ANADOLU UNIVERSITY

The Turkish Online Journal of Distance Education

TOJDE

Editorial Board

Owner
Prof. Dr. Fuat ERDAL (Anadolu University Rector)

Editor-in-Chief
Dr. T. Volkan YUZER (Anadolu University)

Associate Editors
Dr. Gulsun KURUBACAK (Anadolu University)
Dr. Ela AKGUN OZBEK (Anadolu University)

Editorial Board Members
Dr. Abdul Waheed KHAN (Canada)
Dr. Alan TAIT (United Kingdom)
Dr. Anna RYBAK (Poland)
Dr. António TEIXEIRA (Portugal)
Dr. Antonis LIONARAKIS (Greece)
Dr. Asha KANWAR (Canada)
Dr. Bobby HARREVELD (Australia)
Dr. Carmencital CASTOLO (Philippines)
Dr. Cleborne D. MADDUX (Canada)
Dr. David METCALF (USA)
Dr. Dursun GOKDAG (Turkey)
Dr. Ene KOITLA (Estonia)
Dr. Ezendu ARIWA (United Kingdom)
Dr. Fahriye ALTINAY AKSAL (Turkey)
Dr. Farhad SABA (USA)
Dr. Ferhan ODABASI (Turkey)
Dr. Feyzi ULUG (Turkey)
Dr. Fons NOUWENS (Australia)
Dr. Francis GLASGOW (South America)
Dr. Gilly SALMON (United Kingdom)
Dr. Gonca Telli YAMAMOTO (Turkey)
Dr. Hakan TUZUN (Turkey)
Dr. Hanafi ATAN (Malaysia)
Dr. Ilknur KECIK (Anadolu University)
Dr. Ipek KURU GONEN (Anadolu University)
Dr. Jack KOUMİ (United Kingdom)
Dr. Jim FLOOD (United Kingdom)
Dr. John TRAXLER (United Kingdom)
Dr. Katherine M. SINITSA (Ukraine)
Dr. Kinshuk (New Zealand)
Dr. Kay Mac KEOGH (Ireland)
Dr. Linda HARASIM (Canada)
Dr. Liz MARR (United Kingdom)
Dr. Loreta ULVYDIENE (Lithuania)

Dr. Marina McISAAC (USA)
Dr. Mark BULLEN (Canada)
Dr. Meena HWANG (South Korea)
Dr. Mehmet KESIM (Turkey)
Dr. Michael R. SIMONSON (USA)
Dr. Michail KALOGIANNAKIS(France)
Dr. Mihai JALOBEANU (Romania)
Dr. Nabi Bux JUMANI (Pakistan)
Dr. Naeem TARIQ (Pakistan)
Dr. Natalija LEPKOVA (Lithuania)
Dr. Ojat DAROJAT (Indonesia)
Dr. Patrick DANAHER (Australia)
Dr. Paul KAWACHI (Japan)
Dr. Piet KOMMERS (Netherlands)
Dr. Ramesh C. SHARMA (India)
Dr. Rory McGREAL (Canada)
Dr. Roza DUMBRAVEANU (Moldova)
Dr. Rozhan B. M. IDRUS (Malaysia)
Dr. Santosh PANDA (India)
Dr. Sarah GURI-ROSENBLIT (Israel)
Dr. Shivakumar DEENE (India)
Dr. Simon STOBART (United Kingdom)
Dr. Som NAIDU (Australia)
Dr. Stephen DOWNES (Canada)
Dr. Steve WHEELER (United Kingdom)
Dr. Taerim LEE (South Korea)
Dr. Tamar LOMINADZE (Georgia)
Dr. Tian BELAWATI (Indonesia)
Dr. William John FRASER (South Africa)
Dr. Yavuz AKBULUT (Turkey)
Dr. Zehra ALTINAY GAZİ (Turkey)
Dr. Zeki KAYA (Turkey)
Dr. Zdena LUSTIGOVA (Czech Republic)
Dr. Zhang WEI-YUAN (Hong Kong)

Composition and Visuals
Kagan KUCUK (Anadolu University)
Aysegul DIBEK (Anadolu University)

Honorary Editorial Board of TOJDE

Prof. Dr. Ugur DEMIRAY - Founder Editor of Turkish Online Journal of Distance Education - TOJDE

Prof. Dr. Cevat ALKAN - The pioneer of educational technology in DE in Turkey (Turkey)

Prof. Dr. Engin ATAC - Former Rector of Anadolu University for 1999-2006 period (Turkey)

Prof. Dr. John BAATH - The well-known Swedish distance educator (Sweden)

Prof. Dr. Tony BATES - Father of DE in Canada (Canada)

Prof. Dr. Yılmaz BUYUKERSEN - The founder of DE in Turkey (Turkey)

Prof. Dr. Chris CURRAN - The founder director of National DE Centre in Ireland (Ireland)

Prof. Dr. Chere Campbell GIBSON - She studied for DE all her life. Emeritus Professor (USA)

Prof. Dr. Börje HOLMBERG - He studied for DE. Emeritus Professor (Sweden)

Prof. Dr. James MARAJ - The pioneer of the open university movement (Australia)

Prof. Dr. Charles A. WEDEMEYER - The pioneer of DE in the world (USA)

Indexing

TOJDE is abstracted, indexed and cited by the following databases around the world:

- Emerging Sources Citation Index-ESCI (Web of Science)
- Q3 Level by Scimago Instituions Rankings
- ASOS
- The Education Resources Information Center – ERIC
- The Directory of Open Access Journals – DOAJ
- EBSCOhost Research Databases
- Genamics JournalSeek
- Google Scholar
- InfoBase Index
- International Institute of Organized Research - I2OR
- Scientific Indexing Service
- SCOPUS
- UlrichsWeb - Global Serials Directory
- SOBIAD

Table of Contents

Dear TOJDE Readers,

Welcome to Volume 22 Issue 1 of TOJDE.

There are 15 articles and two book reviews in the January 2021 issue of TOJDE. 40 authors from 9 different countries contributed to the issue. These countries are Egypt, India, Indonesia, Iran, Oman, Saudi Arabia, South Korea, Tanzania, and Turkey.

STUDENTS' EXPERIENCES AND PERCEPTIONS OF ONLINE COLLABORATIVE LEARNING IN HIGHER EDUCATION OF KOREA AND THE UAE authored by Jieun LEE and Gihan OSMAN is the first article. This research compares the experiences and perceptions of UAE and Korean students in campus-based universities of online collaborative learning (OCL) in terms of frequency, assessment, barriers, support, and attitude for OCL in each country. The results reveal that UAE students had more frequent experiences of and more positive attitudes toward OCL than did Korean students, although the two countries have similar cultural propensities.

The title of the 2nd article is A MODEL PROPOSAL ON THE DETERMINATION OF STUDENT ATTENDANCE IN DISTANCE EDUCATION WITH FACE RECOGNITION TECHNOLOGY. The authors are Durmus OZDEMIR and Mehmet Emin UGUR. The authors propose a design model using face recognition algorithms to determine attendance in distance education, to ensure more active participation and to increase success indirectly. It was seen that the proposed design model provided more than 80% accuracy with increasing number of samples.

The 3rd article, THE META-ANALYSIS OF THE STUDIES ABOUT THE EFFECTS OF FLIPPED LEARNING ON STUDENTS' ACHIEVEMENT, is written by Mustafa AYDIN, Burcu OKMEN, Seyma SAHIN, and Abdurrahman KILIC. The aim of this meta-analysis of 25 research articles and theses conducted in Turkey between 2014-2018 is to analyze the effect of the flipped learning model on the academic success of students. The results yielded that flipped classroom had medium effect on success and study type, educational level, and year do not have a significant effect on success.

THE SATISFACTION LEVEL OF UNDERGRADUATE SCIENCE STUDENTS TOWARDS USING E-LEARNING AND VIRTUAL CLASSES IN EXCEPTIONAL CONDITION COVID-19 CRISIS is the title of the 4th article, and the author is Ali Khaled BAWANEH. The study aims at investigating the science students' satisfaction with e-learning and virtual classes during COVID-19 crisis at a university from Eastern Province, Saudi Arabia. The results revealed that the science students' satisfaction level of using e-learning and virtual classes is medium in general with varying degrees across variables.

Ezgi Aydemir ALTAS and Enisa MEDE are the authors of the 5th article titled THE IMPACT OF FLIPPED CLASSROOM APPROACH ON THE WRITING ACHIEVEMENT AND SELF-REGULATED LEARNING OF PRE-SERVICE ENGLISH TEACHERS. This quasi-experimental research investigates the impact of flipped classroom on pre-service English teachers' Advanced Writing achievement and explores whether flipped classroom approach makes a difference on the self-regulated learning of the participants or not. The results demonstrated that the implementation of flipped classroom approach resulted in better writing achievement, yet self-regulated learning showed no significant difference between groups.

The title of the 6th article is MOTIVATIONAL FACTORS UNDERLYING THE USE OF ONLINE LEARNING SYSTEM IN HIGHER EDUCATION: AN ANALYSIS OF MEASUREMENT MODEL. Ridwan Daud MAHANDE and AKRAM are the authors. This quantitative research which aims at empirically developing and testing a measurement model of several motivational constructs, proposes a theoretical model which can be integrated into three motivational theories: ARCS, McClelland's needs, and Self-Determinant Theory (SDT). The results show that the construct of motivation with indicators that built it met validity and reliability requirements. The results of this research present two alternative instruments for explaining the relationship between motivational factors including the indicators that influence the use of online learning systems in tertiary institutions.

MODELING THE CONTRIBUTION OF DISTANCE EDUCATION TO STUDENTS' PREPARATION FOR THE PROFESSIONS is the 7th article. Mustafa CAVUS, Betul KAN KILINC, Berna YAZICI, Seda TEKELI, Guler GUNSOY, Bulent GUNSOY and Caglar KARADUMAN are the authors. The authors investigated the contribution level of open and distance learning to students' career, in order to perceive the pathway for higher quality standards. The analysis of the data obtained from approximately 17,000 associate and undergraduate students at Anadolu University Faculty of Open Education indicate that there is a positive relationship between family size and the contribution level of distance education on students' preparation for the professions. It was also found that the students with moderate and higher socioeconomic levels demonstrated superior levels of contribution.

The authors of the 8th article are Ishaq AL-NAABI, Thuwayba AL BARWANI, Salma AL-HUMAIDI and Otherine NEISLER. The title is ONLINE COURSE DESIGN: TAKING A RIGHT TURN! The authors evaluated a 5-week online course, designed according to Nation and Macalister's (2010) eight-step language curriculum design model, from the perspective of students, instructors and course reviewers at the Arab Open University (Oman). The analyses revealed that most stakeholders were satisfied with course design, yet some modifications were required. The study provides course developers with an evidence-based, enhanced online course design model that will help create online courses.

Sibel Ergun ELVERICI is the author of the 9th article. The title of this article is CAN SOCIAL MEDIA PROMOTE SOCIAL PRESENCE AND ATTITUDE IN EFL CLASSES? This explanatory mixed design study aims to reveal the effects of integrating social media on students' social presence and their attitudes to it when social media is integrated in foreign language classes. In the study, Facebook was used as part of high school students' curriculum in English lessons. The results of the study showed that there was no significant difference in students' attitude to social media, but there was a significant difference in their social presence.

The 10th article which is authored by Esra ACIKGUL FIRAT and Selcuk FIRAT is titled WEB 3.0 IN LEARNING ENVIRONMENTS: A SYSTEMATIC REVIEW. The results of this systematic review of 81 Web 3.0 papers from 2005 to 2020 reveal an increase in the number of studies in 2008 and 2013, a dominance of experimental studies especially in science education. It was also found that the majority of the studies were quantitative; most benefited from surveys, questionnaires and observational information in the data collection process; and the majority of studies focus on the learning usefulness and learning outcomes of the software used in the research.

STUDENTS' BARRIERS TO ONLINE TUTORIAL is the 11th article authored by SUGILAR. This mixed methods study aimed to identify barriers for students to participate in the online tutorial in Universitas Terbuka. The results of the study revealed that the students' barriers to online tutorial reflected in four factors, i.e. (1) information, (2) motivation, (3) technical, and (4) support. The study proposes some recommendations to improve student participation in online tutorials.

The 12th article ASSESSMENT AND EVALUATION IN OPEN EDUCATION SYSTEM: STUDENTS' OPINIONS ABOUT OPEN-ENDED QUESTION (OEQ) PRACTICE is authored by Nejdet KARADAG, Belgin BOZ YUKSEKDAG, Murat AKYILDIZ and Ali İhsan İBİLEME. The aim of this quantitative study is to determine students' opinions about open-ended question exam practice in several programs at Anadolu University Open Education System during 2018-2019. The results of the study showed that majority of the participants find open-ended questions more difficult than multiple-choice questions and have negative opinions about open-ended questions in terms of measuring subject matter competency and fair assessment.

Shirin SADAGHIAN and Susan MARANDI are the authors of the 13th article titled FOSTERING LANGUAGE LEARNER AUTONOMY THROUGH INTERDEPENDENCE: THE POWER OF WIKIS. The present study reports on a collaborative writing project initiated and completed by 18 Iranian English language learners enrolled in an online writing course. The findings of the study revealed student-writers' autonomous contributions, autonomous alterations and peer correction in the final product. In addition, teacher intervention was witnessed throughout the process and the findings from the teacher interviews revealed a need for a teacher as a facilitator and resource.

The 14th article titled EXAMINATION OF SAMPLE COURSE DESIGN STUDIES PERFORMED BY PRE-SERVICE SOCIAL STUDIES TEACHERS BY USING DIGITAL TECHNOLOGIES is authored by Turkan CELIK. The aim of this design-based research study is to examine the sample course design studies performed by pre-service social studies teachers by using digital technologies and to describe the opinions of pre-service teachers about this process. The findings revealed that the pre-service teachers integrated their content knowledge and pedagogical knowledge with digital technologies in their designs. Addition, all of the views of pre-service teachers on the process were found to be positive.

The 15th article, CORRELATION BETWEEN FACEBOOK USE, MENTAL HEALTH AND LEARNING ENGAGEMENT: A CASE OF UNIVERSITIES IN SURABAYA CITY, INDONESIA, is authored by Baraka Manjale NGUSSA, Fifi Khoirul FITRIYAH and Syaiputra Wahyuda Meisa DININGRAT. This descriptive correlational study investigates the perception on and interrelationships between Facebook use, mental health and engagement in learning during COVID 19 Pandemic. The findings yield that students did not consider Facebook as a valuable platform for learning and preferred platforms like Google classroom, WhatsApp and Zoom. Students experienced anxiety and it was not easy for them to cope up with stressful moments. However, they concentrated in learning without any interference from Facebook and took active role in extra-curricular activities, sports and games. Mental health positively influenced students' engagement while Facebook use enhanced mental health.

The first issue of 2021 covers two book reviews.

Monalisa DASH, in her review of the book THE FLIPPED LEARNING SERIES: FLIPPED LEARNING FOR MATH INSTRUCTION written by Jonathan Bergmann and Aaron Sams critically evaluates the authors' methods in guiding the math teachers, both in-service and pre-service, NGOs in education and curriculum experts. While praising the book of being one of the pioneers in the field and judging it to be a valuable guide for several stakeholders, the review points out to the lack of empirical data and recommendations for impediments.

The last contribution to the issue is the second book review. TECHNOLOGY-ENABLED LEARNING: POLICY, PEDAGOGY AND PRACTICE edited by Sanjaya MISHRA and Santosh PANDA is reviewed by Aysun GUNES. The reviewer provides and extensive outline of the book which documents the positive outcomes of the interventions supported by the Commonwealth of Learning.

May 2021 bring health, joy and comfort after all the negative effects of the COVID 19 Pandemic during 2020. I wish you all a happy new year! Hope to meet again in the next issue of TOJDE.

Cordially,

Dr. T. Volkan YUZER

Editor in Chief

STUDENTS' EXPERIENCES AND PERCEPTIONS OF ONLINE COLLABORATIVE LEARNING IN HIGHER EDUCATION OF KOREA AND THE UAE

Dr. Jieun LEE

ORCID: 0000-0001-5692-9263
School of Education
Chosun University
Gwangju, SOUTH KOREA

Dr. Gihan OSMAN

ORCID: 0000-0001-8830-3409
Graduate School of Education
American University in Cairo
Cairo, EGYPT

Received: 29/01/2020 **Accepted:** 11/05/2020

ABSTRACT

The purpose of this study was to compare the experiences and perceptions of UAE and Korean students in campus-based universities of online collaborative learning (OCL). 262 college students participated in online surveys. Their experiences in terms of frequency, assessment, barriers, support, and attitude for OCL in each country were examined. With Importance-Performance Analysis, the perceived importance of OCL activities was compared with actual frequency. Both countries' students experienced group projects and group presentations the most frequently, while online collaborative writing and online group exams were rarely used. As barriers to OCL, UAE students pointed out language, gender, and privacy as the major barriers while Korean students mentioned students' attitude and language. UAE students had more frequent experiences of and more positive attitudes toward OCL than did Korean students, although the two countries have similar cultural propensities.

