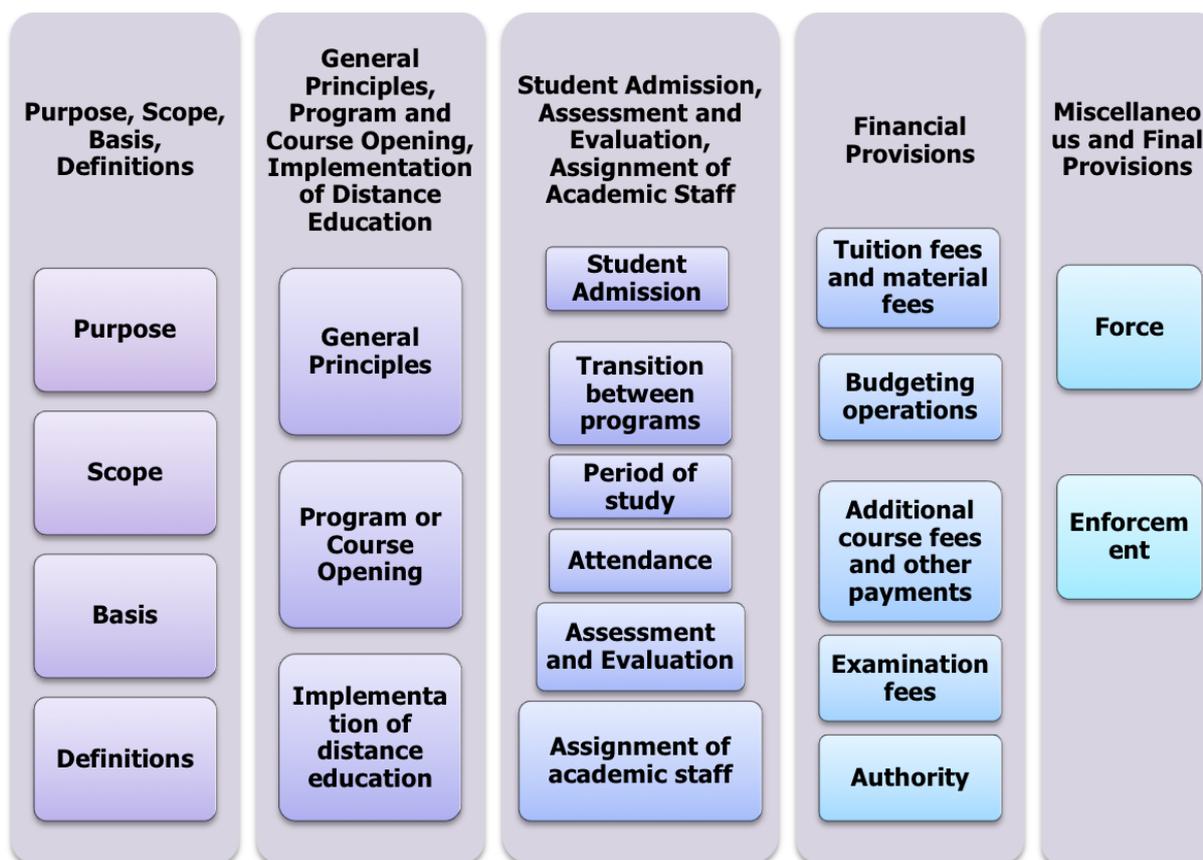
Figure 1. Issues Covered by the Procedures and Principles Regarding Distance Education in Higher Education Institutions

Purpose, Scope, Basis and Definitions

In the first section of the Procedures and Principles, the purpose, scope, and legal provisions of the Procedures and Principles are stated. Moreover, the expressions of the coefficients mentioned in the Procedures and Principles (the unit student coefficient, the program student coefficient, and the course student coefficient), the payment information to be determined and taken into consideration in payments (material fee, tuition fee), and definitions of the unit, board, and commissions are made.

General Principles, Program and Course Opening, Implementation of Distance Education

a. *General Principles:* In this section, the basic principles of distance education practices are discussed.

b. *Program or course opening:* Under this heading, criteria that will be taken into consideration when opening a program or course in distance education were determined and discussed. The dates of the submission of proposals for program and course opening to the Council of Higher Education, quotas, criteria for academic cooperation between higher education institutions, what part of a course can be carried out distantly, and information on the execution of the promotion activities of a distance course or program are given in this section.

c. *Implementation of Distance Education:* The criteria for branching courses taught distantly are presented in this section. The number of students in each branch according to the program level and the maximum number of branches that faculty members can manage were presented.

Student Admission, Assessment and Evaluation, Assignment of Academic Staff

a. *Student Admission:* The criteria for procedures of taking courses in distance education are explained in this section.

b. *Transition between programs:* The regulation governing the transition between distance education programs is specified in this section.

c. *Period of study:* The article of the law to which the periods of study in distance education programs are subject is stated under this heading.

d. *Compulsory attendance:* The forms of determining and announcing activities that require compulsory attendance in distance education programs are mentioned in this section.

e. *Assessment and Evaluation:* The criteria for conducting assessment and evaluation activities in distance education programs (face-to-face-electronic, supervised-unsupervised), methods (oral examination, performance, project, thesis, portfolio), and the effect ratio of activities on the overall success are determined under this heading.

f. *Assignment of Academic Staff:* Which institution will decide on the assignment of academic staff was stated in this section.

Financial Provisions

a. *Tuition fees and material fees:* The principles of determining material fees are mentioned under this heading.

b. *Budgeting operations:* The criteria for fees to be charged to students are mentioned in this section.

c. *Additional course fees and other payments:* The issues taken into consideration while calculating additional course fees in distance education, payment methods, and the upper limit determined for an additional course fee and additional course hour, and the maximum number of courses that a faculty member can take are stated in this section.

d. *Examination fees:* The criteria taken into consideration in the payment of examination fees are discussed and expressed in this section.

e. *Authority:* The authority for the sub-arrangements to be made by the boards of higher education institutions, provided that they are not contrary to the mentioned Procedures and Principles, is stated in this section.

Miscellaneous and Final Provisions

In this section, the date of the entry into force of the Procedures and Principles regarding Distance Education in Higher Education Institutions and executive authority are mentioned.

Other Services

In the final section of the Procedures and Principles regarding Distance Education in Higher Education Institutions, calculation criteria were established by adding scales related to the payments to be made in return for duties in the central examination and other services. It is observed that the Procedures and Principles regarding Distance Education in Higher Education Institutions cover areas in which distance education programs can be opened in higher education institutions, courses to be given through distance education and their credits, the preparation of course materials, the way of conducting examinations, protocols to be made for this purpose between higher education institutions, payments to be made, and other issues related to distance education.

All structural and functional issues related to distance education activities in higher education are regulated centrally by the Council of Higher Education (YOK) (Simsek, 2007). Therefore, the effect of central regulations on distance education is more significant as well as in all areas because all amendments and arrangements that are made centrally directly affect all parts of the system. These Procedures and Principles

ensure standardization at the point of implementation and conducting activities for distance education centers and higher education institutions to which they are affiliated. By eliminating differences in application between distance education centers in different universities, the scope of applications has become clear, and a framework has been formed. Despite all these positive developments, it draws attention that the current amendments to the mentioned Procedures and Principles are not sufficient at the application dimension, and there are some expectations. Indeed, at a workshop organized by Anadolu University in 2015 and attended by open and distance education institutions, the presence of financial and legislative problems was mentioned. It was emphasized that the most important one of these problems was that the existing procedures and principles forced to follow a standard teaching strategy and did not support creative designs (HEC, 2015).

This study's goal is to reveal amendments to the Procedures and Principles regarding Distance Education, areas affected by these amendments, problems, and expectations. In line with the aim of the study, answers to the following questions were sought:

1. What are the amendments to the Procedures and Principles regarding Distance Education in Higher Education Institutions, and the areas affected by them?

2. What are the problems and expectations related to the Procedures and Principles regarding Distance Education in Higher Education Institutions?
    a. What are the problems and expectations at the system level?
    b. What are the problems and expectations at the program level?
    c. What are the problems and expectations at the course level?

It is essential to reveal amendments to the Procedures and Principles and the current problems and expectations in terms of determining what the requirements for distance education activities are and what needs to be expressed more clearly. Nevertheless, central regulations on distance education (limitation, flexibility, or guidance) are very important since they reveal in detail the reflections of the system, program, course, and even in-class activities on the design process in distance education. Furthermore, the determination of how practitioners are affected by these regulations directly based on their experiences provides a holistic view on different levels of distance education. It is estimated that the results of this study will shed light on and guide the central regulations related to distance education.

METHOD

The qualitative research approach was adopted in the study. The aim of the qualitative research approach is to examine data in depth and to reveal relationships between data (Yildirim and Simsek, 2006). In this study, document review was used as a data collection method for the first research question. Document review is the analysis of written materials that contain information about the phenomena intended to be investigated (Yildirim and Simsek, 2006). To find an answer to the second research question, the interview data collection method was used, and a semi-structured interview form was created.

Participants

For the first research question, two published copies of the Procedures and Principles regarding Distance Education in Higher Education Institutions were used. For the second research question, eight people who had served for at least three years as administrators in distance education centers of universities in Turkey and who were selected by the criterion sampling method among purposive sampling methods were interviewed. The administrators of institutions providing distance education constituted the study group since they were individuals who had a grasp of the policies for distance education practices and were directly affected by these policies. Within the scope of this study, having served for at least three years was accepted as a criterion. The administration experience of the study group in distance education ranged from 3 to 8 years. The data collection process was terminated when it was realized that the data reached saturation with the statements of eight people.

The duties performed by the participants within distance education centers, their terms of duty, and their ages are shown in Table 1.

Table 1. Information on the Study Group

Participant No	Duty	Term of Duty (years)	Age
P1	Director	4	41
P2	Deputy Director	3 (Currently)	40
P3	Director	8 (Currently)	38
P4	Director	4 (Currently)	42
P5	Director	7 (Currently)	34
P6	Deputy Director	7	32
P7	Director	4	34
P8	Director	3 (Currently)	34

The participants in the study group ensured that a different number of programs at different levels were conducted through distance education within the distance education centers of their universities. Table 2 presents information on the programs conducted in the distance education centers of the study group.

Table 2. Program Information of the Study Group

Participant No	Program Information	Number of Programs
P1	On-Campus Common Compulsory Courses	
P2	Master's Degree	1
	Associate Degree	1
	On-Campus Common Compulsory Courses	
P3	Master's Degree	4
	Bachelor's Degree Completion	1
	Associate Degree	6
	On-Campus Common Compulsory Courses	
P4	On-Campus Common Compulsory Courses	
P5	Certificate Program	3
	Bachelor's Degree Completion	1
	On-Campus Common Compulsory Courses	
P6	Master's Degree	6
	Bachelor's Degree Completion	4
	On-Campus Common Compulsory Courses	
P7	Master's Degree	6
	Bachelor's Degree Completion	4
	On-Campus Common Compulsory Courses	
P8	On-Campus Common Compulsory Courses	

As is seen in Table 2, on-campus common courses are conducted in all distance education centers where the study group participants work, and a different number of master's degree, bachelor's degree completion, and associate degree programs are carried out in some of them. There is also a certificate program in a distance education center where one participant works.

Validity and Reliability

Confirmations were received from the participants, and opinions were obtained from two different experts to ensure the validity and reliability of the study. Some resulting differences were discussed among the experts, and a decision was taken on final codes, categories, and themes. Cross-check was performed by two researchers to check whether the codes adequately reflected the issue examined. Some of the data were

re-analyzed by the same researcher after approximately a year to ensure the reliability of the codes generated during the data analysis process. The internal consistency of the two coding processes was found to be .85. This result can be regarded as a piece of evidence for the required level of reliability.

Data Collection

For the first research question in the study, two published copies of the Procedures and Principles regarding Distance Education in Higher Education Institutions were examined. A semi-structured interview form was created for the second research question. Experts in the field of education and evaluation were consulted for the final version of the questionnaire, and then the form was finalized.

Data Analysis

In this study designed according to the qualitative research approach, the data on the first research question were analyzed by document review. Document analysis is a method of analysis in which written materials (books, journals, newspapers, e-content documents) are examined (Miles and Huberman, 1994).

The data on the second research question in the study were analyzed by content analysis. Content analysis is bringing together similar data within the framework of certain concepts and themes and arranging and interpreting these data in a way that the reader can understand (Miles and Huberman, 1994). In this context, interviews conducted with the participants within the scope of this study were recorded by a voice recorder, and all data obtained were transcribed. The research results were obtained by analyzing the data of documents and interviews.

FINDINGS

In this study, it was tried to reveal amendments to the Procedures and Principles regarding Distance Education in Higher Education Institutions, practices affected by the amendments, and expectations at the system, program, and course levels in the Procedures and Principles regarding Distance Education in Higher Education Institutions. The results obtained in accordance with the research questions are presented below, respectively.

Amendments to the Procedures and Principles regarding Distance Education in Higher Education Institutions and the affected areas

After the Council of Higher Education issued the Procedures and Principles regarding Distance Education in Higher Education Institutions in 2013, amendments to the Procedures and Principles were made on 20.02.2014. Some of these amendments were as follows: making additions to the article content, reducing issues in the article content, and changing the article content. Along with these amendments, changes were also made in distance education practices. In Table 3, amendments to the Procedures and Principles regarding Distance Education in Higher Education Institutions are mentioned.

It is known that some amendments were made to the Procedures and Principles regarding Distance Education in Higher Education Institutions in 2014. It is understood that these amendments were mainly in the articles under the headings of program and course opening, branching, assignment, and student admission. It is also noteworthy that there are expression additions and the removal of expressions in some articles, and extensive changes in expressions in the others. In Table 3, the articles with addition, removal, and change in the Procedures and Principles regarding Distance Education in Higher Education Institutions, information on the change status, and the articles amended in the content of the article, the type of amendment, and the content of the amended article are clearly stated.

Table 3. Amendments to the Procedures and Principles regarding Distance Education in Higher Education Institutions

Article Scope	Service	Article No.	Addition / Removal / Change Status	The Content of the Added / Removed/ Changed Article
General Principles, Program and Course Opening, Implementation of Distance Education		Article 6/1(F)	Addition	Assigned (outside the province, short-long term) lecturers can give courses from the place to which they are assigned.
Financial Provisions		Article 16/1	Removal	The number of students enrolled in a course should be taken into account in the payments to be made to teaching staff.
			Addition	*"If the amount of payment to be distributed in semester payments is higher than the distributable amount of the current semester in the related unit account, all payments should be reduced in proportion to the ratio of the total distributable payments to the amount to be distributed".*
		Article 16 / 2(A)	-	-
		Article 17/2	Removal	The statement that the payment amount for the coordinator and assistants in examinations attended by fewer than five thousand students should not exceed fifty percent of the maximum amount was removed.
The Scale of Payments to be Made in Return for Other Services	Unit Coordinator	Service Definition and Description	Addition	The payment rate is determined by the board of directors of the university upon the proposal of the distance education unit according to the service quality assessment principles to be determined by the board of directors of the university.
		Equivalent of the Service Work Load	Change	When a payment is made, a maximum of 3 hours is taken as a basis for each course instead of 2 hours per month.
		Calculation of the Monthly Payment Hourly Basis	Change	When calculating the hourly basis of the monthly payment, coefficients are multiplied by 3 instead of 2.
	Program Coordinator	Service Definition and Description	Addition	The payment rate is determined by the board of directors of the university upon the proposal of the distance education unit according to the service quality assessment principles to be determined by the board of directors of the university.
		Equivalent of the Service Work Load	Change	When a payment is made, 4 hours are taken as a basis for each course instead of 3 hours per month.
		Calculation of the Monthly Payment Hourly Basis	Change	When calculating the hourly basis of the monthly payment, coefficients are multiplied by 3 instead of 2.
	Publication Commission	Service Definition and Description	-	-
		Equivalent of the Service Work Load	Change	When a payment is made, 2 hours are taken as a basis for each course instead of 1 hour per month.
		Calculation of the Monthly Payment Hourly Basis	Change	When calculating the hourly basis of the monthly payment, coefficients are multiplied by 2 instead of 1.

Category	Service	Aspect	Type	Description
The Scale of Payments to be Made in Return for Other Services	Educational Scenario Design	Service Definition and Description	-	-
		Equivalent of the Service Work Load	Change	Two hours instead of 1 hour are taken as a basis for each interactive scenario (for 5 nominal pages).
		Calculation of the Monthly Payment Hourly Basis	Change	The nominal number is multiplied by 2 instead of 1 in scenario design.
	Development of Written and Visual Education/Teaching Materials	Service Definition and Description	-	-
		Equivalent of the Service Work Load	Change	Two hours instead of 1 are taken as a basis for 5 nominal pages of the developed written and visual education and teaching material.
		Calculation of the Monthly Payment Hourly Basis	Change	Two hours instead of 1 hour are taken as a basis for written and visual education and teaching material
	Supervision of Written and Visual Education/Teaching Materials	Service Definition and Description	-	-
		Equivalent of the Service Work Load	Change	The number of pages based on 1 hour is reduced from 40 to 30 in the supervised written and visual education and teaching material.
		Calculation of the Monthly Payment Hourly Basis	Change	The number of the approved nominal pages after supervision is divided into 30 instead of 40.
	Course Management	Service Definition and Description	Change	Virtual course management payments are calculated over the total course credit conducted per month instead of the total virtual course hours per month.
		Equivalent of the Service Work Load	Change	One hour is taken as a basis for every 7 credits instead of every 10 hours.
		Calculation of the Monthly Payment Hourly Basis	Change	Virtual course management payments are calculated over the total course credit conducted per month instead of the total virtual course hours per month.
	Course Coordination/Supervision	Service Definition and Description	Addition	Virtual course coordination and supervision payments are calculated over the total course credit per month instead of the total virtual course hours per month
		Equivalent of the Service Work Load	Change	One hour is taken as a basis for every 7 credits instead of every 10 hours.
		Calculation of the Monthly Payment Hourly Basis	Change	Virtual course coordination and supervision payments are calculated over the total course credit per month instead of the total virtual course hours per month.
	Assessment and Evaluation Question Bank Preparation	Service Definition and Description	Addition	-
		Equivalent of the Service Work Load	Change	One hour is taken as a basis for 2 original questions instead of the 3 original questions accepted
		Calculation of the Monthly Payment Hourly Basis	Change	The number of the accepted questions (20) is calculated by dividing into 2 instead of 3.

As a result of the analysis, it is observed that there are additions, removals, and complete changes in some articles of the Procedures and Principles regarding Distance Education in Higher Education Institutions. It is understood that amendments are related to the conduct of courses in assignments outside the province, the calculation of payments made to lecturers, issues in payments made to coordinators and their assistants, and change in the coefficient that is taken as a basis in the calculation of payments to persons assigned in distance education.

Problems and Expectations for the Procedures and Principles Regarding Distance Education

The procedures and principles regarding distance education have ensured the conduct of distance education practices on a basis. The existence of the procedures and principles has established certain standards, particularly in terms of system structuring and conducting programs and course activities. Analyses indicate that these standards have not been sufficient to fill in some gaps in distance education practices.

As a result of the studies conducted, it is observed that there are problems and expectations about the Procedures and Principles regarding Distance Education in Higher Education Institutions at the system, program, and course levels. Figure 2 presents problems and expectations for the Procedures and Principles, which were revealed as a result of the interviews conducted within the scope of the study.
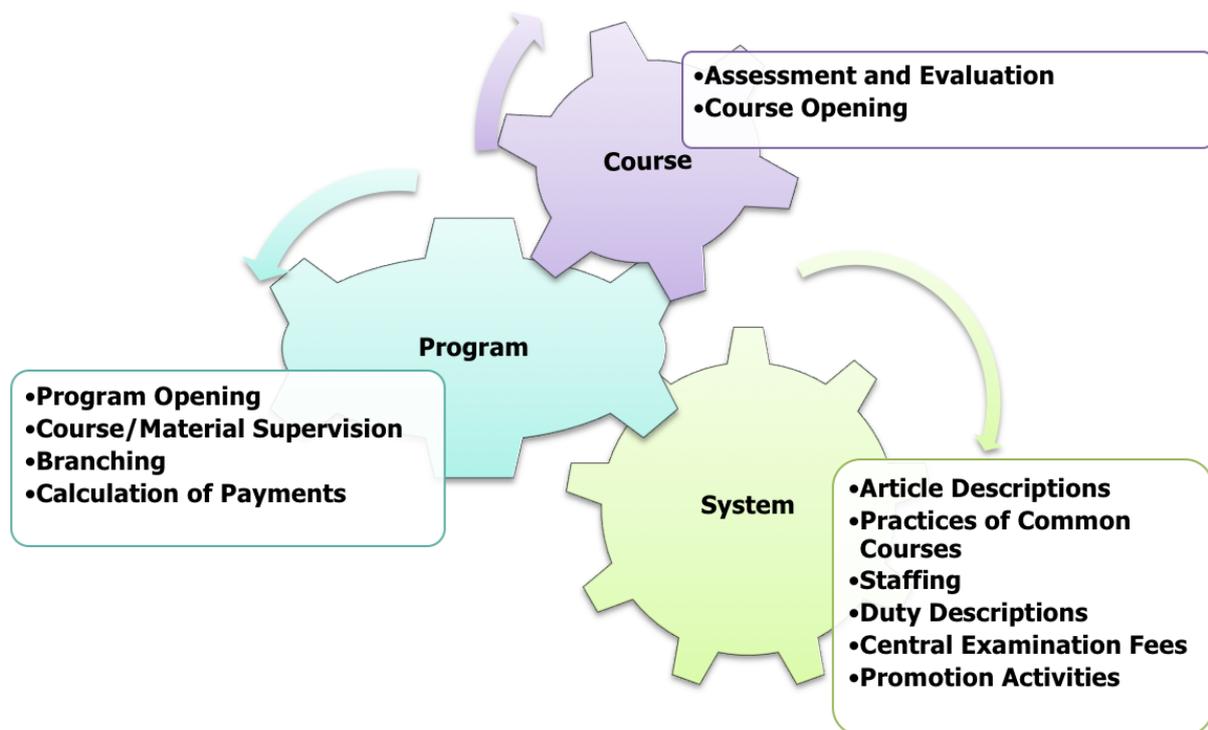
Figure 2. Problems and Expectations for the Procedures and Principles Regarding Distance Education in Higher Education Institutions

Problems and Expectations at the System Level

The interviews conducted within the scope of the study show that the presence of some points that should be developed at the system level is remarkable. These points are understood to be mainly expectations for explicit expressions and expectations for descriptive expressions of specific issues. Expectations are observed to be primarily for clarifying statements about staffing, central examination fees, and promoting and dissemination activities of distance education.

Expectations for Uncertainties in the Articles of the Procedures and Principles

All distance education centers in Turkey carry out their practices according to the Procedures and Principles regarding Distance Education in Higher Education Institutions. Although the board of directors has taken decisions and established implementation principles in some special cases, differences experienced in implementation leave distance education centers in a problematic situation in terms of operation. Problems and expectations were stated for expressions in the articles of the Procedures and Principles regarding Distance Education in Higher Education Institutions to contain more explicit judgments and to be expressed in such a way that will not cause confusion. Statements of a few participants regarding this situation are presented below:

> *"Assessment and evaluation are mentioned, but it will be better if there is also clarity there, regarding what will be included in the evaluation. It's not certain. Teachers say, let's make a test and pass it. Everything should be explained in more detail." (P1)*

> *"The duties and authorities of distance education centers and other units should obviously be expressed more clearly in the procedures and principles. There are implementation differences." (P2)*

> *"Who should be in the publication commission, what they should do, what a supervisor will do should be stated more clearly." (P3)*

> *"The procedures and principles are our source of defense. If there is a discussion, we rely on an article if it is open and clear, but it becomes uncertain what we will do on issues that are not included. The articles in the procedures and principles should be open and clearly stated." (P4)*

> *"It is said "original," but what does it mean "original"? Will it be sufficient to add references? These should be certain." (P6)*

> *"There is no clarity about opening a program. There must be clear statements regarding this. Limitations in opening a program, a department should be eliminated." (P7)*

> *"It is not clear which items for distance education programs apply to common courses and which do not." (P8)*

Considering the participant statements, it is observed that the fact that the articles in the procedures and principles contain ambiguous statements makes the functioning of distance education more difficult. In particular, there are problems and expectations for clarifying uncertainties experienced in terms of the duty and authority definitions, assessment and evaluation practices, and payments to be made to faculty members, and statements open to interpretation.

Expectations for the Absence of Articles Specific to the Common Compulsory Courses Taught through Distance Education

The common compulsory courses taught at universities to which distance education centers are affiliated are taught through distance education. However, it was determined that the articles in the current procedures and principles do not cover some common compulsory courses. The lack of articles specific to common compulsory courses in the procedures and principles was stated by the participants as a severe problem for distance education centers, especially conducting only common compulsory courses. There is a need for articles supported by clear statements, especially on issues of virtual courses, exam preparations, content development, and payments to be made to lecturers and examiners. Statements of a few participants regarding this situation are as follows:

> *"Distance education first starts with common courses. Teachers can't keep up. Classrooms are not enough. They say, let's teach it through distance education, but it is not clear in the regulation according to which we will make a payment, and some distance education centers take the initiative. We could not pay teachers when we taught virtual courses." (P4)*

> *"We could not pay teachers when we gave live lessons for common courses.*
> *The motivation of teachers was also decreasing. We could not manage the system." (P6)*
>
> *"Central examination is held in exams of common courses. However, officers are not paid. There were those who asked why they were not paid." (P7)*
>
> *"There are no special articles for common courses. Teachers who teach common courses experience problems in getting a payment, they demand payment, but they cannot be paid according to the legislation. Even those who take part in the central examination of common courses demand payment, but they cannot be paid." (P8)*

When the participant statements are examined, it is observed that there is a need for articles about virtual classes of common courses, exam preparations, content development, and payments to be made to lecturers and examiners in the procedures and principles.

Expectations for the Lack of Staffing Authority

Distance education centers, which have the status of other research centers under the current conditions, face some difficulties while undertaking this role. Although distance education centers are institutions that provide support to faculties and institutes in the conduct of virtual classes, the creation, development, and uploading of course materials into the system, and conducting assessment and evaluation activities, they do not have their staffing mechanism. While carrying out their duties, distance education centers employ staff from other departments. In the case of the insufficiency of personnel, there may be disruptions and problems in the specified working processes. The statements of a few participants concerning this situation are presented below:

> *"All our staff members work as employees from other departments. We may have to do a lot of work with very few people."(P5)*
>
> *"There is no technical staff working permanently with us since the staff in centers is assigned. We are doing this job even with deputy directors. For example, our staff normally work in the Computer Sciences Research and Application Center. We call them when there is a job." (P6)*
>
> *"We demand personnel recruitment. The center has no authority to recruit personnel. You need personnel concerning this, but you cannot put an advertisement."(P7)*
>
> *"Non-expert people are assigned to the unit so that they would learn the work, and they are overloaded."(P8)*

When the statements of the participants are examined, the lack of the staffing authority of distance education centers manifests itself as an inadequacy, especially in the increase in workload and specialization of the staff.

Expectations for not Clear Duty Descriptions

Distance education centers carry out their practices in cooperation with faculties/institutes/vocational high schools at universities to which they are affiliated. This cooperation is provided, especially at the stages of the effective conduct of virtual classes, the development of course contents, and conducting exams. However, the unclear distribution of tasks in the joint working stage also leads to problems in cooperation. The participant statements concerning this situation are as follows:

> *"It is not clear what distance education will do and who will do what job. It will be very good if these are defined in the procedures and principles." (P3)*
>
> *"We take on everything while conducting programs. However, this time, we are unable to solve the problems." (P8)*

Expectations for the Absence of Articles about Central Examination Payments in Common Courses

The distance education staff coordinates the teaching and examination of bachelor's degree completion and postgraduate programs carried out by distance education, as well as tasks related to common compulsory courses in vocational high schools and faculties in the districts at Ataturk University. Lecturers are supported in the teaching activities of courses, while assessment and evaluation activities are conducted entirely by distance education centers. This causes the workload of the personnel at distance education centers to exceed the reasonable limits. Despite these situations, the preparation of common course examinations is not included in the scope of payments in central examinations. Statements of a few participants concerning this situation are presented below:

> *"Central examination is held in exams of common courses. However, officers are not paid. There were those who asked why they were not paid." (P1)*

> *"The procedures and principles do not cover common courses. There is a need for updating. We are making exam preparations, but we cannot pay a penny." (P2)*

> *"We don't make payments in common courses, anyway." (P3)*

> *"We held the central examination of common courses. However, we could not pay. It is usual for them. Consequently, the expectation emerges." (P8)*

It is observed that the scale of payments given in Appendix-1 of the Procedures and Principles is not taken into consideration in the payment of examination fees of common courses carried out within distance education centers. It is stated that this situation constitutes a problem for the distance education center personnel who spend overtime for this.

Expectations for the Low Perception of Distance Education

The instructor of a course taught through distance education provides the content of the course and exam questions or conducts virtual classes. In the Procedures and Principles regarding Distance Education in Higher Institutions, criteria that will change the perceptions of faculty members of distance education or will provide the widespread of distance education are not mentioned. Although there is guidance, there are also shortcomings. The statements of a few participants concerning this situation are presented below:

> *"There are teachers who are not very willing to conduct a distance education course. We are trying to encourage them by our own means, to the extent it is sufficient …" (P1)*

> *"The procedures and principles should pave the way for initiatives to change the perception of distance education." (P3)*

> *"Lecturers do not adopt distance education. We tried to convince teachers. We gave a seminar. Can't something be done with this?" (P5)*

> *"The motivation of teachers towards distance education is really low …" (P8)*

When the participant statements are taken into consideration, it is observed that the transition of faculty members to distance education is not at the desired level. There is a need for mechanisms that will support the skills of faculty members necessary for distance education.

Problems and Expectations at the Program Level

Problems and expectations in the program dimension are observed to be concentrated in the fields of program opening, content supervision, and determining supervisors, branching, and payment calculations.

Expectations for Difficulties Aat the Stage of Program Opening

There are some requirements for opening a program that is planned to be conducted through distance education. When a request is made to the Council of Higher Education for a program to be taught through distance education, information should be provided about the technical infrastructure facilities of a distance education center, the number of staff, and the equipment to be used during the execution of the program. However, some difficulties are experienced at this point. If there is a lack of technical infrastructure and staff within the center, the Council of Higher Education does not approve of opening a program. However, the university rectorate has an approach that the technical infrastructure and personnel support will be provided in case of opening new programs. The statements of a few participants regarding this situation are as follows:

> *"The Council of Higher Education does not accept all content when you want to open a program. SCORM says it should be compatible, interactive. However, at the moment, we cannot get staff to ensure these in a technical sense. The existing ones work in other units." (P5)*

> *"Even though we make a request to the Council of Higher Education for opening a program, the lack of personnel comes to the fore. The rectorate says that the department should be opened so that it can provide the staff. The Council of Higher Education says that you cannot open a department without interactive, SCORM-based content, and technical infrastructure. Since we have few people now, we cannot open a new program." (P6)*

When the participant statements are examined, it is understood that there are procedural barriers that distance education centers experience in program opening. Furthermore, distance education centers, which carry out their studies with limited opportunities and very few personnel, have difficulties in overcoming this situation.

Expectations for the Control of Course Contents

For each course taught through distance education, different types (presentations, visual materials, text-based materials, etc.) of course materials are prepared by faculty members who will teach the course. These prepared materials are examined by supervisors in terms of their compliance with copyright and the methods of preparation of teaching material in the Procedures and Principles. The interviews demonstrated that there were problems at the point of supervising and reporting of course materials by supervisors. Moreover, it was stated that calculating and pricing the number of nominal pages of materials was a very time-consuming and complex process. The statements of a few participants concerning this situation are presented below:

> *"The roles of the supervisor are stuck in the air in that respect." (P4)*

> *"Supervisors only count pages, and the item is also not clear. How visuals, tables, and graphs in reading texts would be calculated?" (P6)*

> *"We cannot go beyond calculating the number of pages because supervisors do not have a command of everything." (P7)*

When the statements of the participants are examined, it is observed that supervisors who control course materials experience some problems while performing their duties. These problems are mainly caused by the failure to specify the supervision criteria in an open and clear way. At the same time, it is understood that supervisors perform formal control rather than content control when examining materials of a course in which they are not domain experts.

Expectations for Branching

One of the remarkable practices related to central regulations is the branching and the limitation of branch quotas. Program branching and branch quotas in paragraph 1 of article 7 of the procedures and principles are specified in fixed numbers. However, not using explicit expressions throughout the article makes the application more difficult. The analysis of the statements of administrators about their experiences indicated that they did not provide sufficient guidance on branching, they were unable to act flexibly due to a scaring

limitation, they could not decide on how to reflect this situation to different distance education practices such as common compulsory courses, and they had difficulties in it. Statements of a few participants regarding this situation are as follows:

> *"We cannot decide whether to open a branch for ten people or add them to another branch." (P1)*

> *"When we open a new branch, it is necessary to assign a teacher to that branch. However, a teacher cannot attend classes in more than two branches at the same time. We think where to place a small number of students." (P2)*

> *"Difficulties are inevitably experienced in branching. For example, 150 people are assigned to each branch in an undergraduate program. If the number exceeds 150 people, a second branch is opened. If 630 people take the course, a new branch should be opened, and new teachers should be assigned for 30 people. Sometimes, there is no teacher in the department. Can't be these numbers made more flexible?"(P7)*

> *"There is no statement regarding how many people can be in a branch of a course for common courses." (P8)*

In general, there are problems due to the lack of clear items related to branching. The branch quotas specified by exact numbers are observed to bring about some problems in case of the presence of more than one branch. Especially when a new branch needs to be opened since the branch quota is filled, there appears to be a need for guidance on how to apply quotas, which seems to cause severe instability and burden on practitioners. Furthermore, different interpretations of distance education administrators for branching on a personal basis prevent the formation of standard practices expected by the central regulation. Nevertheless, the fact that branching practices are directly related to pricing makes administrators feel more stressed.

Expectations for Payment Calculations

In distance education, the unit student coefficient is included in calculations when a payment is made to a unit coordinator, the program student coefficient is included in calculations when a payment is made to a program coordinator, and the course student coefficient is included in calculations when a payment is made to a lecturer teaching the course. The *unit student coefficient* refers to a number found by dividing the current number of students by the opened quota to be taken as a basis for calculating payments to be made to unit coordinators assigned in distance education diploma programs opened in the relevant units continuing education. The *program student coefficient* is a number found by dividing the current number of students by the opened quota to be taken as a basis in calculating payments to be made to program coordinators assigned in distance education diploma programs. The *course student coefficient* refers to a number found by dividing the number of students enrolled in the course by the opened quota to be taken as a basis for calculating payments to be made to lecturers in courses given through distance education, except courses that are decided by the Senate to be given only through distance education. When the quota is not filled to full capacity, i.e. when there is no student enrollment at the quota rate opened for a program, there is a decrease in payments. However, for each course opened, planning is done, and courses are conducted without considering the number of students. The statements of a few participants regarding this situation are presented below:

> *"When the quota is not filled for all departments in distance education (when the course student coefficient decreases), the payment made to teachers decreases. Now, teachers prepare the lesson, but when the payment is so low, how efficiently they can spend a 3-hour class." (P1)*

> *"When an equal payment is made to everyone according to the course student coefficient, departments with few students are not able to pay with their incomes. Therefore, they become unable to pay." (P2)*

> *"Due to the course student coefficient, some teachers in distance education received the payment even lower than the daytime wage. There is obviously a problem in the course student coefficient." (P5)*

> *"There is an unjust treatment concerning pricing for common courses …" (P8)*

When the participant statements are examined, it is observed that faculty members who make all the preparations for a course and conduct the course suffer financially when the course student coefficient is taken into consideration in payments. It is also stated that this situation may cause reluctance to conduct a distance course among faculty members in the long term.

Problems and Expectations at the Course Level

There are also problems and expectations for the development of the procedures and principles at the course level. In the analysis, it is understood that these problems and expectations are related to assessment and evaluation activities and course opening procedures.

Expectations for the Failure to Make Payments for Alternative Assessment and Evaluation Activities

Payments for examinations conducted through distance education are mentioned in the Procedures and Principles. The environment (face-to-face-online) and observation (supervised-unsupervised) statuses are taken into account in examination payments. However, there are no statements regarding the scope, type, and pricing of alternative assessment and evaluation activities. The statements of a few participants regarding this situation are as follows:

> *"Although we want to support courses with different activities, unfortunately, it becomes a dream." (P1)*

> *"We want some different types of questions (open-ended questions, assignments, etc.) to be asked in exams. However, teachers ask how they will be paid for this. We can't answer this. It just stays as it is." (P5)*

> *"Multiple-choice questions are asked in exams. It is easier for teachers to prepare them. It is time-consuming to give and evaluate assignments. It is said that the time spent is taken as a basis in the Procedures and Principles, but nobody knows how much the hourly rate will be." (P6)*

When the participant statements are examined, it is observed that there is uncertainty about the time spent on alternative assessment and evaluation activities in distance education or how the actual contribution will be charged.

Activities for Course Opening

In the current situation, boards of higher education institutions can decide on faculty members who will give courses through distance education. However, faculty members cannot request to open a course. Therefore, there is a need for specifying the criteria for opening a distance course and application conditions for a faculty member who wants to conduct a distance course in the Procedures and Principles regarding Distance Education in Higher Education Institutions. If a faculty member wants to teach a course taught face-to-face through distance education, there is a need for informing about this. Statements of a few participants regarding this situation are presented below:

> *"For example, a teacher wants to know what he will do, what article he will adhere to when he wants to teach a postgraduate course distantly." (P6)*

> *"There are teachers who want to conduct a course through distance education. However, we don't know which path to follow on this subject." (P7)*

There is obviously a need for a road map in the Procedures and Principles on this subject for faculty members who want to conduct a course through distance education.

As a result, there are periodic amendments to the legislation developed for distance education practices. However, these legislative amendments do not meet the expectations of practitioners at some points. In

addition to the points that need to be developed, especially at the system level, a need for some improvements in program applications and course execution procedures draws attention. At the system level, mainly problems and expectations for the elimination of uncertainties in article definitions, special expressions for common courses, staffing authority, exam payments, and promotion activities come to the forefront. At the program level, there are problems and expectations for opening new programs, course/material supervision, branching, and payment calculations. At the course level, there are expectations for the mechanisms that encourage alternative assessment and evaluation activities and the criteria for course opening.

DISCUSSION AND CONCLUSION

The Procedures and Principles regarding Distance Education in Higher Education Institutions entered into force in February 2013 for the first time, and some amendments were made to them afterward. The preparation of the Procedures and Principles has become an essential step for the implementation of distance education in higher education institutions in Turkey. This study's goal is to reveal amendments to the Procedures and Principles regarding Distance Education, areas affected by these amendments, and to reveal problems and expectations. It is observed that there are periodic amendments to the legislation developed for distance education practices.

However, these legislative amendments do not meet the expectations of practitioners at a number of points. While it is desired to have qualified education with certain standards in distance education, limitations arising from political regulations cause administrators to take fewer risks as a result of having difficulty in decision-making, which causes the failure to open certain programs at all and the inability to conduct certain programs at the desired level so that new steps that can reveal the potential of distance education cannot be taken. Therefore, some expectations of distance education practitioners for distance education legislation appear. In addition to the points that need to be developed, especially at the system level, the need for some improvements in program applications and course execution procedures draws attention.

Within the scope of the study, expectations, especially for the elimination of uncertainties in article definitions, special expressions of common courses, staffing authority, examination payments, and promotion activities, come to the forefront at the system level. In addition to faculty members, administrative staff, teaching staff (research assistants, specialists, lecturers, teaching assistants) are also involved in distance education. In the study, the necessity of arrangements in assignment procedures performed to conduct distance education was stated. Gurer, Tekinarslan, and Yavuzalp (2016) emphasize that regulations on distance education practices should be legally clear. While carrying out their duties, distance education centers employ staff from other departments. In the case of the insufficiency of personnel, there may be disruptions and problems in the specified working processes. Dogan (2014) emphasizes that research assistants working in distance education centers related to the assignment from academic units feel psychological pressure and are not efficient.

Li, Zhang, Yu, and Chen (2014) also emphasized the importance of establishing legal duties and responsibilities in distance education institutions. It was especially noted that administrative staff, teaching staff, and other assigned employees who support faculty members and bear the significant burden of distance education do not receive compensation for their labor both financially and morally. It was also stated that there is a need for a duty description in which a person assigned to coordinating the technical design and execution of a program will be named the "administrative and technical coordinator." Cho and Berge (2002) argue that sufficient rewards and incentives should be given to everyone working for a distance education program. Furthermore, it is suggested that a detailed guide should be prepared for employees, and their opinions should be obtained on determining the additional working hours to normal working periods. Isman (2011) emphasizes that distance education institutions must be open to innovation and change to be successful. Otherwise, organizational problems will inevitably emerge, and the program will turn into a slow and challenging process.

At the program level, there are expectations for opening new programs, course/material supervision, branching, and payment calculations. It was also stated that calculating and pricing the number of nominal pages of materials was a very time-consuming and complex process. It was emphasized that although lecturers prepare for a course regardless of the number of students taking the course, the fact that the course student coefficient is taken into account in calculating course payments causes discomfort among lecturers.

Determining payment policies for the distance education activities of faculty members of institutions has become one of the most important problems. Payment policies may have significant effects on the essential points of the learning and teaching process, such as which materials will be used in a course and how active students will be. Moore & Kearsley (2012) state that it can be regarded as part of the work of full-time faculty members, and in some applications, this is more valuable than efforts made for face-to-face students' classes and that additional payment mechanisms can be developed for this. Moore & Kearsley (2012) indicate that developing course materials or designing and conducting a distance education course by faculty members are evaluated in this sense within rewarding mechanisms such as promotion in the position, etc.

At the course level, there are expectations for mechanisms that encourage alternative assessment and evaluation activities and criteria for course opening. Steps should be taken to remove barriers to distance education centers. It is understood that there are procedural barriers that distance education centers experience in program opening. Ozarslan and Ozan (2014) argue that criteria for opening programs in distance education should support flexible models, creativity, innovation, and diversity. Furthermore, course materials of different types (presentation, figure, text, etc.) are prepared by faculty members who will teach courses. These prepared materials are examined by supervisors in terms of their compliance with copyright and the methods of preparing teaching materials in the Procedures and Principles regarding Distance Education. The interviews demonstrated that supervisors experienced some difficulties in supervising and reporting course materials. The determination of supervisors, especially by ignoring the title and subject area expertise, constitutes a problem for healthy supervision.

SUGGESTIONS

The worldwide spread of distance education also increases the importance of distance education policies that appeal to the aim and care about quality. It is necessary to carefully focus on quality assurance with a holistic view by considering all factors affecting distance education to reach broader masses and provide them with effective learning opportunities. Distance education institutions, policymakers, and society should set comparable quality standards and external evaluation mechanisms for distance education in collaboration with a holistic view. Sound strategic planning is necessary to establish a sound technological infrastructure for distance education, to ensure the competence of students and instructors, and to encourage the design and development of qualified teaching activities and materials. The policies designed and implemented should also be examined by administrators of distance education institutions or policymakers after the policy development process (Lin, 2008).

In this study, there are some concrete suggestions for the relevant plans. They are listed below as follows:

- Distance education centers can be transformed into a different structure with its own personnel and assignment.
- The job descriptions of the administrative staff supporting the teaching staff and other assigned staff can be determined with clear statements.
- The mechanisms to encourage the execution of face-to-face courses through distance education can be supported by legislation. For example, distance teaching may contribute in the encouragement and promotion stages.
- Contribution can be made to the pedagogical and androgogical development of faculty members.
- Arrangements can be made in which unit, program, and course student coefficients are not included in payment calculations.
- A new method of preparing nominal pages can be created by classifying materials at the stage of material supervision and payment of copyrights.
- Asynchronous educational activities can be encouraged in distance education. Activities such as answering to students' questions, evaluating assignments, or practices that are available in the current form of the Procedures and Principles regarding Distance Education but that do not have an equivalent in the scale in Appendix-1 can be supported.
- Course credits can be taken into account in the payments of virtual courses.

- In student branching, intervals can be determined instead of net numbers.
- A flexible system, in which new branches can be opened as the number of students participating in virtual courses increases, can be established.

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REFERENCES

Akan, H. (2012). Yuksekogretimde Reform mu, Onarim mi? [Reform or Repair in Higher Education?], Journal of Higher Education and Science, 2 , 24-25

Aydin, C. H. (2008). Uzaktan egitim sureclerinin tasarimi [Design of distance education processes]. Uluslararasi uzaktan egitim Konferansi, Maltepe Universitesi, 17-18 Ekim 2008: Istanbul. Retrieved December 11, 2015 from http://basin.maltepe.edu.tr/node/20

Darab, B., & Montazer, G. A. (2011). An eclectic model for assessing e-learning readiness in the Iranian universities. Computers & Education, 56, 900-910.

Cho, S. K., & Berge, Z. L. (2002). Overcoming barriers to distance training and education. USDLA Journal, 16 (1), 16-34.

Dogan, H. G. B. (2014). Yuksekogretim kurumlarinda web tabanli uzaktan egitim programlari bilesenleri: Uygulamalar ve sorun alanlari [Web-based distance education program components in higher education institutes: Practices and problem areas]. Yayimlanmamis Doktora Tezi (Unpublisted Dissertation]. Hacettepe Universitesi Egitim Bilimleri Enstitusu, Ankara.

Gonzalez, A., & Roig, H. (2018). Regulations for distance education for the Argentine university: Pending advances and challenges. Virtualidad Educacion Y Ciencia, 9(16), 152-157.

Gurer, M. D., Tekinarslan, E., & Yavuzalp, N. (2016). Cevrimici ders veren ogretim elemanlarinin uzaktan egitim hakkindaki gorusleri [Online instructors' views on distance education]. Turkish Online Journal of Qualitative Inquiry, 7(1).

Higher Education Council. (2015). Yuksekogretim Kalite Kurulu Bilgi Notu [Higher Education Quality Council: Annotation].

Kim, S., & Kim, H. (2017). South Korea. In International perspectives on psychotherapy (pp. 139-157). Springer, Cham.

Lee, D., Lim, C., & Lim, J. (2009). Distance education. Seoul: Korea National Open University Press.

Li, S., Zhang J., Yu, C., & Chen, L. (2017). Rethinking distance tutoring in e-learning environments: A study of the priority of roles and competencies of Open University tutors in China. The International Review of Research in Open and Distributed Learning. (In press).

Lim, Y. (2015). Restructuring types of higher education. Sejong: Minstry of Education, Korea

Lin, H. (2008). On the lack of regulations and regulation planning of distance education [J]. Modern Distance Education Research, 3.

Miles, M, B., & Huberman, A. M. (1994). Qualitative data analysis: An expanded sourcebook. (2nd ed). Thousand Oaks, CA: Sage

Moore, M. G., & Kearsley, G. (2011). Distance education: A systems view of online learning. (3rd ed.). Belmont, CA: Wadsworth.

Ozarslan, Y., & Ozan, O. (2014). Yuksekogretimde uzaktan egitim programi acma sorunsali [The problem of opening a distance education program in higher education]. XIX. Turkiye'de Internet Konferansi, 27-29.

Resmi Gazete, 2000, "Enformatik Milli Komitesi Yonetmeligi" [Informatics National Committee Regulation], 1 Mart 2000 tarihli ve 23980 Sayili Resmi Gazete.

Resmi Gazete, 2000, "Enformatik Milli Komitesi Yonetmeligi [Informatics National Committee Regulation]", 1 Mart 2000 tarihli ve 23980 Sayili Resmi Gazete.

Rabinovich, T., Berthon, P., & Fedorenko, I. (2017). Reducing the distance: financial services education in web-extended learning environments. Journal of Financial Services Marketing, 22(3), 126-131.

Sahin, I., & Shelley, M. (2008). Considering students' perceptions: The distance education student satisfaction model. Educational Technology & Society, 11(3), 216–223.

Simsek, H. (2007). Turkey. In J. J. F. Forest & P. G. Altbach (Eds.), International handbook of higher education (reprinted Vol. 2, pp. 1003–1018). Dordrecht: Springer

Tesolin, A., & Tsinakos, A. (2018). Opening real doors: Strategies for using mobile augmented reality to create inclusive distance education for learners with different-abilities. In Mobile and Ubiquitous Learning (pp. 59-80). Springer, Singapore.

YOK. (2014). Yuksekogretim Kurumlarinda Uzaktan Ogretime Iliskin Usul ve Esaslar [Procedures and Principles Regarding Distance Education in Higher Education Institutions], Retrieved December 23, 2019 from yok.gov.tr/Documents/Kurumsal/egitim_ogretim_dairesi/Uzaktan_ogretim/ yuksekogretim_kurumlarinda_uzaktan_ogretime_iliskin_usul_ve_esaslar.pdf

TBS. (2002). Bilgi Toplumuna Dogru, Taslak Rapor, Egitim calisma grubu [Towards the Information Society, Draft Report, Education working group] (S. Korkut, Ed.). Turkiye Bilisim Surasi. 10-12 May 2002. Ankara

Yildirim, A., & Simsek, H. (2006). Sosyal bilimlerde nitel arastirma yontemleri [Qualitative research methods in social scriences] (6. ed.). Ankara: Seckin Yayincilik.

Zawacki-Richter, O., & Qayyum, A. (2019). Brief history of distance higher education. Olaf Zawacki-Richter Adnan Qayyum Editors, 7.

Zhang, J. F., Zheng, S. H., & Yu, D. (2012). Thoughts about legislation of modern long-distance education. Adult Education, 3.

UNDERSTANDING CULTURAL DETERMINANTS OF MOOCs OFFERING: A CROSS-COUNTRY STUDY

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ABSTRACT

Massive Open Online Courses, also known as MOOCs, figure as the main trend in the international educational market in recent years, characterized by the offer of free, open access and global courses. Although many current studies address issues like design, quality and acceptance of these courses, little attention has been given regarding cultural aspects that could influence this global open learning movement. Therefore, the aim of this paper is to investigate cultural determinants of MOOCs offering, through a cross-country analysis. To this end, four cultural factors proposed by Hofstede were considered. Through the multivariate regression analysis, we evaluated the relation between these factors and the number of MOOCs offered in each country. The results show that Individualism presents a significant and positive effect on MOOCs offering. Power Distance, Uncertainty Avoidance and Masculinity dimensions of culture do not present significant effect on MOOCs offering. This means that although individuals from countries with higher rates of Masculinity and lower levels of Uncertainty Avoidance and Power Distance are more likely to attend online courses, universities in these countries are not necessarily the ones offering more MOOCs. The results of the study may be useful to support the implementation of strategies for the diffusion and internationalization of MOOCs.

Keywords: MOOCs, e-learning, culture, distance education, global courses.

INTRODUCTION

In recent years, the paradigm of distance education has changed with the emergence of global open online courses known as MOOCs (Massive Open Online Courses) (Joo, So & Kim, 2018). These courses are part of an open learning movement led by prestigious universities around the world that might be interpreted as a way of democratizing education by the offering of more affordable and accessible learning tools (Joo, So & Kim, 2018).

Generally, MOOCs are offered completely online and are not taken in real time, which provides the students with considerable flexibility in terms of time and space (Freitas, Morgan & Gibson, 2015; Pasha et al., 2016). In most cases, the courses are free of charge or require small fees for the possibility of receiving a certificate (Joo, So & Kim, 2018). Additionally, the courses usually do not require enrollment fees, contributing even more to their popularity (Pasha, Abidi & Ali, 2016).

Due to these characteristics, the MOOC phenomenon has been a common subject in recent studies that address issues like the impact of MOOCs on high education, quality assurance, accreditation, learning assessment, the concept of openness, among other topics (Jacoby, 2014). Several authors have also been focusing on better understand MOOCs users and their behavioral patterns (Alraimi, Zo & Ciganek, 2015; Joo; So & Kim, 2018; Albelbisi & Yusop, 2019; Lu, Wang & Lu, 2019).

MOOCs represent both opportunities and challenges for educators. The courses have the potential to eliminate barriers in the learning process, as consequence of their openness in terms of enrolment, content, design, participation and assessment methods (Zawacki-Richter et al., 2018). However, Sanchez-Gordon and Lujan-Mora (2018) point out that although these courses play a relevant role for the achievement of universal education, their platforms and content are not sufficiently accessible to all students. Another challenge pointed by Despujol, Cataneda and Turro (2018) is how to make this courses self-sustained, especially in a context of economic crisis.

High dropout rates and variations in levels of engagement and motivations among users are also problems that need to be addressed (Park, Jung & Reeves, 2015; Conole, 2015; Littlejohn et al., 2016; Albelbisi & Yusop, 2019). In this sense, Fini (2009) states that in order to better evaluate the effectiveness of MOOCS, it is necessary to further research about the students' profiles, since these aspects can be related to course outcomes and retention.

As pointed by Park, Jung and Reeves (2015, p. 73), "MOOC learners come from different cultures, are of all ages and educational backgrounds and have different motivations". Bozkurt, Yazici and Aydin (2018) emphasize that the cultural diversity promotes social exchange and new ideas, but if it is not well understood it can create problems, such as social conflicts and integration issues. Thus, it is important to analyze the effect of cultural aspects on online education in order to understand how MOOCs can be better applied and widespread in a global context.

Several studies point that cultural factors influence teachers 'preferences (Alfy & Gomes, 2017), students' learning style (Lim, 2004; Heffernan et al, 2010; Krain et al., 2015; Li, 2019), students' performance (Strang, 2010), and the adoption of e-learning and m-learning (Downey et al., 2005, Arpaci, 2015). However, little attention has been given regarding cultural aspects that could influence the MOOCs movement (Liu et al., 2016). Recent literature reviews on MOOCs indicate that cultural issues are one of the least researched and that further analysis is required of questions related to this topic (Bozkurt, Akgun-Ozbek & Zawacki-Richter, 2017; Sanchez-Gordon and Lujan-Mora, 2018; Al-Rahmi et al., 2019). In this context, the current study aims to investigate how cultural aspects influence MOOCs offering.

LITERATURE REVIEW

The term MOOCs (Massive Open Online Courses) was created to describe online classes designed by higher education institutions aimed at large numbers of participants (Shapiro et al., 2017; Kumar &A Al-Samarraie, 2018). Renowned universities are offering MOOCs through platforms such as Udacity, Coursera, Edx and others, while technology companies, like Google, are developing their own platforms to assist in the creation and hosting of MOOCs (Pasha, Abidi & Ali, 2016).

According to Baturay (2015), MOOCs are open, meaning that anyone with access to the Internet can enroll in free open courses, and the content generated through the course is available publicly. Unlike typical higher education programs, MOOCs have no application process and are independent of prior requirements, being also participatory and distributed, which indicates that the participants are encouraged to contribute and share personal contributions (Baturay, 2015; Burd; Smith & Reisman, 2015).

Openness is as central factor for the development of MOOCs and has the potential to be particularly disruptive for universities (Jacoby, 2014). Regarding the different types of MOOCs, Connectivist MOOCs, also known as cMOOCs, are based on connectivist pedagogical ideas (connection over content) and provide multiple interactions between participants and with network resources, allowing participants to connect and collaborate openly to amplify the content of the courses (Bali et al., 2015; Wang et al., 2017). Extended MOOCs (xMOOCs), on the other hand, present a more institutionalized approach, acting as extensions of university courses (Rhoads, 2015).

A great deal of attention has been given by the literature to the acceptance and use of MOOCs under the perspective of information and communication technologies - ICT, such as the study performed by Khan et al. (2017), which examines the factors that influence the students' adoption of MOOCs in a developing country. The results of the study showed positive effects of task and technology characteristics on behavioral intention. Alraimi, Zo and Ciganek (2015) presented a study that aimed to identify factors that enhance the intention to continue using MOOCs, based on the information systems continuance

expectation-confirmation model. The research conducted by Wu & Chen (2017) proposed a unified model integrating the technology acceptance model (TAM), task fit technology (TTF), MOOCs features and social motivation to investigate the continuance intention to use MOOCs.

Other researchers have investigated MOOCs in terms of usability, quality and design (Loizzo & Ertmer, 2016; Gregori et al., 2018; Kumar & Al-Samarraie, 2018) as well as the users' responses and behaviors related to the adoption of technology (Chang, Hung & Lin, 2015; Nordin; Norman, & Embi, 2015; Liu, Brown & Lynch, 2016; Joo; So & Kim, 2018). From the perspective of business and economics, research has also been performed to explore MOOCs business models and their potential to disrupt the higher education sector (Kalman, 2014; Belleflamme & Jacqmin, 2016).

Regarding cultural aspects, the study of Bozkur and Akbulut (2019) showed that the dropout rates tend to be higher in high cultural contexts than in low culture contexts. Edmundson (2007, p. 99) highlights that "most e-learning courses are designed in Western cultures, whereas the largest and fastest-growing consumer groups live in Eastern cultures, challenging educators to provide e-learning that results in equitable learning outcomes for targeted learners in different cultures".

Several studies emphasize that most of the MOOCs are offered in English and that the dominant ideas from global centers of knowledge located in the United States and England are reflected in the thinking and orientations of most of those designing MOOCs, which makes MOOCs socio-culturally exclusionary for non-English speakers, for those with English as a second language, and for native English speakers in colonized countries (Bozkurt et al., 2018; Altbach, 2014; Adam, 2019; Lambert, 2020). The implications, especially for the developing countries are serious, as agued by Altbach (2014), because MOOCs produced in these centers are easily accessible and inexpensive for the user, but may inhibit the emergence of local academic culture and content focused on the national audience. Thus, despite their potential advantages to local audiences and institutions from developing countries, the number of MOOCs offered in these countries remains low (Pasha, Abidi & Ali, 2016).

THEORETICAL MODEL AND HYPOTHESIS

The term culture can be defined as "the collective programming of the mind which distinguishes the members of one group or category of people from another" (Hofstede 2003, p. 861). Hofstede (2003) proposed four dimensions that can be used to predict cross-country differences among national cultures: Individualism as opposed to Collectivism, Masculinity as opposed to Feminility, Uncertainty Avoidance, and Power Distance. In this study we intend to analyze the influence of these four cultural dimensions on MOOCs offering.

Individualism as Opposed to Collectivism

While members of collectivist cultures value group needs, social norms and cooperation with the group, and are more likely to sacrifice their own interests to achieve group goals, members of highly individualistic cultures believe that the individual is the most important unit (Cox, Lobel & Mcleod, 1991; Downey et al., 2005). Thus, studies indicate that individualism/collectivism may influence the use of computer-based learning systems (Downey et al., 2005; Balakrishnan, 2017). Keller (2009) points out that in an e-learning context, students from countries with a high degree of individualism are likely to ask questions and contribute more often to online discussions, while students from more collectivist countries tend to not to manifest themselves in the environment of e-learning. According to Alfy and Gomes (2017), in more collectivist societies there is a preference for human interaction over teaching through technologies, which makes instructors feel more comfortable with face-to-face teaching, considering it more effective. Therefore, it is expected that:

> **H1:** There is a positive effect of individualism on MOOCs offering.

Masculinity as Opposed to Feminility

Masculinity represents societies in which social gender roles are clearly distinct, while femininity represents societies in which these social roles overlap (Hofstede, 2003). Masculine societes are more competitive and

value achievement, heroism, and material success, while feminine societies are more consensus-oriented and value cooperation, caring for others, and quality of life (Hofstede Insights, 2019). In a context of e-learning implementation, Keller (2009, p. 70) states that "teachers from a masculine culture would expect rewards for developing the use of e-learning tools, while teachers from a more feminine culture would not". In masculine societes, individuals are more likely to adopt technologies if they find them useful in their learning (El-Masri & Tarhini, 2017). Studies show that women present higher levels of anxiety and more negative perception of technology than men, being less likely to use computers (Zaharias et al., 2007; Harvey et al., 2017). Thus, we hypothesized that:

H2: There is a positive effect of masculinity on MOOCS offering.

Uncertainty Avoidance

Uncertainty avoidance representes "the degree to which the members of a society feel uncomfortable with uncertainty and ambiguity" (Hofstede, 2003, p. 861). According to Arpaci (2015), individuals from countries with less uncertainty avoidance are more likely to accept and test new products being, therefore, more innovative. Nistor et al. (2013) also state that uncertainty avoidance may have a negative effect on the intention to use technologies. As pointed out by Keller (2009), resistance to the adoption of e-learning is greatest in countries with a high degree of uncertainty avoidance. Thus, we hypothesized the following:

H3: There is a negative effect of uncertainty avoidance on MOOCS offering.

Power Distance

Power Distance is defined as the degree to which individuals in a society accept the unequal distribution of power in institutions (Hofstede, 2003). Wang (2007) points that the Power Distance dimension of culture may influence online presence and learners' perceptions. Higher perceptions of power distances tend to widen the perceived gulf between students and teachers, resulting in students' reluctance to question and challenge the teacher (Wang, 2007; Hodkinson & Poropat, 2014). Thus, in the implementation of e-learning systems, Keller (2009) states that countries with a high degree of power distance would implement one-way teaching with teacher-centered education, while in countries with a low degree of power distance, two-way education would be implemented and education would be student-centered. According to the study by Nistor et al. (2013), members of cultures with greater power distances tend to use less educational technologies. Therefore, it is expected that:

H4: There is a negative effect of uncertainty avoidance on MOOCS offering.

The research model with the number of MOOCs offered per country as the dependent variable and four independent variables related to the cultural dimensions of Hofstede (2003) is summarized in Figure 1.
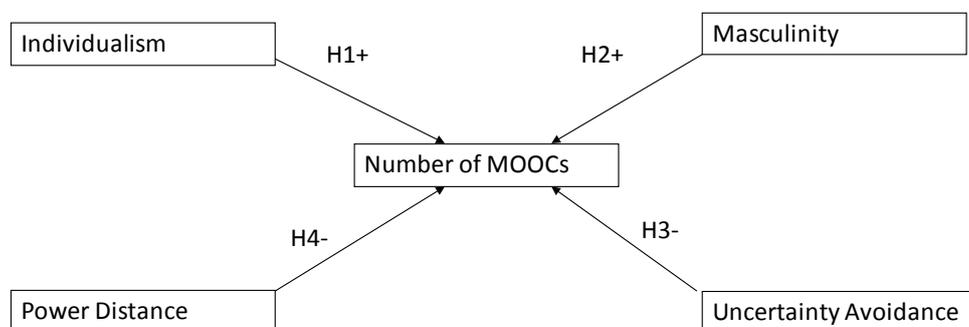
Figure 1. Research Model

METHOD

In order to reach the research goal, we first collected data from Class Central (2019), which is a search engine and reviews site where there is a list of online courses offered through Massive Open Online Course (MOOC) platforms. At the Class Central site there was a list of 941 Universities from 55 countries that offer MOOCs. For each university we collected the number of MOOCs and the country where the university is located.

Then, for each country of the sample, we collected four Hofstede's cultural dimensions (Uncertainty avoidance, Power Distance, Masculinity, and Individualism) (Hofstede Insights, 2019). We also collected the population, and percentage of population using the Internet from the World Bank (2019) site.

The data obtained were first analyzed following the descriptive analysis. Through the multivariate regression analysis, we evaluated possible factors related to the number of MOOCs offered in each country. Thus, regression analysis using ordinary least squares was performed with the number of MOOCs offered per country as the dependent variable. In the estimated models, we also observed the variance inflation factor (VIF) statistics that can indicate if the model has any multicollinearity related problem. Four independent variables related to the cultural dimensions of Hofstede (2003) were considered, in line with the four hypotheses previously established in the study. The population, and percentage of population using the Internet were used as control variables.

RESULTS

First, we analyzed the data collected based on the descriptive statistics. Table 1 displays information related on the variables. Initially, the database had 55 observations. However, after excluding those with missing values for the cultural dimensions and for the control variables, the database reduced to 52 observations. Regarding the individuals using Internet, Nigeria is the country with less percentage of population with access to the Internet (27,681% of population), followed by El Salvador (31.25%). The average number of MOOCs offered by country is 187.539. The maximum number of courses (4016 courses) is offered by universities located in the United States, which represents 42% of the MOOCs. Ukraine, Poland, Nigeria, Kuwait, Greece, El Salvador, and Ecuador have only one course offered by their Universities. These results reinforce those of Edmundson (2007), Pasha et al. (2016), Altbach (2014) and Bozkurt et al. (2018) that pointed to the dominance of institutions from developed and western countries, especially American universities, in the academic thinking and the reflection of this dominance in the development and offering of MOOCs.

Table 1. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
MOOCs	52	187.539	569.266	1	4016
Individualism	52	46.500	23.893	6	91
Masculinity	52	48.519	18.355	5	95
Unc. Avoid.	52	67.154	23.831	8	100
Power Dist.	52	59.038	22.320	13	100
Internet Use	52	75.441	18.515	27.681	98.260
Population (Ln)	52	16.991	1.605	12.747	21.050

After the descriptive analyzes, we performed a bivariate correlation to evaluate possible relationships between the variables considered in the quantitative model. Table 2 shows the correlation matrix.

Table 2. Correlation Matrix.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) MOOCs	1.000						
(2) Power Dist.	-0.137	1.000					
(3) Individualism	0.370 ***	-0.755 ***	1.000				
(4) Masculinity	0.150	0.172	-0.028	1.000			
(5) Unc. Avoid.	-0.167	0.348 **	-0.378 ***	0.033	1.000		
(6) Population (Ln)	0.360 **	0.315 **	-0.078	0.436 ***	0.050	1.000	
(7) Internet Use	0.016	-0.467 ***	0.480 ***	-0.203	-0.263 *	-0.494 ***	1.000

As the correlation matrix indicated a high correlation between the Individualism and Power Distance variables, and a moderate correlation between Internet Use and Power Distance and between Internet Use and Individualism, before interpreting the results of multivariate regression analysis, we proceeded to the evaluation of the VIF statistics. This evaluation indicates whether there are some concerns related to multicollinearity among the independent variables. However, as can be seen in Table 3, the mean VIF statistic was 1,970, while the highest value was 2,895. This result suggests that the quantitative model has no biases resulting from multicollinearity between the explanatory variables.

Table 3. VIF Values

Variable	VIF
Individualism	2.950
Power Dist.	2.800
Internet Use	1.810
Population (Ln)	1.800
Masculinity	1.240
Unc. Avoid.	1.190
Mean VIF	1.970

Thus, we proceeded to the analysis of the hypotheses based on the results shown in Table 4.