Keywords: Online collaborative learning, Korea, UAE, cross-cultural study, IPA.

INTRODUCTION

According to the OECD, group-based activities and interactions are increasingly regarded as important for the 21st century learner (Martin 2018). Many researchers have pointed out the importance of helping learners develop skills related to team-work, uncertainty, and collaborative knowledge construction all associated with collaborative learning (e.g. Muukkonen & Lakkala, 2009). Students' development of work-related competencies depends on the "learning environment and its educational methods (Lakkala, Toom, Ilomäki, & Muukkkonen, 2015, p.521)." A report by the World Bank (2008) suggested that higher education in the Middle East should put greater emphasis on constructivist methodologies, collaborative strategies, student-centered learning as well as the integration of technology. Similar concerns were shared for other developing countries (Adam, 2003), and even in the USA (Choi, Khamalah, Kim, & Burg, 2014).

The diffusion of Internet technologies has stimulated the rapid adoption of online collaborative learning (hereafter OCL). Their affordances enable promoting the pedagogical values of collaborative learning (e.g. higher-order thinking, information retention, cognitive reasoning, improved satisfaction, social skills) beyond the limitations of time and place (Oh & Yoon, 2014). Particularly for campus-based universities, OCL provides learners with the flexibility for extended learning and enables multi-level interactions, resource sharing, and higher-order thinking activities, alongside improving competencies to deal with real-world problems (Oliveira, Tinoca, & Pereira, 2011). This is It is also associated with developing skills such as

cross-cultural communication, developing multiple perspectives, and reflective thinking (Choi et al. 2014). OCL would be one of the most demanding but properly prepared online pedagogies in the recent pandemic situation that brings a forced shift to online learning.

Despite the many benefits and potential of OCL, the actual implementation does not always align with its theoretical promises (Osman, Duffy, Chang, & Lee, 2011), nor do students equally react to such activities (Fung, 2004; Hilliard, Kear, Donelan, & Heaney, 2020). Also, OCL presents the learner with many challenges (Havard, Du, & Xu, 2008) such as the absence of social context (Hishina, Okada, & Suzuki, 2005), possible lack of feedback from facilitators or peers, limited time to participate, slow Internet, and low participation (Chang & Kang, 2016) to name a few.

With advances in technology and the use of social media, and its rapid and massive uptake by young people everywhere, the geographical distances are bridged virtually. Also, internationalization efforts, manifested in student exchange and faculty mobility as well as MOOC offerings, are also increasing cross-cultural communication. As the OCL environment becomes multicultural or transnational, there is a strong need for research on what students from different cultures experience with OCL and how they perceive it. Culturally relevant pedagogy and teaching should be implemented fairly even for the underserved culture (Adams, Rodriquez, & Zimmer, 2019). However, cultural differences have been often tackled superficially in the literature and have lacked empirical supports (Al-Harthi, 2010). Some cultures are also under-represented, and often misunderstood. Examples of these would be Middle Eastern and Asian countries, other than China. Not only are these cultures often stereotyped, but they are also often depicted as a homogeneous entity. It is tenacious to assert that China and Korea in Far East Asia hold similar cultural values. Although the two countries have similar collectivistic propensity, China has very different cultural values than Korea in 'uncertainty avoidance' (Culture Compass™, 2019). Therefore, generic statements about 'Asian learners' or 'Middle Eastern learners' should be treated with caution (Sawir, 2005). As Sawir (2005) suggested, inquiry into students' prior learning experiences and their beliefs about learning should be undertaken, in order to gain a more complete understanding of the students.

Previous studies noted that few empirical studies have examined several aspects of online collaboration from a cross-cultural perspective (Zhu, 2012). There is also a need for research examining cultural influence on OCL in broader contexts other than China and USA (Uzuner, 2009; Zhu, 2012). South Korea is the third-ranked place of origin of international students, and students from the Middle East constitute almost 10% of all international students in the US (IIE, 2018). These under-represented student groups are major international student populations in western universities. It is crucial to understand how these student groups experience online collaborative learning where these groups are major places of origin of international students. Also, Korea and the UAE need to establish a clear mutual understanding in terms of their online learning experiences for their future partnership in the tertiary education field (Human Resources Development Service of Korea, 2019).

To address these needs mentioned above, the following questions were put forth: (1) How do students in Korea and the UAE experience online collaborative learning activities in higher education? (2) How do students in the two countries perceive online collaborative learning? (3) Are there differences between the reported use and perceived importance of online collaborative learning activities in Korea and the UAE?

LITERATURE REVIEW

Culture and Prior Learning Experience in OCL

OCL has become accepted as a pedagogically effective strategy for tertiary education (Oye et al., 2014; Hilliard et al., 2020). Previous studies confirmed its several benefits that could often render it superior to face-to-face collaboration; student engagement is more intense and equally distributed among learners (Angeli, Valanides, & Bonk, 2003), and online collaboration in the form of asynchronous discussions enhances student learning achievement (Young, 2000) by adding flexibility of place and time. It is suggested that online can be a medium for "true collaborative work" since there is little social pressure and greater freedom for learners to express their ideas through more reflective and effective communication (Henri & Rigault, 1996).

Student's and teacher's attitude towards online learning influence its adoption and use, and culture impacts those perceptions (Jung, 2014). Culture may play an important role in the online learning environment (Uzuner, 2009). Previous studies indicate that students from diverse cultures vary in how they behave online (Kim & Bonk, 2002) and in their satisfaction with online learning activities (Gunawardena, 1998; Hannon & D'Netto, 2007). For example, Ramiah (2014) reported that American students prefer e-learning while Asians are not likely to actively participate in online discussion and assessment. By comparing factors affecting the adoption of e-learning systems between USA and Qatar, El-Masri and Tarhini (2017) asserted that the attitude in developing countries differs from in developed ones. Other than the degree of a country's development, several researches have used some indices drawn from Hofstede's cultural dimensions as a framework to understand students' culture. Wang (2007) and Selinger (2004) used 'power distance' to examine its influence on student learning. Some studies suggested that individualism fits more with online communication than collectivism. Collectivistic learners are more group-oriented (Chang & Lim, 2002) and consider relationships to be more important than the task (Trumbull, Rothstein-Fisch, & Greenfield, 2000). In terms of online communication, they try to understand meaning through nonverbal language, while individualistic learners will rely mostly on the words exchanged (Hall, 1976). In individualistic societies, collaboration is a process of the search for solutions. In collectivist societies, on the other hand, an individual may fail to differentiate between her work and the result of group activities. The process of grouping and re-grouping would be more difficult in collectivist than in individualistic cultures (Economides, 2008). However, these assertions from previous studies may not be plausible without understanding students' prior learning experiences, one of the critical sources to represent the current attitude toward learning (Sawir, 2005). In sum, it is critical to understand student group's learning experiences embedded in a certain cultural context. A recent study reported that the dropout rates of the learners from low context culture are greater than in high context culture (Bozkurt & Akbulut, 2019). In sum, culture of learners is a critical component to expect or predict online learning outcomes and engagement.

Experiences around Communication, Barriers, Support, and Assessment in OCL

Students' beliefs about learning are rooted in their prior learning experiences (Sawir, 2005). Some of the most memorable and influential experiences are those related to assessment since what is assessed is what is valued in a learning context (Swan, Shen, & Hiltz, 2006). Assessment has been regarded as the engine driving and shaping student online collaborative activity (Swan, Shen, & Hiltz, 2006) and a way of ensuring participation in online collaboration (Brindley, Walti, & Blaschke, 2009). It will impact the development of online collaborative skills indirectly. Some issues around the assessment of collaboration lie in the complexity of assessing both individual and group collaboration. To encourage collaboration, both individual and group effort must be appropriately assessed since it can maintain individual accountability and also positive interdependence (Johnson & Johnson, 1986). Unfortunately, the examples that implement both individual and group assessment in online collaborative learning are not frequently observed (Swan, Shen, & Hiltz, 2006). Alignment between task and assessment is critical also for online courses (Adams, Rodriquez, & Zimmer, 2019). Compared to face-to-face instructional design, online learning design is relatively lacking alignment between assessment and learning objectives since online learning puts more focus on values of access and content management rather than on pedagogy (Hannon & D'Netto, 2007).

In OCL, students are expected to work in a team effectively, which requires, for example, team work, negotiation, group decision making, project management skills, and handling some technical issues. The whole process of OCL requires practice and time to develop. To nurture these skills, instructional supports are critical. Thorpe (2002) strongly suggested re-conceptualization of the term 'learner support' in online learning since all online learners should be supported, as there are exceptional needs compared to offline. Support from instructors or institutions can help create a more safe and effective learning environment for all learners by reducing hassles, anxiety, and inconvenience (Moore & Kearsley, 2011).

One of the challenges online is the absence of contextual cues found in face-to-face communication (Chang & Lim 2002). Hannon and D'Netto (2007) found that local students whose first language was English had significantly more positive perceptions of online courses and higher mean scores when compared with international students whose first language was not English. Moreover, for students to communicate

clearly online, they must be familiar with the language of a discipline (Macdonald, 2003) in addition to the language of instruction. Although Palloff and Pratt (1999) argue that online environment neutralizes learners' cultural, ethnic, or social conditions, there is an opposite position asserting that online environment plays a role as an escalator to enlarge those cultural differences such as languages (Hannon & D'Netto, 2007). Bates (2015) underscores that importance of realizing that learners collaborating online might be struggling with the language. As globalization in education has expanded, the number of students studying in English has grown. Language difficulties involve different concerns over colloquial language, writing difficulties, and problems of interpretation (Sawir, 2005).

Taken together, these results indicate that students engaged in collaborative learning may have completely different expectations in diverse cultures and also due to different prior OCL experiences. It is critical for instructors to consider the differences of students toward OCL, which enables to design an optimized learning environment and to plan adequate supports.

METHODS

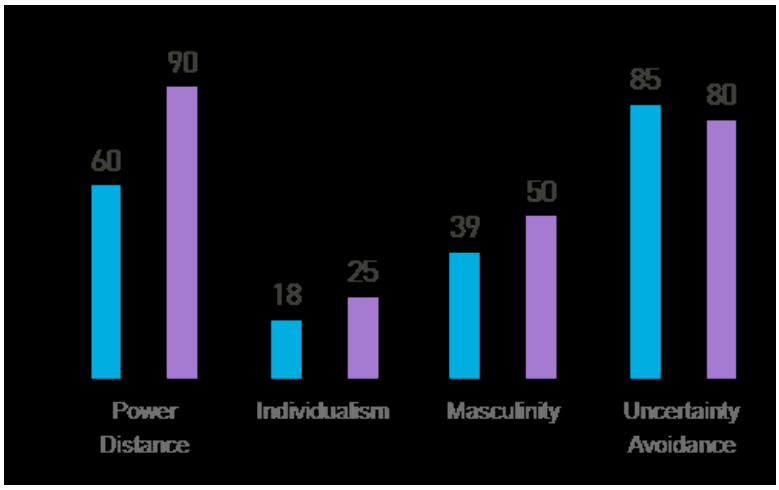
Participants and Context

262 college students participated in the study between November 2015 to January 2016, including 210 from Korea and 52 from the UAE. To recruit participants, the authors contacted 10 instructors working in 10 different colleges in Korea and 9 instructors in 5 colleges in the UAE. The instructors were asked to encourage their students to participate in the online survey. After screening the data, three unsuitable cases were deleted. Participating students in Korea were all Koreans, whilst in the UAE, 62% were Emiratis (UAE nationals); the rest were from Egypt, Sudan, Canada, Palestine, and 8 other countries. The diversity of nationality in the UAE and the homogeneity in Korean participants reflected the current student composition in higher education of each country. All universities targeted for this study were campus-based.

Table 1. Information of participants (n=259)

	Korea (n=208)	UAE (n=51)
Nationality	Koreans (n=208, 100%)	UAE (n=31, 60%)
		Egypt (n=3, 6%)
		Canada (n=2, 4%)
		Pakistan (n=2, 4%)
		Palestine (n=2, 4%)
		Sudan (n=2, 4%)
		USA (n=2, 4%)
		Ghana (n=1, 2%)
		India (n=1, 2%)
		Indonesia (n=1, 2%)
		Jordan (n=1, 2%)
		Syria (n=1, 2%)
		Uzbek (n=1, 2%)
		Yemen (n=1, 2%)
Gender	Male (n=63, 30.3%)	Male (n=16, 31.4%)
	Female (n=145, 69.70%)	Female (n=35, 68.6%)
Age	Mean 22.3 (SD= 5.54)	Mean 24.6 (SD=5.59)
Major	Education (n=132, 63.5%)	Design (n=18, 35.3%)
	Engineering (n=48, 23.1%)	Int'l Relations (n=15, 29.4%)
	Computer Science (n=8, 3.8%)	Education (n=5, 9.8%)
	Design (n=5, 2.4%)	Business Management (n=4, 7.8%)
	Library Science (n=4, 1.9%)	Computer Science (n=3, 5.9%)
	Others (n=11, 5.3%)	Others (n=6, 11.8%)

Korea is an East Asian country, speaking Korean, mostly with a racially homogeneous student population in higher education. The UAE is an Arab country located in the Arabian Peninsula. About 10% of the population is Emiratis, whereas most of the rest are multi-cultural expatriate workers and their families. Although Arabic is the official language of the country, English is more widely spoken. UAE students are exposed to other cultures and educational contexts, especially with a majority of expatriate faculty (Madsen & Cook, 2010). According to Hofstede (1986) and Hofstede Insights (2018), Korea and the UAE have a similar cultural propensity toward his four dimensions (collectivism-individualism, femininity-masculinity, power distance, and uncertainty avoidance). However, there is a slight difference in that Korea is characterized by having smaller power distance, more collectivism, more femininity, and slightly stronger uncertainty avoidance than the UAE (see Figure 1).



Note: Left bar (blue) is Korea and right bar (purple) is the UAE.

Figure 1. Cultural Beliefs of Korea and the UAE

Source: https://www.hofstede-insights.com/country-comparison

Instrument

The survey questionnaire consisted of 48 items in three sections. As it was hard to find the appropriate existing survey questionnaire that fit our purpose, the questionnaire was developed by referencing several existing surveys, which were designed to ask about perceptions of instructional innovations (Zhu & Engels, 2014) and online learning issues (Magjuka, Shi, & Bonk, 2005). The list of specific OCL activities were established from the one on one interviews with 9 instructors from the UAE and 10 from Korea, which was one of the data collection methods for another research by the authors (in review). The first section had 5 questions to collect demographic information. The second contained 21 items to elicit students' experiences and perceptions of OCL regarding frequency, communication tools, beliefs, barriers, support, and assessment. The third consisted of 22 items that collected actual frequency usage of collaborative learning activities versus perceived pedagogical importance. The instrument was developed in English and Korean. For the reliability of the two versions, the Korean version was translated back into English, compared with the English version, and corrected where there were inconsistencies. The reliability of the instrument was high (Cronbach alpha = .821).

Data Analysis

The survey data were analysed using SPSS 21.0. To examine the mean difference between Korean and UAE students in terms of the experience and perception of OCL, Welch's t-test was conducted. It could address the unequal sample size problems since it may increase the probability of Type 1 error and lower the statistical power (Fraenkle & Wallen, 2011). To answer the third research question, an Importance-Performance Analysis was performed.

RESULTS

Experience with OCL

The participants were asked to answer the number of courses that employed OCL in the current semester. UAE students seemed to have more courses with OCL components than Korean students had and were required to spend more hours on online communication. There were significant differences in the number of courses having online collaborative components (t=-2.29, p=.024) and the time spent for online communication (t=-2.88, p=.001).

Table 2. Number of courses with online collaborative learning and hours on online communication

		M	*SD*	*t*	*Df*
No. of Courses/term	Korea	2.57	1.58	-2.29*	76.307
	UAE	3.12	1.50		
Hrs. of online communication/week	Korea	1.53	.79	-2.88*	63.745
	UAE	1.96	.98		

** denotes that the t value is significant at .01.*

Communication Tools for OCL with Peers

The students were asked to choose up to three tools that their instructors required them to use for online communication. Course messages (e.g., emails) and discussion boards were frequently used in both countries. Korean courses rarely used synchronous meeting tools, blogs, and wikis, whereas the UAE courses used them more frequently. The chat tool is the most frequently used in Korea and course messages were the most frequently used in the UAE.