Table 4. Results for the Regression Analysis

Variable	Coef.	Std. Err.	t	Signif.
Individualism	11.074	5.115	2.170	0.036 **
Masculinity	-0.524	4.321	-0.120	0.904
Unc. Avoid.	-1.144	3.265	-0.350	0.728
Power Dist.	3.180	5.339	0.600	0.554
Internet Use	0.637	5.170	0.120	0.903
Population (Ln)	133.671	59.585	2.240	0.030 **
Constant	-2732.170	1165.757	-2.340	0.024 **
n =	52			
$F_{(6, 45)}$ =	3.150			
Prob > F =	0.011			
Adj R-squared =	20.2%			

The results show that Population presents a significant effect on MOOCs offering, while percentage of population using Internet does not have significant effect. Regarding H1, the results show that Individualism presents a significant and positive effect on MOOCs offering. This result is in line with the study of Alfy and Gomes (2017).

Regarding H2, H3, and H4, Power Distance, Uncertainty Avoidance and Masculinity do not present significant effect on MOOCs offering, which diverges from previous studies (Keller, 2009; Nistor et al., 2013). According to the literature, individuals from countries with higher rates of Masculinity and lower levels of Uncertainty Avoidance and Power Distance are more likely to attend online courses. However, universities in these countries are not necessarily the ones offering more MOOCs.

DISCUSSION AND CONCLUSION

The objective of this study was to investigate cultural determinants of MOOCs offering. Through a cross-country analysis, the results show that only the dimension of Individualism has an impact on MOOCs offering. Although the literature indicates that individuals from countries with higher rates of masculinity and lower levels of uncertainty avoidance and power distance are more likely to attend online courses, universities in these countries are not necessarily the ones offering more MOOCs. Thus, universities in countries with higher levels of Masculinity and lower levels of Uncertainty Avoidance and Power Distance could benefit from a potential demand to develop and offer more MOOCs.

The analysis also showed that the number of MOOCs offered in some countries is low, especially in developing countries. The large majority of MOOCs are created and offered by universities from western countries, mainly by those located in the United States. These results reinforce the conclusions of other studies that indicate that most of online courses are offered by universities from developed and western countries.

Although previous studies have indicated that cultural aspects may influence online education, to the best of our knowledge this is the first study that tests the relation between cultural aspects and MOOCs offering. The results of the present study bring some points of reflection. First, if MOOCs have the potential to benefit individuals from developing countries, especially those with no access to formal education, could this potential be fully explored without taking into consideration the cultural values of these countries during the design and implementation of MOOCs? Second, could this gap between cultural dimensions and MOOCs offering, be one of the factors associated to the high dropout rates of these courses?

It is apparent that higher education can benefit from the Massive Open Online Courses, with the expansion of the knowledge to a greater number of learners and the diffusion of these courses worldwide. However, in order to establish the basis for a cross-national education, it is necessary to understand and meet the specific demands of the target audience. By understanding how cultural differences impact on distance education, universities wishing to internationalize their courses will be better able to develop and implement MOOCS that can be accessed by users from different countries.

Future studies can be developed to understand the perception of MOOCs users from eastern countries about the content and pedagogical aspects of the courses offered by universities located in western countries. The perception of individuals from developing countries about the courses offered by institutions from developed countries could also be investigated.

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REFERENCES

Adam, A. (2019) Digital neocolonialism and massive open online courses (MOOCs): colonial pasts and neoliberal futures. *Learning, Media and Technology*, 44(3), 365-380.

Albelbisi, N. A. & Yusop, F. D. (2019) Factors Influencing Learners' Self-Regulated Learning Skills In A Massive Open Online Course (Mooc) Environment. *Turkish Online Journal of Distance Education - TOJDE*, 20(3), 1-16.

Alfy, S. E., Gomez, J. M., & Ivanov, D. (2017). Exploring instructors' technology readiness, attitudes and behavioral intentions towards e-learning technologies in Egypt and United Arab Emirates. *Education and Information Technologies*, 22(5), 2605-2627.

Al-Rahmi, W., Aldraiweesh, A, Yahaya, N., Kamin, Y. B., & Zeki, A. M. (2019) Massive Open Online Courses (MOOCs): Data on higher education. *Data in Brief*, 22, 118–125.

Alraimi, K. M., Zo, H., & Ciganek, A. P. (2015). Understanding the MOOCs continuance: The role of openness and reputation. *Computers & Education*, 80, 28-38.

Arpaci, I. (2015). A comparative study of the effects of cultural differences on the adoption of mobile learning. *British Journal of Educational Technology*, 46(4), 699-712.

Altbach, P. G. (2014). MOOCs as neocolonialism: who controls knowledge?. *International Higher Education*, 75, 5-7.

Balakrishnan, V. (2017). Key determinants for intention to use social media for learning in higher education institutions. *Universal Access in the Information Society*, 16(2), 289-301.

Bali, M., Crawford, M., Jessen, R., Signorelli, P., & Zamora, M. (2015). What makes a cMOOC community endure? Multiple participant perspectives from diverse cMOOCs. *Educational Media International*, 52(2), 100-115.

Baturay, M. H. (2015). An overview of the world of MOOCs. *Procedia-Social and Behavioral Sciences*, 174, 427-433.

Belleflamme, P., & Jacqmin, J. (2016). An economic appraisal of MOOC platforms: business models and impacts on higher education. *CESifo Economic Studies*, 62(1), 148-169.

Bozkurt, A. & Akbulut, Y. (2019) Dropout Patterns and Cultural Context in Online Networked Learning Spaces. *Open Praxis*, 11(1), 41–54.

Bozkurt A., Akgun-Ozbek, E. & Zawacki-Richter, O. (2017) Trends and Patterns in Massive Open Online Courses: Review and Content Analysis of Research on MOOCs (2008-2015). *International Review of Research in Open and Distributed Learning*, 18(5), 118-147.

Bozkurt, A., Yazici, M. & Aydin, I. E. (2018) Cultural Diversity and Its Implications in Online Networked Learning Spaces. In: E. Toprak, & Evrim. G.K., *Supporting Multiculturalism in Open and Distance Learning Spaces* (p.56-81). Hershey, PA: IGI Global.

Burd, E. L., Smith, S. P., & Reisman, S. (2015). Exploring business models for MOOCs in higher education. *Innovative Higher Education*, 40(1), 37-49.

Chang, R. I., Hung, Y. H., & Lin, C. F. (2015). Survey of learning experiences and influence of learning style preferences on user intentions regarding MOOCs. *British Journal of Educational Technology*, 46(3), 528-541.

Class Central (2019, Jun 2). List of Universities offering MOOCs. Retrieved from: https://www.classcentral.com/universities

Conole, G. (2015). Designing effective MOOCs. *Educational Media International*, 52(4), 239–252.

Cox, T. H., Lobel, S. A., & McLeod, P. L. (1991). Effects of ethnic group cultural differences on cooperative and competitive behavior on a group task. *Academy of Management Journal*, 34(4), 827-847.

Despujol, I., Castaneda, L., & Turro, C. (2018). Developing a Mooc Initiative: Lessons Learnt from the Universitat Politecnica de Valencia Experience. *Turkish Online Journal of Distance Education - TOJDE*, 19(1), 215-233.

Downey, S., Wentling, R. M., Wentling, T., & Wadsworth, A. (2005). The Relationship between National Culture and the Usability of an E-learning System. *Human Resource Development International*, 8(1), 47 – 64.

El-Masri, M., & Tarhini, A. (2017). Factors affecting the adoption of e-learning systems in Qatar and USA: Extending the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2). *Educational Technology Research and Development*, 65(3), 743–763.

Edmundson, A. (2007). Using Level 1 e-Learning to Support Socio-Economic Development. *Educational Media International*, 44(2), 99–111.

Fini, A. (2009). The Technological Dimension of a Massive Open Online Course: The Case of the CCK08 Course Tools. *International Review of Research in Open and Distance Learning*, 10(5), 1-26.

Freitas, S. I., Morgan, J., & Gibson, D. (2015). Will MOOCs transform learning and teaching in higher education? Engagement and course retention in online learning provision. *British Journal of Educational Technology*, 46(3), 455–471.

Gregori, E. B., Zhang, J., Galvan-Fernandez, C., & de Asís Fernandez-Navarro, F. (2018). Learner support in MOOCs: Identifying variables linked to completion. *Computers & Education*, 122, 153-168.

Harvey, H. L., Parahoo, S., & Santally, M. (2017). Should gender differences be considered when assessing student satisfaction in the online learning environment for millennials?. *Higher Education Quarterly*, 71(2), 141-158.

Heffernan, T., Morrison, M., Basu, P. & Sweeney, A. (2010). Cultural differences, learning styles and transnational education. *Journal of Higher Education Policy and Management*, 32(1), 27–39.

Hodkinson, C. S., & Poropat, A. E. (2014). Chinese students' participation: the effect of cultural factors. *Education + Training*, 56(5), 430-446.

Hofstede, G. (2003). Culture's Consequences: Comparing Values, Behaviors, Institutions, and Organizations across Nations, *Behaviour Research and Therapy*, 41, pp. 861–862, 2003.

Hofstede Insights (2019, Jun 10). Compare Countries. Retrieved from: https://www.hofstede-insights.com/product/compare-countries/

Jacoby, J. (2014). The disruptive potential of the Massive Open Online Course: A literature review. *Journal of Open, Flexible, and Distance Learning*, 18(1), 73-85.

Joo, Y. J., So H. J., & Kim, N. H. (2018). Examination of relationships among students' self-determination, technology acceptance, satisfaction, and continuance intention to use K-MOOCs. *Computers in Human Behavior*, 122, 260-272.

Kalman, Y. M. (2014). A race to the bottom: MOOCs and higher education business models. *Open Learning: The Journal of Open, Distance and e-Learning*, 29(1), 5-14.

Keller, C., Lindh, J., Hrastinski, S., Casanovas, I., & Fernandez, G. (2009). The impact of national culture on e-learning implementation: a comparative study of an Argentinean and a Swedish university. *Educational Media International*, 46(1), 67-80.

Khan, I. U., Hameed, Z., Yu, Y., Islam, T., Sheikh, Z., & Khan, S. U. (2018). Predicting the acceptance of MOOCs in a developing country: Application of task-technology fit model, social motivation, and self-determination theory. *Telematics and Informatics*, 35(4), 964-978.

Krain, M., Kille, K. J., & Lantis, J. S. (2015). Active Teaching and Learning in Cross-National Perspective. *International Studies Perspectives,* 16, 142–155.

Kumar, J. A., & Al-Samarraie, H. (2018). MOOCs in the Malaysian higher education institutions: The instructors' perspectives. *The Reference Librarian*, 59(3), 163-177.

Lambert, S. R. (2020) Do MOOCs contribute to student equity and social inclusion? A systematic review 2014–18. *Computers & Education*, 145, 1-17.

Li, K. (2019) MOOC learners' demographics, self-regulated learning strategy, perceived learning and satisfaction: A structural equation modeling approach. Computers & Education, 132, 16–30.

Lim, D. H. (2004). Cross Cultural Differences in Online Learning Motivation. *Educational Media International*, 41(2), 163-173.

Littlejohn, A., Hood, N., Milligan, C., & Mustain, P. (2016). Learning in MOOCs: Motivations and self-regulated learning in MOOCs. *Internet and Higher Education*, 29, 40–48

Liu, Z., Brown, R., Lynch, C., Barnes, T., Baker, R. S., Bergner, Y., & McNamara, D. S. (2016). MOOC Learner Behaviors by Country and Culture: an Exploratory Analysis. *In proceedings of the International Conference on Educational Data Mining*, Raleigh, NC, USA, 9, 127-134.

Loizzo, J., & Ertmer, P. A. (2016). MOOCocracy: the learning culture of massive open online courses. *Educational Technology Research and Development*, 64(6), 1013-1032.

Lu, W., Wang, B. & Lu, Y. (2019). Understanding Key Drivers of Mooc Satisfaction and Continuance Intention to Use. *Journal of Electronic Commerce Research*, 20(2), 105-117.

Nistor, N., Gogus, A., & Lerche, T. (2013). Educational technology acceptance across national and professional cultures: a European study. *Educational Technology Research and Development*, 61(4), 733-749.

Nordin, N., Norman, H., & Embi, M. A. (2015). Technology Acceptance of Massive Open Online Courses in Malaysia. *Malaysian Journal of Distance Education*, 17(2), 1-16.

Park Y., Jung, I., & Reeves, T. C., (2015). Learning from MOOCs: a qualitative case study from the learners' perspectives. *Educational Media International*, 52(2), 72–87.

Pasha, A., Abidi, S. H., & Ali, S. (2016). Challenges of offering a MOOC from an LMIC. *The International Review of Research in Open and Distributed Learning*, 17(6), 221-228.

Rhoads, R. A., Camacho, M. S., Toven-Lindsey, B., & Lozano, J. B. (2015). The massive open online course movement, xMOOCs, and faculty labor. *The Review of Higher Education*, 38(3), 397-424.

Sanchez-Gordon, S., & Lujan-Mora, S. (2018). Research challenges in accessible MOOCs: a systematic literature review 2008–2016. *Universal Access in the Information Society*, 17(4), 775–789.

Shapiro, H. B., Lee, C. H., Roth, N. E. W., Li, K., Cetinkaya-Rundel, M., & Canelas, D. A. (2017). Understanding the massive open online course (MOOC) student experience: An examination of attitudes, motivations, and barriers. *Computers & Education*, 110, 35-50.

Strang, K. D. (2010). Multicultural e-Education: Student Learning Style, Culture and Performance. In: H. Song, & T. Kidd (Eds.), *Handbook of Research on Human Performance and Instructional Technology* (pp. 392–412). Hershey, PA: IGI Global.

Wang, M. (2007). Designing online courses that effectively engage learners from diverse cultural backgrounds. *British Journal of Educational Technology,* 38(2), 294–311.

Wang, Z., Anderson, T., Chen, L., & Barbera, E. (2017). Interaction pattern analysis in cMOOCs based on the connectivist interaction and engagement framework. *British Journal of Educational Technology*, 48(2), 683-699.

World Bank (2019, Sep 3) World Bank Open Data. Retrieved from: https://data.worldbank.org/

Wu, B., & Chen, X. (2017). Continuance intention to use MOOCs: Integrating the technology acceptance model (TAM) and task technology fit (TTF) model. *Computers in Human Behavior*, 67, 221-232.

Zaharias, P. (2008). Cross-cultural differences in perceptions of e-learning usability: An empirical investigation. *International Journal of Technology and Human Interaction*, 4(3), 1-26.

Zawacki-Richter, O., Bozkurt, A., Alturki, U., & Aldraiweesh, A. (2018). What Research Says About MOOCs – An Explorative Content Analysis. *International Review of Research in Open and Distributed Learning*. 19(1), 243-259.

THE IMPACT OF LEARNING MANAGEMENT SYSTEMS ON STUDENTS' ACHIEVEMENT IN LANGUAGE EXAMS

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ABSTRACT

The use of technology in or beyond classrooms has created a stupendous paradigm to bring down the classroom walls and open up for new and unique learning opportunities. With the plethora of materials and rich learning object repositories, LMSs gripped attention of many educational institutions in different levels. Although LMS has been heralded as a great platform to support learning, the impact of it on student achievement has always been under question. Therefore, the aim of this study was to investigate the relationship between university students' achievement in an English preparatory program and the use of LMS in language learning process. In a mixed-method design, quantitative data were collected from 321 students in the School of Foreign Languages, and qualitative data were gathered from interviews with 30 randomly selected students. The results revealed that the use of LMS had a much greater impact on midterm exams than the proficiency exam although it had an effect on both. The analyses of the interviews indicated that participants had mostly positive attitudes towards the use of LMS as they thought it contributed to their language learning processes.

Keywords: LMS, language, EFL, ELT, exam, achievement.

INTRODUCTION

It has been realized that until the nature of educational relationships changes in the classroom and in the institutional level, the value of information will not be fully understood. Educational experience should be transferred in such a way that it becomes meaningful to the information-age learner (Frand, 2000). Thus, education has faced a digital transformation with the technological aspects used in every part of education. Green and Gilbert (1995) states that "The old competitive reference points describing information resources that used to distinguish between institutions – the numbers of science labs and library books -are being replaced by a new one: information resources and tools available to students (p.15) Like all the fields in education, English Language Teaching (ELT) has also undergone a change. A lot of changes have been brought into materials and technology devices used in language learning process. The use of technology as a tool to develop different language skills has received great attention. (Chapelle, 2001) Among all these tools and interfaces, Language Management Systems (LMS) have rapidly emerged and have been widely used in second language learning. The first introduction of the LMS dates back to late 1990s. However, the content and format of LMS was nothing close to what it is today. The LMS picked up quick with innovations right before the turn of the century and they have become ubiquitous at higher education all around the world.

LITERATURE REVIEW

"The Learning Management System is an online program that serves as a learning and communication platform for students" (Borboa, Joseph, Spake & Yazdanparast, 2017, p.19). Also, Reigeluth et al. (2008) maintain that LMSs could provide "a variety of instructional features that allow teachers to truly customize learning for each learner, and to facilitate choice and control for the learners as they work towards mastery of required attainments and deep knowledge of all standard subjects and skills" (p.38). According to Ellis (2009) an LMS should do the following:

- centralize and automate administration
- use self-service and self-guided services
- consolidate training initiatives on a scalable web-based platform assemble and deliver learning content rapidly
- support portability and standards
- personalize content and enable knowledge reuse

To be able to fulfill its functions, LMSs have communication and cooperation tools (announcement areas, e-mail, chat, list servers, instant messaging and discussion forums); content development and delivery tools (learning resources, development of learning objects repositories and links to internet resources); management tools (registering, enrolling, displaying timetables, managing students activities and electronic office hours); and assessment tools (submission, multiple choice testing, collaborative work and feedback) (Coates,et al., 2015).

Over the years, with the changes experienced in education, ELT approaches methods and techniques have moved from teacher- centered approach to learner-centered ones and Watson, Lee and Reigeluth (2007) indicate that "the learner –centered paradigm of education cannot be effectively implemented without technology and by the same token, technology cannot approach its potential contribution to education and learning without a learner-centered paradigm of education" (p.70). Some contributions of technology to education like customizing assessment, analyzing student progress, evaluating student performance, tracking academic achievement, and identifying areas for additional scaffolding or assistance are clearly the support of learner-centered paradigm (Taylor, 2004; Watson &Watson 2007). Among the available technologies for instruction and learning, LMSs appear to be the most promising tool to facilitate learner-centered instruction in language education. The use of LMS in the lecture shifts the traditional way of learning (teacher-centered approach) to a more student-centered approach in which a student is the constructor of knowledge (Lippert, 1993). According to Chittaro and Ranon (2007), with the use of LMS in teaching and learning, students become responsible for their learning and identify and interact with a variety of technologies to construct and discover their own knowledge. Other benefits that LMS offer in the classrooms are student-centered, team-centered collaborative learning, and a high level of student-to student interaction (Kiesler, 1992). LMS enables collaboration-based learning activity among students (Cavus, 2007). According to Roschelle (2003), with the help of collaborative activities, students are able to deal with more complex problems and understand the subject matter better. It also allows learners to communicate and interact with their teachers and peers in order to work together in a new and enjoyable way (Aljarrah, 2011). Actually, one of the driving forces for adopting LMS is often related to improved communication between lecturers and students in large classes (Eyitayo, 2005). Most LMSs include some or all of the following core components facilitating the interaction and collaboration among the students course management tools (syllabus, calendar, drop boxes, announcements), content tools (content pages, quizzes, assessments), and communication tools (asynchronous e-mail, discussion forums, chat), all of which allow instructors to provide content and learning activities, test learning, receive assignments, and conduct discussions and other course-related activities in a principally asynchronous online environment (Simonson, Smaldino, Albright & Zvacek, 2006). As it is claimed by Govender (2010), all these positive aspects of LMS seem to better engage students individually in the learning process and this affects the success of students in a positive way. According to the result of the studies conducted by Hardy et all., (2005) and Govender&Grayson (2008), there is a positive correlation between use of LMS and students' achievement level. Students who performed well in exams used LMS almost twice as much as others.

Although LMS has become an important part of language learning process all over the world, there are still some problems that need to be covered by the institutions. According to Bates (2005) low rates of participation, learner resistance, high non-completion rates and poor learner performance are among these problems. Also, Mott& Wiley (2009) believe that it did not give the expected success because of several reasons. One of the reasons of this failure is the institutional resistance to change. Digital transformation of the higher education institutions is not always easy and takes effort and time to implement. In some cases, institutions are trying to apply this technology just to be competitive among others and for the sake of using technology though it is not seen as a part of the solution (Chadwick,2001). Also, as Coates et al., (2005) state institutions do not have overall control over content. Without ultimate control over the source code that runs the program, pedagogical content may no longer serve to the purpose of the teacher and the institution. Another problem is the gap in terms of digital literacy between the teacher and the students (Bennett, Maton, &Kervin, 2008). The new generation called digital natives (Prensky, 2001) are tech-savvy individuals and they are more inclined to use technology in their learning process than their teachers who are mostly used to conventional methods of teaching. This gap could create some problems in the implementation of LMS. No matter new generation is good at using technology, students who are new to this particular technology might still exhibit some concerns initially and this could cause a reluctance to actively participate in the online classroom areas (CEDL, 1999).Thus, multiple factors must be taken into consideration while implementing LMS into language learning process and enough attention must be given to computer skills and the knowledge of both the teachers and students (Zanjani, Nkyvist, & Shlomo, 2013).

METHOD

Research Design

This study investigates the relationship between university students' achievement in an English preparatory program and student related variables as well as the use of LMS in language learning process. Therefore, the design of the study is descriptive and cross-sectional without any experimental manipulation. Since the study combines the quantitative data and qualitative data related to students' perceptions regarding the use of LMS, mixed method research was used. The study aims to answer the following research questions:

1. Is there a significant difference in LMS scores according to the student attitudes (with regard to time spent for LMS, having technical equipment, having technical knowledge, convenience of the system, technical support, teacher help, teacher encouragement, pleasure and benefit)?
2. Is the student achievement in English Proficiency Exam associated with student related variables (education year, level, faculty, program type) and the use of LMS?
3. Is the student achievement in Midterm Exam associated with student related variables (education year, level, faculty, program type) and the use of LMS?
4. What are the students' perceptions considering the use of LMS in a language learning process?

Participants

The participants of the study were university students registered in the 1- year English Preparatory Program of a state university in Turkey during the interval 2017-2018, Spring Semester. Students contributed to the study on voluntary basis, therefore the ones who provided the required data were all included. In total, 321 students aged between 18-24 partook in the research.

Measurements

Dependent Variables

Achievement: To assess students' achievement, the overall scores of English Proficiency Exam, which was administered at the end of spring term, were used. The items of the exam were prepared by the Testing Unit of the institution based on the learning outcomes defined by Global Scale of English in the range of

24-66. The exam consists of three parts: 1) Multiple-choice proficiency test includes items for listening comprehension, reading comprehension, language and vocabulary use. 2) Writing test requires students to showcase their writing skills on the given genres which are also in the outcomes of the course. 3) Speaking test includes individual and pair discussion questions for which students perform in front of a jury and their performances are video recorded. The products of writing and speaking tests are evaluated by the instructors based on predetermined rubrics after standardization and norming sessions, whereas the multiple-choice test is evaluated in a computerized system. Students in different levels can take the proficiency exam when they finish one-year program. To reach the overall proficiency score, 60% of the multiple-choice test, 20% of the writing test, and 20% of the speaking test are added. Students who receive 60 points or over are considered successful. In this respect, students' overall proficiency scores were used as the indicator of achievement in this research. The scores were recoded as a dichotomous variable with the values 0= FAIL and 1= PASS. Descriptive statistics revealed that out of 321 students, 37,1 % received passing score, while 62,9% failed (See Table 1).

In addition, scores (out of 100) of the first Midterm Exam in spring term were also received. Similar to the Proficiency Exam, the items were prepared by the Testing Unit of the institution based on the learning outcomes defined by Global Scale of English. Since this is an achievement test, the content of the exam is specific to each level and covers what has been taught. The exam consists of three parts: 1) Multiple-choice test includes items for listening comprehension, reading comprehension, language and vocabulary use. 2) Writing test requires students to showcase their writing skills on the given genres which are also in the outcomes of the course. 3) Speaking test includes individual and pair discussion questions for which students perform in front of a jury and their performances are video recorded. The products of writing and speaking tests are evaluated by the instructors based on predetermined rubrics after standardization and norming sessions, whereas the multiple-choice test is evaluated in a computerized system.

Independent Variables

LMS Scores

In the preparatory program, students are required to attend two hours of laboratory lessons where they have to complete several productive tasks to be done with the help of computer and internet by using several web tools and the exercises from a publisher provided Learning Management System (LMS) based on the outcomes of the course (the name of the publishing company or the LMS platform will not be mentioned here in order to avoid copyright infringement and biased conceptions of the results). These LMS exercises are assigned by the class teacher every week to be done in the lab hours or sometimes as self-study materials that students can complete at home at their own pace. The system keeps track of students' scores in each exercise and produces a final report including overall assignment score. In this study, overall assignment scores in LMS for spring period were used as one of the independent variables to predict their effect on achievement in proficiency and midterm exams. LMS scores were also taken as one of the dependent variables to analyze the impact of student attitudes on the variation of LMS scores.

Level

Students in the English Preparatory Program are placed in 5 different proficiency levels based on the results they receive from the placement test which is administered at the beginning of the education year. These levels are named as A Success, A, B, C, and D which are equivalent to upper intermediate, intermediate, pre-intermediate, elementary and beginner levels respectively. In this study, data from A, B, and C level students in spring term were used (levels were coded as 1, 2 and 3 in the same order). Data from A Success and D levels were excluded since the number of students was limited and the data from them included missing values. On this ground, out of 321 students 90 A Level, 107 B Level, and 124 C Level students provided data for the study (See Table 1).

Year

Students in the preparatory program are categorized in two groups as obligatory and optional. In the obligatory group, one-year English program is a requirement of the faculties prior to the studies in the fields students are registered. In the optional group, students join in the English program with their own request although it is not a requirement of their faculties. In this case, students who are unsuccessful in the obligatory group have to repeat the year, while the ones in optional group can continue their education in their faculties without the certificate of proficiency. Students participated in this study were 88,8% first year students (either obligatory or optional coded as 1) and 11,2% repeat students (coded as 2).

Faculty

Students registered to various faculties at this university receive one-year English education either optionally or mandatorily. The majority of students in this study were registered to Engineering Faculty (34%), Economics (17,8%) and Communication (13,4%) respectively as can be seen in Table 1.

Program Type

This variable categorizes students into two groups: the ones who receive education in English preparatory program optionally (coded as 1), and obligatorily (coded as 2) based on the requirements of their faculties. In accordance with the relevant regulations of the university, all the departments of Engineering Faculty and certain departments of Literature, Education, Science, Economics, and Communication Faculties require students to receive 1 year English Preparatory Education obligatorily. On the other hand, preparatory programs in Faculty of Law, Architecture, Tourism, Aviation, Health Sciences, Sports Sciences and Vocational School of Transportation are optional. Students in both groups are placed in classes based on the placement exam scores and they are responsible for the same curriculum according to their levels. As can be seen in Table 1, out of 321 students 73 are registered in the optional program whereas 248 are in the obligatory program.

Table 1. Total sample by pupil variables

Variable	Value	N	%
Proficiency Result	Pass (1)	119	37.1
	Fail (0)	202	62.9
Level	A (0)	90	28.0
	B (1)	107	33.3
	C (2)	124	38.6
Year	First (0)	285	88.8
	Repeat (1)	36	11.2
Program Type	Optional (0)	73	22.7
	Obligatory (1)	248	77.3
Faculty	Literature (0)	11	3.4
	Science (1)	31	9.7
	Aviation (2)	25	7.8
	Education (3)	8	2.5
	Law (4)	4	1.2
	Economics (5)	57	17.8
	Communication (6)	43	13.4
	Architecture (7)	19	5.9
	Engineering (8)	109	34.0
	Health Science (9)	2	0.6
	Tourism (10)	5	1.6
	Vocational (11)	7	2.2

Data Collection Instruments and Analysis

Both qualitative and quantitative data were collected from students at the end of Spring Term in 2018 for the study. In the last laboratory lessons of the term, students were given an online questionnaire which includes items to evaluate the LMS procedure they used during the year. The questionnaire designed by the researchers included 5 items for general information (group, level, year, type of program, faculty) and 9 items to investigate participants' attitudes towards the use of LMS. These 9 items were created based on the literature and controlled by three experts in the field prior to the study in terms of language and clarity. In addition, the questionnaire was piloted on two classes (43 students apart from the actual participants of the study) and necessary changes were made in terms of language. As the questionnaire does not examine a single phenomenon similar to the scales, but was designed in order to collect data about the different aspects of students' LMS use and their attitudes towards them, exploratory and confirmatory factor analyses were not conducted.

The LMS scores of students in the platform are not publicly available. Assigned laboratory teachers could only see them when they sign in their account. To collect students' LMS scores, a detailed guideline on how to export reports in the system was sent to the class teachers. Teachers downloaded student reports from the LMS system for their classes in an Excel Sheet format and emailed to the researchers when the term finished. The scores of the students who completed the questionnaire were filtered from the reports.

Similarly, when the grading procedures finished in the second week of June, students' Midterm grades and Proficiency Exam scores were received from the administration as they are not publicly available. Midterm and Proficiency Exam scores of students who completed the questionnaire were filtered as well.

Also, semi-structured interviews were conducted with 30 students (10 from each level) who participated in the study in the same week. These students were randomly selected from the participant group, and joined the interviews on voluntary basis. Interview questions were designed by the researchers according to the literature and checked by the same three experts in the field. Necessary changes were made on the questions based on their comments.

The data collected for the study were computed and analyzed by using IBM SPSS 22 statistical software. In the quantitative phase of the analyses, nonparametric tests and two different regression analysis were conducted. The association between LMS scores and student attitudes on the items in questionnaire was examined with Kruskal-Wallis and Mann-Whitney U tests. In order to analyze the relationship between Midterm scores and independent variables, multiple regression analysis was conducted. The association between Proficiency Exam scores and independent variables was analyzed with logistic regression method.

Qualitative data collected from semi-structured interviews were coded and general themes were created. In order to increase the validity and reliability of the results, two researchers and another academician with a PhD on Distance Education independently coded the interviews and results were compared. Also, detailed descriptions of the participants were given above.

FINDINGS

The Effect of Student Attitudes on LMS Scores

Data collected with student questionnaire were analyzed to examine the effect of student attitudes on LMS scores. Since the data did not show a normal distribution, proven in both Kolmogorov- Simirnov and Shapiro-Wilk tests ($p<.05$), nonparametric tests (Mann Whitney U and Kruskal Wallis Test) were used instead of t-test and ANOVA to make comparisons.

Table 2. Kruskal-Wallis Test Results

Variable	Category	N	Rank mean	X^2	p	Significant difference
How many hours a week do you spend for LMS?	None	68	55.11	16.358	.001***	None / 1-2 hours
	1-2 hours	211	86.69			None / 3-4 hours
	3-4 hours	36	99.24			
	5-6 hours	6	106.50			
Do you like studying English with LMS?	Strongly Disagree	67	65.69	6.741	.150	
	Disagree	54	73.64			
	Neutral	115	88.13			
	Agree	65	85.83			
	Strongly Agree	20	91.50			
Is it beneficial to study English with LMS?	Strongly Disagree	39	64.84	6.950	.139	
	Disagree	48	88.43			
	Neutral	124	75.55			
	Agree	83	93.49			
	Strongly Agree	27	77.44			

*(p<.001***, p<.01**, p<.05*)*

As the variables included more than 2 categories, Kruskal-Wallis test on k independent samples was conducted. The results, as can be seen in Table 2, revealed that LMS scores significantly vary according to the time spent for LMS (X^2=16.358, p=0.001). When the pairwise comparisons were examined, it was detected that students who spent 1or 2 hours on LMS received better scores compared to the ones who did not spend any time, which was not a surprising fact. Similarly, students who spent 3 or 4 hours on LMS received better scores compared to the ones who did not spend any time on LMS. On the other hand, neither pleasure about studying English with LMS nor its benefit on the studies reported significant results (p>0.5).

Table 3. Mann-Whitney U Test Results

Variable	Category	N	Mean Rank	Sum of Ranks	U	p
Do you have technical equipment to use LMS?	No	62	70.65	1907.50	1529.500	.203
	Yes	259	83.09	11133.50		
Do you have technical knowledge to use LMS?	No	19	49.05	490.50	435.500	.024*
	Yes	302	83.12	12550.50		
Do you get technical support when you need?	No	90	84.48	3801.50	2453.500	.553
	Yes	231	79.65	9239.50		
Does your teacher help when you need?	No	12	80.70	403.50	388.500	.988
	Yes	309	81.01	12637.50		
Does your teacher encourage you to use LMS?	No	24	91.65	916.50	648.500	.453
	Yes	297	80.29	12124.50		
Is it easy to use LMS?	No	25	62.43	437.00	409.000	.278
	Yes	296	81.84	12604.00		

*(p<.001***, p<.01**, p<.05*)*

As these were dichotomous variables, Mann-Whitney U test on 2 independent samples was conducted. According to the estimations given in Table 3, it was seen that students who have technical knowledge to use LMS received significantly better scores (*p*<.05). It can be implied that the knowledge on how to use computer and the Internet significantly affects LMS scores. However, having technical equipment, convenience of the system, technical support, teacher help and teacher encouragement did not create a significant variance on LMS scores.