Table 3. Communication tools for online collaboration

Communication Tools	**Korea**		**UAE**	
	n	%	N	%
Synchronous meetings (e.g. Google Hangout, Skype)	11	3.09	11	12.79
Blogs	14	3.93	8	9.30
Wikis	5	1.40	2	2.33
Course messages (email)	101	28.37	27	31.40
Discussion boards of LMS	43	12.08	26	30.23
Chats (e.g. Whatsapp in the UAE, Kakaotalk in Korea)	182	51.12	12	13.95
TOTAL	356	100	86	100

Barriers to Online Collaborative Learning

As the major barrier to OCL, UAE students chose language whilst Korean students selected students' attitude toward working with peers. In terms of privacy issues, UAE students showed much more concern than Koreans. Regarding gender, most Koreans did not care at all, while UAE students mentioned it as a barrier (12%). Both countries pointed out that students' attitude and lack of collaboration skills can negatively influence online collaboration. Compared to Korea, UAE students showed more concern over the technology skills of students and instructors as well as infrastructure.

Table 4. Barriers to online collaborative learning

Barriers	Korea		UAE	
	n	%	n	%
Language	33	16.6	26	63.4
Gender issues	1	0.5	5	12.2
Privacy	30	15.1	11	26.8
Attitude toward working with peers	151	75.9	18	43.9
Collaboration skills	80	40.2	19	46.3
Student technology skills	28	14.1	24	58.5
Instructor technology skills	19	9.5	13	31.7
Infrastructure (e.g., Internet speed, computer specs)	38	19.1	15	28.3

Assessment and Support of Online Collaborative Learning

Korean students experienced more courses that do not tie performance in collaboration to grades or that combine group scores with individual scores, if the courses tie collaborative activities to grade. It seems that instructors in the UAE are more likely to give a group grade but not an individual grade for the OCL. OCL in both countries is not being implemented with well-designed assessments that encourage individual responsibility as well as positive interdependence in groups. Also, assessments of OCL activities are largely focused on outcomes, and not on process.

Table 5. Assessment of online collaborative learning

Items	Korea		UAE			
	m	*sd*	*m*	*sd*	*t*	*df*
Performance on collaborative activities is tied to course grades.	2.32	.89	2.70	.84	-2.75*	257
The instructor evaluates the product of online activities and not the process.	2.49	.85	2.50	.80	-.07	257
The instructor gives a group grade but not an individual one.	2.47	.89	3.00	.69	-4.64*	94.84

**Note: Those questions were asked with a 4-point Likert scale ranging from 4=True for all courses to 1=True of no course.*

In all the items related to the instructor and technical support, there were statistically significant differences, with more support provided in the UAE than in Korea. UAE students showed more concern over lack of technology skills. Regarding team conflicts, UAE instructors seemed more likely to address them than did their Korean counterparts.

Table 6. Support of online collaborative learning

	Items	Korea		UAE			
		m	*sd*	*m*	*sd*	*T*	*df*
Instructor Support	The instructor provides support to students that face conflicts within teams.	2.09	.91	3.05	.66	-8.55*	101.77
	We are given training on how to work as a group.	2.19	.85	2.59	.84	-3.05*	257
Tech Support	We are provided with the necessary technology training to use online collaboration tools.	2.02	.87	2.70	.84	-5.04*	257
	Technical support is available whenever needed.	2.00	.88	2.49	.86	-3.60*	257

**Note: Those questions were asked with a 4-point Likert scale ranging from 4=True for all courses to 1=True of no course.*

Attitude toward Online Collaborative Learning

The most noticeable difference is in the item, "I'd rather meet up with colleagues…than meet online." Korean students strongly prefer meeting in-person to meeting online. Also, they more strongly agree with "Online communication leads to misunderstandings" and "It bothers me when my teammates do not respond…" than UAE students. Another big difference appeared in the item, "I feel comfortable to express … online." Taken these results together, it seems UAE students feel much more comfortable in communicating and working online than Korean students. Regarding feedback from instructor and peers in OCL, Korean students appreciated it more than UAE students did. However, UAE students expressed a more positive stance about assessment in OCL.

Table 7. Perceptions toward online collaborative learning

	Items	Korea		UAE		
		m	*sd*	*m*	*Sd*	*t*
Communication	I would rather meet up with colleagues to work on a project than meet online.	3.22	.81	2.07	.88	8.94*
	I feel comfortable to express different ideas and question others online.	2.48	.82	3.30	.68	-7.39*
	Online communication leads to misunderstandings.	3.00	.72	2.48	.93	3.76*
	Not everyone knows how to communicate their ideas clearly online.	3.14	.59	3.41	.73	-2.77*
	It bothers me when my teammates do not respond to my online communications.	3.35	.71	2.62	.75	6.57*
	It is easier to reach consensus online.	2.27	.71	2.93	.76	-5.83*
Assessment	Working online allows the instructor to better judge individual contributions of team members since the system archives all the activities.	2.52	.76	2.95	.82	-3.58*
	Grades on online collaborative activities are fairer.	2.15	.76	2.28	.97	-0.86
Feedback	Instructor feedback on our online collaborative groupwork performance is important.	3.14	.65	2.89	.96	1.78*
	Reading the online contributions/comments of others helps me understand the content better.	2.90	.63	2.80	.81	0.84

**Note: The questions were asked with a 4-point Likert scale ranging from 4=strongly agree to 1=strongly disagree.*

Differences between Frequency and Importance of Online Collaborative Learning Experiences

Frequency of Use of OCL Activities

There are significant differences in the frequency of use of group discussion, understanding course content through group discussion, group practice exercise, collaborative writing, and knowledge sharing (see Table 8). Except for peer review and collaborative data collection and analysis, most of the other collaborative learning activities were used more frequently in the UAE than in Korea. Largely it seems that UAE students experienced all the other collaborative learning activities more frequently than Korean students.
Only two activities, peer feedback and collaborative data collection, were used more frequently in Korea than in the UAE. Group exams and collaborative writing were the least used in both contexts.

Table 8. t-Test of use & importance of OCL activities between Korean and the UAE

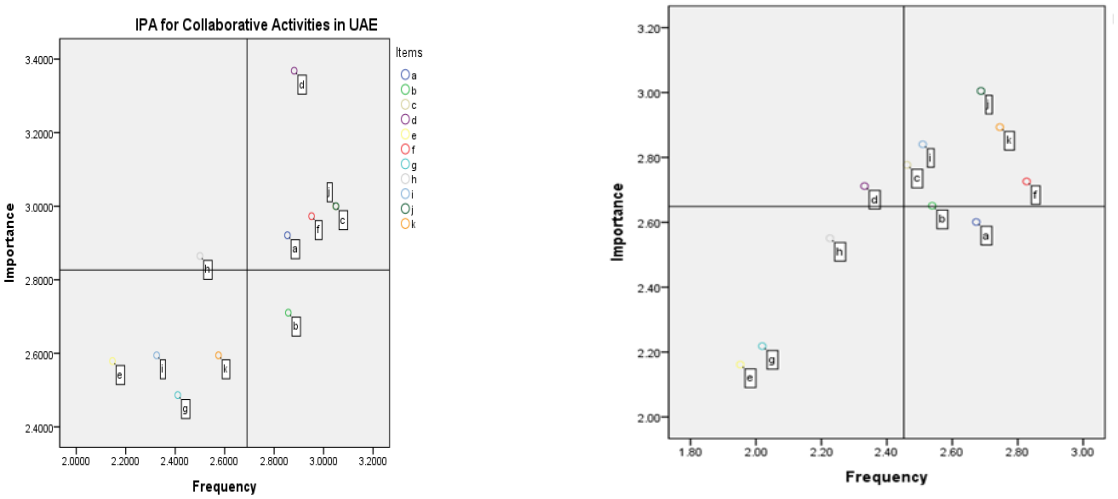
		Use			*Importance*		
OCL activities	**Country**	***M***	***Sd***	***t***	***M***	***Sd***	***t***
a. Group project	Korea	2.67	.85	-1.67	2.60	.83	-2.65*
	UAE	2.85	.65		2.92	.76	
b. Group discussion	Korea	2.54	.83	-2.87*	2.65	.82	-.47
	UAE	2.86	.68		2.71	.85	
c. Understanding course content	Korea	2.46	.79	-5.65*	2.78	.79	-2.00
	UAE	3.05	.63		3.00	.69	
d. Practice exercise	Korea	2.33	.81	-5.03*	2.71	.81	-6.39*
	UAE	2.88	.67		3.37	.61	
e. Group exam	Korea	1.95	.88	-1.50	2.16	.91	-2.93*
	UAE	2.16	.84		2.58	.95	
f. Group presentation	Korea	2.83	.83	-.95	2.73	.95	-1.88
	UAE	2.95	.85		2.97	.81	
g. Collaborative writing	Korea	2.02	.87	-3.18*	2.22	.91	-1.91
	UAE	2.41	.77		2.49	.86	
h. Group reflection	Korea	2.23	.81	-2.17	2.55	.87	-2.35*
	UAE	2.50	.80		2.86	.85	
i. Peer review	Korea	2.51	.85	1.36	2.84	.87	1.81
	UAE	2.33	.93		2.59	.86	
j. Knowledge sharing	Korea	2.69	.81	-3.35*	3.00	.79	.04
	UAE	3.05	.66		3.00	.69	
k. Collaborative data collection	Korea	2.75	.87	1.27	2.89	.82	2.33*
	UAE	2.58	.80		2.59	.84	

Importance of Use of OCL Activities

It seems that UAE students perceive most of the collaborative learning activities as more important than Korean students except for peer review, knowledge sharing, and collaborative data collection. Practice exercises was the activity that was perceived as the most important by UAE students, followed by understanding course content through group discussion and knowledge sharing. Group reflection in the UAE needs to be focused while it was not regarded as important in Korea. Group discussion in both countries was more frequently used than its importance. The activities that need to be more focused on are practice exercises in Korea and group reflection in the UAE.

Importance-Practice Analysis of OCL Activities in Korea and the UAE

The participants thought that practice exercises in Korea and group reflection in the UAE should be implemented with more frequency. Group exams and collaborative writing were regarded as a low priority and rarely implemented in both countries. These activities belong to the 'Low priority' quadrant. Group discussion is commonly regarded as a 'too-much-used-but-with low-importance' activity in both countries. The activities such as 'understanding course content,' 'group presentation,' and 'knowledge sharing' were those that were currently implemented appropriately and also need to be maintained in Korea and the UAE.



Korea UAE

Figure 2. IPA quadrants of online collaborative activities in Korea and the UAE

Table 9. Online collaborative learning activities by IP analysis

I-P area	Online Collaborative Activities		
	Korea	**Common**	**UAE**
I. Concentrate here (Low P, High I)	d (practice exercise)	-	h (group reflection)
II. Keep up the good work (High P, High, I)	c, f, i, j, k (understanding course content, presentation, peer review, knowledge sharing, coll. data collection)	c, f, j	a, c, d, f, j (group project, understanding course content, practice, presentation, knowledge sharing)
III. Low priority (Low P, Low I)	e, g, h (group exam, coll. writing, group reflection)	e, g	e, g, i, k (group exam, coll. writing, peer review, coll. data collection)
IV. Possible overkill (High P, Low I)	a, b (group project, group discussion)	b	b (group discussion)

CONCLUSION AND DISCUSSION

The importance of inquiry into students' perception and experiences with online collaboration lies in that collaborative learning will be more successful when learners value it (Swan et al., 2006). This study investigated college students' perceptions and experiences of OCL in Korea and the UAE and also analysed each country's current practice and the perceived importance of several OCL activities.

The results of this study show that OCL is implemented in a considerable number of courses offered by the campus-based universities in both countries. Although the proportion of courses that should contain online

collaboration would vary by context and the overall program outcomes, the picture presented by this study shows landscapes not entirely dominated by lecturing, which is a shift from the stereotypical depiction of traditional Eastern contexts, dominated by the persona of the all-knowing instructor (Al-Adwan & Smedley, 2012). Regarding the communication tools for OCL, it is not surprising that e-mail and discussion boards are frequently used since these are the more traditional and older forms of online communication that both students and instructors are well familiar with. However, noteworthy of observation is the dominance of synchronous tools in both contexts, where informal chatting apps constitute more than 50% of communication in the Korean context, and to a lesser extent among UAE students, thereby underscoring the potential of social media for online collaborative work for the new generations (Abdul Khalek, 2014). Kakaotalk, an SNS communication app, is widely used in Korea at every age level of population and is being utilized for educational purposes, such as a learning environment for the writing of second language (Lee et al., 2016). With its pervasiveness and enjoyable leisure activities for young people (Erstad, Gilje, & de Lange, 2007), the SNS app is being considered and actively explored as an innovative educational platform.

However, there are several points that show significant differences. Overall, UAE students had a more positive attitude toward OCL than Korean students in terms of communication, assessment, and feedback despite its shorter history of online learning. Regardless of cumulative research affirming educational effects of collaborative learning (Slavin, 1991), it is not appreciated by many Korean college students (Lee, 2014), who try not to enroll in courses with collaborative tasks. Korean students reported that not many courses that they experience tied OCL performance with course grades. Considering group work naturally entails substantial team work (Kirschner, Paas & Kirschner, 2009) in addition to the cognitive load generated by learning, students appreciate and persist with group learning only when they are appropriately compensated for their effort. What is assessed tends to be more valued by students (Swan, Shen, & Hiltz, 2006). UAE students perceived assessment online as much fairer than Korean students. This might be grounded in that Korean instructors are likely to give a group grade but not an individual one in OCL and to assess largely group outcomes, rather than the process (see Table 5), which can implicitly allow free riders in group work (Lee, 2014). This is also true to other countries. Some learners may experience a various range of unpleasant emotions and feelings such as anxiety and frustration when they work with unknown others (Hilliard et al., 2020). However, the fairness of grades of online performance was not positively evaluated by the participants in both countries. Clear and detailed criteria of online performance would lessen students' worries over fairness of grades (Swan, Shen, & Hiltz, 2006). Therefore, a well-designed assessment scheme that encourages individual responsibility and positive interdependence among teammates (Johnson & Johnson, 1986; Child & Shaw, 2016) should be adopted for sustainable online collaborative learning.

In addition, UAE students regarded OCL as more important and experienced it more frequently than Korean students. Since the UAE is more multicultural in student composition in tertiary education, and has gender segregation in face to face classes, OCL may be more welcomed (Al-Fadhli, 2008) than in Korea, a quite homogeneous country. UAE students felt much more comfortable than Korean students did with online communication. This may be related to a relatively wider use of synchronous meeting tools in the UAE than in Korea. Korean students rarely used them for educational purposes. Online communication using synchronous meeting tools may dramatically reduce misunderstandings and discomfort from the time lag caused by text-based asynchronous communication.

Previous studies revealed that students commonly experience anxiety from relying on 'unknown others', fear of negative evaluation and worries about other group members' negligence (Hilliard et al., 2020). Concerns over privacy and gender are unique to the UAE, while there is the lack of such anxieties in Korea, depicting the unique barriers to online learning and collaboration inherent to more conservative Middle Eastern countries in the Gulf (Osman, 2018). Al-Fadhli (2008) reported that gender is a critical factor to satisfaction of e-learning in Kuwait since online learning could help overcome these cultural limitations, barriers, and challenges by providing alternative means of collaboration without radically changing the social norms. The more positive attitude toward OCL of UAE students could be understood in the same line. While the previous studies indicate that digital access and capabilities is more favorable to male on a global scale (Alaleeli, & Alnajjar, 2020), the participating college students in Korea and the UAE are not this case. For digital divide, gender would not be a critical factor compared to economic and societal status.

Language constituted the most important barrier for students in UAE settings and previous research (Hall, 2011; Osman, 2018; Wong, 2004) supports this finding. The UAE is a multicultural expatriate society with diverse language backgrounds. In many cases, the language of pre-university instruction is one other than English. At university, however, students are expected to communicate in English – an expectation that many students fail to meet (Hall, 2011). The use of technology in educational settings is also new to the region (Osman, 2018); thus, it could be expected that students are concerned about the technology skills of peers and the instructor as well as the infrastructure. Interestingly, about 16% of Korean students indicated that the language is also a barrier for them, even though they use Korean, the mother tongue for most of the students. Perhaps for Korean students, the language problem is not caused by the use of other languages, but may be related to difficulty with text-based asynchronous communication (Lee, 2004). Online interaction is very different from face-to-face interaction in that it does not permit non-verbal communication (Berge & Collins, 1993) and is also likely to lead misunderstandings (Tu, 2000). To overcome these negative aspects, participants articulate their thoughts, and opinions by using the elaborated expression that requires deep cognitive processing causing cognitive load (Lee, 2004). Two common barriers in Korea and the UAE were concerns about collaboration skills and peers' attitudes; possibly implying the novelty of OCL. Student's attitudes toward OCL can be formed from a complex combination of individual learning motivation, prior OCL experiences, team culture, and team dynamics. Also, social loafing or sucker effect can be present in any group work (Lee, 2014). The instructional design of OCL to reduce those phenomena helps establish a positive team culture.