Thus, it can be summarized that students who know how to operate computer systems and the Internet, as well as the ones who spend more time to study English with LMS, receive better scores on the platform.

Student Achievement in Proficiency Exam

In the previous section, students' attitudes which affect the LMS scores were identified. The major aim in this section was to see whether LMS scores have an impact on the English Proficiency Exam results. In order to determine the relationship between the achievement in English Proficiency Exam and the independent variables, a logistic regression model was designed. Prior to the analyses, residual statistics and collinearity diagnosis were performed to detect outliers and multicollinearity problems among the variables and to check the assumptions of the regression models used. The results of the residual statistics reveal that the values reached are in an acceptable range (between -2.163 and +2.279). In this study, VIF values range between 1.033 and 4.292, which proves there is an acceptable level of multicollinearity. In summary, based on the values reached it is assumed that the error terms are independent and predictors are not correlated with each other (Barnett and Lewis, 1978; Cook & Weisberg, 1982; Field, 2009; Menard, 1995; Myers, 1990). Therefore, the logistic regression analysis was conducted and the results were given in Table 4.

Table 4. Logistic regression on proficiency exam scores

Variables	Model 1					Model 2				
	B	df	Sig	Wald	Exp(B)	B	df	Sig	Wald	Exp(B)
Constant	-.162	1	.306	1.047	.851	-.726	1	.567	.328	.484
LMS						.018	1	.004**	8.503	1.018
Level (1)						-1.579	1	.063	3.457	.206
Level (2)						-2.299	1	.000***	23.241	.100
Faculty (1)						-1.478	1	.051	.3.802	.228
Faculty (2)						1.206	1	.415	.664	3.339
Faculty (3)						1.430	1	.241	1.377	4.181
Faculty (4)						21.108	1	1.000	.000	1.469E+9
Faculty (5)						-.690	1	.186	1.749	.502
Faculty (6)						-.260	1	.689	.160	.771
Faculty (7)						.192	1	.901	.015	1.212
Faculty (8)						1.006	1	.426	.633	2.735
Faculty (9)						-18.871	1	1.000	.000	.000
Faculty (10)						3.281	1	.066	3.382	26.613
Faculty (11)						-20.415	1	.999	.000	.000
Type (1)						1.097	1	.396	.721	2.996
Year (1)						-.792	1	.175	1.841	.453
-2 Log Likelihood:			222.143					161.168		

Reference category: First

*R^2= 0.274, Cox & Snell R^2=.315, Nagelkerke R^2=.421, Model X^2=60.974, p<0.000 (p<.001***, p<.01**, p<.05*)*

When the logistic regression was carried out with only the constant variable (proficiency) in Model 1, it was detected that only 54% of the participants were classified correctly as pass or fail as can be seen in Table 6. Wald test result also indicated that the model was not significant (p=0.306). In addition, the overall statistics result for the variables which were not in the equation was found 51.255 (p<0.001), and this implies that other variables should be added to the model. Model 2 was carried out using Enter method and independent variables (LMS, level, faculty, type, year) were added to the regression model. The results revealed that the classification of participants according to the proficiency exam increased to 76.4%. -2 Log Likelihood value decreased from 222.143 to 161.168 indicating that the regression model improved. When the independent variables were examined, it was determined that LMS scores positively contributed to the proficiency exam

result significantly (*p*=0.01). Beta value implies that when LMS scores increase one point, possibility of passing from proficiency increases 0.018. In addition, according to the odds ratio, students who have higher LMS scores have the possibility to pass from the proficiency exam 1.018 times more. Students' level of English was another factor which was included in the regression model. According to the results, it was seen that level variable negatively influenced the achievement in the proficiency exam. While the statistics did not show a significant result for B level students (*p*=0.63), findings for C level students were highly significant (*p*<0.001). Also, adjusted odds ratio explains that when the level decreases to C level, the possibility to pass from proficiency exam is 10 times less compared to A level students. On the other hand, none of the categories in the faculty, type and year variables show a significant outcome (*p*>0.05). To analyze how much the model improved after the inclusion of independent variables, Hosmer & Lemeshow Test was conducted. In general terms, this value ranges between 0 and 1 and 1 indicates a perfect fit. In our case, the significance of Hosmer& Lemeshow Test result was found 0.838 (X^2=4.209, df=8), which shows the model predicts the achievement in proficiency exam in a good level.

Student Achievement in Midterm Exam

The impact of independent variables on midterm exam was analysed with multiple regression method. For the variables measured in nominal scale, dummy variables were created and included in the model. A level, first year students, optional program, and Literature Faculty were taken as the reference categories to make comparisons.

Table 5. Summary of multiple regression analysis for midterm scores (N=321)

Variable	B	SE(B)	b	t	Sig.(*p*)
LMS	.098	.027	.256	3.576	.000*
B Level	-2.035	3.806	-.039	-.535	.594
C Level	-2.248	2.087	-.089	-1.077	.283
Repeat	-5.324	2.847	-.145	-1.870	.064
Obligatory	21.737	5.184	.694	4.193	.000*
Science	13.452	3.224	.309	4.172	.000*
Aviation	18.968	6.065	.362	3.127	.002*
Education	.815	4.734	.012	.172	.864
Law	22.811	12.118	.142	1.882	.062
Economics	-4.538	2.435	-.143	-1.864	.064
Communication	-1.171	3.088	-.029	-.379	.705
Architecture	22.732	5.922	.454	3.838	.000*
Engineering	21.729	6.024	.682	3.894	.000*
Health Sciences	14.547	12.011	.090	1.211	.228
Tourism	42.457	8.038	.454	5.282	.000*
Vocational	12.839	9.458	.113	1.358	.177

R= .569 R²= .324, DR2=.254, *p<0.01, F_{Change}=4.625, p<0.001, Durbin-Watson=1.939

The overall model of the multiple regression analysis was conducted using Enter method. Multiple correlation coefficient between the independent variables and midterm scores was found R=0.569. According to the R^2 value, it was identified that 32.4% of the variability in midterm scores is accounted for by the predictors included in the model. F-ratio of the model was found 4.625 which is significant with a probability p<0.001. In addition, Durbin-Watson statistic reports the value of 1.939. When these change statistics were examined, it can be assumed that the inclusion of the independent variables improved the regression model. Also, ANOVA test result indicates that the regression model significantly predicts the midterm scores (F=4.625, df=15, *p*<0.001).

In the next step of the analysis, parameters included in the model were examined. Beta value for LMS was found .098. This result indicates that when LMS scores increase one point, midterm scores increase 9.8 points ($p < 0.001$). Another significant predictor was the program type and it was found that students in the obligatory program receive better scores from the midterm exams compared to the ones in optional program. As the positive beta value shows, when students are in the obligatory program, their midterm scores increase 21.7 points ($p < 0.001$). The analysis of the faculties revealed that being in the Science Faculty, Aviation, Architecture, Engineering and Tourism Faculties have positive impact on midterm scores. According to the beta values, students who are registered to the Science Faculty receive 13.45 more points from the midterm exams compared to the Literature Faculty students ($p < 0.001$). Also, students in Aviation Faculty receive 18.9 points more ($p < 0.01$), Architecture Faculty students get 22.73 points more ($p < 0.001$), Engineering students get 21.72 more ($p < 0.001$) and Tourism students get 42.45 points more ($p < 0.001$) from the midterm exams compared to the Literature Faculty students. On the other hand, it was seen that other variables related to faculties, education year and level did not create a significant impact on midterm scores ($p > 0.05$).

The comparison of the regression analyses of proficiency exam and midterm exam shows that LMS scores have a much greater impact on midterm exam scores although it has an effect on both. Besides, while the level factor was a significant predictor on proficiency scores, it was not associated with the midterm scores. The comparisons also indicate that program type does not influence proficiency results significantly whereas it has an effect on midterm scores. Also, faculties students are registered to are significant in predicting midterm scores while they do not predict proficiency exam results. On the other hand, being a first year or repeat student predicts neither proficiency exam nor midterm exam results significantly.

Perceptions of Students Related to LMS

In order to reach a deeper insight about the students' perceptions on the use of LMS, semi-structured interviews were conducted with 30 randomly selected students. Since the interviews were conducted at the end of the school year, students commented on the questions according to their hands-on experience with a publisher-provided LMS. The numbers given in the tables do not match the total number of the participants since students have mentioned more than one theme in their comments.

Initially, students were asked about the easy and difficult aspects of LMS. As can be seen in Table 6, 25 students found the use of LMS easy, while the rest (5) thought it is difficult to use.

Table 6. Easy and difficult aspects of LMS

What are the easy and difficult aspects of LMS?	f		f
Easy	25	Difficult	5
-access	14	-spelling	3
-interface/web design	13	-listening recordings	2
- types of exercises	4	-using headphones	1
		-uploading homework	1

The majority of the students who thought it is easy to use LMS mentioned about the easy access to the platform. Similarly, 13 students thought the interface of the platform is easy to use as they can navigate easily in the system and find appropriate tasks. Also, 4 students mentioned that types of the exercises are easy as they are quite similar to the ones they use in their course book. These ideas can be seen in the student comments given below.

> *"Everything in the system is within easy reach. I can access with my password even at home with my mobile phone."*
> *"The web design is not complicated, it is very simple. I can find what I want easily."*
> *"Exercises are similar to the ones in our course book, so I can understand the instructions easily."*

Students who found it difficult to use mentioned mostly about the spelling rules that the system accepts or not. It was indicated that the system requires correct capitalization and punctuation while writing answers for the open-ended questions. Also, as LMS is an internet-based platform, the problems caused by the speed or quality of connection are indicated. Due to the connection speed, students found it difficult to upload files or listen to recordings. On the other hand, the hardware required to use LMS, such as headphones, was mentioned as the source of difficulty.

> *"The system considers my answers incorrect because of the smallest punctuation or capitalization mistakes even when my answers are correct."*
>
> *"Sometimes when I upload my homework, the system freezes and I can't do anything."*
>
> *"Because of the internet speed, listening tracks frequently stop. It is difficult to listen or watch something."*
>
> *"Most of the earphones in the language labs do not work, so I skip the listening parts."*

Participants were asked about the technical support they might have needed during their LMS use. 24 students did not need any technical support, while 6 of them needed help for different problems they faced.

Table 7. Technical support for LMS

Have you ever needed technical support?	*f*		*f*
Yes	6	No	24
-registration	3		
-password	2		
-voice recording	2		

Three students who needed technical support, faced with problems at the initial stage of their experience while they were signing up for the LMS. They received support from class teachers at this stage. These students mentioned that the codes provided by the publisher did not work or registration process did not work. Two of the students forgot their passwords and had to contact with the online help to reset a new password. In addition, two of the participants required technical help while they were recording and uploading their voice. On the other hand, majority of the participants found the system quite simple or solved the technical problems themselves. Students' comments related to this question are given below:

> *"In the first lesson while we were signing up for LMS, I could not manage to register. It was the first time I started using LMS, so I needed my teacher's help."*
>
> *"I forgot my password and I could not access the platform. I chatted with the online help desk and they sent a link to my email. I used it and created a new password."*
>
> *"While I was recording my voice, the program gave errors frequently and the page froze. My teacher helped me about it."*

Students were also asked whether the use of LMS contributed to their language learning process or not. Out of 30 participants 23 gave positive answers while the rest responded negatively about it (see Table 8).

Table 8. Contribution to language learning process

Do you think LMS contributes to your language learning process?	f		f
Yes	23	No	7
-reinforcement	8	-boring exercises	3
-skills practice	4	-mismatch with exams	2
-match with course book	4	-waste of time	2
-advantage for quizzes	4		
-easy recall	3		
-exposure to language	2		
-detecting weaknesses	2		

8 of the students who gave positive answers mentioned that the use of LMS provided a good reinforcement for the things they learned during the course. 4 of them indicated that it was a good chance to practice different language skills and 4 thought LMS contributed to their learning process as the learning object repository of the platform was similar to the materials given in their course book. Also, 4 students asserted that studying with LMS helped them in quizzes and in-class assessment procedures. 3 students mentioned that they could easily recall what they studied on the platform as they were visual learners. While 2 of the participants thought they were exposed to the language more, 2 of them indicated that they were able to increase their awareness about their weaknesses in different skills. However, 3 of the participants mentioned that the exercises in the platform were boring. Also, 2 of them asserted that there was a mismatch between the exercises in the system and the question types in the midterm or proficiency exams. In addition, 2 of the participants felt extremely negative about the contribution of LMS and thought it was a waste of time. Comments given on this interview question depict the attitudes of students:

> "The platform gives simple explanations of the topics I learn in class. In this way, it helps me to remember and reinforce what I learn. I practice at home after the class."
>
> "Vocabulary and listening exercises were really good. They gave the examples of everyday language."
>
> "The exercises were designed in accordance with the things we learned in our book. So, it helped me to practice."
>
> "When I studied with LMS before the quizzes, I received better grades."
>
> "We were exposed to the language more. You know, it is not possible to hear English on the street here."
>
> "The exercises are very boring and childish."
>
> "Exam questions were not similar to the exercises, so they were not useful."

Another interview question sought an answer about the specific skills that LMS might have contributed to (see Table 9).

Table 9. Contribution to language skills

Which language skills did LMS contribute the most?	f
All	23
Grammar	18
Vocabulary	14
Pronunciation	14
Listening	11
Writing	8
Reading	4
None	7

As can be seen in Table 9, while 7 of the participants thought it was helpful for none of the skills, majority of the students felt it was useful for improving all skills. Students mostly mentioned about the positive effect of LMS on grammar (f = 18), vocabulary (f = 14), pronunciation (f = 14), and listening (f = 11) skills improvement. 8 students mentioned that their writing skills improved the most and only 4 participants indicated the reading skill. However, none of the participants mentioned about the effect of LMS on speaking skill. This might have resulted due to the lack of emphasis on speaking skill in the system or just because of the students' preferences.

In addition, students were asked about the sections they enjoyed a lot in LMS.

Table 10. Enjoyable sections of LMS

What are the most enjoyable sections of LMS?	f
Listening exercises	23
Vocabulary games	20
DVDs / videos	16
Grammar exercises	12

As it is given in Table 10, majority of the participants mentioned they enjoyed the listening exercises the most (f = 23). Also, students liked the vocabulary games since these games helped them to remember and use the words better (f = 20). DVDs and videos were also popular among participants (f = 16) as they exemplified the authentic use of language. Besides, grammar exercises caught students' fancy in the LMS.

> *"I liked the listening sections in LMS. It was enjoyable to hear and complete the exercises."*
>
> *"Vocabulary games are just my cup of tea. Learning words by playing games is really enjoyable. I loved puzzles."*
>
> *"Watching the videos of native people were really fun."*

In the last interview question, participants were asked whether they recommend the use of LMS in language learning process or not. Out of 30 participants, 23 mentioned that they would recommend it to language learners, while 7 responded negatively (see Table 11).

Table 11. Recommendation of LMS

Do you recommend using LMS in a language learning process?	f		f
Yes	23	No	7
-beneficial	20	-expensive	6
-reinforcing	19	-boring	5
-fun	12	-waste of time	2

Among the students who responded positively, 20 participants mentioned that LMS was beneficial for their studies, 19 of them thought the exercises were reinforcing, and 12 found the use of LMS fun. On the other hand, among the students who responded negatively, 6 participants mentioned that it was expensive, 5 found LMS boring, and 2 indicated that it is a waste of time. Some of the comments that support these findings were given below:

> *"Studying with LMS after class is really reinforcing. I think other students should use it, too."*
>
> *"Instead of listening to the lectures or doing traditional exercises, practicing in front of a computer by myself was more enjoyable. I recommend it other students as well."*
>
> *"The cost of the access code was really expensive. We can find free online websites instead of LMS."*
>
> *"I don't think it is beneficial. Course book and supplementary pack are more than enough. I think LMS is a waste of time."*

DISCUSSIONS AND CONCLUSION

This study investigated the relationship between university students' achievement in an English preparatory program and student related variables as well as the use of LMS in language learning process in a mixed method design. It has been found out that these variables had an impact on students' achievement in language proficiency and midterm exams. For the proficiency exam, students' language level significantly predicted the scores. Students who have lower level of English received lower scores on the proficiency exam. This result is also supported by the study conducted by Amua-Sekyi & Nti (2015) in which the findings suggest that students' weak background in English contributed to students' poor performance in the English examination. A similar study conducted in Turkish context by Aydin (2012) investigated the role of English proficiency level of students from a state university and found out that students who had high proficiency level achieved better scores in English Proficiency Exam.

For the midterm exam, program type (whether the program is obligatory or optional) and faculties that students were registered also affected the scores significantly. According to this study, students in the obligatory program received better scores from the midterm exams compared to the ones in optional program. As opposed to our study, El-Omari (2016) indicated that there were no statistical differences between compulsory and optional status of programs in terms of students' language achievement. In addition, it was observed in our study that achievement of students from different faculties varied which is also pointed out by the studies of Akay & Toraman (2015) and Yu& Shen (2012).

In addition to the abovementioned student related variables, this study mainly showed that the use of LMS by students in their language learning process predicted the proficiency and midterm scores significantly. Our findings asserted that the students who received higher scores in LMS better performed in these exams, which is also supported by literature. The studies conducted by Hardy et all., (2005) and Govender&Grayson (2008) proved that there is a positive correlation between the use of LMS and students' achievement level. Students who used LMS more than others received better exam results. As Freeman & Anderson (2011) states, LMS provides the students with more access to the target language as they can find many authentic materials. Another study revealed that incorporating LMS activities increased students' motivation to the class content (Anwaruddin,2013). Similarly, a study which examined the contribution of technology in teaching English Language proved that LMS could enhance students' language proficiency ad facilitate teaching process (Navidinia, Bidaki& Hekmati, 2016). Freeman & Anderson (2011) also pointed out that use of technology in language teaching could be beneficial not only for students but also for teachers as it can provide authentic written and audio-visual materials online.

The positive impact of LMS on students' exam scores may have resulted from several reasons just as stated in the literature. Since LMSs have different tools for communication and cooperation, content development and delivery, management and assessment (Coates,et al., 2015), students could have control over their own language learning processes. Thus, this may have a positive reflection on their language achievement.

Although the results were only specific to a university and difficult to generalize to other contexts, it is worth considering LMS as a valuable tool to improve students' motivation and achievement in language learning after analyzing the advantages and drawbacks it may create.

As a result, LMS might bring new efficiencies to learning and teaching. With the use of LMSs, higher education institutions may have the opportunities to reduce course management expenses and physical space demands. Also, these tools may enhance knowledge management, enrich learning and teaching environments by unifying fragmented information technologies, accelerate the access to information, improve quality assurance procedures for course design and delivery (Brown 2001; Dutton & Loader 2002; Katz 2003; King 2001)

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REFERENCES

Akay, E., & Toraman, C. (2015). Students' attitudes towards learning English grammar: A study of scale development. *Journal of Language and Linguistic Studies*, *11*(2), 67-82.

Aljarrah, A.(2011). University of Jordan Students' Attitudes Towards the use of the Learning Management System as a learning tool. *Dirasat Journal, educational sciences. 38*(4). 1293 – 1304.

Amua-Sekyi, E.T.&Nti, S.K. (2015). Factors affecting students' performance in English at colleges of education in Ghana. *International Journal of Research in Humanities, Arts and Literature*, *3*(10), 29-44.

Anwaruddin, S. M. (2013). Web 20 and Language Learners' Motivation: An Action Research Study. *Canadian Journal of Action Research*. 14(1):51–68.

Aydin, G. (2012). The role of English proficiency level, personal and affective factors predicting language preparatory school students' academic success. *Unpublished Master's Thesis, Middle East Technical University, Ankara, Turkey*.

Barnett, V., & Lewis, T. (1978). *Outliers in statistical data*. New York: Wiley.

Bates, A. W. (2005). *Technology, e-learning and distance education* (2nd ed). New York: Routledge Falmer.

Bennett, S., Maton, K., & Kervin, L. (2008). The 'digital natives' debate: A critical review of the evidence. *British Journal of Educational Technology, 39*, 775–786.

Borboa, D., Joseph, M., Spake, D., & Yazdanparast, A. (2017). Perceptions and Use of Learning Management System Tools and Other Technologies in Higher Education: A Preliminary Analysis. *Journal of Learning in Higher Education*, *10*(2), 17-23.

Brown, S. (2001). Campus Re-Engineering. In F. Lockwood & A. Gooley (eds), *Innovation in Open and Distance Learning: Successful Development of Online and Web Based Learning.* London: Kogan Page.

Chadwick, C. (2001). Computadoras en la educacion: Problemas y precauciones. *Revista Latinoamericana de Estudios Educativos*, XXXI (001), 87–98.

Chapelle, C. (2001). *Computer Applications in Second Language Acquisition.* Cambridge University Press, Cambridge.

Chittaro L. and R. Ranon. (2007). Web3D technologies in learning, education and training: Motivations, issues opportunities. *Computers and Education*, 49(1):3–18.

Cavus, N. (2007). Assessing the success rate of students using a learning management system together with a collaborative tool in web-based teaching of programming languages. *Journal of Educational Computing Research, 36*(3), 301-321.

CEDL (1999). Lucent Technologies Centre for Excellence in Distance Learning. *Student attitudes towards distance learning.* Available: http:/www.lucent.com/cedl/stdtatt.html.

Coates, H., James, R., & Baldwin, G. (2005). A critical examination of the effects of learning management systems on university teaching and learning. *Tertiary education and management*, *11*, 19-36.

Cook, R. D., & Weisberg, S. (1982). *Residuals and influence in regression.* New York: Chapman & Hall.

Dutton, W.H. & Loader, B.D. (2002). Introduction: New Media and Institutions of Higher Education and Learning. In W.H. Dutton & B.D. Loader (eds), *Digital Academe: The New Media and Institutions of Higher Education and Learning.* London: Routledge.

Ellis, R. K. (2009). A Field Guide to Learning Management Systems. *American Society for Training & Development (ASTD).*

El-Omari, A. H. (2016). Factors affecting students' achievement in English language learning. *Journal of Educational and Social Research*, *6*(2), 9.

Eyitayo, O. (2005). Experimenting eLearning with a large class. *International Journal of Education and Development using ICT,* 1(3).

Field, A. P. (2009). *Discovering statistics using SPSS (and sex and drugs and rock' n' roll)* (3rd ed.). London: Sage.

Frand, J. L. (2000). The INFORMATION-AGE Mindset. *Educause review*, *35*(5), 14-20. Freeman, L. D, Anderson M.(2011) Techniques and Principles in Language Teaching. Oxford University Press 199-218.

Govender, I., & Grayson, D. J. (2008). Pre-service and in-service teachers' experiences of learning to program in an object-oriented language. *Computers & Education*, *51*(2), 874-885.

Govender, D. W. (2010). Attitudes of students towards the use of a Learning Management System (LMS) in a face-to-face learning mode of instruction. *Africa Education Review*, *7*(2), 244-262.

Green, K. C., & Gilbert, S. W. (1995). Great expectations: Content, communications, productivity, and the role of information technology in higher education. *Change: The magazine of higher learning*, *27*(2), 8-18.

Hardy, J., Bates, S., Antonioletti, M., & Seed, T. (2005, September). Integrating e-learning and on-campus teaching II: evaluation of student use. In J.Cook and D.Whitelock (eds.): *Exploring the frontiers of e-learning. Research Proceedings of the 12th Association of Learning Technology Conference (Manchester)*, pp. 140-153.

Katz, R.N. (2003). Balancing Technology and Tradition. *Educause Review* 38(4), 48-59.

Kiesler, S. (1992). Talking, teaching, and learning in network groups: Lessons from research. In A. Kaye (Ed.), *Collaborative learning through computer conferencing: The Najaden papers* (pp. 117-136). Berlin: Springer-Verlag.

King, B. (2001). Making a Virtue of Necessity - A Low Cost, Comprehensive Online Teaching and Learning Environment. In F. Lockwood & A. Gooley (eds), *Inno- vation in Open and Distance Learning: Successful Development of Online and Web Based Learning.* London: Kogan Page.

Menard, S. (1995). *Applied logistic regression analysis.* Sage university paper series on quantitative applications in the social sciences, 07-106. Thousand Oaks, CA: Sage.

Mott, J., & Wiley, D. (2009). Open for learning: The CMS and the open learning network. In Education – Exploring our connective educational landscape, 15, 3–22.

Myers, R. (1990). *Classical and modern regression with applications* (2nd ed.). Boston, MA: Duxbury.

Navidinia, H., Bidaki, M. Z., & Hekmati, N. (2016). Incorporating E-learning in teaching English language to medical students: exploring its potential contributions. *Medical journal of the Islamic Republic of Iran*, *30*, 462.

Lippert, C. R. (1993). *Computer-based education and training in South Africa.* Pretoria: J.L. Van Shaik Academic.

Prensky, M. (2001). Digital natives, digital immigrants part 1. *On the horizon*, *9*(5), 1-6.

Reigeluth, C.M., Watson, W.R., Watson, S.L., Dutta, P., Chen, Z., & Powell, N.D.P. (2008). Roles for technology in the information-age paradigm of education: Learning management systems. *Educational Technology, 48*, 32–39.

Roschelle, J. (2003). Learning by collaborating: conceptual change. *The Journal of the Learning Sciences, 2*, 235-276.

Simonson, M., Smaldino, S., Albright, M., & Zvacek, S. (2006). *Teaching and learning at a distance: Foundations of distance education* (3rd ed.). Upper Saddle River, NJ: Prentice Hall.

Taylor, J.S. (2004). An analysis of the variables that affect technological literacy as related to

selected Technology Student Association activities (Unpublished doctoral dissertation). North Carolina State University.

Watson, W.R., Lee, S., & Reigeluth, C.M. (2007). Learning management systems: An overview and roadmap of the systemic application of computers to education. In F.M.M. Neto & F.V. Brasileiro (Eds.), *Advances in computer-supported learning* (pp. 66–96). London: Information Science Publishing.

Watson, W.R., & Watson, S.L. (2007). An argument for clarity: What are learning management systems, what are they not, and what should they become? *TechTrends: Linking Research and Practice to Improve Learning, 51*, 28–34.

Yu, B., & Shen, H. (2012). Predicting roles of linguistic confidence, integrative motivation and second language proficiency on cross-cultural adaptation. *International Journal of Intercultural Relations*, *36*(1), 72-82.

Zanjani, N., Nykvist, S. S., & Shlomo, G. (2013). *What makes an LMS effective: a synthesis of current literature.* Paper presented at the Proceedings of CSEDU 2013–5th International Conference on Computer Supported Education.

CONTEXT MATTERS: STUDENT EXPERIENCES OF INTERACTION IN OPEN DISTANCE LEARNING

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ABSTRACT

An important factor in online learning is how students are afforded opportunities for interactions to create their own knowledge and attain high levels of student satisfaction. In open distance learning, three types of interaction were initially distinguished: interaction with content, with the lecturer and with fellow students. As technology plays an essential role in online learning, interaction with technology was added. This study was conducted at an open distance learning institution using a blended learning approach. Since it was the first fully online course for first-year Education students, the purpose of the study was to determine students' experiences of their learning in order to consider how offering the course online might affect their satisfaction and academic success. Within a connectivist paradigm, the research used a case study involving questionnaires with closed and open-ended questions. Findings confirmed the value of interaction on all levels and pointed towards the challenges in interaction with technology. Based on these findings, the study suggests that lecturers should consider the contexts of students when planning and designing online courses. As a result, it remains the university's responsibility to put systems in place to support and prepare students.

Keywords: Student interaction, context, open distance learning, student-centeredness, online learning.

INTRODUCTION

Open distance learning (ODL) is characterized by a separation between student and lecturer, the use of technology to facilitate teaching and learning and student-centeredness. Students who come from a conventional form of education that is structured and mostly teacher-centered, may find the transition to becoming an ODL student in a more unstructured, student-centered learning environment very challenging (Banna, Lin, Stewart & Fialkowski, 2015). For this reason, Wang, Chen and Anderson (2014), as well as Tirri and Kuusisto (2013), state that interaction with both humans and technology is critical in building the necessary connections in virtual learning environments. The technology system itself should be seen as an environment that allows students to engage in learning-related activities at any time and from anywhere (Bouhnik & Marcus, 2006). As an online course designer, Trentin (1998) indicates that the more accessible these environments are structured to meet students' communication needs, the more enjoyable and trouble-free the interaction will be. In their online teaching, lecturers have to determine what the system has to offer to ensure that all types of interaction are enjoyable and useful.

Unlike face-to-face interaction, where instruction is synchronous, interaction in distance learning can be either synchronous or asynchronous (Ustati & Hassan, 2013). This is an important difference, in the sense that immediate or synchronous interaction is set for a specific time and creates a feeling of belonging (Dzakiria, Rozhan & Hanafi, 2005). The opposite may be true for asynchronous interaction – the interaction examined in the current study – where students may not have that sense of belonging and can easily feel isolated, which, in turn, can lead to a lack of motivation and dropout (Banna et al., 2015). On the other hand, asynchronous interaction has the advantage of providing students with more freedom and flexibility – they can take control of when and how they prefer interaction with humans and the system.

The concept of interaction is defined in various terms and no single definition exists. The term is associated with concepts such as cooperation, collaboration and active learning (Kenny, 2002). According to Muirhead and Juwah (2004), interaction as a multifaceted phenomenon, is about the personal nature of sharing information in the online classroom. Both Tait (2000) and Dzakiria, Kasim, Mohamed & Christopher, (2013) claim that the greater the interaction, the better for the student, as well as for the teaching and learning process. This is also true for ODL courses, where interaction is seen as a challenging but critical aspect of distance learning (Dzakiria et al., 2013; Wang et al., 2014). Although research on student interaction has been documented within the ODL environment, there is no best-fit system for student interaction, since it remains highly context-based (Dzakiria et al., 2013). In fact, Woo and Reeves (2007) argue that the nature and frequency of interaction is dependent on the contexts in which these interactions occur, while Lee and Martin (2017) state that contextual factors have to be taken into consideration in online teaching and learning. Artino (2010) points out that although online learning is growing, little is known about the personal factors that influence online learning, while Naidu (2013, p.268) argues that "very little attention is paid to analyzing and understanding learners and their unique contexts before teaching and learning occurs". From the above, it is clear that several authors have emphasized the importance of context in student interaction. Yet, despite these statements, no study focusing on context in student interaction could be found and this paper intends to make a contribution in this regard.

Because of vastly different contexts, it does not make sense to generalize the profile of a typical ODL student. However, to establish a background for this paper, it is necessary to include a few comments on the context in which ODL students in general find themselves. These students differ in their dependence on interaction, according to their age, self-directedness and learning styles (Pavalache-Ilie & Cocorada, 2014). Students who are more autonomous, may need and prefer less interactivity, while younger or first-year students may rely more on interaction (Dzakiria et al., 2005). ODL students often experience challenges in respect of ODL and interaction. One such challenge is the fact that, while there might be a need for frequent interaction, such interaction might not always be possible, especially for students who do not live in urban areas and do not have regular access to computers or the internet. Related to the lack of access, is the need for information and communication technologies (ICT) skills. This need, according to Kirlidog, Van der Vyver, Zeeman and Coetzee (2018), is dire in the South African context. Many students come from school environments where these skills were not taught or prioritized and it might, therefore, be a daunting task to get them to the point where they can competently use technology for success in their courses. Hillman, Willis and Gunawardena (1994) note that student success in ODL is related to their ICT proficiency and the ability to find and post the right information, while both Dzakiria et al. (2005) and Weidlich and Bastiaens (2018) caution that using the electronic medium can inadvertently exclude students who lack the necessary skills. A further challenge is that internet costs can be quite high, especially in a country such as South Africa, which is well known for its exorbitant internet costs (Oyedemi, 2015). High data costs result in an additional financial burden for the ODL student. Lecturers and other ODL stakeholders should be aware of students' challenges and realities which could impact on successful interaction.

STUDENT INTERACTION IN ODL

Moore (1989) was the first author to distinguish between three types of interaction, that is student-content interaction, student-teacher interaction, and student-student interaction in distance education. The three types of interaction have different effects on students and on the effectiveness of the teaching-learning experience (Dzakiria et al., 2005). Following Moore (1989), researchers such as Hillman et al. (1994) and Bouhnik and Marcus (2006) added a fourth type, namely interaction with the system, i.e. technology as a medium. More authors have provided variations and developments regarding types of interaction (see, for example, Anderson & Garrison, 1998; Anderson & Dron, 2007; Dron, 2007). However, for the purpose of this paper, the focus is on the four types of interaction and they are discussed in the subsequent paragraphs.

Interaction with content takes place when students, with the assistance of the lecturer, create new knowledge by combining new information with their existing knowledge. Without this kind of interaction, as in agreement with Bouhnik and Marcus (2006), no education takes place. Because this engagement is about communication between the author of the content and the reader, student-content interaction is regarded

as interpersonal and interactive (Xiao, 2017). Student-content interaction can take many forms, such as watching instructional videos, interacting with multimedia, doing research and searching for information (Abrami, Bernard, Bures, Borokhovski & Tamim, 2011). However, Hege (2011) correctly states that to create a vibrant online community, lecturers must facilitate students' engagement with the study material and assignments.