The assessment of OCL seems to lie in between emphasis on the product versus the process, mirroring the dichotomy in approach found in previous international literature (Child & Shaw, 2016). Although UAE students regarded assessment of OCL as fairer than did students in Korea, the reasons for that discrepancy are not clear. However, across both contexts, there seems to be room for improvement of assessment. Swan et al. (2006) underscored the importance of utilizing assessment strategies that enhance active participation and address individual accountability (Child & Shaw, 2016), which can cope with students' discomfort of member's negligence.

Both countries show a similar representation of usage and perceived importance regarding online collaborative activities, although there were slight differences. Among OCL activities, collaborative writing and group exams are the least valued activities and rarely experienced by both countries' students. However, with the forced shift to online learning in the current global pandemic situation, online exams will be indispensable and demands of more diverse online collaborative activities should be addressed even in the campus-based universities. The group presentation and knowledge sharing were the most frequently used and the most important perceived activities. Collaborative writing was expected to be actively implemented with the aid of technology such as Wikis and Google Docs. However, it has not been widely adopted yet because of low awareness of how to use those tools and how to facilitate it (Zhou, Simpson, & Domizi, 2012). In addition, students are unwilling to make changes or modifications of others' work (Britcliffe & Walker, 2007) and visibility of all the actions online may create discomfort among users (Lee, 2010). Although most current LMSs include the exam or quiz function, they are not used broadly due to concerns such as security and academic integrity without proctoring (Cluskey, Ehlen, & Raiborn, 2011). In addition, group online exams apparently involve much more concerns regarding operation and grading. Exams are usually associated with individual accountability and the group-focused version is still considered to be an oxymoron to the majority of students (Hodges, 2004).

> *While Korean students put more pedagogical value on peer review than UAE students, it seems that the latter prefers and trusts instructors' feedback more, a tendency that is quite prevalent in high power distance societies (Hofstede, 1986; Sayed, 2010). Liu and Carless (2006) reported that the majority of students in Hong Kong showed resistance to peer assessment. There were several reasons behind the phenomena, such as concern for reliability and belief that assessment is the sole responsibility of instructors. Considering that most online courses have more students enrolled than traditional courses, peer feedback can be a practical alternative in higher education to instructor's feedback if students are well trained to provide a quality critique on peer's work. From the pedagogical value, students' ability to evaluate outcomes can be a high cognitive learning objective and peer feedback*

allows students to take an active management role in their own learning (Liu & Carless, 2006). According to Boud (1995), peer feedback mirrors self-assessment and requires the articulation of what they know about a subject. To promote students' learning, peer feedback can be encouraged. Once students trust peers' capability and observe their feedback equivalent to instructors', peer feedback would be diffused even in a large power distance society.

UAE students also perceive getting more technical and social support than do students in Korea. This might explain the more positive attitude of UAE learners. UAE learners also seem to feel comfortable with being and functioning effectively online as well as having more generous expectations regarding communicating in this way, reflecting the general belief in the important potential of the Internet for formal and informal learning in the region (Vein, 2014). Korean students exhibit higher anxiety towards communication online and have higher expectations regarding the outcomes of these interactions. It can be explained by Koreans' unique Pali-pali (meaning quickly, quickly) culture that appears in all aspects of Korean culture and lifestyle, even in online communication (Lau, Kim, & Atkin, 2005). Since most current OCL is mediated by asynchronous technology, the time lag between questions and replies is inevitable. By using synchronous technology that enables many-to-many communication, such a concern over misleading communication and inefficiency that many Korean students showed, could be diminished.

IP analysis gives a concise picture of participants' experience by their perceived importance regarding each OCL activity. Korean students want practice exercise to be more frequently used, while UAE students expect group reflection to be implemented more often online. The students in both countries commonly valued understanding course content, presentation, and knowledge sharing, and experienced those activities frequently. They did not appreciate group exams and collaborative writing, which might be due to their limited experience of these activities and concerns over integrity issues of group exams (Cluskey, Ehlen, & Raiborn, 2011), and reluctance issues of revising others' writing (Britcliffe & Walker, 2007).

Since group discussion activity is, in fact, a basis of all the other collaborative activities, it is surprising that the students in both countries did not value its educational benefits and wanted to lower its frequency. This indicates that online group discussion was not filled with quality interaction, lacking rationale or evidence that support opinions (Ju, Choi, & Yoon.,2017; Kim & Lee, 2019). However, online discussion has been regarded as an effective vehicle for collaborative learning (Swan et al., 2006). Substantial research (Hawisher & Pemberton, 1997; Jiang & Ting, 2000) found that successful online collaborative discussion is directly related to its assessment. Undervalued group discussion might be grounded in that it is not properly assessed or appropriately designed and facilitated. In addition, without sufficient training of online discussion or intervention of instructors, and preparation for the discussion, online discussion is hard to bring to an expected outcome.

OCL is being actively adopted in the tertiary classrooms of Korea and UAE's campus-based universities regardless of region and culture. Different cultures bring different expectations about OCL and also some common concerns. Based on the understanding of students' culture, OCL with systemic design that considers barriers, valid and fair assessment of process as well as product, and appropriate support, will offer students with pedagogically sound quality learning experiences with better academic outcomes.

Limitations of Study

The difficulty in finding an equivalent number of participants caused a limitation of the study. IP analysis of this study was based on the perceptions of students that might be far from the pedagogical values of the activities according to instructional objectives and needs. The results should be interpreted carefully in the context of campus-based university.

Suggestions or Future Research

The results suggest a huge variation in attitude across cultures, implying the need for supporting this evidence-based theory grounded instructional approach based on a deeper understanding of the issues through qualitative research with both students and professors. Further research is needed to practically investigate the role of language choice in OCL settings. This is particularly important, as we increasingly communicate across cultures and languages. In addition, with the forced shift to fully online learning in all the campus-based universities due to the recent pandemic situation, the landscape of OCL would be dramatically different from the past. The study of the OCL in diverse countries needs to be implemented in the near future.

Authors' Note: This work was supported by the National Research Foundation of Korea Grant funded by the Korean Government(NRF-2014S1A2A1A01027507)

BIODATA and CONTACT ADDRESSES of AUTHORS

Dr. Jieun LEE is an associate professor at the Department of Education at Chosun University in South Korea. She earned her Ph.D. in Instructional Systems Technology from Indiana University Bloomington, M.Ed. in Educational Technology from Seoul National University, and B.A. in Sociology from Yonsei University. She worked as a marketing specialist at IBM Korea. Her research interests are instructional design for student-centered education, online collaborative learning, instructional consulting to improve student engagement, and teaching expertise development in higher education. She investigated enablers and barriers of instructional design factors for transfer in the workplace as her doctoral dissertation and conducted social network analysis to examine relationships and interactions among participants in online learning environments. She teaches distance education, instructional systems design, educational technology for pre-service teachers.

Jieun LEE
Department of Education, School of Education
Address: Chosun University, 61452, Gwangju, South Korea
Phone: +821073781942
E-mail: jieelee@chosun.ac.kr

Dr. Gihan OSMAN is assistant professor at the Graduate School of Education & the Center for Learning and Teaching at the American University in Cairo. Osman's Research interests focus on the role of online learning as a catalyst for educational change and reform in Egypt & the MENA region. She teaches courses on research methods, assessment, digital literacies, innovative pedagogies, social entrepreneurship, and emerging technologies at the Graduate School of Education Osman has her Ph.D. and MSc in Instructional Systems Technology from Indiana University Bloomington, an M.A. in TEFL from the American University in Cairo, and a BA in English from Alexandria University.

Gihan OSMAN
Department of International and Comparative Education
Address: Graduate School of Education,
American University in Cairo, P.O. Box 74, Cairo, Egypt
Phone: +201271112968
E-mail: gosman@aucegypt.edu

REFERENCES

Adam, L. (2003). Information and communication technologies in higher education in Africa: Initiatives and challenges. *Journal of Higher Education in Africa, 1*(1). 195–211. Retrieved from https://www.jstor.org/stable/24486119

Adams, M., Rogriquez, S., Zimmer, K. (2019). Studying cultural relevance in online courses: a thematic inquiry. Online Learning, 22(4). http://dx.doi.org/10.24059/olj.v22i4.1262.

Abdul Khalek, J. (2014). *High speed Internet and the values of the Arab Spring* (The World Bank). Retrieved from https://blogs.worldbank.org/arabvoices/high-speed-internet-and-values-arab-spring

Al-Adwan, A., & Smedley, J. (2012). Implementing e-learning in the Jordanian higher education system: Factors affecting impact. *International Journal of Education and Development using Information and Communication Technology, 8*(1), 121–135. Retrieved from https://www.learntechlib.org/p/188017/

Alaleeli, S., & Alnajjar, A. (2020). The Arab digital generation's engagement with technology: The case of high school students in the UAE. *Journal of Technology and Science Education, 10*(1), 159-178. https://doi.org/10.3926/jotse.756

Al-Fadhli, S. (2008). Students' perceptions of E-learning in Arab society: Kuwait university as a case study. *E-Learning and Digital Media*, *5*(4), 418-428. doi:10.2304/elea.2008.5.4.418

Al-Harthi, A. S. (2010). Learner self-regulation in distance education: A cross-cultural study. *The American Journal of Distance Education*, *24*(3), 135-150. doi:10.1080/08923647.2010.498232

Angeli, C., Valanides, N., & Bonk, C. J. (2003). Communication in a web-based conferencing system: The quality of computer-mediated interactions. *British Journal of Educational Technology*, *34*(1), 31-43. doi:10.1111/1467-8535.00302

Bates, A.W. (2015). *Teaching in a digital age: Guidelines for designing teaching and learning for a digital age.* Vancouver, BC: University of British Columbia.

Berge, Z., & Collins, M. (1993). Computer conferencing and online education. *The Arachnet Electronic Journal on Virtual Culture*, *1*(3), 1-21. Retrieved from http://serials.infomotions.com/aejvc/aejvc-v1n03-berge-computer.txt

Boud, D. (1995). Assessment and learning: contradictory or complementary. *Assessment for learning in higher education*, 35-48.

Bozkurt, A., & Akbulut, Y. (2019). Dropout patterns and cultural context in online networked learning spaces. *Open Praxis, 11*(1), 41-54.

Brindley, J. E., Walti, C. & Blaschke, L. M. (2009). Creating effective collaborative learning groups in an online environment. *International Review of Research in Open and Distance Learning, 10*(3). doi:10.19173/irrodl.v10i3.675

Britcliffe, W., & Walker, R. (2007). Making wikis work: How do we create the conditions for effective collaborative learning? *ALT-C 2007*, *9*, 91-92.

Chang, T. T., & Lim, J. (2002). Cross-cultural communication and social presence in asynchronous learning processes. *E-Service*, *1*(3), 83-105. doi:10.1353/esj.2002.0009

Child, S., & Shaw, S. (2016). Collaboration in the 21st century: Implications for assessment. *Research Matters, 22* (Summer), 17-22. Retrieved from https://www.cambridgeassessment.org.uk/Images/374626-collaboration-in-the-21st-century-implications-for-assessment.pdf

Choi, S., Khamalah, J. N., Kim, M. H., & Burg, J. E. (2014). Internationalization of a regional campus: Faculty perspectives. *International Education, 43*(2), 7-24. Retrieved from https://search.proquest.com/openview/376ca5a576fd4b30f663fc891d065b5f

Cluskey Jr, G. R., Ehlen, C. R., & Raiborn, M. H. (2011). Thwarting online exam cheating without proctor supervision. *Journal of Academic and Business Ethics, 4*, 1-7.

Culture Compass™ (2019). Retrieved from https://hi.hofstede-insights.com/the-culture-compass

Daft, R. L., & Lengel, R. H. (1986). Organizational information requirements, media richness and structural design. *Management Science, 32*(5): 554–571. doi:10.1287/mnsc.32.5.554

Economides, A. A. (2008). Culture-aware collaborative learning. *Multicultural Education & Technology Journal*.

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. doi:10.1007/s11423-016-9508-8

Erstad, O., Gilje, Ø., & de Lange, T. (2007). Re-mixing multimodal resources: Multiliteracies and digital production in Norwegian media education. *Learning, Media and Technology, 32*(2), 183-198. doi:10.1080/17439880701343394

Fraenkle, J. R., & Wallen, N. E. (2009). *How to design and evaluate research in education*. New York: McGrow-Hill.

Gunawardena, C. N. (1998). Designing collaborative learning environments mediated by computer conferencing: Issues and challenges in the Asian socio-cultural context. *Indian Journal of Open Learning*, *7*(1), 101-19. Retrieved from https://www.learntechlib.org/p/86080/.

Hall, E.T. (1976), *Beyond culture.* Garden City, NY: Doubleday & Company.

Hall, K. (2011). Teaching composition and rhetoric to Arab EFL learners. In C. Gitsaki (Ed.), *Teaching and learning in the Arab world* (pp. 421–440). New York: Peter Lang.

Hannon, J., & D'Netto, B. (2007). Cultural diversity online: Student engagement with learning technologies. *International Journal of Educational Management, 21*(5), 418-432. doi:10.1108/09513540710760192

Hawisher, G. E., & Pemberton, M. A. (1997). Writing across the curriculum encounters asynchronous learning networks or WAC meets up with ALN. *Journal of Asynchronous Learning Networks*, *1*(1), 52-72. doi:10.24059/olj.v1i1.1940

Havard, B., Du, J., & Xu, J. (2008). Online collaborative learning and communication media. *Journal of interactive learning research*, *19*(1), 37-50. Retrieved from

https://www.learntechlib.org/primary/p/22804/.

Henri, F., & Rigault, C. R. (1996). Collaborative distance learning and computer conferencing. In *Advanced educational technology: Research issues and future potential*. Springer, Berlin, Heidelberg. doi:10.1007/978-3-642-60968-8_3

Hilliard, J., Kear, K., Donelan, H., & Heaney, C. (2020). Students' experiences of anxiety in an assessed, online, collaborative project. *Computers & Education*, *143*, 103675.

Hishina, M., Okada, R., & Suzuki, K. (2005). Group formation for web-based collaborative learning with personality information. *International Journal on e-learning*, *4*(3), 351-364.

Hodges, L. C. (2004). Group exams in science courses. *New Directions for Teaching and Learning, 100*, 89-93. doi:10.1002/tl.175

Hofstede, G. (1986). Cultural differences in teaching and learning. International Journal of intercultural relations, 10(3), 301-320. http://dx.doi.org/10.1016/0147-1767(86)90015-5

Hofstede Insights (2018). Country comparison. Retrieved from https://www.hofstede-insights.com/country-comparison/

Human Resource Development of Korea (2019). International cooperation. Retrieved from http://www.hrdkorea.kr/3/5/2/1

Institute of International Education (2018). International students by academic level and place of origin, 2016.2017-2017/2018. *Open Doors Reports on International Educational Exchange.* Retrieved from http://iie.org/opendoors

Jiang, M., & Ting, E. (2000). A study of factors influencing students' perceived learning in a web-based course environment. *International Journal of Educational Telecommunications*, *6*(4), 317-338. Retrieved from https://www.learntechlib.org/primary/p/8482/.

Johnson, D. W., & R. Johnson. (1986). Computer-assisted cooperative learning. *Educational Technology, 26*(1), 12–18. Retrieved from https://www.jstor.org/stable/44424559

Ju, H., Choi, I., & Yoon, B. Y. (2017). Do medical students generate sound arguments during small group discussions in problem-based learning? An analysis of preclinical medical students' argumentation according to a framework of hypothetic-deductive reasoning. *Korean journal of medical education, 29(2)*, 101-109. doi:10.3946/kjme.2017.57

Kim, K. J., & Bonk, C. J. (2002). Cross-cultural comparisons of online collaboration. *Journal of Computer-Mediated Communication*, *8*(1), JCMC814. doi:10.1111/j.1083-6101.2002.tb00163.x

Kim, M., & Lee, J. (2019). Analysis of interaction in cooperative learning by academic achievement in a middle school English class. *Journal of Educational Technology, 35*(1), 1-35.