Coppola, Hiltz and Rotter (2002) assert that the three roles of lecturers, being cognitive, affective and to teach, are more complex in an online environment. The cognitive role shifts to deeper complexity, the affective role requires lecturers to find ways to express emotion and the teaching role requires more detail for structuring and monitoring of students to ensure that learning takes place and to prevent them from getting lost in the online environment. In her research, Swan (2002) found that instructors need to interact with students frequently to bridge the psychological and physical gap of distance learning. According to Bouhnik and Marcus (2006), interaction between students and lecturers leads to effective interaction with the content. However, student-lecturer interaction (which includes interaction with tutors and teaching assistants) can be regarded as expensive and demanding since it requires the online presence of the lecturer and extensive involvement in course facilitation (Anderson, 2003). Yet, Anderson points out that the advancement of technology has, in some instances, enabled the replacement of student-lecturer interaction with student-content interaction by offering information in different formats, such as video and audio. These statements confirm that the different kinds of interactions are interdependent and that the relationship is complex.

In their research, Yu, Tian, Vogel and Kwok (2010) found that discussions amongst students not only affected learning outcomes positively, but that such discussions also assisted them in gaining social acceptance and adapting to the university culture. Banna et al. (2015) point out that since research has indicated that students learn better in groups than on their own, student-student interaction is particularly significant in promoting an online environment. Furthermore, according to Woo and Reeves (2007), learning occurs through communication with peers sharing the same context and real-life experiences. One of the most influential features in asynchronous learning courses is interaction between students through discussions (Bouhnik & Marcus, 2006). In online discussions, every student has a voice, and neither the lecturer nor a student can dominate the conversation. Swan (2002) adds that online group discussions are more equitable and democratic than face-to-face discussions and can lead to further opportunities for reflection, mindfulness and a sense of belonging.

The three kinds of interaction, described above and prevalent in the online learning environment, are mediated by an underlying technology. Interaction with technology is therefore a further vital type of interaction that needs to be added to Moore's initial three types of interaction. Interaction with an increasingly interactive system, where students can interact with machines and digital artefacts, has changed the way in which lecturers teach and the way in which students learn, forcing the whole world into a different way of doing things. Bouhnik and Marcus (2006) explain that learning is complex but that the benefits of the technological system can easily be lost if not dealt with satisfactorily. They further state that even if the technology is utilized to its fullest, there is no guarantee that it will add quality to the learning process. It is therefore vital that technology supports teaching and learning, be fully functional and not become a psychological or functional barrier. In their study, Kedar, Baruch and Gruvgald (2003) found that if the technical problems that students encounter are not addressed immediately, this will negatively impact on their learning experiences. Support should therefore be available to assist students as quickly as possible.

PURPOSE OF THE STUDY

The University of South Africa (UNISA), which previously was a paper-driven distance education institution, is currently following a blended approach and is progressively moving to an online model of teaching and learning. As a result, learning is facilitated through multiple teaching and learning strategies, a range of technologies in combination with face-to-face interaction and the deployment of both physical and electronic study material (UNISA, 2008). Not all students have regular access to the internet, therefore they receive electronic as well as hard copies of study material to ensure that no one is disadvantaged. However, the University is moving towards a delivery model with more online courses and programs. Part of this process is to facilitate channels for students to have access to electronic devices and processes, and

procedures have been put in place to ensure connectivity and support to students (UNISA, 2018). The learning management system (LMS) at the University (the Sakai platform, known as myUnisa) is a teaching, learning and administrative tool and is the official mode of online communication with students. Since more courses are gradually being offered online, it was necessary to discover how students experience this environment. Xiao (2017) confirms that much more understanding is needed of the role, as well as the functionality of interaction in ODL, and how it affects students' learning experiences and satisfaction. This paper is intended to offer a contribution in this regard, its purpose being to describe students' experiences of a first-year fully online course within a specific teaching and learning context. It is important to listen to students' voices to understand their educational experiences. Only then can lecturers and instructional designers develop online courses that meet students' needs, in order to improve their online interactions and ultimately, facilitate their learning.

The intention of this study was to document how students experience their interaction with their peers, lecturers, the course content, and technology within the ODL context.

THEORETICAL FRAMEWORK

Interaction has been a highly valued key concept in distance learning since the earliest generations of correspondence distance education (Taylor, 2001). With the continuing development of interaction and interactive technologies, online learning has developed from having cognitive behavioral pedagogical roots, to socio-constructivist learning and most recently to connectivist learning (Wang et al., 2014). As opposed to other learning theories, connectivism is about interaction between the student and different knowledge sources: other people, groups sharing the same interests, the internet and learning management systems (Pavalache-Ilie & Cocorada, 2014). This paper is therefore framed within the connectivist learning theory, assuming that learning takes place because of and by means of these interactions which take place between humans and between humans and technology (Downes, 2007). Siemens (2005) and Downes (2007) developed this relatively recent pedagogical theory to understand learning in a digital and connected world. The connectivist learning theory has had an impact on teaching and learning practices, making knowledge distribution possible to all network members (Van den Berg, 2017). In this regard, Siemens (2006) argues that knowledge has changed from categorization and hierarchies to networks and ecologies. We currently exist in a knowledge society, implying that our lives focus on the creation, communication and application of knowledge. Connectivism is therefore not only about transferring or building knowledge, it is also about interactions or connections to facilitate learning and development. Siemens (2006) states that these connections are fluid, adaptive and vary in size and scope. Connectivism plays a vital role in the development of new pedagogies, where control is shifted from the lecturer to an increasingly independent student (Kop & Hill, 2008). Wagner (1994, p.8) states that "interactions are reciprocal events that require at least two objects and two actions". This definition of interaction implies reciprocal events between students and technology, between living and non-living entities in physical and digital spaces, which is an important notion in connectivist learning (Wang et al., 2014). Different interactions are necessary for connection building, which deepens and creates different layers of learning. According to Siemens (2006), learning is not always about learning new content, but to be able to access sources of knowledge when it is needed. In a world that grows and continuously produces new knowledge, it is this access to the sources that is an asset to the student and positions him/her as a lifelong learner (Bozkurt, Honeychurch, Caines, Bali, Koutropoulos & Comier, 2016). Within this connectivist framework, the focus of the interactions discussed in this paper is pedagogical in nature. Against this background, the next section explains the methodology of the empirical research.

METHODOLOGY

Research Design

This study is part of a larger research project to evaluate online courses at UNISA. Within a connectivist research paradigm, the study followed a case study design to determine students' experiences of an online course. Data was collected quantitatively as well as qualitatively, therefore a mixed-mode approach was used.

Participants and Context

Students, who were enrolled for a first-year online semester course at the College of Education at UNISA, participated in this study and were involved and treated as an exemplary (sample) case of similar online courses at the University. The study was conducted in the second semester of 2018, after the students had completed the first two of a total of six assignments. Besides exposing students to working within an online learning environment, the course content focused on teaching the values, roles and responsibilities of a professional school teacher. The students were grouped into virtual classes of between 40 and 50 students, with a teaching assistant to act as a learning facilitator and assessor and continued for 16 weeks, which is the duration of this semester course. In using the LMS as the teaching and learning platform, students were able to interact freely with their fellow students and teaching assistants in the discussion forums.

Research Instrument

In order to establish how students experienced this first-year online course, a questionnaire with five biographical and 27 open and closed questions related to various aspects of their online course was sent to all students enrolled for the second semester of the 2018 academic year. Because open and closed questions were used to elicit quantitative and qualitative data, a mixed-method approach was used. Open question responses lead to qualitative analysis, while the closed question responses were analyzed quantitatively. Out of the 7 030 questionnaires, a total of 358 responses (5.09%) were received. The low response rate can be attributed to the formal nature of the e-mail sent to the students as official university correspondence, incorrect or invalid e-mail addresses on the university administrative system and personal reasons of working students.

The instrument of data gathering was the question "How do you feel about this online course?" This question had a closed response, framed to elicit answers on a five-point Likert scale, ranging from "dislike extremely" to "like extremely", while in the second part of the question, which was the open-ended part, students were asked to explain their choice of the first answer.

Procedures

Before the study commenced, ethical clearance and permission to conduct the research were granted by UNISA. Students were informed that their participation in the study was voluntary and that their identity would be kept confidential at all times. To ensure the internal validity and reliability of the instrument, it was piloted and tested with ten students who were enrolled in an online module in a different college at the university, and who were therefore not part of the research. Saunders, Lewis and Thornhill (2009) argue that prior to using a questionnaire to collect data, it should be piloted with a minimum number of ten participants to refine the instrument. Based on their feedback, a few minor changes were made to improve the instrument. Because of the low response rate, the external validity of this study is at stake. However, the purpose was not to generalize the results of the current study to the world at large, but to learn more about a specific group of students' experiences of an online course. UNISA offers a number of similar online courses in its various colleges. It also has the purpose of initial research that could be followed up with more qualitative research.

The Statistical Package for the Social Sciences (SPSS) was used for data analysis, to calculate frequency distributions. The qualitative data was analyzed using content and thematic analysis. According to Braun and Clarke (2006), thematic analysis can be described as a method for identifying, analyzing and reporting on patterns. Commonly occurring and prevalent themes were identified to assist in answering the research question about the students' experiences of online interaction.

Responses from students were categorized into four themes:

- Interaction with fellow students
- Interaction with lecturers
- Interaction with content
- Interaction with the system

FINDINGS AND DISCUSSION

Quantitative Analysis

Of the 358 responses received, 290 (81%) students were female and 68 (19%) male. The low number of male students is congruent with local trends in student enrolments in education. For example, in 2017, 29,3% of education students enrolled at universities were male, while 70,7% were female (Statistics SA, 2019).

The age distribution of the participants is indicated in Table 1.

Table 1. Responses by age group

Age group	Response (N=358)	% Student responses
18-24	192	53.6%
25-29	87	24.3%
30-34	37	10.3%
35-39	21	5.9%
40-44	13	3.6%
45+	6	1.7%

This information was relevant, specifically because most students (77.9%) were under the age of 30 and can therefore be regarded as familiar with access to and the use of entrenched technologies such as computers, email and smartphones (Kennedy et al., 2008). In addition, many of these students had recently left school where they were introduced to technology and developed ICT knowledge and skills and as such, could easily adapt to an ODL environment.

Of the 358 participants who submitted questionnaires, 243 (68%) indicated that they were part-time students, while 114 (32%) were studying full time. Since most students were working and studying, they might have had the additional burden of balancing their work life, their family life and their studies, as found in previous studies by Carney, McNeish and McColl (2005) and Erasmus and Grebe (2016).

The first part of the question was based on a five-point Likert scale, ranging from "dislike extremely" to "like extremely".

Table 2. Frequency of participants' responses on how they felt about the online course

Response	Response (N=358)	% Student responses
Dislike extremely	9	2.2%
Dislike very much	13	3.6%
Neither like or dislike	71	18.8%
Like very much	189	52.8%
Like extremely	76	21.2%

The results show that most students liked the online course (74%), while some neither liked nor disliked it (18.8%), and a few (6.6%) did not like it at all. The second part of this question asked students to explain their answers. The analyses of student responses were categorized according to the four categories of interaction, i.e. with students, lecturers, content and with the system.

Qualitative Analysis

The written responses substantiating the students' choices on the Likert scale question were coded and categorized and will be discussed next under each of the four themes.

Interaction with Fellow Students

The written responses showed that the students were appreciative of the assistance they received from their peers. Assistance was articulated in terms of social and emotional support, learning support, knowledge gained and opportunities to participate in online debates. Regarding social and emotional support, one student stated: "By having the course online, we have support from other students doing the same subject instead of having to complete it on our own, especially when we are struggling", while another student referred to "the respect and kindness from my fellow students when I need help". Apart from the social and emotional support, students referred to the learning support they received, indicating the knowledge they gained from other students, their participation in debates and sharing different views and ideas. For example, a student said: "Initially I was not sure if I was on the right track, but after discussions with a few of my classmates, I received the confirmation I needed. It gave me confidence to complete the rest of my assignment". Such positive student responses about interactions with fellow students are in line with the results from a study by Agudo-Peregrina, Iglesias-Pradas, Conde-González and Hernández-García (2014), showing that students' academic performance in online learning mostly depended on student-student interactions.

Students who reported a positive online experience, also substantiated their feelings with references to group membership. They indicated that they were grateful to belong to a group. The following is an example of such a statement:

> This is my first online course and I enjoy every moment – as I am sitting in my room at home on my own, I do not feel alone or overwhelmed by the thought of going through this on my own. I am part of a group and can ask questions anytime.

In explaining the view that they found interactions with fellow students valuable, references were made to a free and safe environment, where students felt that they could participate freely and learn from others. This is evident in the following example:

> I was communicating with different people even if I didn't know them. But because of the way in which we were communicating, I felt I knew them.

In addition, students affirmed that they felt safe to communicate within their group, although they sometimes lacked confidence, especially at the beginning of the course. When referring to their interaction in groups, terms such as "cooperate", "interact", "communicate", "connect" and "participate" were used. These comments show students' "sense of belonging", which, as Dzakira et al. (2005) state, is sometimes difficult to achieve in distance learning.

However, students' interaction with their peers was not always perceived as positive, as 22 out of the total of 358 participants made remarks indicating that they did not always have good experiences. The responses showed that some students had difficulty in their interaction with fellow students. Exemplary explanations included a statement about a fellow student being "rude" and another one who constantly changed the subject to "political issues". Other responses showed that students' online experiences were in some cases negative, with remarks about this interaction being "useless", and maintaining that "it's just a bunch of random people posting random comments just to be able to say that they have participated in the discussions". Another response was:

> I don't like doing things online, for example, chatting or discussing something with other students. I know I can perhaps learn something from them, that it saves time and money, but I just don't enjoy it.

The comment above shows that it cannot be taken for granted that students need or want interaction with fellow students and confirms the statement of Muirhead and Juwah (2004) recognizing the fact that the need for interaction is dependent on students' style of learning and their specific contexts.

From the findings of the students' interaction with fellow students, it is significant to note that not all students had similar experiences and that the findings were diverse. For instance, while most students appreciated interaction with their fellow students, some found it problematic and preferred not to interact. In their study, Pavalache-Ilie and Cocorada (2014), found that students are comfortable to participate in an online learning environment, but that it depends on factors such as students' contexts and their level of self-directedness. Furthermore, students interact and access knowledge when it is needed, which refers to the complexity of these interactions, but also to the fact that learning is fluid, adaptive and that it varies in size and scope (Siemens, 2006). For instance, a self-directed, independent student does not necessarily need or prefer interaction with fellow students (Pavalache-Ilie & Cocorada, 2014).

Interaction with Lecturers

Of the 265 student participants who responded positively on their experiences of the online course, the majority said that they received frequent communication from their lecturers (who were academics responsible for the course design, as well as for teaching on the LMS) or teaching assistants (who were working under the supervision of the lecturers and who were responsible for group teaching and the assessment of students' work). These students were satisfied with the interaction with their lecturers and teaching assistants and used terms such as "always available", "excellent", "amazing" and "helpful" when referring to such communication. In this regard, one student stated:

> I have asked many questions to my teaching assistant, especially in the beginning of the semester. I was not familiar with myUnisa and had no confidence to study online. But my teaching assistant gave me confidence, she responded to my questions and gave me the guidance I needed. Now I can say that I enjoy this course.

Another student said that the teaching assistant continuously monitored their progress, and that they appreciated it, because it showed that the lecturer was concerned about their success, while another one said, "the teaching assistant is always there for me". Similar results came from studies by Arbaugh and Benbunan-Fich (2007) and Marks, Sibley and Arbaugh (2005), showing that the most significant predictors of student success were student-lecturer interactions. These authors further argue that students must be sufficiently engaged to ensure that they successfully complete their courses.

The findings of this research, however, showed that 12 students were not always satisfied with the level of interaction with their lecturers. In this regard, one student argued:

> It is fine to learn online, but I would have liked to get better responses from my lecturer, on time and with good guidance. In the beginning of this course I was unsure what to do and where to start. I asked many questions but did not always receive prompt responses. This was demotivating.

Another student indicated that the lecturer was "not always available". This lack of the necessary lecturer support shows the importance of lecturer facilitation in online learning, as confirmed by both Swan (2002) and Hege (2011).

From the above, it is clear that most students experienced interaction with their lecturers as sufficient, while others needed more guidance or found that their lecturers were not always available when they needed them.

Interaction with Content

Since the course content was about being a professional teacher, students, in their explanations of their online experiences, mostly referred to the content related to the course. A student made the following comment: "…(I)t refers to so many aspects of teaching as a profession; I was not aware of some of them until I did this course. The study material was accessible on the site, and I could easily look up information when I needed it for my assignments". Another student mentioned that the online teaching methods were found to be useful.

Students who indicated that they were positive about their online experiences with their course material, described this course as "interesting", "nice", "easy", "time-saving", "less stressful", "innovative", "mind-provoking", and most students indicated that they were positive about the online course. Furthermore, one student stated:

> The online course is manageable, and I enjoy having everything online. It is easy to access content and videos when I need it. I enjoy this course.

On the other hand, several responses showed that students were not always positive about the course or found it easy. One student said: "I tried so hard to understand this online course, but it is difficult", while another student stated: "I didn't understand some things and it was not always explained very well online". Yet another student said that he/she disliked the course because it was online and working with books was so much easier.

Additionally, time was a factor for some students. Because this course had more assignments (six in total) than most semester courses for which the students are enrolled (generally two assignments), a total of 42 students mentioned that they struggled to complete their assignments on time. This shows that students need sufficient information and guidance regarding the number of assignments, as well as the time needed to complete an online course, especially when they are enrolled in a first-year course.

The participants indicated the different skills they gained, such as "self-study", "searching for information on the internet", "computer skills to access my materials" and "using videos". Some students referred to the saving of costs by not having to buy textbooks. This specific course only had online resources, of which most were open education resources (OERs) and therefore free to access.

From the responses, it was evident that this was the first online course undertaken by many of the students and thus a new experience. In this regard, one student said

> At first, I was intimidated by the online medium of this course, because it is my first fully online course, but once I got started, I found this approach refreshing.

The fact that several students referred to the course as a new experience, and indicated that they had struggled at first, shows the importance of lecturer support and facilitation from the start of the course.

The findings on students' interaction with content indicated that most students had positive experiences during this course, but that there were also some students who stated that they did not enjoy the online environment, found the course difficult and found studying on paper easier. Likewise, while some found that studying online saved time, others indicated that they struggled to find enough time to study online. In their study, Muirhead and Juwah (2004) found that the level and the context of a course have a significant impact on interaction types, which is relevant to this study in the sense that the findings showed that some students needed a substantial amount of support, while others were comfortable to study on their own.

Interaction with the System

An online course depends on effective interaction with a system. In explaining their positive experiences of online learning, students expressed appreciation for the fact that they could do their work on their own devices, "from anywhere, at any time", and a student also referred to "the flexibility of online learning". These student statements correlate with a study by Weidlich and Bastiaens (2018) indicating that convenience and flexibility regarding the time and location of learning are often put forward as major advantages of online learning. A few students further highlighted other advantages of interaction with the system, such as the fact that the computer did automatic correction of spelling, which is a plus for non-native speakers of English, and the time they were saving because "I can do everything online". Additionally, a student said, "The learning units contain internet links and relevant local teaching advice. It is really just better to present a course this way."

However, a total of 42 students indicated that sufficient time was a problem, because they did not have computers or internet connectivity at home and had to go to a facility like a Unisa regional center, internet cafe or public space for internet access. A student said,

> I battle to get a chance to go to the internet cafe because I am volunteering at a school full-time and some things like the brochure we had to do for an assignment could not be done on my phone. Also, I do not have in-depth knowledge of a computer.

The student above not only had difficulty finding sufficient time to access a computer/the internet, but also lacked the necessary ICT skills, thus confirming the view of Shi, Shen and Tian (2010) that online students need to possess a medium or high level of confidence in utilizing the internet in order to perform online tasks and interact with others. Another student said, "The online course is fine, but sometimes it is difficult because not all of us have access to computers and the internet. "Within the South African context, Kirlidog et al. (2018) indicate that the country has a need for more people with adequate ICT skills. This particular student above, used his/her cell phone to access the course, resorting to mobile learning. The student was not the only one in this position, with another one confirming, "I could access the course information on my phone and tablet". In total, 18 students confirmed that they used their mobile devices to access their courses. These comments should make lecturers aware that online courses should be designed for use on different devices.

Related to limited access to devices and the internet, was the lack of enough data. One student stated that "the online course made things easy for me and I knew that all my assignments were safely received, but I spent all my money on data bundles". Several students had similar concerns about the lack of money for sufficient data.

Although many students gave positive feedback about their online learning experiences, others found the navigation challenging. For example, one student said, "I feel that more guidance should be given on how to start, where to start and especially on the final portfolio submission".

Another challenge that students experienced, was accessibility to the University's LMS. Students stated that the system was not always available. For example, one student said: "myUnisa is sometimes offline and then I cannot submit my assignments. This is frustrating us". This means that student-system interaction was not satisfactory, which has a negative effect on students' motivation and learning experiences in general. In this regard, studies by both Muirhead and Juwah (2005) and Joksimović, Gašević, Kovanović, Riecke and Hatala (2015) show that positive and frequent student-technology interaction was the most important predictor of positive learning outcomes. This further concurs with both Arbaugh and Benbunan-Fich (2007) and Muirhead and Juwah (2004) that successful online learning requires high levels of digital proficiency, as well as user-friendly systems to support student-system interaction.

A significant specific finding of this study is the fact that students found it expensive to have internet connectivity and some of the comments imply that students had difficulty finding the money to buy data. If students do not have sufficient internet connectivity, connections with either human beings or technology is impossible, and interaction and learning cannot take place.

RECOMMENDATIONS

This study revealed that the contexts of students differ and that ODL institutions cannot take it for granted that all their students have the necessary knowledge and skills needed for online learning. It is therefore recommended that institutions ensure that their students, specifically first-year students with inadequate experience, are appropriately prepared for online learning when they enroll for an online course. Such student preparation can be, for example, a general ICT induction course at the beginning of their studies or an introductory first part to each course for which students enroll.

The findings of the study also showed that students need to have connectivity to the internet and enough data to access information. The study therefore recommends that students should be able to visit their university's website and their courses for free. Agreements with local service providers can assist universities to ensure that students do not have to add large amounts of unexpected data costs to their study fees.

Lastly, the purpose of the study was to find out how students experience interaction in an ODL context. The findings revealed that students' experiences and needs differ, depending on their contexts. Instructors should therefore gather the necessary information about their students to ensure that courses make provision for these different contexts. By doing so, students can benefit optimally from their online interactions during their studies.

CONCLUSION

This study reports on students' experiences of an online course and the findings confirmed that most students were positive about their experiences and found the interaction during the course useful. This means that interactions have taken place between students and different sources of knowledge: between living and non-living entities in digital spaces, which Wang et al. (2014) regard as an important part of connectivist learning.

Students' interaction with their fellow students, the content, the lecturer and the system provide the pedagogical foundation for effective teaching and learning in an ODL environment, especially because of the physical separation between the student and the lecturer. This study further confirmed that during these interactions every student, every institution and every curriculum is unique, and each exhibits a unique context with differing strengths and weaknesses. While the strengths need to be embraced, lecturers and stakeholders at universities must be aware of possible weaknesses and challenges, with students' unique contexts being taken into consideration when planning and designing online courses. It remains a university's responsibility not only to put systems in place, but also to provide the necessary online training and support for its students. Only then will students be in a position to benefit optimally from operating in a connectivist learning environment, enabling them to be lifelong learners.

This study focused on students involved in only one online course in teacher education at one university and does not reflect the entire population. It should, however, serve as a basis for further studies concerning the importance of context in different online courses at different institutions.

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REFERENCES

Abrami, P. C., Bernard, R. M., Bures, E. M., Borokhovski, E., & Tamim, R. M. (2011). Interaction in distance education and online learning: Using evidence and theory to improve practice. *Journal of Computing in Higher Education*, *23*, 83–103.

Agudo-Peregrina, A. F., Iglesias-Pradas, S., Conde-González, M. A., &Hernández-García, A. (2014). Can we predict success from log data in VLEs? Classification of interactions for learning analytics and their relation with performance in VLE-supported F2F and online learning. *Computers in Human Behavior*, *31*, 542–550.

Anderson, T. (2003). Getting the mix right again: An updated and theoretical rationale for interaction. *The International Review of Research in Open and Distance Learning*, (4), 2. Retrieved September 4, 2018, from https://0-search-proquest-com.oasis.unisa.ac.za/docview/1634543750/A38D3C92A1824B3BPQ/7?accountid=14648

Anderson, T., & Dron, J. (2007). Groups, networks and collectives in social software for e-learning. Paper presented at 2007 European Conference on E-Learning, Copenhagen, Denmark.

Anderson, T., & Garrison, D. R. (1998). Learning in a networked world: New roles and responsibilities. In C. Gibson (Ed.), Distance learners in higher education (pp. 97–112). Madison, WI.: Atwood Publishing.

Arbaugh, J., & Benbunan-Fich, R. (2007). The importance of participant interaction in online environments. *Decision Support Systems*, *43*(3), 853–865.

Artino Jr, A. R. (2010). Online or face-to-face learning? Exploring the personal factors that predict students' choice of instructional format. *The Internet and Higher Education*,13(4), 272–276.Banna, J., Lin, M. G., Stewart, M., & Fialkowski, M.K. (2015). Interaction matters: Strategies to promote engaged learning in an online introductory nutrition course. *MERLOT Journal of Online Teaching and Learning*, *11*(2), 249–261.

Bouhnik, D., & Marcus, T. (2006). Interaction in distance-learning courses. *Journal of the Association for Information Science and Technology*, *57*(3), 299–305.

Bozkurt, A., Honeychurch, S., Caines, A., Bali, M., Koutropoulos, A., & Cormier, D. 2016. Community tracking in a cMOOC and nomadic learner behavior identification on a connectivist rhizomatic learning network. *Turkish Online Journal of Distance Education,* 17(4):4-30.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101.

Carney, C., McNeish S. & McColl, J. (2005) The impact of part time employment on students' health and academic performance: a Scottish perspective, *Journal of Further and Higher Education*, 29:4, 307-319, DOI: 10.1080/03098770500353300

Coppola, N., Hiltz, S., & Rotter, N. (2002). Becoming a virtual professor: Pedagogical roles and asynchronous learning networks. *Journal of Management Information Systems*, 18(4), 161–189.

Downes, S. (2007). What Connectivism Is. Paper presented at the Online Connectivism Conference, University of Manitoba. Retrieved January 24, 2018, from http://ltc.umanitoba.ca/moodle/mod/forum/discuss.php?d=12 Dron, J. (2007). Control and constraint in e-learning: Choosing when to choose. Hershey, PA.: Information Science Pub.

Dzakiria, H., Kasim, A., Mohamed A. H., & Christopher, A. A. (2013). Effective learning interaction as a prerequisite to successful Open Distance Learning (ODL): A case study of learners in the northern state of Kedah and Perlis, Malaysia. The *Turkish Online Journal of Distance Education*, 14(1), 111–125.

Dzakiria, H., Rozhan, M. I., & Hanafi, A. (2005). Interaction in Open Distance Learning: Research issues in Malaysia. *Malaysian Journal of Distance Education*, 7(2), 63–77.

Erasmus, C.F. & Grebe, G.P.M. 2016. Availability of Study Time for Undergraduate Finance Students at an Open and Distance Learning Institution in South Africa. *Journal of Higher Education in Africa / Revue de l'enseignement supérieur en Afrique*, 14 (1): 141-154

Hege, B. A. R. (2011). The online theology classroom: Strategies for engaging a community of distance learners in a hybrid model of online education. *Teaching Theology and Religion*, 14(1), 13–20.

Hillman, D. C. A., Willis, D. J., & Gunawardena, C. N. (1994). Learner-interface interaction in distance education: An extension of contemporary models and strategies for practitioners. American Journal of Distance Education, 8(2), 30–42.

Joksimović, S. Gašević, D., Kovanović, V., Riecke, B. E., &Hatala, M. (2015). Social presence in online discussions as a process predictor of academic performance. *Journal of Computer Assisted Learning*, 31(6), 638-654.

Kedar, T., Baruch, R., &Gruvgald, E. (2003). Satisfaction from the e-learning system. Unpublished manuscript, Bar-Ilan University, Ramat Gan, Israel.

Kennedy, E.K., Judd, T.S., Churchward, A. & Gray, K. 2008. First year students' experiences with technology: Are they really digital natives? *Australasian Journal of Educational Technology, 24(1): 108-122.*

Kenny, A. (2002). Online learning: Enhancing nurse education? *Journal of Advanced Nursing*, 38, 127–135.

Kirlidog, M., Van der Vyver, C., Zeeman, M., & Coetzee, W. (2018). Unfulfilled need: Reasons for insufficient ICT skills in South Africa. *Information Development*, 34(1), 5–19.

Kop, R., & Hill, A. (2008). Connectivism: Learning theory of the future or vestige of the past? *The International Review of Research in Open and Distance Learning*, 9(3). Retrieved October 4, 2018, from http://www.irrodl.org/index.php/irrodl/article/view/523/1103

Lee, J., & Martin, L. (2017). Investigating students' perceptions of motivating factors of online class discussions. *International Review of Research in Open and Distributed Learning*, 18(5), 148–172.

Marks, R. B., Sibley, S. D., & Arbaugh, J. B. (2005). A structural equation model of predictors for effective online learning. *Journal of Management Education*, *29*(4), 531–563.

Moore, M.G. (1989). Three types of interaction. *The American Journal of Open Distance Learning*, 3(2), 1–6.

Muirhead, B., & Juwah, C. (2004). Interactivity in computer-mediated college and university education: A recent review of the literature. *Educational Technology & Society*, 7(1), 12–20.

Naidu, S. (2013). Instructional design models for optimal learning. In M.G. Moore (Ed.),*Handbook of distance education*(pp. 268–281). New York: Routledge

Oyedemi, T. (2015). Participation, citizenship and internet use among South African youth. *Telematics and Informatics*, 32(1), 11–22.

Pavalche-Ilie, M. & Cocorada, S. (2014). Interactions of students' personality in the online learning environment. *Procedia – Social and Behavioural Sciences*, 128, 117–122.

Saunders, M., Lewis, P. & Thornhill, A. (2009). *Research methods for business students. Fifth Edition.* India: Pearson Education.

Shi, J., Chen, Z., & Tian, M. (2010). Internet self-efficacy, the need for cognition, and sensation seeking as predictors of problematic use of the Internet. *Cyberpsychology, Behavior, and Social Networking*, 14(4), 231–234. doi:10.1089/cyber.2009.0462

Siemens, G. (2005). Connectivism: A learning theory for the digital age. International Journal of Instructional Technology and Distance Learning, 2(1), 3–10.

Siemens, G. *Knowing Knowledge.* (2006). Vancouver, Canada: Lulu Press.

Statistics SA. (2019). Education Series Volume V: Higher Education and Skills in South Africa, 2017. Pretoria: Statistics South Africa.

Swan, K. (2002). Building learning communities in online courses: the importance of interaction, *Education, Communication and Information*, 2(1), 23–49.

Tait, A. (2000). Planning student support for open and distance teaching. *Open Learning*, 15(3), 287–299.

Taylor, J. C. (2001). *Fifth generation distance education*. Retrieved from http://www.usq.edu.au/users/taylorj/conferences.htm (accessed on 25/01/2018)

Tirri, K., &Kuusisto, E. (2013). *Interaction in Educational Domains*. Sense Publishers.

Trentin, G. (1998). Computer conferencing systems as seen by a designer of online courses. *Educational Technology*, 38(3), 36–43.

UNISA. (2008). *Open distance learning policy*. Pretoria: UNISA.

UNISA. (2018). Policy on the provision of e-devices for e-learning at UNISA. Pretoria: UNISA

Ustati, R., & Hassan, S.S.S. (2013). Distance learning students' need: Evaluating interactions from Moore's Theory of Transactional Distance. *Turkish Online Journal of Distance Education*, 14(2), 292–304.

Van den Berg, G. (2017). Learning theories and the use of technology in the classroom. In Swart, E. and Eloff, I. (Eds), *Understanding educational psychology* (pp. 69-76). Cape Town: Juta. ISBN9781485102472.

Wagner, E. D. (1994). In support of a functional definition of interaction. *The American Journal of Distance Education*, 8(2), 6–26.

Wang, Z., Chen, L., & Anderson, T. (2014). A framework for interaction and cognitive engagement in connectivist learning contexts. *The International Review of Research in Open and Distributed Learning, 15*(2). doi:http://dx.doi.org/10.19173/irrodl.v15i2.1709

Weidlich, J., & Bastiaens, T.J. (2018). Technology matters – The impact of transactional distance on satisfaction in online distance learning. *International Review of Research in Open and Distributed Learning*, 19(3), 222–242

Woo, Y., & Reeves, T.C. (2007). Meaningful interaction in web-based learning: A social constructivist interpretation. *Internet and Higher Education*, 10, 15–25

Xiao, J. (2017). Learner-content interaction in distance education: The weakest link in interaction research. *Distance Education*, 38(1), 123–135.

Yu, A. Y., Tian, S. W., Vogel, D., & Kwok, R. (2010). Can learning be virtually boosted? An investigation of online social networking impacts. *Computers and Education*, 55(4), 1494–1503.

SENSE OF COMMUNITY, PEER FEEDBACK AND COURSE ENGAGEMENT AS PREDICTORS OF LEARNING IN BLOG ENVIRONMENTS

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ABSTRACT

Blogs have the potential to improve in-depth thinking, reflection, interaction and sense of community in higher education settings. Although the effectiveness of blogging on performance and thinking skills, student interaction and collaboration have been investigated by many educators, the number of studies on what influences learning in blog-based learning environments is limited. The aim of this study was to investigate the relationship between sense of community, perception of peer feedback, course engagement and learning in a blog-based learning environment. A relational study was adopted, and 170 university students participated in this study. The data of the study were collected through an online questionnaire that measures students' sense of community, peer feedback, course engagement, and perceived learning. In order to analyze the data, correlation and multiple regression tests were applied, as well as mean and standard deviation. At the end of the study, it was found that students' perceived learning, sense of community, peer feedback perceptions and course engagement were at a high level. In addition, the results of this study showed that in blog environments, students' sense of community, peer feedback perception and course engagement were significant predictors of their learning. The study findings have implications for both teachers and students and can be used as a framework to help the successful use of educational blogs.

Keywords: Blogging, sense of community, peer feedback, course engagement, perceived learning

INTRODUCTION

The emergence and development of Web 2.0 technologies have provided new environments to support collaboration and interaction. As one of these technologies, blogs, play a major role in innovative ways of meeting, sharing ideas and collaboration. Although the definition changes with the development and capabilities of technology, a blog is an acronym for "weblog" or "web-based logs". A blog can be defined as a web portal where text-based content, videos, and photos are published, and articles appear in reverse chronological order, typically run by a person or small group. Blogs have simple user interfaces and allow end-users to easily add and manage content without HTML or FTP knowledge and skills. Most blogs provide feedback from readers through the comment feature. This interactive feature describes blogs as social and network-oriented.

Among the Web 2.0 tools, blogs could be used as content creation and sharing environments to engage students, provide communication among students, teachers and public, facilitate interaction and collaboration among students and shared knowledge construction. In recent years, educational blogs have attracted the attention of both educators and researchers. Blogs have been used at primary and secondary education (Angelaina & Jimoyiannis, 2011), higher education (Cakir, 2013; Top, 2012), professional development of teachers (Caldwell & Heaton, 2016) and informal learning in adults (Harju, Pehkonen, & Niemi, 2016; Holland, 2019). Previous research claims that blogs promote reflective learning because of their technical and pedagogical characteristics (Yang, 2009). In addition, blogs support the transition from superficial learning to a deeper understanding through resource and knowledge sharing, critical and reflective thinking, and teamwork and interaction (Cakir, 2013).

In recent years, the number of studies investigating the effects of blogging on learning, student interaction, presence and perceptions of students in learning environments has increased. However, the number of studies on the factors that affect learning in blog environments is still limited. Hence, it is necessary to identify the factors that affect learning in blog-based environments (Halic, Lee, Paulus, & Spence, 2010). Halic et al. (2010) and Top (2012) conducted studies attempting to identify these factors. However, examining the impact of different variables on learning in different blog-based learning contexts will lead to deeper and broader conclusions. The aim of this study is to examine students' perceptions of blog usage in the context of a higher education course. A better understanding of blogging in learning environments helps teachers to design and implement blog-based learning activities in different contexts and to improve the effectiveness of blogging in classroom settings. This study argues that developing a sense of community among students through blog-based discussions, peer feedback through blogs, and engagement within blog activities influence students' perceived learning levels.

LITERATURE REVIEW

Blogs in Learning Environments

In recent years, interest in blogs for learning and teaching has increased, and blogs have become one of the most popular social media tools in higher education (Angelaina & Jimoyiannis, 2011). Blogging in education is considered to facilitate collaborative and constructivist learning through information sharing, feedback and social support (Johnson & Johnson, 1994). According to the social constructivist learning theory, knowledge is produced by discussing society and reaching a social consensus. Because blogs provide a useful platform for reflection, they are used as an effective learning environment in the process of knowledge construction. Blogs serve as online journals and encourage students to reflect on students' experiences in blog settings (Richardson, 2005). Blogging promotes critical and analytical thinking as it enables students to interact with their peers to develop broader perspectives in the context of constructivist learning (Ellison & Wu, 2008). Jimoyiannis and Angelaina (2012) asserted that as students can construct and validate meaning through discourse, continuous reflection and content sharing, blogs enable learners to develop both social and cognitive entities as a research community. In blog-supported environments, students begin to comprehend the sharing, exchange and collaboration of knowledge that contributes to learning and professional development (Top, 2012; Wassell & Crouch, 2008). Previous studies suggests that blogs can be used (a) as a teaching and learning tool to support active participation of students in a classroom (Kilic & Gokdas, 2014), (b) to increase peer support and collaboration (Chang & Chang, 2014), (c) to facilitate students' motivation and engagement in the classroom (Pursel & Xie, 2014; Shana & Abulibdehb, 2015); and (d) to facilitate reflection and critical thinking (Li, Bado, Smith, & Moore, 2013; Xie, Ke, & Sharma, 2008).

The primary purpose of blogging in higher education classrooms is to develop critical and reflective thinking and collaboration among students to promote deep learning. However, studies examining the potentials of blogs to improve learning have shown conflicting results (Chang & Chang, 2014; Petko, Egger, & Graber, 2014). For example, Xie et al. (2008) reported that while blogging enhanced students' reflective thinking over time, students' peer evaluation had no effect on reflective thinking. According to Chang and Chang (2014), blogging improves the contextualization of learning which is crucial for peer support, while peer feedback in online learning environments does not support students' reflective learning. In addition, students may feel more comfortable when they agreed, rather than having a different opinion with someone, fearing that they might compromise their position in the classroom. Moreover, in a quasi-experimental study, Petko, Egger, and Graber (2014) compared reflective writing on blog and paper and concluded that blogs do not provide significant benefits in terms of quality of writing.

Sense of Community

The sense of community means "the sense of belonging, the feeling that members care about each other and the group, and a common belief that the needs of the members will be met together" (McMillan & Chavis, 1986, p. 9). In learning environments, the sense of community can be established by joint goals and responsibility, communication and interaction among students and teachers, value and interest, mutual

respect, and behavioral and emotional engagement. It was asserted that students' sense of community is positively correlated with learning experiences, achievement, performance and learning outcomes (Sadera, Robertson, Song & Midon, 2009). Isolation or disconnection of students from the learning community may lead to dropout and failure. Insufficient interaction and collaboration, disbelief, conflict, the presence of clues that reveal or emphasize identities and exclusion of others are reasons for isolation of the learners or disconnection of community (Rovai, 2002).

Bangert (2009) suggests that the sense of class community is an essential element of successful e-learning. Similarly, Rovai (2002, p.321) argues that "if online learners feel a sense of community, this emotional commitment can provide learners with the support they need to successfully complete a course or program and learn more". Therefore, students should be given a strong sense of community and increased emotional support should be provided. Some studies indicate that feelings of isolation and disconnection can be partially achieved, and a strong sense of community can be provided by collaboration and interaction among learners in a classroom setting (Liu, Magjuka, Bonk, & Lee, 2007; Phirangee, 2016). Blogs can support a sense of community by increasing collaboration and interaction in face-to-face or online classes (Cuhadar & Kuzu, 2010). In addition, through blogging, students are able to share and change ideas and collaborate on learning activities to enhance a sense of community (Petersen, Chabert & Divitini, 2006). Proper use of blogs with instructional strategies facilitates the feelings of belonging to a learning community. Through peer dialogue in a blogging environment, students can visit each other's blogs to give feedback, encourage each other, force each other to think critically, reduce their feelings of isolation, and create a community feeling (Rockinson-Szapkiw & Walker, 2009). In the process of creating a sense of community, blogs could be used not only for grading, but also to improve students' interaction and reduce their isolation and alienation.

Peer Feedback

Peer evaluation requires the use of knowledge and thinking skills to criticize and reflect on others' work (Ballantyne, Hughes & Mylonas, 2002). Topping (1998) asserted that reviewing, clarifying and correcting others' work involves students in new knowledge, and help students to deepen the comprehension of the new content subject. Hence, peer evaluation supports students' critical thinking and to become individual learners. In addition, it is assumed that students would be more accurate and reasonable when assessing their peers. This forces students to develop a sense of responsibility and ownership for their peer learning (Dochy, Segers & Sluijsmans, 1999; Topping, Smith, Swanson & Elliot, 2000). When students provide peer feedback on draft assignments through exchange of information and experience, they would have the opportunity to comprehend and reflect on their peers' assignments. This leads students to reflection and learning deep.

Social networking sites, especially blogs, offer writers the opportunity to receive formative feedback from peers and the broad public in different ways, different from traditional classroom practices. Blogs are effective when gaining deep feedback is crucial and create a learning environment that enables students to participate in effective peer feedback (Bouzidi & Jaillet, 2009). Arslan and Aysel (2010), comparing paper-based writing instruction with writing instruction performed through blogs, showed that writing integrated with blogging could contribute to more performance than in paper-based teaching. Novakovich (2016) conducted a quasi-experimental study to test whether there were significant differences between instruction through traditional methods and through the blogging platform in terms of the quality of writing and peer feedback. The study showed that students produced higher quality writing and more critical comments in a blog environment. Yeh, Tseng, and Chen (2019) investigated the impact of online peer feedback via blogging on the speech performance of university students studying English as a Foreign Language (EFL). At the end of the study, the overall speech performance of the students increased significantly with the support of peer feedback. It was also found that students who responded more actively to peers' feedback had made more progress in the video development process.

Course Engagement

Bangert-Drowns and Pyke (2001, p.215) defined engagement as the organization of cognitive, affective and motivational strategies for explanatory procedures. The literature on student engagement indicates that active students are better learners, engage in more intensive and comprehensive learning tasks, and effective

teaching encourages student participation (Handelsman, Briggs, Sullivan & Towler, 2005; Bangert-Drowns & 2005). Most studies on student participation suggest that participation is a multidimensional structure that includes behavior, emotion, cognition, and social interaction (Fredricks, Blumenfeld & Paris, 2004; Handelsman et al., 2005).

Blogging is considered as an online activity to increase students' learning, motivation and engagement. Online publishing creates a motivating learning environment for students to develop their engagement and performance in an efficient way by supporting collaboration, self-regulation and performance (Novakovich & Long, 2013). The use of blogs in classes enables students to participate in class discussions, which increases their active participation in classroom activities (Al-Hebaishi, 2012). Kurt, Izmirli and Izmirli (2011) conducted research with 68 undergraduate students who took the Information and Communication Technologies (ICT) course in order to investigate students' perceptions about the use of blogs for complementary purposes in the courses and interviewed with them at the end of the teaching. During teaching, the students were asked to write articles on their personal blogs in order to reflect their knowledge and views on the course topics. The results of the study showed that the students involved in the blog activities showed more interest and were more successful in the course. Cameron (2012) examined whether blogs would increase student engagement in the real-world situation of the economy. As a result of the study, he stated that blogs enable students to be more interested and participatory and to be aware of current economic issues. Moreover, Kucuk and Richardson (2019) and Dixon (2015) argue that students' emotional, behavioral and cognitive engagement in online learning communities have significant effects on satisfaction and learning.

Aim of the Study

The aim of this study was to reveal the factors associated with perceived learning in a blog environment. In addition, this study examined to what extent community feeling, peer feedback, and course engagement affected students' perceived learning in a blog environment. The study sought answers to the following research questions:

- What are the students' sense of community, perception of peer feedback, course engagement and perceived learning in a blog-based learning environment?
- What is the relationship between sense of community, perception of peer feedback, course engagement and perceived learning in a blog-based learning environment?
- To what extent can students' sense of community, perception of peer feedback, course engagement predict their perceived learning in a blog-based learning environment?

METHODOLOGY

Participants and the Context

The participants of the study were 170 students at the Turkish Language Teaching Department of the Faculty of Education at a state university. Of the participants, 76 (44.7%) of them were female and 94 (55.3%) of them were male. Regarding their blogging experience, 156 (91.8%) of the students had no previous blogging experience, 10 (5.9%) of them had 1-3 years of experience and 4 (2.4%) of them had 5 years or more experience of blogging.

The study was carried out in the Computer II course, which is a compulsory course of students' curriculum. The students were divided into four sections. Before the implementation, the students were asked to form groups of two to four. The groups were determined based on the students' own decisions. Each group created a blog account using a service provider that provides a free blogging service. With this service provider, blog posts and web sites can be created. The researcher taught the students how to create, edit, share and publish the content with that service provider. In addition, information about how to change the interface, how to active widgets and how to use them effectively was presented.

During the spring semester, the groups created content and instructional materials using WebQuest, digital video and digital storytelling techniques, and they published their products on each group's blog pages. The instructional materials were created based on the learning achievements stated in the secondary school

Turkish Language course program. In addition to these contents, the ADDIE model-based instructional design process which was followed to develop the instructional materials was published on the blog. Before each application, theoretical information about the instructional technique was told to the students by the researcher. The use of these techniques in the teaching of Turkish and the types of materials that could be developed with these techniques were discussed with the students. In addition, different examples were shared with them.

Each group published its detailed information and content on the product development process and its product on the blog. Regarding peer feedback, a group of students in one section evaluated both the instructional design process and the product developed by another group in another section. Semi-structured and open-ended evaluation criteria for each product type and process were presented to the students. Commenting feature of the blog page were kept open so that reviewers could comment on the blog page. Based on these evaluation criteria, the students made open-ended comments on the other group's blog each week. Discussions were made on the relevant blog page while adhering to the rules of Internet ethics. Taking the feedback into consideration, the students revised both the process and the product. All these treatments lasted for 10 weeks, four hours per week. Furthermore, the peer evaluation process made up 10% of the final grade.

Data Collection

In order to collect data, Peer Feedback Perception Scale, Student Course Engagement Scale, Sense of Community Scale and Perceived Learning Scale were used. An online data collection tool was prepared to collect the data and the web address of the scale was shared with the students at the end of the semester. Students were able to answer the scales using any tool having Internet access. Since participation in the data collection part of the study was voluntary, only the volunteer students answered the scales. Six students did not participate in the data collection phase at the end of the term.

The Peer Feedback Perception Scale developed by Vaezi and Abbaspour (2015) was used to determine the students' views on peer feedback through blogs. The scale consisted of 14 items in a 5-point Likert type (1 = Strongly disagree – 5 = Strongly agree) and the reliability coefficient of the scale was computed 0.91. The back-translation method was used to translate items into Turkish. First, a faculty member of the English Language Teaching program translated into Turkish and back-translated the questionnaire to the original language. Next, the two versions of the instrument (original language and back-translated version) are compared for concept equivalence. After exploratory factor analysis (EFA), two items were removed from the scale. The Keiser-Meier-Olkin (KMO) and Bartlett's Test of Sphericity (BTS) showed that the sample size was acceptable, and the data were appropriate (KMO = 0.825, p < 0.05) for the factor analysis (Field, 2009). Twelve items were collected under three constructs – attitude toward blogging, reader role of student, and writer role of student. Three constructs explained 70.17% of the total variance which might be acceptable (Tavsancil, 2010). The internal consistency reliability coefficient of the scale was found to be high, 0.86. In addition, the reliability coefficients of the attitude toward blogging, reader role of student, and writer role of student constructs were computed as 0.82, 0.89, and 0.86, respectively. "I can express my thoughts comfortably with the blog", "it was unnecessary to review the assignments on the blogs of other groups", and "it helped me to hear my classmates' comments about our assignments" are examples of items in the scale.

To investigate students' engagement in the classroom, the Student Course Engagement Scale initially developed by Handelsman et al. (2005) and translated and adopted into Turkish by Author (2013) was used. It consisted of three constructs, skills, interaction and performance, and emotional. The reliability coefficient of the Turkish version of the scale was computed 0.87. In the current study, the internal consistency reliability coefficient of scale was found to be high, 0.93. Moreover, the reliability of the skills (0.94), interaction and performance (0.92), and emotional (0.92) constructs were high. In the scale, students were asked "To what extent do the following behaviors, thoughts, and feelings describe you, in this course. Please rate each of them on the following scale: 1 = not at all characteristic of me, 2 = not really characteristic of me, 3 = moderately characteristic of me, 4 = characteristic of me, 5 = very characteristic of me." "Putting forth effort", "helping fellow students", and "staying up on the readings" were sample items of this scale.

Sense of Community and Perceived Learning Scales developed by Halic et al. (2010) were used to determine the students' perceptions of community and learning in the blog environment. The scales were adapted to Turkish by Top (2012). The Sense of Community scale consists of six items in a 5-point Likert type and examines attitudes towards blogging and community building. Some of the sample items in the scale were "The blog helps me feel connected to other students in the course" and "In comparison to my other classes, the quality of interaction with other students in this class has increased due to the blog". Top (2012) found the reliability coefficient of the scale to be 0.79. In this study, the internal consistency coefficient of the scale was calculated as 0.75, which was good. The Perceived Learning Scale consists of seven items in a 5-point Likert type (1 = Completely disagree - 5 = Completely agree). Items such as "I believe that incorporating blogs with teaching can enhance my learning experience in general" and "the blog discussions help me to share my knowledge and experience with my peers" were on the scale. Top (2012) founded the reliability of the scale as 0.84. In this study, it was found to be high, 0.82. Hence, it could be said that the scales used in the current study have high reliability.

Data Analysis

Before analyzing the data, negative items in the scales were reversed. The data collected by an online questionnaire were subjected to descriptive statistics such as mean and standard deviation using SPSS 20.0 software. The normality of the data was tested on the assumption that in a normally distributed sample, 95% of the z-skewness and z-kurtosis scores should be between -1.96 and +1.96 (Field, 2009). The analysis showed that the scores from the scales had a normal distribution.

Then, bivariate and multivariate analysis were performed on the data. For example, the Pearson Correlation coefficient was calculated to examine the relationship between students' perceptions of peer feedback, course engagement, sense of community, and perceived learning. In addition, multiple regression analysis was performed to measure how well the students' perceived learning could be explained in terms of selected variables (peer feedback perception, course engagement, sense of community).

FINDINGS

Descriptive Statistics

Descriptive statistics of students' scores on the sense of community, perception of peer feedback, course engagement, and perceived learning are presented in Table 1. The mean of the scores of the variables obtained from the five-point scale was interpreted considering the group interval for mean scores was 0.80. While the students' sense of community ($\bar{X}$ = 3.93), course engagement ($\bar{X}$ = 3.69) and peer feedback perception ($\bar{X}$ = 4.16) were found to be moderately high, the perceived learning average was high ($\bar{X}$ = 4.33).

Table 1. Descriptive statistics

	N	Range	$\bar{X}$	Std. dev
Sense of community	170	1-5	3.93	.72
Perception of peer feedback	170	1-5	4.16	.45
Course engagement	170	1-5	3.69	.75
Perceived learning	170	1-5	4.33	.45

Correlations Among Variables and Regression Analysis

Table 2 indicates the correlation coefficients among perceived learning and predictive variables. Correlation analysis indicated positive, moderate and significant correlations between perceived learning and sense of community (r = 0.591, p <0.01), peer feedback perception (r = 0.697, p <0.01), and course engagement (r = 0.518, p <0.01). In addition, there was a positive and moderately significant correlation between sense of community and peer feedback perception (r = 0.612, p <0.01) and course engagement (r = 0.426, p <0.01). Finally, a positive and moderately significant correlation between peer feedback perception and

course engagement (r = 0.491, p <0.01) was found. The correlation coefficients among the variables were less than 0.80, indicating that there was no multicollinearity among the variables. Therefore, it could be said that one of the assumptions of multiple regression analysis, no multicollinearity among the variables, was met (Field, 2009).

Table 2. Correlations among variables

	1	2	3	4
(1) Perceived learning	-	.591**	.697**	.518**
(2) Sense of community		-	.612**	.426**
(3) Perception of peer feedback			-	.491**
(4) Course engagement				-

**. p<0,01

Table 3 shows that the regression model was significant at p <0.001 (F (3, 166) = 69,546, p = 0,00). With the model, R^2 was found as 0.557 which means that 55.7% of the variance in perceived learning in the blog environment was significantly explained by three factors in the model (sense of community, perception of peer feedback and course engagement). As can be seen in Table 4, sense of community (t = 3.367), perception of peer feedback (t = 0.6736), and course engagement (t = 3.228) were significant predictors of perceived learning in blog environments. Positive weight coefficients show that they had positive effects on perceived learning. The standardized coefficients of the predictor variables were measured as peer feedback perception (β = 0.465), sense of community (β = 0.224), and course engagement (β = 0.195). In other words, a one unit increase in self-reported score of Perception of peer feedback led to 0.465 point increase in the score of perceived learning, a one point increase in the self-reported score of Sense of Community led to 0.224 point increase in the score of perceived learning, and a one unit increase in self-reported score of Course Engagement led to 0.195 point increase in the score of perceived learning. This result showed that the most influential variable on perceived learning in blog environments was the perception of peer feedback.

Table 3. ANOVA result for regression model

Model	Sum of squares	df	Mean square	F	p
Regression	19.013	3	6.338	69.546	.000
Residual	15.127	166	.091		
Total	34.140	169			
R = 0.746	R^2 = 0.557		R^2(adjusted) = 0.549		

Table 4. Multiple regression model of perceived learning with sense of community, perception of peer feedback, and course engagement

Model	Unstandardized coefficients		Standardized coefficients	t	p
	B	SE B	β		
(Constant)	1.408	.217		6.476	.000
Sense of community	.140	.042	.224	3.367	.001
Perception of peer feedback	.466	.069	.465	6.736	.000
Course engagement	.117	.036	.195	3.228	.002

DISCUSSION

The results of the study indicate that the students' views about the use of blogs are positive and discussion through blogging contributes positively to their learning. In particular, comments made by peers on blogs are essential for students, and comments on blogs have contributed to the development of different perspectives. These results are similar to the results of the studies examining the experiences of students in blog environments. Kilic and Gokdas (2014), Kuo, Belland and Kuo (2017) and Top (2012) found that the students' perception of learning was high in blog-based learning environments and that the comments written on their blogs contributed to their learning. However, Halic et al. (2010) found a controversial result and stated that only one-quarter of the students found the feedback of the others valuable. From the social constructivist learning theory perspective, it can be said that guided, informative and high-quality comments written by peers helped the students to develop different perspectives (Johnson & Johnson, 1994).

In blog settings, it is seen that students have a high level of feeling that they see themselves as members of a community. Students see themselves as part of a learning group during blog-based activities. Additionally, students stated that they had more interaction with peers and their interactions with peers had of higher quality in comparison to their other classes. Halic et al. (2010) and Kuo et al. (2017) also found that blogs contributed to the development of community feeling among participants who thought that sharing learning experiences and knowing others' ideas would contribute to mutual development. Similar to the results of previous studies, the results of this study indicated that sense of community was important for perceived learning (Halic et al., 2010; Kilic & Gokdas, 2014; Kuo, et al., 2017; Top, 2012). The sense of community was found to be not only related to perceived learning but also an important determinant of it. Students' perceptions of learning in blog settings are influenced by their sense of community. According to this result, it can be predicted that the students who have a high sense of community will have a high level of learning. This result implicates that increasing students' sense of community by integrating blogs into the learning process can increase their learning experiences. Therefore, to improve the learning experiences of students at higher education level, one of the tasks of teachers would be to create a classroom community and to help students become part of this community.

Although Halic et al. (2010) claimed that students did not value feedback in blog environments, they suggest that an understanding of this result requires further studies. In this study, contrary to the study of Halic et al. (2010), it is seen that the students' opinions about using feedback in the blog environment are positive. This result is similar to the findings of Top (2012) and Kilic and Gokdas (2014). The students stated that peers' feedback helped them to identify the weaknesses in the assignments, that examining the other groups' assignments posted in their blogs contributed to their own learning and that they were able to express their thoughts easily within the blogs. Hence, it is concluded that blogs are learning environments that help to provide effective peer feedback to students. Additionally, according to the results of this study, feedback by peers on their blogs was one of the critical factors that affect their learning. It can be thought that in blog environments, the students who have more positive opinions about peer feedback will have higher perception of learning. Arslan (2014) claimed that one of the reasons that students do not believe in feedback from their peers is that they do not take peer feedback seriously. During this study, considering the evaluation criteria provided to the students by the teacher, the students made open-ended evaluations on the design process and the instructional material. Providing students with semi-structured assessment criteria rather than unstructured and providing feedback in line with these criteria may lead to better quality comments. Hence, the quality of feedback was also one of the factors affecting learning (Novakovich, 2015). Teachers can also apply semi-structured feedback activities to encourage students to reveal their reflective thinking and learn from their peers.

According to the results of the study, it can be said that students' participation in the class is high in blog-based learning environments. The students stated that they contributed to the group activities at a high level, they made great efforts to understand the subject of the course and that they had fun in the course. However, it was seen that the students did not raise their hands in the classroom or the frequency of asking questions to the teacher was low. The reason for this might be help from peers when they need or the comments on

their blogs. Moreover, meaningful knowledge is constructed, and effective learning occurs when the level of interaction between students is high (Joo, Lim & Kim, 2011). This result of the study is similar to the studies showing that students actively participate in class activities in blog settings (Al-Hebaishi, 2012; Kurt et al., 2011) and that blog interactions support cooperation and performance (Novakovich & Long, 2013). It was found that students' participation in the course had a significant and positive relationship with learning and was one of the factors that significantly influence learning in blog environments. Similarly, Kucuk and Richardson (2019) and Dixon (2015) argue that one of the crucial factors that affect students' continuity and enhance learning performance is their engagement in the course. Therefore, it is expected that students who have a high level of participation in the courses will have higher learning in blog environments. Engagement, which means active participation in the course activities through continuous efforts to achieve the desired learning outcomes, affects the level of learning outcomes, cognitive development and quality of learning (Ma, Han, Yang & Cheng, 2015). Therefore, providing students' behavioral, cognitive and emotional support or engagement and maintaining this support may contribute to higher learning.

This result suggests that students who perceive themselves as a part of a classroom community, value peer feedback, and engage in the learning activities through blogs are likely to achieve more in blog-based learning environments. Previous studies have shown that the sense of community was the most important predictor of learning in blog settings (Halic et al., 2010; Kilic & Gokdas, 2014; Top, 2012). However, these studies were conducted without considering the perception of peer feedback and students' course engagement. When the sense of community, peer feedback perception and course engagement variables were taken together, it was found that these three variables were significant predictors of learning in blog settings and explained 55.7% of the variance in learning. This implies that the three variables have a great impact on students' learning in blog-based environments. Moreover, unlike other studies, this study revealed that peer feedback is the most significant factor among the others affecting learning in a blog setting. Therefore, this study highlighted the important relationships among the variables that influence learning in a blog environment.

CONCLUSION

Blogs have the potential to transform teaching and learning by enabling community feeling, peer feedback, and course engagement, and to enhance learning experiences. The higher the level of sense of community, peer feedback, and course engagement, the higher the perceived learning of students. This study demonstrates that students who (a) feel part of a learning community, (b) have a positive experience in their feedback through blogs, or (c) participate in teaching activities will have better learning experiences.

The most valuable feature of blogs is that it allows individual reflection, peer interaction and evaluation. This study emphasizes several points that teachers should consider when integrating blogs into learning environments. First, blogs have a higher impact when combined with compatible pedagogical environments and processes. Secondly, it is central to build a classroom community to help students learn in integrated environments, to help them develop positive experiences in peer feedback, and to engage in learning activities. The sense of community can be strengthened by the development of interaction between students. Semi-structured and open-ended peer evaluations can provide more focused and subject-specific feedback. Collaboration between students, weekly tasks and peer control of tasks can also be used to help students engage in activities.

Publishing a project or assignment on a course blog is a great convenience for a teacher in managing and supervising student assignments. The teacher has more control over the level of participation and collaboration of students. In addition, students are encouraged and motivated to achieve their work when their assignment is published online. Santos and Leahy (2014) state that writing on the web, which is a public environment, is a risky business. Unpredictable web audiences and peers are of great concern to the student. This concern leads to increased audience awareness. Therefore, it can be said that blog-based collaboration creates digital criticism on students and peer feedback helps students perform and learn better.

This study was performed at a state university in Turkey and the cause-effect relationship has not been confirmed. Therefore, the generalizability of the results is still limited. Additional research can be conducted using different samples, courses and learning environments. The impact of blogs on students of higher education in different countries can be examined. It was found that the variables in the model explain 55.7% of the learning in the blog environment. Therefore, studies can be conducted with different variables to explain the remaining 44.3%. In the study, multiple regression analysis tests were applied to predict learning in blog environments. In another study, structural equation modeling, an analysis that runs more than one multiple regression models at the same time, can be used to construct a model that measures the factors affecting learning in these settings. The present study could be further expanded by analyzing the content of the students' messages and the quality of peer feedback. Finally, the collation of quantitative data with qualitative input would help to understand the effects of the variables on learning in a more comprehensive manner.

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REFERENCES

Al-Hebaishi, S. M. (2012). Pre-service teachers' perceptions towards academic blogging. Journal of Theoretical and Applied Information Technology, 37(2), 279–288.

Angelaina, S., & Jimoyiannis, A. (2011). Educational blogging: Developing and investigating a students' community of inquiry. In A. Jimoyiannis (Ed.), Research on e-learning and ICT in education (pp. 167–180). New York, NY: Springer.

Angelaina, S., & Jimoyiannis, A. (2012) Analysing students' engagement and learning presence in an educational blog community. Educational Media International, 49(3), 183–200. DOI:10.1080/09523987.2012.738012

Arslan, R. S. (2014). Integrating feedback into prospective English language teachers' writing process via blogs and portfolios. The Turkish Online Journal of Educational Technology, 13(1), 121–150.

Arslan, S., & Aysel, S. K. (2010). How can the use of blog software facilitate the writing process of English language learners? Computer Assisted Language Learning, 23(3), 183–197. DOI: 10.1080/09588221.2010.486575

Ballantyne, R., Hughes, K., & Mylonas, A. (2002). Developing procedures for implementing peer assessment in large classes using an action research process. Assessment & Evaluation in Higher Education, 27(5), 427–441. DOI:10.1080/0260293022000009302

Bangert, A. W. (2009). Building a validity argument for the community of inquiry survey instrument. The Internet and Higher Education 12(2), 104–11. DOI:10.1016/j.iheduc.2009.06.001

Bangert-Drowns, R. L., & Pyke, C. (2001). A taxonomy of student engagement with educational software: An exploration of literate thinking with electronic text. Journal of Educational Computing Research, 24(3), 213-234. https://doi.org/10.2190/0CKM-FKTR-0CPF-JLGR

Bouzidi, L., & Jaillet, A. (2009). Can online peer assessment be trusted?. Journal of Educational Technology & Society, 12(4), 257–268.

Cakir, H. (2013). Use of blogs in pre-service teacher education to improve student engagement. Computers & Education, 68, 244–252. DOI:10.1016/j.compedu.2013.05.013

Caldwell, H., & Heaton, R. (2016). The interdisciplinary use of blogs and online communities in teacher education. International Journal of Information and Learning Technology, 33(3), 142–158. DOI:10.1108/IJILT-01-2016-0006

Cameron, M. P. (2012). Economics with training wheels: Using blogs in teaching and assessing introductory economics. Journal of Economic Education, 43, 397–407. DOI:10.1080/00220485.2012.714316

Chang, Y. J., & Chang, Y. S. (2014). Assessing peer support and usability of blogging in hybrid learning environments. Interactive Learning Environments, 22(1), 3–17. DOI:10.1080/10494820.2011.619889

Cuhadar, C., & Kuzu, A. (2010). Improving interaction through blogs in a constructivist learning environment. Turkish Online Journal of Distance Education, 11(1), 134–161.

Dixon, M. D. (2015). Measuring student engagement in the online course: The online student engagement scale (OSE). Online Learning, 19(4), 1–15. DOI:10.24059/olj.v19i4.561

Dochy, F., Segers, M., & Sluijsmans, D. (1999). The use of self-, peer and co-assessment in higher education: a review. Studies in Higher Education, 24, 331–350. DOI:10.1080/03075079912331379935

Ellison, N. B., & Wu, Y. (2008). Blogging in the classroom: A preliminary exploration of student attitudes and impact on comprehension. Journal of Educational Multimedia and Hypermedia, 17(1), 99–122.

Eteokleous-Grigoriou N., & Photiou S. (2014) Integrating blogs in primary education. In: Karagiannidis C., Politis P., Karasavvidis I. (eds) Research on e-Learning and ICT in Education. Springer, New York, NY.

Field, A. (2009). Discovering statistics with SPSS, 3rd Edition. California: Sage Publications.

Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. Review of Educational Research, 74, 59–109. DOI:10.3102/00346543074001059

Gürer, M. D. (2013). Utilization of learning objects in social studies lesson: Achievement, attitude and engagement. Unpublished Ph.D. thesis, Middle East Technical University, Turkey.