Kirschner, F., Paas, F., & Kirschner, P. A. (2009). A cognitive load approach to collaborative learning: United brains for complex tasks. *Educational psychology review*, *21*(1), 31-42.

Lakkala, M., Toom, A., Ilomäki, L., & Muukkonen, H. (2015). Re-designing university courses to support collaborative knowledge creation practices. *Australasian Journal of Educational Technology, 31*(5), 521-536. doi:10.14742/ajet.2526

Lau, T. Y., Kim, S. W., & Atkin, D. (2005). An examination of factors contributing to South Korea's global leadership in broadband adoption. *Telematics and Informatics*, *22*(4), 349-359.

Lee, L. (2010). Exploring wiki-mediated collaborative writing: A case study in an elementary Spanish course. *Calico Journal*, *27*(2), 260-276. doi:10.11139/cj.27.2.260-276

Lee, S. (2004). An analysis of interaction patterns in face-to-face and online synchronous/ asynchronous learning environment. *Korean Journal of Educational Technology, 20*(1), 63-88. doi:10.17232/KSET.20.1.63

Lee, S. L., Kim, J., Golden, K. J., Kim, J. H., & Park, M. S. A. (2016). A cross-cultural examination of SNS usage intensity and managing interpersonal relationships online: The role of culture and the autonomous-related self-construal. *Frontiers in psychology*, *7*, 376.

Liu, N. F., & Carless, D. (2006). Peer feedback: the learning element of peer assessment. *Teaching in Higher Education*, *11*(3), 279-290.

Macdonald, J. (2003). Assessing online collaborative learning: process and product. *Computers & Education, 40*(4), 377-391. doi:10.1016/S0360-1315(02)00168-9

Madsen, S. R., & Cook, B. J. (2010). Transformative learning: UAE, women, and higher education. *Journal of Global Responsibility*.

Magjuka, R. J., Shi, M., & Bonk, C. J. (2005). Critical design and administrative issues in online education. *Online Journal of Distance Learning Administration*, *8*(4), 1. Retrieved from https://www.westga.edu/~distance/ojdla/winter84/magjuka84.htm

Martin, J. P. (2018). Skills for the 21st Century: Findings and Policy Lessons from the OECD Survey of Adult Skills

Moore, M. G., & Kearsley, G. (2011). *Distance education: A systems view of online learning*. Wadsworth: Cengage Learning.

Muukkonen, H., & Lakkala, M. (2009). Exploring meta skills of knowledge-creating inquiry in higher education. *International Journal of Computer-Supported Collaborative Learning, 4*(2), 187–211. doi:10.1007/s11412-009-9063-y

Oh, J. C., & Yoon, S. J. (2014). Predicting the use of online information services based on a modified UTAUT model. *Behaviour & Information Technology, 33*(7), 716-729. doi:10.1080/0144929X.2013.872187

Oliveira, I., Tinoca, L., & Pereira, A. (2011). Online group work patterns: How to promote a successful collaboration. *Computers & Education*, *57*(1), 1348-1357. doi:10.1016/j.compedu.2011.01.017

Osman, G. (2018). Formal e-learning in Arab countries: Challenges and opportunities. In M. Spector & B. Lockee &, M. Childress (Eds.), *Learning, Design & Technology* (pp 1-26). New York: Springer.

Oye, N. D., Iahad, N. A., & Rahim, N. A. (2014). The history of UTAUT model and its impact on ICT acceptance and usage by academicians. *Education and Information Technologies, 19*(1), 251-270. doi:10.1007/s10639-012-9189-9

Palloff, R. M., & Pratt, K. (1999). *Building learning communities in cyberspace* (Vol. 12). San Francisco: Jossey-Bass.

Ramiah, C. K. (2014). Emerging trends in electronic learning for library & information science professionals. In H. K. Kaul, A. Naik & S. Kaul (Eds.), *Knowledge, Library and Information Networking* (pp. 328-350). New Delhi: Developing Network.

Sawir, E. (2005). Language difficulties of international students in Australia: The effects of prior learning experience. *International Education Journal*, *6*(5), 567-580.

Sayed, O. H. (2010). Developing business management students' persuasive writing through blog-based peer-feedback. *English Language Teaching*, *3*(3), 54-66. doi:10.5539/elt.v3n3p54

Selinger, M. (2004). Cultural and pedagogical implications of a global e-learning programme. *Cambridge Journal of Education*, *34*(2), 223-239. doi:10.1080/0305764042000183106

Slavin, R. E. (1991). Synthesis of research of cooperative learning. *Educational leadership*, *48*(5), 71-82. Retrieved from https://eric.ed.gov/?id=EJ247023

Swan, K., Shen, J., & Hiltz, S. R. (2006). Assessment and collaboration in online learning. *Journal of Asynchronous Learning Networks*, *10*(1), 45-62. doi:10.24059/olj.v10i1.1770

Thorpe, M. (2002). Rethinking learner support: The challenge of collaborative online learning. *Open learning*, *17*(2), 105-119. doi: 10.1080/02680510220146887a

Trumbull, E., Rothstein-Fisch, C., & Greenfield, P. M. (2000). *Bridging cultures in our schools: New approaches that work*. San Francisco, CA: WestEd.

Tu, C- H. (2000). Critical examination of factors affecting interaction on CMC. *Journal of Network and Computer Applications 23*, 39-58. doi:10.1006/jnca.1999.0100

Uzuner, S. (2009). Questions of culture in distance learning: A research review. *The International Review of Research in Open and Distributed Learning*, *10*(3). doi:10.19173/irrodl.v10i3.690

Vein, C. (2014). Why increasing digital Arabic content is key for global development? Retrieved from https://www.theguardian.com/media-network/media-network-blog/2014/apr/28/global-development-digital-arabic-content

Wang, M. (2007). Designing online courses that effectively engage learners from diverse cultural backgrounds. *British Journal of Educational Technology*, *38*(2), 294-311. doi:10.1111/j.1467-8535.2006.00626.x

Wong, J. K. (2004) Are the learning styles of Asian internationals culturally or contextually based? *International Education Journal, 4*(4), 154-166.

World Bank. (2008). The road not travelled: Education reform in the Middle East and North Africa. Washington, DC: World Bank.

Young, B. J. (2000). Gender difference in student attitudes toward computers. *Journal of Research on Computing in Education, 33*(2), 204-217. doi:10.1080/08886504.2000.10782310

Zhou, W., Simpson, E., & Domizi, D. P. (2012). Google Docs in an out-of-class collaborative writing activity. *International Journal of Teaching and Learning in Higher Education*, *24*(3), 359-375.

Zhu, C. (2012). Student satisfaction, performance, and knowledge construction in online collaborative learning. *Journal of Educational Technology & Society*, *15*(1), 127. Retrieved from https://www.jstor.org/stable/jeductechsoci.15.1.127

Zhu, C., & Engels, N. (2014). Organizational culture and instructional innovations in higher education: Perceptions and reactions of teachers and students. *Educational Management Administration & Leadership*, *42*(1), 136-158. doi: 10.1177/1741143213499253

A MODEL PROPOSAL ON THE DETERMINATION OF STUDENT ATTENDANCE IN DISTANCE EDUCATION WITH FACE RECOGNITION TECHNOLOGY

Dr. Durmus OZDEMIR
ORCID: 0000-0002-9543-4076
Department of Computer Engineering
Kutahya Dumlupinar University
Kutahya, TURKEY

Mehmet Emin UGUR
ORCID: 0000-0003-2427-3794
Deniz Yildizlari Vocational and Technical Anatolian High School
Ministry of National Education
Kocaeli, TURKEY

Received: 03/03/2020 **Accepted:** 21/05/2020

ABSTRACT

The aim of this study is to present a model proposal on determining the student participation rate in synchronous courses given in Learning Management Systems (LMS). Especially in situations where equal opportunities cannot be provided or opportunities are limited, distance education provides benefits for learning anytime and anywhere (ubiquitous learning) with the support of educational technologies. When the literature is examined, thanks to distance education; It is seen that it offers a very advantageous teaching environment in terms of location, time, convenience in accessing the resources needed and cost-benefit. However, when the literature is analyzed, it is found that there is a problem in determining the participation levels and rates of students in the Learning Management Systems used in distance education. Students access the activity or course in LMS using text-based user information and passwords. Unfortunately, it is not possible to determine with the current LMS whether the participant is the real responsible person or he/she is actively/synchronously following the course. In this context, a design model has been presented using face recognition algorithms to determine attendance in distance education, to ensure more active participation and to increase success indirectly. In the proposed model, tests were made using special filters for image processing, and in cases where the number of samples was increased, more than 80% accuracy was provided. The proposed design model was developed in Visual Studio.Net platform and coded on C# programming language. SQL server is used as database management system and EmguCV library is used for the image processing stages.

Keywords: Face recognition, determining attendance, user identification, course participation, distance education.

INTRODUCTION

Distance Education is a method of education in which students, teachers and teaching materials in different places are brought together through instructional technologies (Bozkurt, et al., 2015; Gunawardena & McIsaac, 2013). Inequality of opportunities in educational activities is prevented with distance education. Many individuals from different socio-cultural backgrounds can access interactive content in environments such as LMS (Learning Management Systems) and MOOC (Massive Open Online Courses) in distance education (Liyanagunawardena, Adams, & Williams, 2013; Shin & Kang, 2015). Distance education is day by day with development of online course platforms, high-speed internet, user friendly eLearning tools and freely available massive open online courses (MOOCs) (Bozkurt et al., 2015). Not only there is an variation

of online courses but also many learning management systems (LMS) exist that manage and deliver the educational content by various universities and schools. In cases where attendance is not possible due to temporal and spatial reasons, or where opportunities are limited, distance learning is provided ubiquities learning (at any time and anywhere) using instructional technologies (Norman, Nordin, Din, Ally, & Dogan, 2015). Planned follow-up of content in distance education environments and the engaging and fluent regulation of the learning process without any restrictions is important for the successful completion of the learning process (Alhabeeb & Rowley, 2018; Battalio, 2009). The educational materials used in distance education activities should be designed to attract the attention of the students, to provide interaction, have a time period and to be motivated (Chao, Saj, & Hamilton, 2010; Hsu & Ching, 2013; Lockwood, 2018). In the literature, there are studies showing that student participation rate is another factor affecting success in distance education (Dalkiran, 2018; Grabe & Christopherson, 2008; Rumble, 2019). There are also studies showing that participation in the course increases the success in distance education systems as in formal education (Arnab, 2018; Crisp, 2018; Lester, 2018).

Therefore, the instructors can give additional points to the students with high course participation rate. However, in Learning Management Systems used in distance education, it was determined which participation rates of the participants were wrong or misleading. Participants provide access to the event or course by entering user information and passwords in text-based validation systems in LMS or MOOCs. If the user name and password are correct, the system will process the time and knowledge of the student (Kamarga, 2018). Unfortunately, the current LMSs and MOOCs cannot be determined whether the participant is a real person to be trained or whether the student is actively following the course. In this study, it is aimed to determine the attendance of the students accurately and clearly by using image processing methods for LMSs and MOOCs used in distance education. In addition, it will be possible to determine the differences in teachers 'presentation methods and the students' course participation rate changes.

Conceptual Framework and Purpose of the Study

In existing LMSs used in distance education, students' attendance cannot be controlled in real time. It was observed that the individuals who participated in the course / activities in the LMS could not be identified with the use of text-based user name and password whether they were real persons, and some of them were not interested in the course content offered after logging in and continued their daily work (Newberry, 2013; Ozgol, Sarikaya, & Ozturk, 2017; Vanslambrouck, Zhu, Lombaerts, Philipsen, & Tondeur, 2018).

It has been stated in the studies conducted between the years of 2004 and 2018 that the student's active participation rate increases the student's academic success in distance education (DeTure, 2004; Hawkins, Frander, Young, & Deal, 2017; Newberry, 2013; Shelton, Hung, & Lowenthal, 2017; Vanslambrouck et al., 2018; Wilson & Pretorius, 2017). For this reason, it is very important to develop identification procedures and apply different methods in LMS and MOOCs used in distance education. This will also prevent unauthorized persons from using the LMS or MOOCs. In this way, the validity and reliability of the exams will be increased with the integration of the our proposed model into the LMS (Flores, Walters, & Kiekel, 2018; Ortagus, 2017).

In the 2016-2017 academic year, 871 students studying at four different secondary schools in Ankara/Turkey investigated the effect of students' participation on their academic achievement (Celik, Toraman, & Celik, 2018). As a result of the research, it was found that there was a positive and high level relationship between cognitive participation and academic achievement. The results of the research showing this relationship are presented in Table 1.

Table 1. Research Results on the Relationship Between Academic Achievement and Class Participation (Celik et al., 2018)

Variables	r	p
Academic Achievement*Sensual Participation	0,990	0,000
Academic Achievement*Behavioral/Class Participation	0,563	0,008
Academic Achievement*Cognitive Participation	0,993	0,000
Academic Achievement*Non-attendance	-0,329	0,012

When the studies in the literature were examined, a positive correlation was found between general academic achievement and class participation (Battalio, 2009; Howell, Saba, Lindsay, & Williams, 2004; Knight, Hakel, & Gromko, 2008; Vanslambrouck et al., 2018; Yukselturk & Bulut, 2007). Academic success increases as participation increases (Han & Shin, 2016). Negative correlation was also found between non-attendance and academic achievement. Thus, it is concluded that not attending the course may cause failure.

LMS consist of course presentation and management, interaction, communication, content development and collaboration. LMS such as Open Source Moodle, ATutor, Sakai and Commercially Available Blackboard, Sum Total, Success-Factors have not included system that can detect course attendance with face recognition technology (Anshari, Alas, Hamid, & Smith, 2016; Krouska, Troussas, & Virvou, 2017). A Massive Open Online Course (MOOC) is a free online course that supports learning in a variety of different subjects and is open to anyone with access to a computer and the internet (Canbek & Hargis, 2015). The MOOC actualize a networked environment designed within the context of distance e-learning and potential engagement. In this connection, MOOCs not only been providing equality in educational and instructional opportunities, but also been meeting the demands of higher education in a wider scale like Learning Management Systems. It was thought that apparent advantage of broader access to potentially a MOOC can help revolutionize higher education pedagogy. MOOCs contain items that support the following terms in the literature. Ubiquitous (anytime, anywhere) learning attributes, motivation, direct and timely applications and endless opportunities to repeat conceptual lessons and assessments until mastery is accomplished (Firat, Kilinc, & Yuzer, 2018). MOOCs aim to connect learners from across the globe with educators and with each other but also it has not included the face detection system in attendance or course paticipation system (Al-Rahmi, Aldraiweesh, Yahaya, Kamin, & Zeki, 2019; Chaudhari & Thakkar, 2019; Lei, Zhou, & Hu, 2019; Salzmann, Piguet, & Gillet, 2019).

When the existing distance education systems are examined, it is seen that users can login to the system by using unique keys such as user name, e-mail, phone number, ID number and the passwords they have previously determined (Walker, Lindner, Murphrey, & Dooley, 2016; Zheng, Wang, Doll, Deng, & Williams, 2018).

In cases where attendance is controlled, individuals may submit their information to the fake participants and request to attend the course in their own place (Paiva Guimarães et al., 2017; Gräther et al., 2018). Another problem is, when the participant logging to the LMS, they open the course screen and continue their daily work. In the currently used LMS systems, the course attendance process is depending on either live class attendance time or video monitoring. Therefore, although students do not participate actively, but the current LMSs are reported to the student that he/she attended the course.

Due to the fact that the student's participation in the course cannot be determined with full accuracy, only the midterm exams are allowed in distance education programmes in higher education institutions (Bilgic & Tuzun, 2015; Broadbent & Poon, 2015). This situation, which is susceptible to abuse, so it needs to be corrected using biometric data and the real participant identified.

In this study, it is aimed to develop a prototype design model for LMS and MOOCs used in distance education and to determine the students' participation to the course by using image processing methods. If the designed system is applied in LMS or MOOCs, the participation rates of the students will be determined. It will also be possible to determine which of the teacher's presentation methods are more motivating or

increase participation. However, a step will be taken to increase the validity and reliability of the exams which are applied in LMSs and MOOCs. Therefore, this can be a new idea for existing LMSs and MOOCs because in the current systems, the attendance status is evaluated only with the information within the log records. However, in this proposed model of our study, the participation of the user in the course with image processing techniques will be determined.

MATERIALS AND METHODS

In this section, the software technologies used in the proposed prototype and the method followed in the design process are presented.