Halic, O., Lee, D., Paulus, T., & Spence, M. (2010). To blog or not to blog: Student perceptions of blog effectiveness for learning in a college-level course. Internet and Higher Education, 13, 206–213. DOI:10.1016/j.iheduc.2010.04.001

Handelsman, M. M., Briggs, W. L., Sullivan, N., & Towler, A. (2005). A measure of college student course engagement. The Journal of Educational Research, 98, 184–191. DOI:10.3200/JOER.98.3.184-192

Harju, V., Pehkonen, L., & Niemi, H. (2016). Serious but fun, self-directed yet social: blogging as a form of lifelong learning. International Journal of Lifelong Education, 35(1), 2-17, DOI:10.1080/02601370.2015.1124930

Holland, A. A. (2019). Effective principles of informal online learning design: A theory-building metasynthesis of qualitative research. Computers & Education, 128, 214–226. DOI:10.1016/j.compedu.2018.09.026

Johnson, D. W., & Johnson, R. T. (1994). Professional development in cooperative learning: short-term popularity vs. long-term effectiveness. Cooperative Learning, 14, 52–54. DOI:10.1016/S0742-051X(97)00039-5

Joo, Y. J., Lim, K. Y., & Kim, E. K. (2011). Online university students' satisfaction and persistence: Examining perceived level of presence, usefulness and ease of use as predictors in a structural model. Computers & Education, 57(2), 1654–1664. DOI:10.1016/j.compedu.2011.02.008

Kılıç, E., & Gökdaş, I. (2014). Learning through blogging: Use of blogs to enhance the perceived learning of pre-service ICT teachers. Educational Sciences: Theory & Practice, 14(3), 1169–1177. DOI:10.12738/estp.2014.3.1987

Kucuk, S., & Richardson, J. E. (2019). A structural equation model of predictors of online learners' engagement and satisfaction. Online Learning Journal, 23(2), 196–216. DOI:10.24059/olj.v23i2.1455

Kuo, Y. C., Belland, B. R., & Kuo, Y. T. (2017). Learning through blogging: students' perspectives in collaborative blog-enhanced learning communities. Educational Technology & Society, 20(2), 37–50.

Kurt, A. A., Izmirli, S. & Sahin-Izmirli, O. (2011). Student experience in blog use for supplementary purposes in courses. Turkish Online Journal of Distance Education, 12(3), 78–96.

Li, K., Bado, N., Smith, J., & Moore, D. (2013). Blogging for teaching and learning: An Examination of experience, attitudes, and levels of thinking. Contemporary Educational Technology, 4(3), 172–186.

Liu, X., Magjuka, R. J., Bonk, C. J., & Lee, S. (2007). Does sense of community matter? Quarterly Review of Distance Education, 8, 9–24.

Ma, J., Han, X., Yang, J., & Cheng, J. (2015). Examining the necessary condition for engagement in an online learning environment based on learning analytics approach: The role of the instructor. Internet and Higher Education, 24, 26–34. DOI:10.1016/j.iheduc.2014.09.005

McMillan, D. W., & Chavis, D. M. (1986). Sense of community: A definition and theory. Journal of Community Psychology, 14, 6–23. DOI:10.1002/1520-6629(198601)14:1<6::AID-JCOP2290140103>3.0.CO;2-I

Novakovich, J. (2016). Fostering critical thinking and reflection through blog-mediated peer feedback. Journal of Computer Assisted Learning, 32, 16–30. DOI:10.1111/jcal.12114

Novakovich, J., & Long, E. (2013). Digital performance learning: Utilizing a course weblog for mediating communication. Journal of Education Technology and Society, 16(4), 231–241.

Petersen, S. A., Chabert, G., & Divitini, M. (2006). Language learning: Design considerations for mobile community blogs. IADIS International Conference Mobile Learning (pp. 14–15). Dublin.

Petko, D., Egger, N., & Graber, M. (2014). Supporting learning with weblogs in science education: A comparison of blogging and hand-written reflective writing with and without prompts. Themes in Science & Technology Education, 7(1), 3–17.

Phirangee, K. (2016). Students' perceptions of learner-learner interactions that weaken a sense of community in an online learning environment. Online Learning, 20(4), 13–33.

Pursel, B. K., & Xie, H. (2014). Patterns and pedagogy: Exploring student blog use in higher education. Contemporary Educational Technology, 5(2), 96–109.

Richardson, W. (2005). Blogs, wikis, podcasts, and other powerful web tools for classrooms. Thousand Oaks, CA: Corwin Press.

Rockinson-Szapkiw, A. J., & Walker, V. L. (2009). Web 2.0 technologies: Facilitating interaction in an online human services counseling skills course. Journal of Technology in Human Services, 27(3), 175–193. DOI:10.1080/15228830903093031

Rovai, A. P. (2002). Sense of community, perceived cognitive learning, and persistence in asynchronous learning networks. The Internet and Higher Education, 5(4), 319–332. DOI:10.1016/S1096-7516(02)00130-6

Sadera, W. A., Robertson, J., Song, L., & Midon, M. N. (2009). The role of community in online learning success. MERLOT Journal of Online Learning and Teaching, 5, 277–284.

Sánchez, B., Colón, Y., & Esparza, P. (2005). The role of sense of school belonging and gender in the academic adjustment of Latino adolescents. Journal of Youth and Adolescence, 34, 619–628. DOI:10.1007/s10964-005-8950-4.

Santos, M. C., & Leahy, M. (2014). Postpedagogy and web writing. Computers and Composition, 32, 84–95. DOI:10.1016/j.compcom.2014.04.006

Shana, Z. A., & Abulibdehb, E. S. (2015). Engaging students through blogs: Using blogs to boost a course experience. International Journal of Emerging Technologies in Learning, 10(1), 30-38. DOI:10.3991/ijet.v10i1.4240

Tavşancıl, E. (2010). Tutumların ölçülmesi ve SPSS ile veri analizi. Ankara: Nobel Yayın Dağıtım.

Top, E. (2012). Blogging as a social medium in undergraduate courses: Sense of community best predictor of perceived learning. The Internet and Higher Education, 15, 24–28. DOI:10.1016/j.iheduc.2011.02.001

Topping, K. (1998). Peer assessment between students in colleges and universities. Review of Educational Research, 68, 249–276. DOI:10.3102/00346543068003249

Topping, K., Smith, F. F., Swanson, I., & Elliot, A. (2000). Formative peer assessment of academic writing between postgraduate students. Assessment and Evaluation in Higher Education, 25, 149–169. DOI:10.1080/713611428

Tse, S.K., Yuen, A.H.K., Loh, E.K.Y., Lam, J.W.I., & Ng, R.H.W. (2010). The impact of blogging on Hong Kong primary school students' bilingual reading literacy. Australasian Journal of Educational Technology, 26(2), 164–179. DOI:10.14742/ajet.1088

Vaezi, S., & Abbaspour, E. (2015). Asynchronous online peer written corrective feedback: effects and affects. In: Mehrak R. (Ed.), Handbook of Research on Individual Differences in Computer-Assisted Language Learning, (pp 271–297). PA: USA.

Wassell, B., & Crouch, C. (2008). Fostering critical engagement in preservice teachers: Incorporating weblogs into multicultural education. Journal of Technology and Teacher Education, 16(2), 211–232.

Xie, Y., Ke, F., & Sharma, P. (2008). The effect of peer feedback for blogging on college students' reflective learning processes. The Internet and Higher Education, 11(1), 18–25. DOI:10.1016/j.iheduc.2007.11.001

Yang, S. H. (2009). Using blogs to enhance critical reflection and community of practice. Educational Technology & Society, 12(2), 11–21.

Yeh, H. C., Tseng, S.-S., & Chen, Y.-S. (2019). Using online peer feedback through blogs to promote speaking performance. Educational Technology & Society, 22(1), 1–14.

A STUDY ON DIGITAL CITIZENSHIP:
PRESCHOOL TEACHER CANDIDATES VS. COMPUTER EDUCATION AND INSTRUCTIONAL TECHNOLOGY TEACHER CANDIDATES

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ABSTRACT

The main goal of this study is to determine the digital citizenship perceptions and digital citizenship levels of preschool teacher candidates in terms of digital rights and responsibilities, digital security and digital law by comparing them with Computer and Instructional Technologies teacher candidates' perception. To this end, we worked with 80 teacher candidates in total. Both qualitative and quantitative research methods were employed. To identify participants' digital citizenship levels, a questionnaire was administered. Also, semi-structured interviews were conducted to understand their digital citizenship perceptions. The results showed that participants' digital citizenship levels were above average and their digital citizenship perceptions supported this result. In addition, their responses related to digital security, digital rights and responsibilities, and digital law were parallel to their definitions in the literature and they connected them with digital communication and ethics. However, teacher candidates' misconceptions in terms of digital rights and responsibilities and digital security were observed.

INTRODUCTION

Developments in today's technologies have changed the meaning of citizenship and introduced the concept of digital citizenship. Although digital citizenship was initially described as online access, it has recently been re-defined as using digital technologies in a safe and responsible manner, or in other words, behavioral norms in digital environments (Ribble, Bailey & Ross, 2004, Jones & Mitchell, 2016; Yue, Nekmat & Beta, 2019). Cubukcu and Bayzan (2013) defined digital citizenship as people using technological tools in an accurate, reliable and accountable manner, and they defined a digital citizen as a person who respects ethical rules and individual rights in digital environments. A good digital citizen, however, should be able to interfere with inappropriate behavior and help other people to use technology effectively (Ribble, 2011). Digital access, digital commerce, digital communication, digital literacy, digital security, digital health, digital rights and responsibilities, digital law and constitute the elements of digital citizenship (Hill, 2015). Among them, this study digital ethics examines three main elements of digital citizenship: digital security,

digital rights and responsibilities, and digital law. The rationale of this choice is that in the literature, studies found that although teacher candidates have sufficient knowledge in digital access, digital commerce, digital communication, digital literacy, digital health, and digital ethics, they have insufficient knowledge in digital security, digital rights and responsibilities, and digital law (Hollandsworth, Donovan, & Welch, 2017; Jones and Mitchell, 2016; Sincar, 2011).

DIGITAL CITIZENSHIP TODAY

Recent developments in digital technologies have restructured the way people live and communicate (Aslan, 2016; Ohme, 2018; Siemens, 2005; Schlichter & Danylchenko, 2014). Weigel, James and Gardner (2009) emphasize that individuals meet digital technology at a very early age and spend a long time with digital technologies during critical developmental stages. In an information society, people are expected to show active attitudes and participation in matters such as digital decision making, ethics and legal issues, and online security (Hollandsworth, Dowdy, & Donovan, 2011). Developments in digital technologies, the requirements of information society, increased number of communication ways, and unlimited access to information brought forth the concept of digital citizenship (Aslan, 2016). Digital citizens, full members of an online community, are individuals who make frequent use of technology, benefit from digital technologies while performing their citizenship duties, and use technology for economic purposes (Mossberger, Tolbert & McNeal, 2008). They are also those who have the ability to access, use, create, evaluate information, and communicate with others in online environments (Choi, 2016). Jones and Mitchell (2016) distinguished digital citizenship from the prevention of cyberbullying or only digital literacy, and defined it as using internet resources to perform civic engagement activities with respect and tolerance to others. Along with the changing structure of the society, digital citizens with digital skills and ability to adapt to the society are needed. In regard to the scope of the current study, three sub-dimensions of digital citizenship were explained in the following section.

Digital Security

Due to the widespread use of digital media and the development of internet technologies, access to information is easier than ever and behaviors of sharing information increase day by day (Liu, Safavi-Naini & Sheppard, 2003; Xu, Yang, MacLeod & Zhu, 2019). Despite the positive effects of the intensive use of digital media, digital security problems also arise (Yilmaz, Sahin and Akbulut, 2015). There are risks in digital environments such as viruses, cyber-attacks, digital rights violations, online theft, fraud, cyber bullying and child abuse (Kim, Jeong, Kim, & So, 2011). For example, Livingstone, Haddon, Gorzig and Ólafsson (2011) investigated security issues and risks on the internet in a study with children aged 9-16 in 25 European countries and found out that children were exposed to messages and photos with sexual content and bullying. This means that individuals start encountering problems in digital environments at an early age. Individuals need to be aware of digital security and take the necessary precautions to protect themselves from these risks. The literature contains studies on digital security awareness of individuals. In their study, Pusey and Sadera (2011) investigated digital security knowledge levels of prospective teachers. They found that prospective teachers had limited knowledge of digital security, and they had limited or no knowledge of 60% of the information presented in the questionnaire that included cybercrime- and cyber-security-related items. Additionally, prospective teachers emphasized that they could only teach 4% of information about cyber ethics and cyber security to their students (Pusey & Sadera, 2011). In similar studies, the digital security awareness levels of teachers were low (Akgun & Topal, 2015; Turkey, Gokmen & Akgun, 2015). Table 1 summarizes the behaviors that are expected from users in terms of digital security.

Table 1. Expected behaviors related to digital security

Expected Behaviors	Sources
Not sharing personal information with strangers	Ivanoff and Belvery (2016)
Checking privacy settings on social media	Ribble (2011)
Not sharing information in online settings	Ribble (2012)
Protecting personal information	Ribble (2011)
Taking necessary actions for personal security	Kaya and Kaya (2014)
Being aware of unsafe files that might threaten computers	Sakalli (2015)
Taking electronic precautions in digital environments	Isman and Canan Gungoren (2013)
Creating strong passwords	Ivanoff and Belvery (2016)
Using anti-virus programs	Ribble (2011); Isman and Canan Gungoren (2013)
Using firewall	Ribble (2011)
Protecting hardware and software	Ribble (2011)

Digital Rights and Responsibilities

Digital citizenship includes online activities related to health, education, public services and so on (Mossberger, Tolbert & Anderson, 2014). All individuals in a society have the right to benefit from these services and use digital technologies (Kocadag, 2012). Digital rights and responsibilities, one of the fundamental elements of digital citizenship, draw attention to this issue. Digital rights and responsibilities are defined as using digital technologies freely, while having awareness of the responsibilities in behaviors in digital environments and acting accordingly (Al-Zahrani, 2015; Greenhow & Robelia, 2009; Kaya & Kaya, 2014) and warning or complaining about those who abuse digital environments (Ribble, & Miller, 2013). Third, Bellerose, Dawkins, Keltie and Pihl (2014) organized workshops with 148 children in 16 countries to determine the participants' views on children's rights in the digital age. They found that children were increasingly seeing digital technology as a fundamental right, they thought of digital rights and human rights as a singular concept, and they were aware of their responsibilities in digital environments. Additionally, in the study, children expressed the importance of digital technology for accessing information, education, and societal engagement (Third, Bellerose, Dawkins, Keltie & Pihl, 2014). In Turkey, there are studies conducted with older individuals rather than younger age groups. In his study, Bakir (2016) concluded that prospective teachers had partial knowledge in defining their digital rights and responsibilities; however, they did not feel free enough in digital environments. In another study, Aslan (2016) concluded that prospective teachers were aware of their digital rights and responsibilities, but sometimes they did not comply with copyrights. Table 2 refers to behaviors that are expected in relation to digital rights and responsibilities in the literature.

Table 2. Expected behaviors related to digital rights and responsibilities

Behaviors	Source
Being aware of privacy rights	Tan (2011)
Reporting inappropriate behaviors in digital environment	Ribble (2011); Sakalli, (2015)
Being free in digital environment	Ribble (2011); Isman and Canan Gungoren (2013)
Free use of digital technologies	Cubukcu and Bayzan (2013); Sakalli (2015)
Using technology properly	Tan (2011)
Being aware of responsibilities while using technology	Tan (2011)
Using online materials after getting permissions	Ribble (2011)
Being aware of equality in the rights of all users in the digital environment	Ribble (2011)
Expressing oneself freely in digital environment	Sakalli (2015)
Understanding rules in the digital environment	Ribble (2011)
Helping others in the digital environment	Ribble (2011)

Digital Law

Digital citizenship is not just the awareness of the risks that can be encountered in digital environments and being protected against these risks. Digital citizens are expected to use digital technologies in a responsible manner (Karaduman and Ozturk, 2014). This situation creates the concept of digital law, which is defined as the awareness of the responsibilities in behaviors and actions in digital environments (Ribble, 2011). Digital citizens are expected to be aware of the rules, laws, and policies that are effective in digital environments and comply with these rules, laws and policies (Cubukcu & Bayzan, 2013). Furthermore, individuals should be able to see the link between real and virtual life and be aware that basic laws also apply in virtual life (Ribble, & Miller, 2013). In their study, Agamba and Keengwe (2012) investigated prospective teachers for taking precautions against crimes committed in the digital environment. Based on their findings, they reported that prospective teachers' level of awareness against digital crime was low. In another study, York (2014) investigated prospective teachers' knowledge of digital law and found that prospective teachers had partially correct perceptions about digital law, but they had a lack of knowledge. As a result of the study, it was emphasized that prospective teachers should be given extensive training in issues of digital law (York, 2014). In the studies conducted in Turkey, while Zeybek (2011) found that high school students did not pay enough attention to intellectual property rights, Gokmen and Akgun (2015) emphasized that prospective teachers did not know about the laws and articles related to cybercrimes in the legal system. In another study, Gokmen and Akgun (2016) stated that prospective teachers did not know what to do when they encountered cybercrime. According to these results, it is evident that prospective teachers' levels of knowledge on digital law are not sufficient. Table 3 shows the behaviors that are expected in relation to digital law based on the literature.

Table 3. Expected behaviors related to digital law

Behaviors	References
Being aware of laws related to use of digital technologies	Ribble (2012)
Being aware of criminal sanctions as a result of inappropriate use of digital technology	Sakalli (2015)
Abiding by the rules of the digital environment and warning those who do not	Sakalli (2015)
Knowing that things that are crimes in real life are also crimes in the digital environment	Sakalli (2015)
Being aware of the copyright laws in digital environments	Ribble (2011)

Digital citizenship is a way of preparing individuals for a society filled with technology (Ribble, 2011). Digital technologies have a strong influence on the lives of individuals, and there has been a significant increase in the use of technology among young people in recent years (Rideout, Foehr, & Roberts, 2011). In this context, the aim of the research is to determine the digital citizenship perceptions and digital citizenship levels of preschool teacher candidates and compare them to prospective Computer Education and Instructional Technologies (CEIT) teachers who receive training in the field of technology. The effects of technology on society show that there will be many changes in the coming decade and children are at the center of these changes (Park, 2016). Children are growing in a constantly digitized environment (Sullivan & Bers, 2016). The use of technology by children ranges from watching television to playing video games, reading electronic books, listening to music, using computers/tablets and so on (Ernest et al., 2014). Based on his study, Palaiologou (2016) encourages children to use digital technology and suggests that school environments should allow and enable the active use of digital technologies to balance the use of digital technology at home. Preschool teacher candidates have various responsibilities as a result of technology being used in early ages due to IT devices' positive effects on the learning of young children, positive transformation of the use of digital technology at home, and recognition of the role of technology (McCarrick & Li, 2007; Parette, Quesenberry & Blum, 2010; Hatzigianni, & Margetts, 2012; McManis & Gunnewig, 2012; Nikolopoulou, 2014; Palaiologou, 2016; Janisse et al., 2017). In addition, Blackwell and colleagues concluded that most of the studies were carried out on K-12 teachers and these were mainly focused on barriers that prevent teachers using technology in their classrooms (Blackwell et al., 2013). Since there are not enough studies on teacher candidates in the literature, it is important to investigate digital citizenship levels of preschool teacher (PT) candidates in this context. On the other hand, Computer Education and Instructional Technologies teacher (CEIT) candidates receive intensive training on information technologies; therefore, they were considered as a benchmark in determining the digital citizenship perceptions and levels of preschool teacher candidates within the scope of this study. This study focuses on senior students, considering that they have already taken the Teaching Practice and School Experience courses, they are about to complete their education, and are about to start their professional careers. Answers to the following questions were sought:

1. What are the main purposes of technology use among PT and CEIT candidates?
2. What are the digital citizenship levels of PT and CEIT candidates?
3. What are the PT and CEIT candidates' perceptions related to digital citizenship?
4. What are the PT and CEIT candidates' perceptions about rights and responsibilities?
5. What are the PT and CEIT candidates' perceptions about digital security?
6. What are the PT and CEIT candidates' perceptions about digital law?

METHOD

Research Model

In this study, a quantitative research method was used to determine the digital citizenship levels of teacher candidates, and a qualitative research method was used to determine digital citizenship perceptions. While the quantitative research approach is about measurement, the qualitative approach is about unearthing (Buyukozturk et. al., 2012). Indeed, the use of qualitative methodology allowed participants to express their perceptions about digital citizenship. It also allowed us to identify misconceptions concerning digital citizenship. The findings are supported with some quotations from the interviews.

Study Group

Quantitative data were collected from 80 teacher candidates studying at a university in the eastern region of Turkey and selected by the method of convenience sampling method. There were 92 undergraduate students registered to both major and they were informed about the study. Among them, 80 teacher candidates (37 CEIT Candidates and 43 PT Candidates) agreed to participate. Qualitative data of the study were obtained from a total of 34 candidate teachers 17 CEIT and 17 PT candidates, who were randomly selected from 80 teacher candidates. The identities of the participants were concealed by giving them code names ranging from PT-1 to PT-17 and CEIT-1 to CEIT-17. Table 4 shows teacher candidates demographic information.

A five-point Likert-type scale entitled the Digital Citizenship Scale that was developed by Isman and Canan Gungoren (2014) was used to determine the digital citizenship levels of the teacher candidates. The scale consists of nine sub-dimensions including digital literacy, digital law, digital rights and responsibilities, digital communication, digital security, digital commerce, digital access, digital ethics and digital health. The Cronbach Alpha internal consistency coefficient of the scale was .85. According to Isman and Canan Gungoren (2014), the highest and lowest scores are 165 and 33, with the average score of 99. This study focuses only on the sub-dimensions of rights and responsibilities, security and legal aspects of digital citizenship, and all the analyses were carried out on these three dimensions.

In order to determine the digital citizenship perceptions of teacher candidates, a semi-structured interview form that was developed by the researchers was used. The interview form was examined in terms of content validity by three experts (a faculty member in the Department of CEIT, a faculty member in the Department of Early Childhood Education, and an Information Technologies teacher in the Ministry of National Education). The interview questions were assessed by two Turkish language teachers in terms of Turkish congruence. Additionally, the interview questions were asked to five CEIT and five PT candidates outside the study group and the comprehensibility of the questions was tested. Unclear or incomprehensible questions were excluded from the interview form based on expert opinions. Based on these evaluations, the interview questions were reduced from ten to five.

Data Analysis

In this study, descriptive analysis was used to determine the existing situation. Content analysis technique was used to analyze the data gathered from the interviews. Reliability for the interviews was calculated by percent agreement [agreement / (agreement + disagreement)]. The reliability was 92%. The researchers discussed codes/sub-codes on which the researchers disagreed and carried out coding based on consensus to create the final data. The quantitative data were analyzed by a data analysis program. Frequency, percentage, and mean scores were used for the analysis.

FINDINGS

First, the respondents were asked about the purpose of their internet use. The findings about the purpose of internet use by the teacher candidates are shown in Table 4. Among the purposes, it was quite clear that there is far greater use of the internet for communication, social media site visits and listening to music for PT candidates. Similar results were found for CEIT candidates, except for listening to music. Instead, they reported use of internet for reading news.

Table 4. Teacher Candidates' Use of Internet

Use of Internet	PT Candidates		CEIT Candidates	
	n	%	n	%
Chatting/messaging	30	83.3	31	72.1
Online games	15	41.7	8	18.6
Listening to music	31	86.1	15	34.9
Reading newspaper/watching news/obtaining information	28	77.8	27	62.8
Official matters/ Online banking	23	63.9	11	25.6
Shopping	24	66.7	14	32.6
Social Network Site visits	32	88.9	24	55.8
Researching	10	27.02	5	11.62
Following online courses	6	16.21	-	
Watching movies, series or documentaries	3	8.10	2	4.65
Stalking	-		3	6.97
Others	11	30.6	2	4.65

Digital Citizenship Levels of Teacher Candidates

Findings related to 'Digital Citizenship Scale' are presented in Table 5.

Table 5. Teacher candidates' digital citizenship levels

	PT candidates $\overline{X}$			CEIT candidates $\overline{X}$		
	n		ss	n		ss
Digital Citizenship levels	43	119.16	15.53	37	124.70	10.10
Digital Law sub-factor	43	15.37	2.08	37	15.37	2.34
Digital Rights and Responsibilities sub-factor	43	17.02	2.12	37	16.32	2.13
Digital Security sub-factor	43	9.97	1.92	37	9.64	2.32

According to the results of the analysis, the mean score of the digital citizenship levels of CEIT teacher candidates was 124.70, and that of pre-school teachers was 119.16.

Based on these findings, it may be stated that the digital citizenship levels of CEIT and PT candidates were above average.

Teacher Candidates' Perceptions of Digital Citizenship

Teacher candidates participating in the study were asked to define the concept of digital citizenship to determine their perception on digital citizenship. PT candidates emphasized the importance of using technology positively and critically while defining the concept of digital citizenship, whereas CEIT teacher candidates emphasized the effective use of technology. The findings obtained in this study were examined in three main categories: "Technology literacy", "Technology, Morality and Ethics" and "Rights and responsibilities in technology use". Table 6 shows teacher candidates perceptions related to digital citizenship.

Table 6. Teacher candidates perceptions related to digital citizenship

Themes	PT candidates f	CEIT candidates f
Technology literacy		
Using technology effectively	4	8
Using technology as a communication tool	2	-
Completing civic duties through technology	1	1
Being aware of the agenda	1	-
Using technology securely	-	4
Access to the information through technology	-	3
Technology, Morality and Ethics		
Using technology in a positive way	15	5
Encouraging good and moral things	5	-
Using technology on behalf of society	2	2
Using technology responsibly	-	4
Rights and responsibilities in technology use		
Acting/thinking critically while using technology	8	2
Knowing rights and responsibilities	3	2
Knowing the consequences of behavior in online environment	3	-

Examples of the statements are given below:

"It is the correct and proper use of technology by citizens and promoting ethical behaviors while using technology. A digital citizen is someone who uses information and communication tools in digital environments within ethical boundaries, who encourages and guides those who abuse digital tools to use these tools within ethical boundaries, and supports ethical behaviors". [PT-3, encouraging good and moral things; using technology effectively]

"Being one with technology. Using technology in your life. Fulfilling citizenship duties through technology." [PT-11, using technology on behalf of society]

"It is the procedures related to the state, and the confidentiality, ethical rules and behaviors regarding the use of technology." [CEIT-6, completing civic duties through technology]

"Digital citizens should have the ability to use the Internet and digital media, question the accuracy of the information they are searching for, and be aware of their rights and responsibilities in digital environments." [CEIT-5, using technology effectively; knowing rights and responsibilities; acting/thinking critically while using technology]

Perceptions about Rights and Responsibilities

In order to determine the opinions of candidate teachers about digital rights and responsibilities, which is a sub dimension of digital citizenship, candidate teachers were asked: "What rights and responsibilities do you think you have in digital environments?" The views of candidate teachers on this subject are given in the Table 7.

Table 7. Teacher candidates' perceptions about rights and responsibilities

Themes	PT candidates f	CEIT candidates f
Security and privacy	7	10
Complaining about disturbing people/behaviors	11	1
Freedom of opinions and thoughts	6	4
Information acquisition and dissemination	4	2
Internet access right	1	-
Pay attention when sharing	8	-
Responsibility to use proper names	5	-
Using trusted sites and getting membership	2	-
Responsibility for respecting ideas	3	-
Responsibility to use technology in a moral and ethical way	2	-
Distinguishing good and bad rights	1	-
Having rights and responsibilities in real life and online environment	1	1
Participating in useful and appropriate activities	1	-
Spending time efficiently	1	-
Having right to privacy	-	6
Right of intellectual property	-	3
Originality	-	2
Right to social interaction	-	2
Right to use rights and responsibilities	-	1
Equal opportunity	-	1

Some statements provided by the candidates are given below.

"I report the content, pictures, text or videos that I see are harmful or disturb me." [PT-6, complaining about disturbing people/behaviors]

"I report inappropriate websites and people that disturb me." [PT-7, complaining about disturbing people/behaviors]

"Privacy rules, personal information, copyright and privacy rights." [CEIT-15, security and privacy]

"I think that in a digital environment, I have the right and responsibility to protect privacy, not to use people's information on any platform, and to enforce justice for those who attack my rights." [CEIT-1, security and privacy]

Perceptions about Digital Security

Teacher candidates' views were determined about digital security, which is another sub-dimension of digital citizenship. The findings were examined based on the subcategories of "personal precautions" and "technological precautions".

Table 8. Teacher candidates' perceptions about digital security

Themes	PT Candidates f	CEIT candidates f
Personal precautions		
Not to communicate with strangers	9	3
Paying attention while posting	8	5
Not to share personal information	7	5
Using trusted and age appropriate websites	13	12
Complaining on disturbing behaviors	2	-
Logging in with security code	1	-
Using proper names (not using fake names)	1	-
Not to fool anyone with lies	1	-
Not to download unsafe files/applications	1	-
Not to insult others	1	-
Paying attention to the posts of the websites	1	1
Avoiding viruses	-	2
Creating difficult-to-crack passwords and security questions	-	4
Avoiding cyber-crimes	-	1
Technological Precautions		
Setting up privacy settings	7	3
Using antivirus software	6	8
Activating the firewall	1	3

It is seen in Table 8 that preschool teacher candidates mostly emphasized individual measures such as not communicating with strangers (9), adjusting privacy settings (7), being careful when posting on social media (8) and not sharing personal information (7). The views of preschool candidate teachers on this subject were as follows:

"I do not let strangers follow me on social media." (PT-11, not to communicate with strangers),

"I try to be careful whenever I share an image, video, etc. on social media. I adjust my privacy settings, so strangers do not see me. I do not friend everyone online." (PT -3, paying attention while posting),

"I always activate security software (antivirus, deepfreeze, firewall etc.). I never share my personal information. Generally I use e-government applications." (CEIT-2, using antivirus software, activating the firewall, not to share personal information, using trusted and age appropriate sites)

"I use antivirus and firewall software. I make my passwords from various numbers and letters. I do not click on random links." (CEIT-3, using antivirus software, activating the firewall, using trusted and age appropriate sites)

Perceptions of Digital Law

Candidate teachers were asked the questions "Do you think behaviors in digital environments have legal consequences? What kind of legal consequences do you think can be encountered?" to assess their views on another sub-dimension of digital citizenship: digital law. Table 9 shows teacher candidates perceptions about digital law.

Table 9. Teacher candidates perceptions about digital law

Themes	PT Candidates f	CEIT candidates f
Legal Penalties		
Imprisonment	3	6
Fine	3	6
Being fired from job	1	-
Banned from social media accounts	1	-
Social Penalties		
Social disapproval	1	-

The views of candidate teachers on this subject were as follows:

"Just as there is a criminal liability for every crime, there are penal and judicial responsibilities for misconduct in a digital environment. These penalties may be monetary or even prison sentences." [PT-5, legal penalties, imprisonment]

"I may face legal consequences if I insult legal or real persons, such as the closure of social media accounts, fines, etc." [PT-11, legal penalties, banned from social media accounts]

"It's a sanction because of fake accounts. There are legal consequences of issues resulting from online payment systems in shopping sites. In such cases, imprisonment based on certain behaviors or monetary penalty can be applied." [CEIT-6, legal penalties, imprisonment]

"I know that there is a cybercrimes unit, and there are prison sentences against hate crimes, cyber-attacks, and hacks on computer systems that are made online." [CEIT-8, imprisonment]

Misconceptions

During the analysis process, teacher candidates' misconceptions were observed. Table 10 was organized to provide themes, under which element the participants considered them, and under which element they were needed to be considered based on the literature. To this end, Ribble and Bailey (2005), Tan (2011), Sakalli (2015), Ribble (2011), Ribble (2012), Isman and Canan Gungoren (2013), Gormez (2016) were taken into account. One critical thing in Table 11 is that PT candidates mainly have misconceptions about digital citizenship, comparing with CEIT candidates. For instance, although PT-3 considered "having the right to access to the internet" as digital rights, it must be considered for digital access. Another example is that although CEIT 6 explained his concerns about shopping sites (images in a commercial site, its followers, payment options) under the digital security, it must be considered under the digital commerce based on the literature.

Table 10. Teacher candidates' misconceptions

Theme	PT candidates f	CEIT candidates f	Elements in which the themes belonged to based on the literature
Digital rights and responsibilities			
Disseminate and acquire information	4	2	Digital access
Internet access right	1	-	Digital access
Attention while sharing information	8	-	Digital security
Responsibility to benefit from technology in a moral and ethical way	2	-	Digital ethics
Effective use of time in online environment	1	-	Digital health
Social interaction right	-	2	Digital communication
Shopping at secured websites	4	1	Digital commerce
Complaining about disturbing behaviors	2	-	Digital rights and responsibilities
Digital security			
Not to fool anyone with lies	1	-	Digital rights and responsibilities
No insulting	1	-	Digital rights and responsibilities
Acting in online environment like in real life	1	3	Digital ethics

RESULTS AND DISCUSSION

Developments in digital technologies have created a new definition of citizenship with transformed social, cultural and individual characteristics (Hermes, 2006; Isman & Canan Gungoren, 2013; Choi, Glassman & Cristol, 2017). Efforts of supporting students in a digital society and instill certain behavioral norms, in other words, increasing their awareness to become digital citizens requires training and role models (Hollandsworth, Dowdy & Donovan, 2011). Accordingly, it has become a necessity to examine the digital citizenship perceptions and levels of teacher candidates who will train the future generations.

In this study, digital citizenship perceptions and levels of preschool and CEIT teacher candidates were examined in terms of digital rights and responsibilities, digital security and digital law. Based on the results of the study, it was seen that the digital citizenship levels of the teacher candidates was above average, and their digital citizenship perceptions supported this result. Educational institutions need to develop common policies, standards, and language to enable ethical and moral use of technology and display positive behaviors (Hollandsworth, Dowdy & Donovan, 2011). In this context, it is clear that a greater emphasis is needed on the appropriate use of technology in Preschool Teacher preparation programs (Parette, Quesenberry & Blum, 2010).

When the literature is examined, it is seen that studies reported an above average digital citizenship level among teacher candidates (Akcil, Altinay and Altinay, 2016; Alqahtani, Alqahtani and Alqurashi, 2017; Al-Zahrani, 2015; Kocadag, 2012; Sakalli, 2015; Sakalli and Ciftci, 2016). Similar results were found in this particular study as well. It is gratifying that teacher candidates who will train the digital citizens of today have an above average digital citizenship level. However, such hopeful results were not observed in other studies with similar research goals across other disciplines in teacher education programs (see Beycioglu, 2012; Karaduman, 2017). Thus, more research is needed on this topic.

Students use digital technologies not only outside the school but also at the school (Hollandsworth, Dowdy & Donovan, 2011). Digital citizenship needs to be included in education to support students in a digital society and accept certain norms of behavior in terms of digital citizenship (Ohler, 2012). In the student standards published by the International Society for Technology in Education (ISTE) in 2014, students are

expected to use and defend technology in a safe, legal, and responsible way, in other words, become digital citizens. Teachers are responsible for preparing students for the digital society or digital citizenship (Lenhart et al., 2011) and play a key role for students developing and implementing digital citizenship norms (Searson, Hancock, Soheil, & Shepherd, 2015). As Livingstone, Haddon, Gorzig and Ólafsson (2011) stated, teacher training should be carried out to equip young children with necessary digital media skills so that teachers must be ready to educate students in schools that are the perfect places to teach the concept of digital citizenship and nine key elements of digital citizenship (Moreillon, 2013). However, Karaduman (2017) emphasized that about half of the teacher candidates did not receive enough training on digital citizenship during their university education. In the curriculum of education programs approved by the Turkish Higher Education Institution (YOK), as Information Technologies and Instructional Technologies courses are the only mandatory courses that are related to technology and technology use in education (YOK, 2018).

Indeed, use of digital technologies, security of information systems, and ethical concepts are included in the Information Technologies course (YOK, 2018). Considering the teacher candidates' level of digital citizenship and their perceptions about its elements such content is not enough. In addition to developments and changes in technology, findings of this and similar studies make it necessary to change process of teacher training (Berson & Balyta, 2004; Bolick et al., 2003; Instefjord & Munthe, 2016; Karaduman, 2017). For practice, it might be suggested to reconsider the contents of the Computer I and II and Instructional Technologies and Material design courses and include digital citizenship and its nine elements as an indispensable piece of content in these courses.

When teacher candidates' digital citizenship perceptions were examined, their views on the concept of digital citizenship were about technology literacy, technology, morality and ethics and rights and responsibilities in technology use. On the other hand, in other studies teacher candidates defined digital citizenship as performing procedures related to public services on the internet and learning and seeking justice about rights in the digital environment (Kaya & Kaya, 2014); as e-government applications (Bakir, 2016), and as fulfilling their civic duty on the internet, use of digital devices and social networking sites, appropriate use of technology and a change in the perception of citizenship due to technology (Karaduman, 2017). In addition, there were teacher candidates who had no idea about digital citizenship (Karaduman, 2017). Consequently, by considering teachers' critical role on children, it is recommended that digital citizenship should be among the prioritized subjects of education, and beyond this, digital citizenship should not be considered as a topic that is separate from the curriculum, and it should cover all areas of education (Ribble, 2012; Ribble & Bailey, 2005). Also, in addition to already exist courses, there needs to be elective courses that include topics including use of technology in education, digital citizenship and sub dimension of digital citizenship, and teacher candidates should be encouraged to take such elective courses. For future research, it might be critical to examine the possible association between technology integration opportunities in teacher education programs and teacher candidates' perception of digital citizenship.

When preschool teacher candidates' views on their rights and responsibilities in digital environments were examined, it was seen that reporting disturbing behaviors, being careful while posting on the internet, and security and confidentiality concepts were emphasized. Aslan (2016) stated that digital rights and responsibilities are perceived as online freedom, user privacy, responsibility while posting, copyrights of digital works and not using illegal sites and programs. In two studies by Karaduman (2017) and Bakir (2016), similar definitions about digital rights and responsibilities were found. Yang and Chen (2010) conducted a study with teachers and teacher candidates, and asked the participants what ethical/social/human problems should be considered when digital technologies are applied to current education. In that study, 70.2% of the participants emphasized that issues related to ethical use of technology, copyrights, and IP rights were encountered. The opinions expressed by the teachers and teacher candidates were similar to those in this study and other studies in the literature. One critical difference of this study was the identification of the participants' misconceptions about digital rights and responsibilities. Although their misconceptions were still under the scope of digital citizenship, for creating collective culture – effective and successful – (Covell, Howe & McNeil, 2010; Ribble & Bailey, 2005) education programs should prepare teacher candidates in and outside of classroom activities so they learn and practice these rights and responsibilities.

In this study, teacher candidates' perceptions about digital security were evaluated under two factors: personal precautions and technological precautions. In similar studies, teacher candidates' digital security perceptions were mainly about encryption, use of trusted sites, and use of antivirus programs (Aslan, 2016; Bakir, 2016). The findings obtained in this study are consistent with those in the literature. Considering the risks that can be encountered when children are exposed to digital environments, children need to be aware of these risks. For this, the greatest support will come from their teachers (Livingstone, Haddon, Gorzig & Ólafsson, 2011). The role of educators in this process is to teach the security measures necessary for children using online environments to protect themselves (OECD, 2012; Ohler, 2011). Indeed, educators need to gain this knowledge during their education (Pusey & Sadera, 2011), so that they can play their role in their own classrooms. Pusey and Sadera (2011) also stressed the need that digital security issues should be discussed regularly in schools. To do this, teachers, counselors, and school administrators should act together, and in addition to the warnings during the lessons and topics that can be explained, various seminars that can be provided to the students should be evaluated. In addition, the literature contains studies suggesting that there are various online environments for teacher candidates to increase their digital security awareness (Yang & Chen, 2010). However, in addition to what educators can do inside and outside the school, internet safety polices should also be reviewed for safe use of technology (Authors, 2016; O'Neill, 2013). For example, the European Union Safe Internet Program plays an important role in promoting online safety of children among member states (OECD, 2012). Digital gaps based on access, usage and knowledge differences necessitate that policies should be tailored accordingly (Livingstone, Haddon, Gorzig, & Ólafsson, 2011).

A limited number of the teacher candidates mentioned imprisonment and pecuniary penalties for legal responsibilities in behaviors in digital environments. According to Bakir (2016,) teacher candidates perceived the digital law dimension as laws that provided internet security, but the participants did not have enough knowledge on this subject. York (2014) and Aslan (2016) reported that teacher candidates had knowledge of criminal behavior within the context of digital law, but there were also topics on which teacher candidates lacked information or were misinformed. In this study, the perceptions of teacher candidates about the concept of digital law overlapped with the other findings in the literature. Ribble (2012) emphasized that, in order for students to understand the concept of digital law, the rules of technology should be discussed in schools, and why these rules are necessary should be explained. Teachers who will teach this for students need extensive training on digital law during their pre-service training period (York, 2014).

As in other studies, this study also has limitations. One limitation of the study was the educational programs that participants enrolled in and the number of the participants. Future research may replicate this study with teacher candidates from different fields. Another limitation was that this study only focused on three elements of digital citizenship: digital rights and responsibilities, digital security and digital law. Researchers may focus on the remaining elements in order to understand teacher candidates' digital citizenship perceptions better. Moreover, in the data analysis, correlational data analysis based on the demographic information of the teacher candidates was not performed. It is recommended to investigate how demographic characteristics may affect digital citizenship and its sub-dimensions.

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REFERENCES

Agamba, J. J., & Keengwe, J. (2012). Pre-Service Teachers' Perceptions of Information Assurance and Cyber Security. *International Journal of Information and Communication Technology Education (IJICTE)*, *8* (2), 94-101.

Akcil, U., Altinay, Z., & Altinay, F. (2016). Assessing the Effects of Managers in the Digital Age on the Management Process of Digital Citizenship Roles. *ANTHROPOLOGIST*, *23* (1-2), 209-217.

Akgun, O. E., & Topal, M. (2015). Egitim fakultesi son sinif ogrencilerinin bilisim guvenligi farkindaliklari: sakarya universitesi egitim fakultesi ornegi. [Information Security Awareness of the Senior Teacher Students: Sakarya University Sample] *Sakarya University Journal of Education,* 5(2), 98-121.

Alqahtani, A., Alqahtani, F., & Alqurashi, M. (2017). The Extent of Comprehension and Knowledge with Respect to Digital Citizenship Among Middle Eastern and US students at UNC. *Journal of Education and Practice, 8 (9),* 96-102.

Al-Zahrani, A. (2015). Toward digital citizenship: Examining factors affecting participation and involvement in the Internet society among higher education students. *International Education Studies*, *8*(12), 203.

Aslan, S. (2016). *Ilkogretim Sosyal Bilgiler Ogretmen Adaylarinin Vatandaslik Duzeylerinin Incelenmesi (Firat, Dicle, Siirt, Adiyaman Universiteleri Ornegi).* Yayimlanmamis Yuksek Lisans Tezi. Firat Universitesi Egitim Bilimleri Enstitusu. Elazig

Bakir, E. (2016). *Sinif Ogretmeni Adaylarinin Dijital Vatandaslik Seviyelerinin Dijital Vatandaslik Alt Boyutlarina Gore Incelenmesi.* Yayimlanmamis Yuksek Lisans Tezi. Karadeniz Teknik Universitesi Egitim Bilimleri Enstitusu: Trabzon.

Berson, M. J., & Balyta, P. (2004). Technological thinking and practice in the social studies: Transcending the tumultuous adolescence of reform. *Journal of Computing in Teacher Education*, *20*(4), 141-150.

Beycioglu, K. (Ed.). (2012). *Ethical Technology Use, Policy, and Reactions in Educational Settings*. IGI Global.

Blackwell, C. K., Lauricella, A. R., Wartella, E., Robb, M., & Schomburg, R. (2013). Adoption and use of technology in early education: The interplay of extrinsic barriers and teacher attitudes. *Computers & Education*, *69*, 310-319.

Bolick, C. M., Berson, M., Coutts, C., & Heinecke, W. (2003). Technology applications in social studies teacher education: A survey of social studies methods faculty. *Contemporary issues in technology and teacher education*, *3*(3), 300-309.

Buyukozturk, S., Kilic Cakmak, E., Akgun, O. E., Karadeniz, S., & Demirel, F. (2015*). Bilimsel arastirma yontemleri.* [Scientific research methods]. Ankara.

Choi, M. (2016). A concept analysis of digital citizenship for democratic citizenship education in the internet age. *Theory & research in social education*, *44*(4), 565-607.

Choi, M., Glassman, M., & Cristol, D. (2017). What it means to be a citizen in the internet age: Development of a reliable and valid digital citizenship scale. *Computers & Education*, *107*, 100-112.

Covell, K., Howe, R. B., & McNeil, J. K. (2010). Implementing children's human rights education in schools. *Improving Schools*, *13*(2), 117-132.

Cubukcu, A., & Bayzan, S. (2013). Turkiye'de dijital vatandaslik algisi ve bu algiyi internetin bilincli, guvenli ve etkin kullanimi ile artirma yontemleri. *Middle Eastern & African Journal of Educational Research*, *5*, 148-174.

Ernest, J. M., Causey, C., Newton, A. B., Sharkins, K., Summerlin, J., & Albaiz, N. (2014). Extending the global dialogue about media, technology, screen time, and young children. *Childhood Education*, *90*(3), 182-191.

Gokmen, O. F., & Akgun, O. E. (2015). Bilgisayar ve ogretim teknolojileri egitimi ogretmen adaylarinin bilisim guvenligi egitimi verebilmeye yonelik yeterlilik algilarinin incelenmesi. Ilkogretim Online, 14(4).

Gokmen, O. F., & Akgun, O. E. (2016). Ogretmen Adaylarinin Bilisim Suclarina Yonelik Deneyimleri ve Bilisim Guvenligi Ders Icerigine Yonelik Gorusleri/Teacher Candidates' Experiences of Cyber Crime and Their Views for the Information Security Course Content. *Mustafa Kemal Universitesi Sosyal Bilimler Enstitusu Dergisi*, *13*(33).

Gormez, E. (2016). Ogretmen Adaylarinin" Dijital Vatandaslik Ve Alt Boyutlari" Hakkindaki Gorusleri (Bir Durum Calismasi). *Electronic Turkish Studies*, *11*(21).

Greenhow, C., & Robelia, B. (2009). Informal learning and identity formation in online social networks. *Learning, Media and Technology*, *34*(2), 119-140.

Hatzigianni, M., & Margetts, K. (2012). 'I am very good at computers': young children's computer use and their computer self-esteem. *European Early Childhood Education Research Journal*, *20*(1), 3-20.

Hermes, J. (2006). Citizenship in the age of the internet. *European Journal of Communication*, 21(3), 295-309.

Hill, V. (2015). Digital citizenship through game design in Minecraft. *New Library World*, *116*(7/8), 369-382.

Hollandsworth, R., Dowdy, L., & Donovan, J. (2011). Digital citizenship in K-12: It takes a village. *TechTrends*, *55*(4), 37-47.

Hollandsworth, R., Donovan, J., & Welch, M. (2017). Digital citizenship: You can't go home again. *TechTrends*, *61*(6), 524-530.

Instefjord, E., & Munthe, E. (2016). Preparing pre-service teachers to integrate technology: an analysis of the emphasis on digital competence in teacher education curricula. *European Journal of Teacher Education*, *39*(1), 77-93.

Isman, A., & Canan Gungoren, O. (2013). Being digital citizen. *Procedia-Social and Behavioral Sciences*, *106*, 551-556.

Isman, A., & Canan Gungoren, O. (2014). Digital citizenship. *TOJET: The Turkish Online Journal of Educational Technology*, *13*(1).

ISTE (International Society for Technology in Education). (2014). ISTE Standards for students. https://www.iste.org/standards/for-students (Date of access: 10.12.2017)

Ivanoff, K. & Belvery, J. (2016). "Digital Security". *DigitalCitizenship.* N.P.,n.d.

Janisse, H. C., Li, X., Bhavnagri, N. P., Esposito, C., & Stanton, B. (2017). A Longitudinal Study of the Effect of Computers on the Cognitive Development of Low-Income African American Preschool Children. *Early Education and Development*, 1-16.

Jones, L. M., & Mitchell, K. J. (2016). Defining and measuring youth digital citizenship. *New media & society*, *18*(9), 2063-2079.

Karaduman, H. (2017). Social Studies Teacher Candidates' Opinions about Digital Citizenship and Its Place in Social Studies Teacher Training Program: A Comparison between the USA and Turkey. *Turkish Online Journal of Educational Technology-TOJET*, *16*(2), 93-106.

Karaduman, H., & Ozturk, C. (2014). Sosyal Bilgiler Dersinde Dijital Vatandasliga Dayali Etkinliklerin Ogrencilerin Dijital Vatandaslik Tutumlarina Etkisi ve Dijital Vatandaslik Anlayislarina Yansimalari. *Journal of Social Studies Education Research*, *5*(1).

Kaya, A., & Kaya, B. (2014). Teacher candidates' perceptions of digital citizenship Ogretmen adaylarinin dijital vatandaslik algisi. *Journal of Human Sciences*, *11*(2), 346-361.

Kim, W., Jeong, O.-R., Kim, C., & So, J. (2011, 5). The dark side of the Internet: Attacks, costs and responses. *Information Systems*, 675-705

Kocadag, T. (2012). Ogretmen Adaylarinin Dijital Vatandaslik Duzeylerinin Belirlenmesi. Yayimlanmamis Yuksek Lisans Tezi. Karadeniz Teknik Universitesi Egitim Bilimleri Enstitusu: Trabzon.

Lenhart, A., Madden, M., Smith, A., Purcell, K., Zickuhr, K., & Rainie, L. (2011). Teens, Kindness and Cruelty on Social Network Sites: How American Teens Navigate the New World of" Digital Citizenship". *Pew Internet & American Life Project.*

Liu, Q., Safavi-Naini, R., & Sheppard, N. P. (2003). Digital rights management for content distribution. In *Proceedings of the Australasian information security workshop conference on ACSW frontiers 2003-Volume 21* (pp. 49-58). Australian Computer Society, Inc..

Livingstone, S., Haddon, L., Gorzig, A., & Ólafsson, K. (2011). *Risks and safety on the internet: the perspective of European children: full findings and policy implications from the EU Kids Online survey of 9-16 year olds and their parents in 25 countries.* EU Kids Online, Deliverable D4. EU Kids Online Network, London, UK.

McCarrick, K., & Li, X. (2007). Buried treasure: The impact of computer use on young children's social, cognitive, language development and motivation. *AACE Journal*, *15*(1), 73-95.

McManis, L. D., & Gunnewig, S. B. (2012). Finding the education in educational technology with early learners. *YC Young Children*, *67*(3), 14.

Moreillon, J. (2013). Leadership: teaching digital citizenship. *School Library Monthly*, Vol. 30 No. 1, pp. 26-27.

Mossberger, K., Tolbert, C. J., & Anderson, C. (2014). Digital citizenship: Broadband, mobile use, and activities online. In *International Political Science Association conference, Montreal.*

Mossberger, K., Tolbert, C. J., & McNeal, R. S. (2008). *Digital citizenship: The Internet, society, and participation.* MIt Press.

Nikolopoulou, K. (2014). ICT integration in preschool classes: Examples of practices in greece. *Creative Education*, *5*(6), 402-410.

Ohme, J. (2018). Updating citizenship? The effects of digital media use on citizenship understanding and political participation. *Information, Communication & Society*, 1-26.

O'Neill, B. (2013). Online child protection and empowerment in a global context. *The Routledge International Handbook of Children, Adolescents, and Media*, 395.

OECD (2012). https://www.oecd.org/sti/ieconomy/childrenonline_with_cover.pdf (Date of access: January 2018)

Ohler, J. (2012). Digital citizenship means character education for the digital age. *Kappa Delta Pi Record*, *47*(sup1), 25-27.

Palaiologou, I. (2016). Children under five and digital technologies: implications for early years pedagogy. *European Early Childhood Education Research Journal*, *24*(1), 5-24.

Parette, H. P., Quesenberry, A. C., & Blum, C. (2010). Missing the boat with technology usage in early childhood settings: A 21st century view of developmentally appropriate practice. *Early Childhood Education Journal*, *37*(5), 335-343.

Park, Y. (2016). An Innovative Digital Citizenship Initiative in Singapore and Korea. In *SITE: Society for Information Technology & Teacher Education International Conference*. Society for Information Technology & Teacher Education.

Pusey, P., & Sadera, W. A. (2011). Cyberethics, cybersafety, and cybersecurity: Preservice teacher knowledge, preparedness, and the need for teacher education to make a difference. *Journal of Digital Learning in Teacher Education*, *28*(2), 82-85.

Ribble, M. (2011). *Digital citizenship in schools.* International Society for Technology in Education, Oregon.

Ribble, M. (2012). Digital citizenship for educational change. *Kappa Delta Pi Record*, *48*(4), 148-151.

Ribble, M. S. & Bailey, G. D. (2005). Teaching digital citizenship: when will it become a priority for 21st century schools. *School Business Affairs*, *71*(3), 11-14.

Ribble, M. S., Bailey, G. D., & Ross, T. W. (2004). Digital citizenship: Addressing appropriate technology behavior. *Learning* & *Leading with technology*, *32*(1), 6.

Ribble, M., & Miller, T. N. (2013). Educational Leadership in an Online World: Connecting Students to Technology Responsibly, Safely, and Ethically. *Journal of asynchronous learning networks*, *17*(1), 137-145.

Rideout, V. J., Foehr, U. G., & Roberts, D. F. (2011). Generation M2: Media in the Lives of 8 to 18 year Olds. *Henry J. Kaiser Family Foundation*.

Sakalli, H. (2015). *Sinif ogretmeni adaylarinin dijital vatandaslik duzeyleri ile siber zorbalik egilimleri arasindaki iliskinin incelenmesi* . Yayimlanmamis Yuksek Lisans Tezi. Adnan Menderes Universitesi, Sosyal Bilimler Enstitusu, Aydin.

Sakalli, H., & Ciftci, S. (2016). Sinif Ogretmeni Adaylarinin Dijital Vatandaslik Duzeyleri Ile Siber Zorbalik Egilimleri Arasindaki Iliskinin Incelenmesi. *Egitim Teknolojisi Kuram ve Uygulama*, *6*(2).

Schlichter, B. R., & Danylchenko, L. (2014). Measuring ICT usage quality for information society building. *Government Information Quarterly*, *31*(1), 170-184.

Searson, M., Hancock, M., Soheil, N., & Shepherd, G. (2015). Digital citizenship within global contexts. *Education and Information Technologies*, *20*(4), 729.

Sincar, M. (2011). An analysis of prospective teachers' digital citizenship behaviour norms. *International Journal of Cyber Ethics in Education (IJCEE)*, *1*(2), 25-40.

Siemens, G. (2005). Connectivism: A learning theory for the digital age. *International Journal of Instructional Technology and Distance Learning, 2(1) http://www.itdl.org/Journal/Jan_05/article01.htm*

Sullivan, A., & Bers, M. U. (2016). Robotics in the early childhood classroom: learning outcomes from an 8-week robotics curriculum in pre-kindergarten through second grade. *International Journal of Technology and Design Education*, *26*(1), 3-20.

Tan, T. (2011). Educating digital citizens. *Leadership*, *41*(1), 30-32.

Tekin, A., Polat, E. (2016). Ortaokul Ogrenci Velilerinin Guvenli Internet Kullanimi Farkindaligi [Secondary School Students' Parents' Safe Internet Usage Awareness]. *Journal of Instructional Technologies & Teacher Education*, *5*(2).

Third, A., Bellerose, D., Dawkins, U., Keltie, E., & Pihl, K. (2014). Children's Rights in the Digital Age: A Download from Children Around the World. Abbotsford, Vic.: Young and Well Cooperative Research Centre. Retrieved from http://researchdirect.westernsydney.edu.au/islandora/object/ uws%3A28202/datastream/PDF/download/citation.pdf

Weigel, M., James, C., & Gardner, H. (2009). Learning: Peering backward and looking forward in the digital era. *International Journal of Learning and Media*. (1)1.(1-18).

Yang, H. H., & Chen, P. (2010). Exploring teachers' beliefs about digital citizenship and responsibility. *Technological Developments in Networking, Education and Automation*, 49-54.

Yilmaz, E., Sahin, Y. L., & Akbulut, Y. (2015). Dijital Veri Guvenligi Farkindaligi Olceginin Gelistirilmesi. *AJIT-e: Online Academic Journal of Information Technology*, *6*(21).

YOK (Yuksek Ogretim Kurumu). Egitim Fakultesi Ogretmen Yetistirme Lisans Programlari. http://www. yok.gov.tr/web/guest/icerik/-/journal_content/56_INSTANCE_ rEHF8BIsfYRx/10279/49875. (Data of Access: 08.01.2018)

York, L. (2014). Preservice Teachers: What do They Know about Cyberlaw? In *SITE International Symposium: Future Focussed Teacher Education*. Society for Information Technology & Teacher Education.

Yue, A., Nekmat, E., & Beta, A. R. (2019). Digital literacy through digital citizenship: Online civic participation and public opinion evaluation of youth minorities in Southeast Asia. *Media and Communication, 7*(2), 100-114.

Xu, S., Yang, H. H., MacLeod, J., & Zhu, S. (2019). Social media competence and digital citizenship among college students. Convergence, 25(4), 735-752.

Zeybek, G. (2011). *Bilgisayar meslek dersi alan ortaogretim ogrencilerinin bilisim teknolojilerini kullanimlarinin etik acidan degerlendirilmesi*. Yuksek Lisans Tezi.Selcuk Universitesi Egitim Bilimleri Enstitusu.
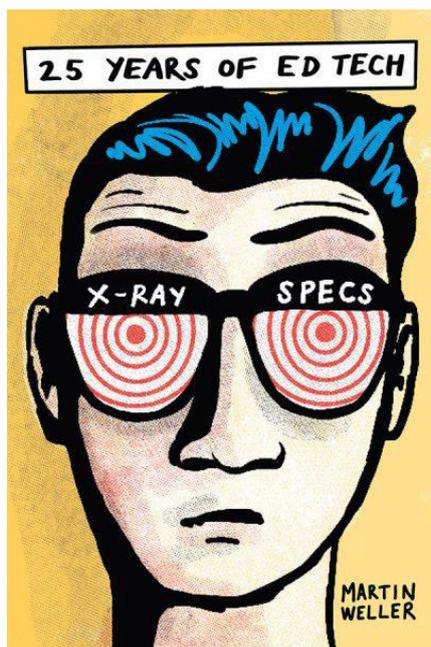
BOOK REVIEW

25 YEARS OF ED TECH
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INTRODUCTION

Martin Weller's 25 Years of Ed Tech aims to contribute to the history of the educational technology (ed tech) field which is seen as a nascent area throughout the years. While the author introduces the prevalent ed tech applications and tools throughout the 25 years, he hopes these technologies, lessons learned and experienced gained, can put up to the future implementations of ed tech in higher education. The author examined 25 technologies over 25 years, starting from 1994 until 2018 (Figure 1). Using his personal experiences, reflections from the field and preferences in the selection of these technologies, the author prioritizes each year in which the related technology was effective, not the year it emerged. Even though the choice of "one technology per year" seems to have undervalued some other technologies or technological movements, it appears that there is a need for other publications that should accompany this book, which forms a basis for the ed tech history.

REVIEW OF THE BOOK

Throughout the book, Weller makes a general evaluation of the related technology in each chapter which is dedicated to a specific year and shares his experiences and thoughts within these technologies. In the last section, he makes a critical overall evaluation and reveals general themes. The first six chapters of the book take the readers to recall the technologies that dominated in the 1990s. In chapter 1, the author points out that the year 1994 is a turning point in terms of ed tech, with the use of the Internet in education. In this sense, 1994 was marked by the Bulletin Board System (BBS). The author states that "BBS had the potential to effectively remove the distance element." (p. 11). The author also notes that BBS is an important technological development that paves the way for social media and discussion forums. In the most essential chapter, chapter 2, the author discusses the Web, which forms the basis for all technologies covered in the

book. The author emphasizes the influence of the Web in 1995, although it appeared before. In this period, the Web, known as Web 1.0, provided people the freedom to publish, interact, and share. The web is also a very important step in reducing the cost of distance education providers and enabling the spread of distance education. Chapter 3 discusses computer-mediated communication (CMC), seen as the forerunner of the Learning Management System (LMS). This technology became a popular tool in 1996. CMC, based on BBS, has also increased the importance of communication in online education. Weller also stated that "If the benefit of the web was the removal of barriers to broadcast and publishing, then CMC delivered the ability to collaborate at a distance." (p. 23).

Figure 1. 25 technological innovations through the years from 1994 to 2018

Chapter 4, the year 1997, focuses on how the understanding of constructivism that prioritized learners' own experiences and social interaction came to the fore when web-based learning became very popular. Weller also states that the constructivist approach has brought about a radical change in the role of the educator in web-based learning environments. In Chapter 5, the year 1998, Weller explains Wikis that have enabled students to work collaboratively on a document regardless of place or time. Weller emphasizes the importance of Wikis with the following words "The web democratized publishing, and the wiki made the process a collaborative, shared enterprise.". When it comes to 1999, Chapter 6, it was the time when e-learning was on the rise and started being a part of mainstream education. Weller points out that, for that time, it was obvious that e-learning would be the shining star of ed tech history, although there were some hesitations.

In Chapters 7-12 Weller explores learning objects, e-learning standards, the learning management system, blogs, open educational resources (OER), and video tools. Although learning objects (LO) are important, they haven't been widely adopted. In chapter 7, in which the year 2000 was covered, Weller discussed the factors that hinder the success of LO and stated that although this technology does not get the place it deserves, there are successful applications based on it in today's ed tech field. In Chapter 8, for the year 2001, Weller explains how the rise of e-learning has led to the development of various e-learning standards.

Weller, citing his personal experiences on the subject, states that these standards later evolved into important developments. In Chapter 9, referring the year 2002, Weller discusses LMS, which is probably one of the most successful educational technologies and reinforces its importance day by day. In Chapter 10, for the year 2003, Weller discusses Blogs which he considered as one of the most important tools after the discovery of the Web. Weller also states that Blogs has transformed people into publishers and provided an online identity. In Chapter 11, Weller chooses the subject of OER, a movement that revolutionized higher education, for the year 2004. Weller adds that "OER represents something of a success story in ed tech" (p. 83) history. In Chapter 12, Weller describes how video technology has reached an important point with the widespread use of Internet access and the introduction of YouTube in 2005. He also describes the effects of the videos on "participatory culture" and "flipped learning" notions.

From Chapter 13 to 18 Weller describes 6 technological innovations through the years from 2006 to 2011, namely, Web 2.0, Second Life and Virtual Worlds, E-Portfolios, Twitter and Social Media, Connectivism, and Personal Learning Environments (PLE). In Chapter 13, for the year 2006, Weller discusses Web 2.0 with three important factors that emerged with Web 2.0 in higher education. These are unbundling, granularity, and quality. For 2007, in Chapter 14, second life and virtual worlds topics that were once very popular and whose use in educational settings was not at the desired level, were discussed. Weller states that he still has a hope regarding this technology. In Chapter 15, for the year 2008, Weller describes and discusses e-portfolios, tools like a digital report card for students. Although e-portfolios support lifelong learning and career development of students, Weller discusses some issues that prevent the effective use of e-portfolios in education. Regarding this technology, he remarks that "The success of any technology lies in an alteration to accompanying practice more than the technology itself." (p. 103). In Chapter 16, covering the year 2009, Weller draws attention to Twitter and social media, which are still felt the most effective and widely used tools today. Shaping life from education to research, economy and sociology, social media still has many challenges besides these benefits. In Chapter 17, referring the year 2010, Weller chooses the connectivism approach as an effective tool. The author labels connectivism as "the first Internet-native learning theory" (p. 115) and he also adds "connectivism was an attempt to make the network nature of the current environment central in learning." (p. 120). Although connectivism may not be up to date for today, this pedagogy has evolved into effective applications. When it comes to 2011, in Chapter 18, Weller explains PLE. This technology, which is the products of the initiatives mentioned in the previous chapters in the book, has unfortunately failed to satisfy learners and has become a history in the ed tech journey. Weller explains some possible reasons why PLE didn't get a general acceptance in the history of ed tech.

Chapter 19, which is dedicated to 2012, focuses on the Massive Open Online Courses (MOOCs) phenomenon. This technology perhaps is the most popular initiative in the 25-year history of ed tech and Weller describes MOOCs as the "glamorous side of open education" (p. 137). However, Weller points out that although this technology has made a great contribution to the ed tech field, some problems have come up in practice. The author also expresses his concerns that MOOCs may have negative consequences in the long run. Chapter 20, referring to 2013, tackles the Open Textbooks application, which is the supplementary part of the OER movement. The author defines this technology as the "practical, even dowdy, application" (p.137). The author also presents several key facts of adoption of this ed tech in higher education. In Chapter 21, for the year 2014, Weller describes how and why learning analytics becomes prevalent in online distance education. The author also discusses the drawbacks and ethical issues of the analytics. The author warns researchers and developers about the possible danger of the learning analytics by stating that "instead of analytics supporting education, analytics becomes education" (p. 147). In Chapter 22, for the year 2015, Weller discusses digital badges with the results of the many research in the literature. The author also states that like many ed techs, badges had great hopes at first, but later turned into a stagnant technology. In Chapter 23, explaining the year 2016, the author discusses Artificial intelligence (AI) technology, which has a nearly 30-year history but is now at its peak in popularity. Although it is not yet at the desired level of use in the field of education, the author emphasizes ethical issues in the use of this technology. He also points out that "perhaps the greatest contribution of AI will be to make us realize how important people truly are in the education system." (p. 160). Chapter 24, in which the year 2017 was covered, focuses on Blockchain technology whose role in the field of education has not yet been clarified. Weller sees this technology as a result of the effort to apply every technology that emerges in the education field. However,

Weller defines Blockchain as "technology as alchemy" (p. 165) and likens Blockchain technology to the adventure of alchemy in the field of chemistry. He also expresses his concern that Blockchain can share the destiny of alchemy. Finally, in Chapter 25, Weller discusses the points where ed tech's journey, which started with great hopes at the beginning, left its place to great doubts and questions after 25 years. The author also underlines the need for more critical perspectives and voices. In the conclusion part, the author arrives at a synthesis considering 25 years of ed tech in the book. Within this context, he makes an evaluation of some themes and makes suggestions regarding the future of ed tech.

CONCLUSION

This book, with a critical perspective, is a great one to learn about the recent history of ed tech. Weller takes the readers to 25 stops on this lively journey. He describes an important technology or a technological movement at each stop and explains each scene like a master tour guide. And in each chapter, he explains the subjects mostly with his first-hand experiences and the results of current scientific studies in the literature. This book is highly recommended for field experts, instructional designers, distance education, and technology enthusiasts. Also, in these days of increasing interest in distance education during the coronavirus pandemic, the book can also be recommended as a starting book for those who are interested in technology and distance education and ask, "where should I start?".

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REFERENCES

Weller, M. (2020). *25 years of ed tech*. Athabasca University, AU Press. https://doi.org/10.15215/aupress/9781771993050.01