OpenCV Library

OpenCV (Open Source Computer Vision) is used as image processing library/framwork. OpenCV is released under a BSD license and is therefore free for both academic and commercial use. It can be developed with C ++, Python and Java programming languages and supports Windows, Linux, Mac OS, iOS and Android operating systems. Therefore, it is thought that the proposed prototype system can be integrated into LMSs developed on different platforms. OpenCV is efficient for computing efficiency and for use in real-time applications (OpenCV Library, 2018).

Assumptions and Limitations

The application presented in this study is presented as a prototype model. It is assumed that the server systems, technical infrastructure and bandwidth required for integration into multi-user systems. In the proposed model, in accordance with the personal data security laws, it is necessary to allow the use of the images of individuals at the beginning of the program and to obtain their consent. For this reason, in the prototype model prepared in the research, approval was obtained from the user at the entrance of the program.

The limitations of facial recognition systems can be listed as follows (Saxena, Sharma, & Sharma, 2016). Physical changes: facial expression change, aging, makeup, glasses, beard, hairstyle, mustache. Camera angle changes: The scale changes on the face and plane rotation of the camera, as well as its rotation in depthly. Imaging changes: Lighting variation or camera variations. No existing system or study in the literature can claim that these problems can be overcome 100% fully.

Development Steps and Method of Proposed Prototype Model

In this section, the method which is designed and applied in the stages of the proposed system is explained. The system consists of 5 parts. The basic functions and process steps of the proposed model are presented in Figure 1. The application interface was developed using the C # programming language on the Microsoft Visual Studio .Net platform. OpenCV framework and EmguCV libraries were used for image processing. SQL Server 2017 software is used for data storage and retrieval. When the literature is examined, eigenfaces recognition algorithm can be used with gaussian, median and laplace filters (Lwin, Khaing, & Tun, 2016). As the results obtained in our study filters were compared, and the gauss filter was used together with the eigenfaces recognition technique because it provides the best performance.

In this study, the proposed system is designed to be modular and developable. In this way, the new modules that will be added to the application later can be easily integrated into the system. The workflow for the proposed system design is summarized in Figure-1

1. Saving User Information to the Database

- The face is detected on the camera,
- Fields are checked,
- User information is saved to the database, face file directory, and face tag text file.

2. Face Detection and Recognition at Login to the System

- Registered trained faces are added to the face list
- Face is detected by the HaarCascade classifier procedure,
- The detected face is checked in the list of trained faces,
- "The value returned from the "EigenObjectRecognizer" class is the label of the trained face and If the ID number is the same, verification of the participant will be successful.

3. Choosing Course/Training Content

- The courses and their contents in the LMS are listed in this field
- Access and usage records of the participant are displayed and transition to the course/training environment is provided by selecting process.

4. Determination of Classroom Participation Time with WebCam

- As long as the face tag detected on the screen and the ID number at the entrance match, the software detects that attendance and also the attendance graphic is drawn.

5. Saving Session Information to the Database and Reporting

- The participant clicks on "End Session" when the training is completed,
- The start and end times of the session and the active participation time and rate determined by the face are recorded in the database.

Figure 1. Workflow of the proposed system design

Also the architecture of the proposed system is presented in Figure 2. While developing the software, it was given importance to be user-friendly, fast and secure.

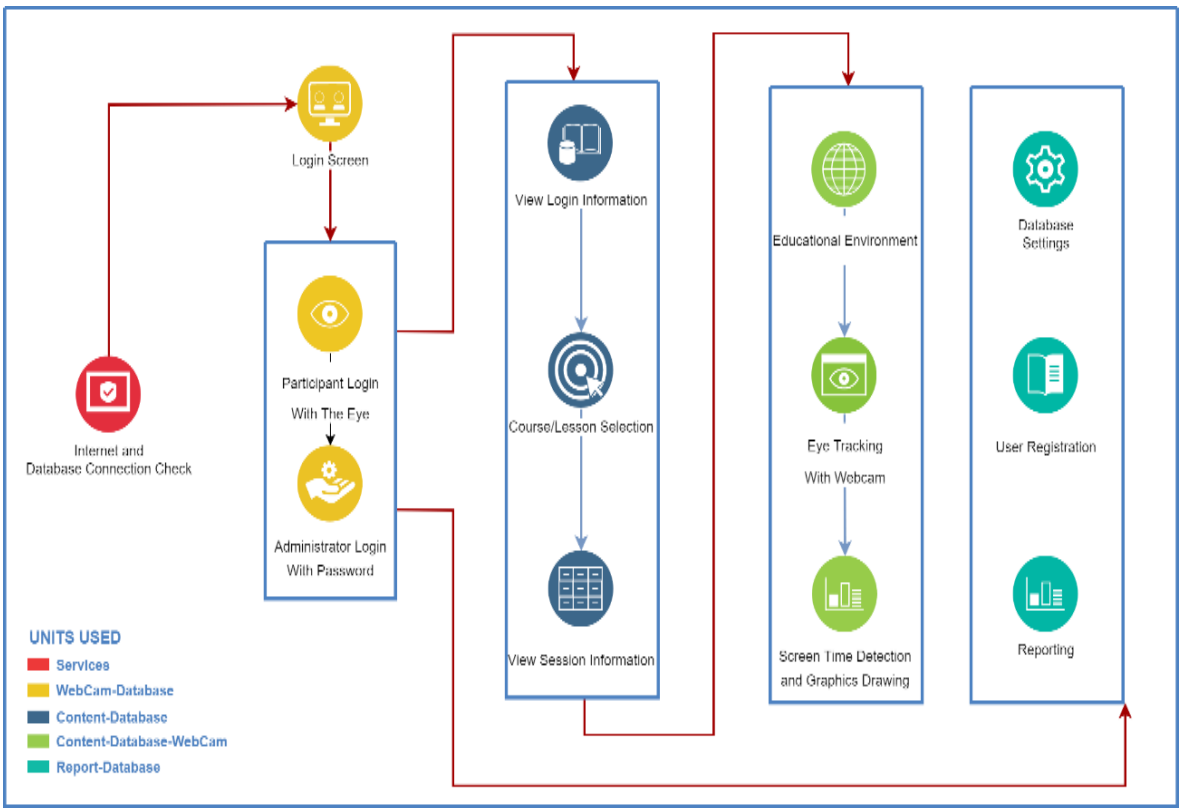


Figure 2. Software architecture of the proposed system

Login Screen

On the login screen, both administrator login and user login are included. In this interface, the user, who has the authority to administer, will be able to access the screens to add new participants to the system and make general reporting.

The checkbox and the "Login" button are activated / deactivated in order for the participant to log in to the system and allow the use of their own camera by the system. When the face information of the participant identified and added to the database matches with the ID number, the application switches to the login screen.

Technical Detail

Timer "timer2" is triggered when the ID number is entered and the "Login" button is clicked. This timer captures snapshots using the "Capture" class in the EmguCV library at intervals of 0.1 seconds. These captured frames are converted to gray color images with the "Convert" method. Then the "Haar Cascade" classifier of the OpenCv library identifies the faces in the images. The "EigenObjectRecognizer" class is used to gather information about the detected face or search the database.

Images trained to search for image matching are called from the relevant folder, and the information of the corresponding tags to the images is called from the relevant text file.

Images and tags are sent to the "EigenObjectRecognizer" class and the result is returned with the "noun" tag. If this "name information" is equal to the information in the entry, the system is logged on. User and administrator sample login screenshots are presented in Figure 3.

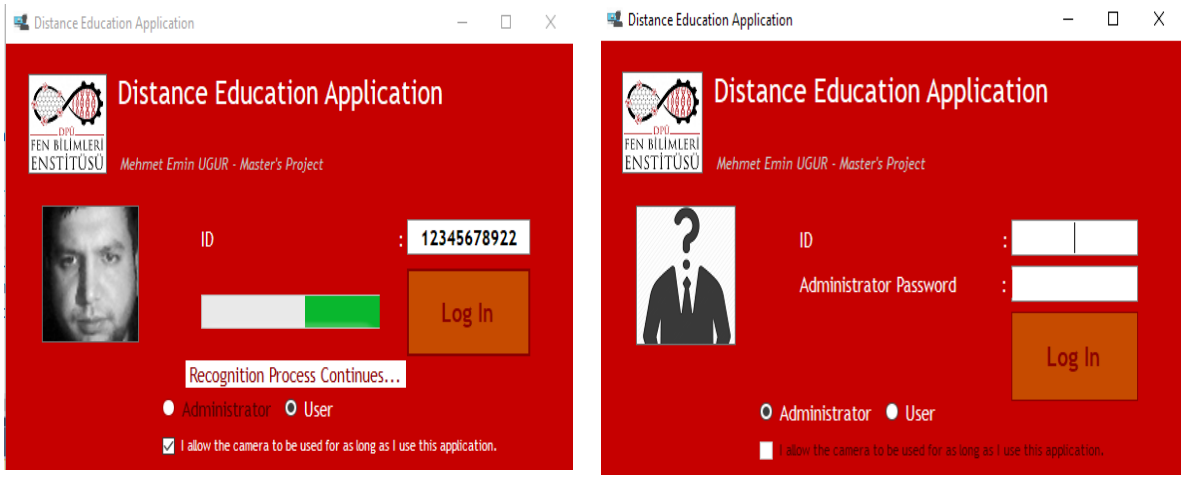


Figure 3. Application login screens for User and Administrator

Login Screen

This screen displays the information of the user who has entered the software. The ID number, name, surname, date of birth, place of birth, e-mail, telephone and authority levels are listed in the user's database. In this way, the user makes sure that he/she enters the system with the correct information. The screenshot of the login screen is presented in Figure 4.

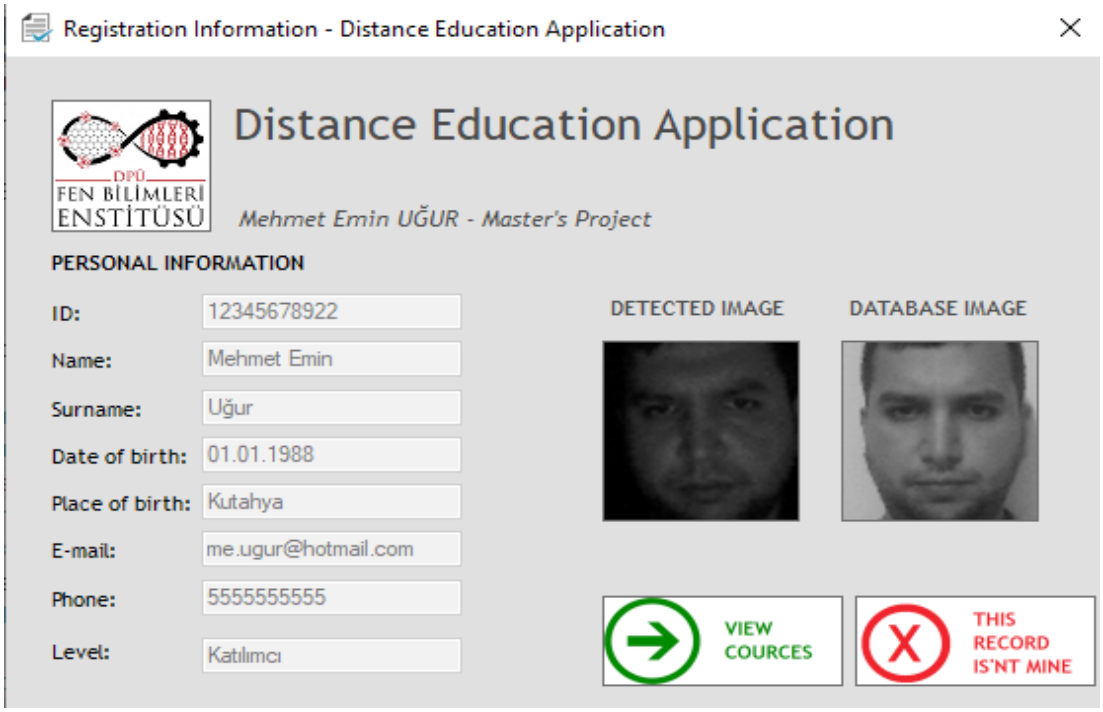


Figure 4. Login screen

Course / Topic Selection Screen

The courses that the participant can take in the Course / Topic Selection screen are grouped according to the courses. Here, when the relevant course and topic is selected, previous session information is displayed. Depending on the individual's choice, previous session information is pulled from the "session" table with query commands and listed in "datagridview". The course / topic selection screen screenshot is presented in Figure 5.

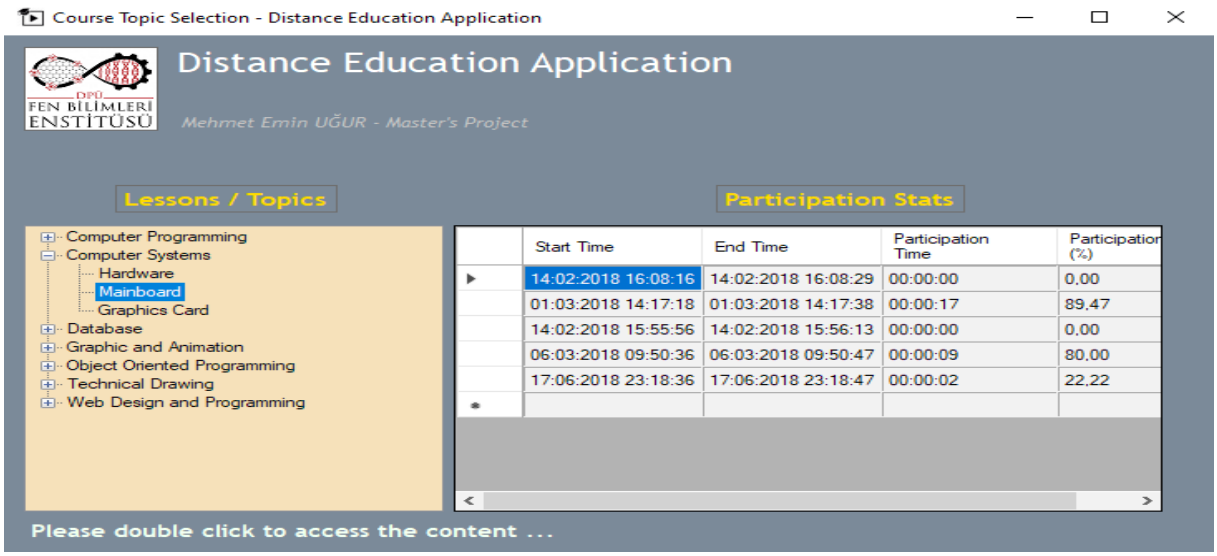


Figure 5. Course / Topic Selection Screen

Course Activity Screen

This screen shows the distance education course activity in which the participant's face detection is made and the participation rate is shown simultaneously with a graphic and also registered in the database. The course

title, video and content reflected on the screen are manageable and adding, deleting and editing operations can be performed by the user. The time of the user to watch / look at the lesson is calculated on this screen and reflected on the graph instantly. While ending the session, the calculated time is added to the database. The training screen image is presented in Figure 6.

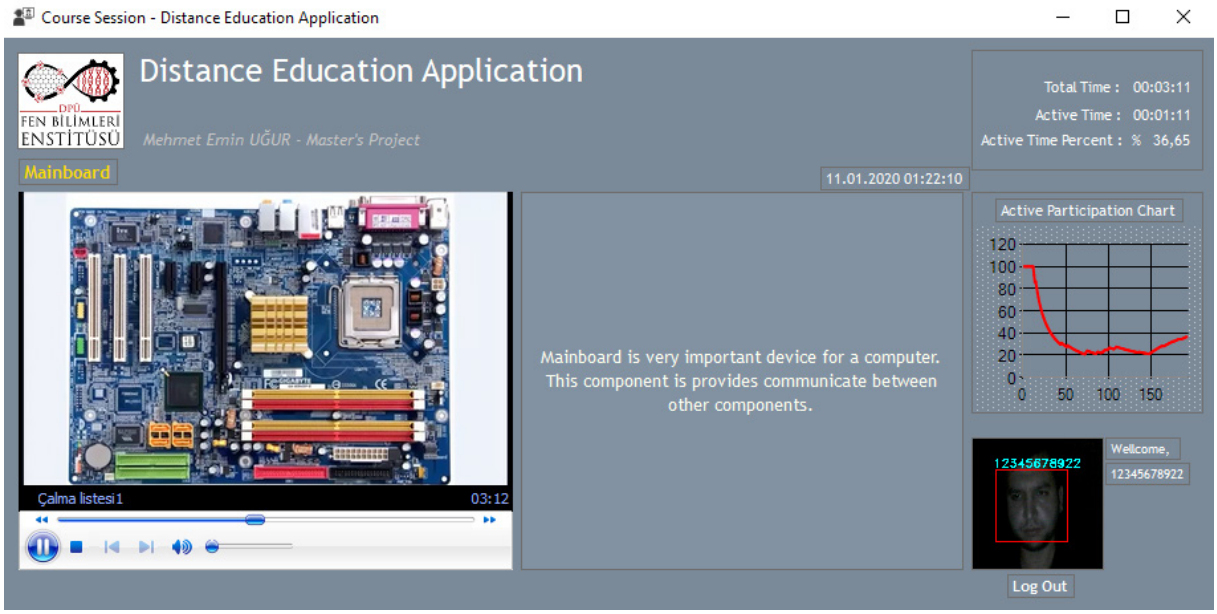


Figure 6. Course Activity Screen

WebCam should be fixed on the screen in order to detect the face in a healthy way. In addition, in order for the system to work properly, WebCam should not be exposed to light directly, but the light should fall on the face of the user. In this form, it captures a snapshot using the "Capture" class in the EmguCV library at intervals of 0.1 seconds. These captured frames are converted to gray color images with the "Convert" method. Immediately afterwards, the "Haar Cascade" classifier of the OpenCv library identifies the faces in the images. The "EigenObjectRecognizer" class is used to gather information about the detected face or search the database.

The snapshot is compared with the ID number and tag of the relevant user in the database and the duration of participation is stored in a variable. The instant participation graph is renewed by calculating the participation rate every second and adding it to the graph. By clicking the "End Session" button on the form; ID number, total time, start and end time, and the current participation rate is recorded in to the database using the created objects. The necessary conditions for correct face recognition are presented in Figure 7.

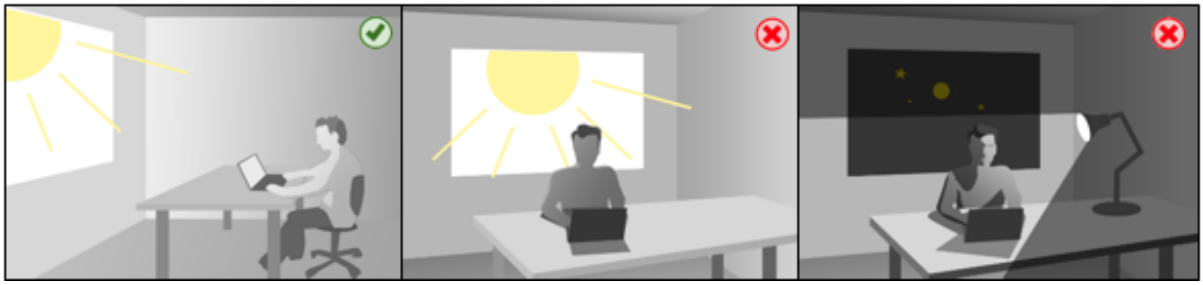
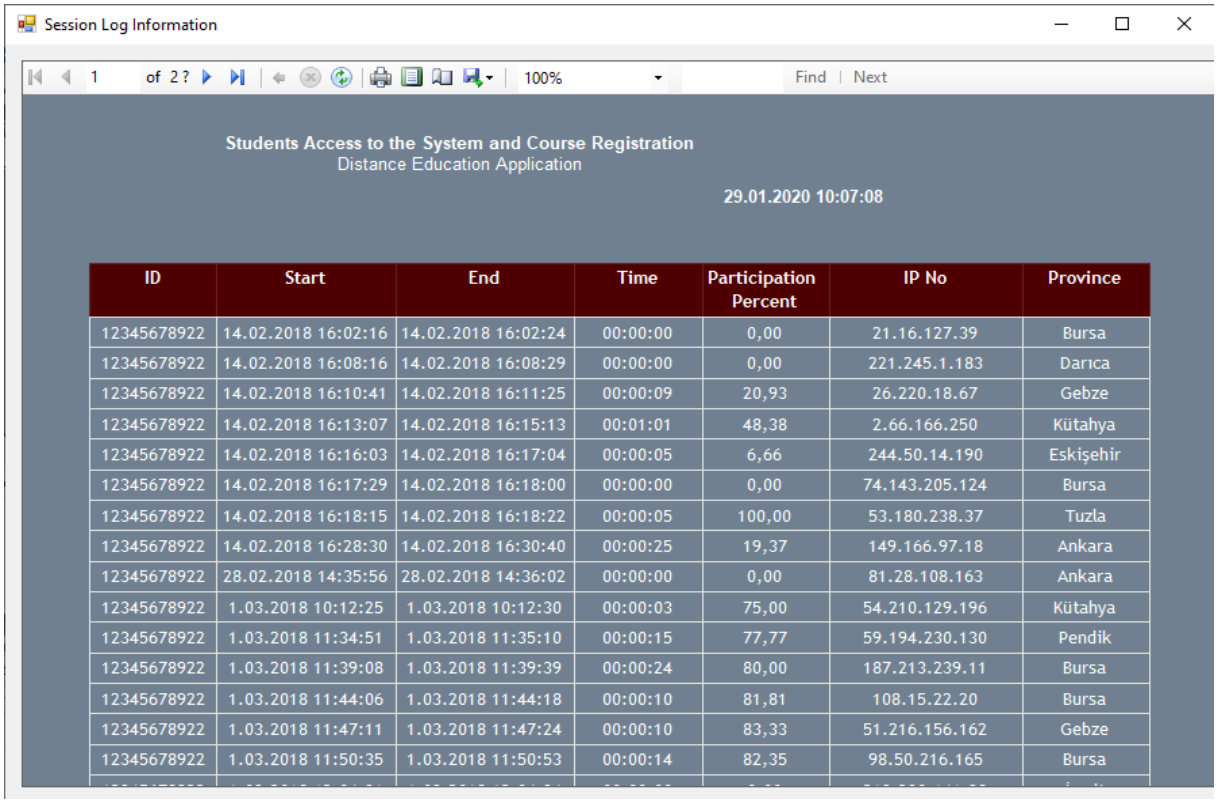


Figure 7. Conditions Required to Achieve High Accuracy in Face Recognition (xLabs Tracker, 2016)

Report Screen

This screen contains statistical information about the participants. It is clear that statistical information is also important for the development of the system. The meanings of the fields in this report are as follows. Student's Identity number (ID), starting time of student participation in the related course (Start), student's exit from the related course (End), the time spent by the student in the relevant course or the active participation time of the student (Time), student participation rate, ip address (IP No) and location of the ip address are kept in the database. The screenshot of the report screen is presented in Figure 8.



ID	Start	End	Time	Participation Percent	IP No	Province
12345678922	14.02.2018 16:02:16	14.02.2018 16:02:24	00:00:00	0,00	21.16.127.39	Bursa
12345678922	14.02.2018 16:08:16	14.02.2018 16:08:29	00:00:00	0,00	221.245.1.183	Darıca
12345678922	14.02.2018 16:10:41	14.02.2018 16:11:25	00:00:09	20,93	26.220.18.67	Gebze
12345678922	14.02.2018 16:13:07	14.02.2018 16:15:13	00:01:01	48,38	2.66.166.250	Kütahya
12345678922	14.02.2018 16:16:03	14.02.2018 16:17:04	00:00:05	6,66	244.50.14.190	Eskişehir
12345678922	14.02.2018 16:17:29	14.02.2018 16:18:00	00:00:00	0,00	74.143.205.124	Bursa
12345678922	14.02.2018 16:18:15	14.02.2018 16:18:22	00:00:05	100,00	53.180.238.37	Tuzla
12345678922	14.02.2018 16:28:30	14.02.2018 16:30:40	00:00:25	19,37	149.166.97.18	Ankara
12345678922	28.02.2018 14:35:56	28.02.2018 14:36:02	00:00:00	0,00	81.28.108.163	Ankara
12345678922	1.03.2018 10:12:25	1.03.2018 10:12:30	00:00:03	75,00	54.210.129.196	Kütahya
12345678922	1.03.2018 11:34:51	1.03.2018 11:35:10	00:00:15	77,77	59.194.230.130	Pendik
12345678922	1.03.2018 11:39:08	1.03.2018 11:39:39	00:00:24	80,00	187.213.239.11	Bursa
12345678922	1.03.2018 11:44:06	1.03.2018 11:44:18	00:00:10	81,81	108.15.22.20	Bursa
12345678922	1.03.2018 11:47:11	1.03.2018 11:47:24	00:00:10	83,33	51.216.156.162	Gebze
12345678922	1.03.2018 11:50:35	1.03.2018 11:50:53	00:00:14	82,35	98.50.216.165	Bursa

Figure 8. Report Screen

Keeping ip addresses and location information is important for the access security of the participants. Knowing which user accessed the system from which ip address will make it easier to identify possible problems.

DISCUSSION AND RESULTS

Attendance is very important for every student in the learning process in distance education as in formal education. It gives them an opportunity to expand their knowledge through interaction with their teachers and friends by asking questions. (Martin, Wang, & Sadaf, 2018; Simonson, Zvacek, & Smaldino, 2019). Increasing class attendance is essential in the learning process and cannot be avoided by any learning institution. In this study the proposed model can be use to increase class attendance in distance education. With the developed prototype model, the time for individuals to look at the screen can be determined in distance education. Although the time of looking at the screen cannot be presented as a concrete indicator of class participation, it is one of the most binding factors. The determination of the attendance status is considered as an important criterion for the success of the course. Celik et al., (2018) found a positive correlation between affective and cognitive participation and course success. A negative relationship was found

between not attending the course and the success of the course. Samson, Czarnik, & Gross (2017) stated that statistical analyses show that several measures of participation including in-class activity participation and number of slides viewed were significantly related to exam scores. As a matter of fact, with our proposed model application, it is foreseen that success will increase when the participation in the class attendance increases. In addition, with this application, some kind of electronic course attendance system will be realized. This situation will be a useful model in the distance education trends period when the instructional technology tools become widespread and even become an integral part of our lives (Bozkurt et al., 2015). Trend technologies like machine learning, smart software systems, image processing and new software technologies changes enterprise learning's status quo with an extraordinary ability to deliver automated and truly personalized learning to completely change the way students learn for the better. Literature studies conducted within the scope of the study show that the student's attendance status has a positive relationship with the course success (Battalio, 2009; Dalkiran, 2018; Sadera, Robertson, Song, & Midon, 2009; Vanslambrouck et al., 2018). For this reason, with the prototype model, it is predicted that the attendance will increase and indirectly, the success of students will increase.

The most important limitation of the study is the success rate (80% -85%) in recognition processes due to the insufficient facial recognition algorithms or the light differences in the image area. As a suggestion for future researches, it is recommended to obtain data from eye tracking devices along with the images taken from the camera in order to increase the success level in determining attendance. Thus, it is predicted that the proposed prototype model will contribute to the reduction of the margin of error. The expected effects of this study is that it encourages learners to follow carefully and complete the courses that they start to take, and in this way it is foresighted to boost their learning effects and to facilitate actual learning transfer (Rae & O'Malley, 2017). And also studies shows that education institutions are searching creative solutions that are developed in distance education course attandance areas. In this connection, the proposed model in this study is given as an alternative for either synchronous or blended approaches where course attendance tracking gets partially uncertain in distance education. In this study, a structural design is provided to determine the attendance status in the learning activities carried out by distance education method through LMSs, MOOCs and other educational management and material platforms.

In this way, it is thought that a solution will be produced to the attendance status system, which is seen as a problem in distance education. In addition, it is foreseen that students' participation in the lessons will increase with this method. Therefore, it will have an indirect effect on academic success. However, it should not be forgotten that, during the login, users should be informed and permitted that the image information is collected and used. It is thought that the model proposal presented in the study will provide a solution to the attendance status problem in distance education and will meet the need in this area.

Authors' Note: This article was produced from the master's thesis prepared by Mehmet Emin UGUR under the supervision of Dr. Durmus OZDEMIR.

BIODATA and CONTACT ADDRESSES of AUTHORS

Dr. Durmus OZDEMIR is currently working as an Assistant Professor of Computer Engineering Department at Kutahya Dumlupinar University since May 2016. He gained his PhD degree at Computer Education and Instructional Technologies Department in Ataturk University in April 2015. His research interests are instructional technology integration, digital transformation, e-learning, distance education policies, optimization, data security science, and deep learning. He has various research articles published in international and national indexed journals, book chapters and papers submitted to international meetings. He supervised 6 master theses. He has also contributed research projects.

Durmus OZDEMIR
Department of Computer Engineering, Faculty of Engineering
Address: Kutahya Dumlupinar University, 43000, Kutahya, Turkey
Phone: +90 2744434253
E-mail: durmus.ozdemir@dpu.edu.tr

Mehmet Emin UGUR is a teacher at Deniz Yildizlari Vocational and Technical Anatolian High School, Ministry of National Education. He obtained his Master's Degree in the Department of Computer Engineering from Kutahya Dumlupinar University in June 2018. His academic interest areas are distance education, face-recognition systems, eye-tracking systems, and determination participation in the lesson. He did some applications on the internet of things area. He has also participated and presented in national and international conferences.

Mehmet Emin UGUR
Deniz Yildizlari Vocational and Technical Anatolian High School, Ministry of National Education
Address: 41700, Darica, Kocaeli, Turkey
Phone: +90 5558552221,
E-mail: me.ugur@hotmail.com

REFERENCES

Al-Rahmi, W., Aldraiweesh, A., Yahaya, N., Kamin, Y. Bin, & Zeki, A. M. (2019). Massive open online courses (MOOCs): Data on higher education. *Data in Brief*, *22*, 118–125.

Alhabeeb, A., & Rowley, J. (2018). E-learning critical success factors: Comparing perspectives from academic staff and students. *Computers & Education*, *127*, 1–12.

Anshari, M., Alas, Y., Hamid, M. H. S. A., & Smith, M. (2016). Learning management system 2.0: Higher education. In *Handbook of research on engaging digital natives in higher education settings* (pp. 265–279). IGI Global.

Arnab, C. (2018). The Absence of Longer Texts in Literature Classes in Some Open and Distance Education Courses in India: Learning Outcomes. *International Linguistics Research*, *1*(1), p95–p95.

Battalio, J. (2009). Success in distance education: Do learning styles and multiple formats matter? *The Amer. Jrnl. of Distance Education*, *23*(2), 71–87.

Bilgic, H. G., & Tuzun, H. (2015). Yuksekogretim kurumlari web tabanli uzaktan egitim programlarinda yasanan sorunlar. *Acikogretim Uygulamalari ve Arastirmalari Dergisi*, *1*(3), 26–50.

Bozkurt, A., Akgun-Ozbek, E., Yilmazel, S., Erdogdu, E., Ucar, H., Guler, E., … Goksel-Canbek, N. (2015). Trends in distance education research: A content analysis of journals 2009-2013. *International Review of Research in Open and Distributed Learning*, *16*(1), 330–363.

Broadbent, J., & Poon, W. L. (2015). Self-regulated learning strategies & academic achievement in online higher education learning environments: A systematic review. *The Internet and Higher Education*, *27*, 1–13.

Canbek, N. G., & Hargis, J. (2015). Educational innovation in e-learning: MOOCs and OER movements in Turkey. *Glokalde*, *1*(1), 19–32.

CELIK, S., TORAMAN, S. O., & CELIK, K. (2018). The relation of student achievement with course attendance and teacher immediacy. *Kastamonu Education Journal*, *26*(1), 209–217.

Chao, I. T., Saj, T., & Hamilton, D. (2010). Using collaborative course development to achieve online course quality standards. *The International Review of Research in Open and Distributed Learning*, *11*(3), 106–126.

Chaudhari, K., & Thakkar, A. (2019). Survey on handwriting-based personality trait identification. *Expert Systems with Applications*, *124*, 282–308. https://doi.org/10.1016/j.eswa.2019.01.028

Crisp, B. R. (2018). From distance to online education: two decades of remaining responsive by one university social work programme. *Social Work Education*, *37*(6), 718–730.

Dalkiran, O. (2018). Investigation of Relationship Between Theoretical Practice Course Success and Attendance. *Journal of Education and Training Studies*, *6*(5), 189–193.

de Paiva Guimarães, M., Alves, B., Martins, V. F., dos Santos Baglie, L. S., Brega, J. R., & Dias, D. C. (2017). Embedding augmented reality applications into learning management systems. *International Conference on Computational Science and Its Applications*, 585–594. Springer.

DeTure, M. (2004). Cognitive style and self-efficacy: Predicting student success in online distance education. *American Journal of Distance Education*, *18*(1), 21–38.

Firat, M., Kilinc, H., & Yuzer, T. V. (2018). Level of intrinsic motivation of distance education students in e-learning environments. *Journal of Computer Assisted Learning*, *34*(1), 63–70.

Flores, S., Walters, N. M., & Kiekel, J. (2018). Academic Instruction at a distance: An examination of holistic teacher perceptions in a virtual high school. *Online Journal of Distance Learning Administration*, *21*(1).

Grabe, M., & Christopherson, K. (2008). Optional student use of online lecture resources: resource preferences, performance and lecture attendance. *Journal of Computer Assisted Learning*, *24*(1), 1–10.

Gräther, W., Kolvenbach, S., Ruland, R., Schutte, J., Torres, C., & Wendland, F. (2018). Blockchain for education: lifelong learning passport. *Proceedings of 1st ERCIM Blockchain Workshop 2018*. European Society for Socially Embedded Technologies (EUSSET).

Gunawardena, C. N., & McIsaac, M. S. (2013). Distance education. In *Handbook of research on educational communications and technology* (pp. 361–401). Routledge.

Han, I., & Shin, W. S. (2016). The use of a mobile learning management system and academic achievement of online students. *Computers & Education*, *102*, 79–89.

Hawkins, A., Frander, E., Young, M., & Deal, K. (2017). Reflection on Retention: An Evaluation Study on Minority Students' Success in an Online Nursing Program. *Perspectives In Learning*, *16*(1), 5.

Howell, S. L., Saba, F., Lindsay, N. K., & Williams, P. B. (2004). Seven strategies for enabling faculty success in distance education. *The Internet and Higher Education*, *7*(1), 33–49.

Hsu, Y.-C., & Ching, Y.-H. (2013). Mobile app design for teaching and learning: Educators' experiences in an online graduate course. *The International Review of Research in Open and Distributed Learning*, *14*(4).

Kamarga, H. (2018). Constructing online based history learning: comparison of learning content management system (LCMS) to learning management system (LMS). *Historia: Jurnal Pendidik Dan Peneliti Sejarah*, *12*(2), 255–273.

Knight, W. E., Hakel, M. D., & Gromko, M. (2008). The Relationship Between Electronic Portfolio Participation and Student Success. Professional File Number 107, Spring 2008. *Association for Institutional Research (NJ1)*.

Krouska, A., Troussas, C., & Virvou, M. (2017). Comparing LMS and CMS platforms supporting social e-learning in higher education. *2017 8th International Conference on Information, Intelligence, Systems & Applications (IISA)*, 1–6. IEEE.

Lei, Z., Zhou, H., & Hu, W. (2019). Combining MOOL with MOOC to Promote Control Engineering Education: Experience with NCSLab. *IFAC-PapersOnLine*, *52*(9), 236–241.

Lester, S. (2018). Sequential schooling or lifelong learning? International frameworks through the lens of English higher professional and vocational education. *Education+ Training*, *60*(2), 213–224.

Liyanagunawardena, T. R., Adams, A. A., & Williams, S. A. (2013). MOOCs: A systematic study of the published literature 2008-2012. *The International Review of Research in Open and Distributed Learning*, *14*(3), 202–227.

Lockwood, F. (2018). *The design and production of self-instructional materials*. Routledge.

Lwin, H. H., Khaing, A. S., & Tun, H. M. (2016). Automatic door access system using face recognition. *International Journal of Scientific & Technology Research*, *4*(6), 210–221.

Martin, F., Wang, C., & Sadaf, A. (2018). Student perception of helpfulness of facilitation strategies that enhance instructor presence, connectedness, engagement and learning in online courses. *The Internet and Higher Education*, *37*, 52–65.

Newberry, R. (2013). Building a foundation for success through student services for online learners. *Online Learning Journal*, *17*(4).

Norman, H., Nordin, N., Din, R., Ally, M., & Dogan, H. (2015). Exploring the roles of social participation in mobile social media learning: A social network analysis. *International Review of Research in Open and Distributed Learning*, *16*(4), 205–224.

Ortagus, J. C. (2017). From the periphery to prominence: An examination of the changing profile of online students in American higher education. *The Internet and Higher Education*, *32*, 47–57.

Ozgol, M., Sarikaya, I., & Ozturk, M. (2017). Students' and teaching staff's assessments regarding distance education applications in formal education. *Journal of Higher Education and Science*, *7*(2), 294–304.

Rae, M. G., & O'Malley, D. (2017). Using an online student response system, Socrative, to facilitate active learning of Physiology by first year graduate entry to medicine students: a feasibility study. *MedEdPublish*, *6*(1), 1–17.

Rumble, G. (2019). *The planning and management of distance education*. Routledge.

Sadera, W. A., Robertson, J., Song, L., & Midon, M. N. (2009). The role of community in online learning success. *Journal of Online Learning and Teaching*, *5*(2), 277–284.

Salzmann, C., Piguet, Y., & Gillet, D. (2019). New Tools for MOOC/MOOL to Sustain Continuity of Experimentation in Control. *IFAC-PapersOnLine*, *52*(9), 254–259.

Samson, P. J., Czarnik, A., & Gross, M. (2017). Relationships Between Digital Measures of Student Engagement and Exam Scores: Is the LMS Enough? *Practitioner Track Proceedings*.

Saxena, S., Sharma, S., & Sharma, N. (2016). Research Article Parallel Image Processing Techniques, Benefits and Limitations. *Research Journal of Applied Sciences, Engineering and Technology*, *12*(2), 223–238.

Shelton, B. E., Hung, J.-L., & Lowenthal, P. R. (2017). Predicting student success by modeling student interaction in asynchronous online courses. *Distance Education*, *38*(1), 59–69.

Shin, W. S., & Kang, M. (2015). The use of a mobile learning management system at an online university and its effect on learning satisfaction and achievement. *International Review of Research in Open and Distributed Learning*, *16*(3), 110–130.

Simonson, M., Zvacek, S. M., & Smaldino, S. (2019). *Teaching and Learning at a Distance: Foundations of Distance Education 7th Edition*. IAP.

Stovall, M. L. (2000). *Relationships between participation in a community college student success course and academic performance and persistence.*

Vanslambrouck, S., Zhu, C., Lombaerts, K., Philipsen, B., & Tondeur, J. (2018). Students' motivation and subjective task value of participating in online and blended learning environments. *The Internet and Higher Education*, *36*, 33–40.

Walker, D. S., Lindner, J. R., Murphrey, T. P., & Dooley, K. (2016). Learning management system usage. *Quarterly Review of Distance Education*, *17*(2), 41–50.

Wilson, G., & Pretorius, R. W. (2017). Utilising Work-Integrated Learning to enhance student participation and engagement in sustainability issues in open and distance learning. In *Handbook of theory and practice of sustainable development in higher education* (pp. 245–257). Springer.

Yukselturk, E., & Bulut, S. (2007). Predictors for student success in an online course. *Journal of Educational Technology & Society*, *10*(2), 71–83.

Zheng, Y., Wang, J., Doll, W., Deng, X., & Williams, M. (2018). The impact of organisational support, technical support, and self-efficacy on faculty perceived benefits of using learning management system. *Behaviour & Information Technology*, *37*(4), 311–319.

THE META-ANALYSIS OF THE STUDIES ABOUT THE EFFECTS OF FLIPPED LEARNING ON STUDENTS' ACHIEVEMENT

Dr. Mustafa AYDIN
ORCID: 0000-0001-8414-0008
Department of Educational Sciences
Necmettin Erbakan University
Konya, TURKEY

Dr. Burcu OKMEN
ORCID: 0000-0002-0296-0078
Ministry of Education
Duzce, TURKEY

Dr. Seyma SAHIN
ORCID: 0000-0003-1727-4772
Ministry of Education
Duzce, TURKEY

Dr. Abdurrahman KILIC
ORCID: 0000-0002-2704-2951
Department of Educational Sciences
Duzce University
Duzce, TURKEY

Received: 17/12/2019 **Accepted:** 30/06/2020

ABSTRACT

The aim of this research is to analyze the effect of the flipped learning model on the academic success of students. In this research featuring a descriptive survey model, a quantitative research method has been used. While criterion sampling method has been used for selecting the sample of this research, meta-analysis has been used to analyze the data. The inclusion and exclusion criteria of this study were as follows: Sources must be an article or a thesis; be studies performed in Turkey; have been published between 2014 and 2018; be open-access; the sampling must consist of students; they must examine the effect of the flipped learning model on success; have an experimental design; have pretest/posttest experimenting and a control group design; include data such as pretest and posttest standard deviation, arithmetic average, and sample size. 14 articles and 11 theses, 25 studies formed the study group.Document review technique has been used as data collection technique. As data collection tool, "meta-analysis form" developed by the researchers has been used. effect size values and unified effect sizes were calculated using Comprehensive Meta-Analysis (CMA) Software.After analysis was conducted based on the random effects model, it was determined that the effect of the flipped learning model on students' success is medium (Hedge's g=0.713). It has been seen that the variables of study type, educational level, and year do not have a significant effect on success (p>0.05). When the effect sizes were examined by year, newer studies had larger effect sizes, while the studies conducted with students at primary-secondary levels and with high school degrees had larger effect size averages.

Keywords: Flipped learning model, flipped classroom, meta-analysis, students' achievement, experimental studies.

INTRODUCTION

Rapidly changing and developing technology is now altering the way of life of society in many areas, from education to communication and from health to working life (Ucar & Bozkurt, 2018). Contemporary children and teenagers differ from their predecessors as they adapt to technology and gain continuous access to different communication channels such as mobile phones and social media (Oyman et al., 2013; Sariyer, 2015). With the wide use of information technologies and social media networks in education, diversified, different, and dynamic learning environments are necessary to educate the learners of this period (Wu & Li, 2015).

Today, one of the fields that has been most influenced by technological developments is education, and schools have had difficulties in keeping pace with the innovations in the world of production and the multiple needs of the new generation (Pinnelli & Fiorucci, 2015). Benefiting from instructional technology effectively in educating these students who are changing more considerably than the previous generation is seen as a necessity (Orhan et al., 2014). One of the methods actively used in instructional technology is flipped learning.

Defining the Flipped Classroom

The flipped learning model is a pedagogical approach emphasizing the formation of a student-centered learning environment and student attendance with the use of instructional and cooperative learning (McCallum et al., 2015; Reyna, 2015; Westermann, 2014). In the flipped learning model, technological equipment is utilized in the teaching and learning processes in a regular and systematical way (Strayer, 2012). Educators transfer the lessons to the students by means of videos outside of class, and time in class is spent on problem-solving and individual or group studies. This model helps form diverse instructional activities according to the learning styles of each student (Bergmann & Sams, 2012).

As the biggest barrier preventing active learning environments where students can learn by experience in class, the problem of time constraints can be solved and additional time can be provided by means of this model (Baker, 2000; Barak & Shakman, 2008). Students receive the necessary low-level information via instructional technology outside of class and they engage in activities to develop high-level thinking skills in class (Bergman & Sams, 2012; Strayer, 2012). In the flipped learning model, learning is not limited to only the classroom environment and students are required to strive and take responsibility for their own learning in accordance with their individual needs and learning speeds (Davies et al., 2013).

To explain flipped learning and to apply it better, 4 basic components were determined by the Flipped Learning Network, consisting of experienced educators, in 2013. These components were shaped around the theoretical framework of the flipped learning model, as well (Tetreault, 2006). Composing the acronym "F-L-I-P," these components are: 1) Flexible environment, 2) Learning culture, 3) Intentional content, and 4) Professional educators (Hamdan et al., 2013). Flipped learning environments must be flexible learning environments that educators and students can regulate at will. Educators must accept complicated and noisy environments in contrast with quiet and systematic classroom environments (Hamdan et al., 2013; Tetreault, 2006).This model has provided students with the ability to watch, listen, read, and revise subject material many times by removing the constraints of time and place (Enfield, 2013). In contrast to the traditional learning model, the educator stops being the source of information. By adapting a student-centered approach and encouraging students to explore the subjects more deeply, educators try to bring a learning culture to the students. In this student-centered system, educators guide students to reach information and check to see whether the students obtain that information or not with various testing methods (Grover & Stovval, 2013). The educators must design the content by thinking about which points are important, how they are related to the learning objectives, and where the students have the most difficulty (Hamdan et al., 2013). Educators are the heart of the matter in this model. They must observe the students continuously, give feedback, and evaluate them (Tetreault, 2006). They must guide the students in class and increase the interaction and communication with students (Flumerfelt & Green, 2013).

Aims of the Study

While scientific thinking is based on information building, it is a considerable undertaking to perform a comprehensive literature review in cases where study features and variables vary and it is difficult to group the results. Staton-Spicer and Wullf (1984) stated that the most suitable way of describing any field of study is to examine the research about that field, and studies examining the research in any discipline can lead the way for those who want to conduct research. Meta-analyses synthesize evidence from multiple studies and can potentially provide stronger evidence than individual studies alone (Mueller et al., 2018).

It is possible to identify many studies stating that flipped learning is effective on the academic success of students in the international literature (Baepler et al., 2014; Donovan & Lee, 2015; Green, 2015; Hamdan et al., 2013; Harvey, 2014; Marlowe, 2012; McCallum et al., 2015; Moravec et al., 2010; Strayer, 2012; Tetreault, 2006; Whitman Cobb, 2016; Zappe et al., 2009).

There are also many studies in the Turkish literature on the effect of the flipped learning model on success. Many studies have revealed that the flipped learning model has positive effects on success. For example, Sengel (2014) found that students participating in a flipped classroom performed as well as normal or better on a physics achievement test. Boyraz (2014) found that the test scores of test groups who were taught with a flipped classroom method were better than those of control groups taught with traditional teaching methods and the difference between the groups was meaningful. Ozpinar et al. (2016) concluded that students in a flipped learning group were more successful and had higher levels of motivation than students in a traditional learning group. Ekmekci (2017) found that there was a statistically significant difference between flipped learning and traditional learning groups' academic success levels. Sarigoz (2017) reported that the academic achievement of students studying according to the flipped classroom model increased more than the academic achievement of students studying according to the traditional education system. Sezer (2017) determined that a flipped classroom yielded both greater academic achievement and greater motivation compared with a traditional learning group. Cetinkaya (2017) found that there was a positive significant difference in favor of the flipped learning group compared to a traditional group. Cakir and Yaman (2018) found that students in flipped learning and traditional groups had a statistically significant difference in favor of the flipped learning group with respect to an achievement test in a science and technology course. Saglam and Arslan (2018) reported that a flipped classroom had a medium effect on students' academic achievements compared to traditional instruction. Sirakaya and Ozdemir (2018) determined that there was a significant difference between a flipped learning group and traditional groups in terms of academic achievement. Acarol (2019) found that flipped learning had a positive effect on student achievement and participation. In contrast, there are also studies showing that the flipped learning model does not have a significant effect on academic achievement. In her study, for example, Cabi (2018) found that there were no significant differences in students' academic achievements between an experimental group including students learning through the flipped learning model and a control group including participants taught according to traditional blended learning. Topal and Akhisar (2018) found that the flipped learning environment had no significant effect on the academic achievement of students.

Despite all these studies that revealed the effects of the flipped learning model on academic success, there is only one previous meta-analysis evaluating the overall success of flipped learning studies in Turkey (Orhan, 2019). Evaluating that study upon completion of the literature review performed for the present work, it is seen that Orhan (2019) included 8 theses and 5 articles about this subject but did not include 18 other relevant studies. Because of this gap in the literature, it is thought that a new meta-analysis of flipped classroom studies would provide useful insights into the implementation formats of the flipped classroom approach. In this context, the aim of this research is to analyze the effect of the flipped learning model on the academic success of students.

METHOD

Model

In this research featuring a descriptive survey model, a quantitative research method has been used. Survey models are research approaches aiming to describe a situation in the past or present in its own form (Karasar, 2015: 77), and a descriptive survey model can be expressed as a method of surveying and analyzing suitable articles as much as possible to provide the generalizability of the results (Avci et al., 2013).

Population and Sample

As one of the most commonly used purposeful sampling methods, the criterion sampling method has been used for selecting the sample of this research. Criterion sampling is the key criterion including common features of the subject and is seen as important by researchers (Ritchie et al., 2013).

A meta-analysis attempts to collate empirical evidence that fits prespecified eligibility criteria to answer a specific research question (Russo, 2007). The inclusion and exclusion criteria of this study were determined by the researchers considering the purpose of the research. The inclusion criteria were thus as follows:

1. Sources must be an article or a thesis.
2. They must be studies performed in Turkey.
3. They must have been published between 2014 and 2018.
4. They must be open-access.
5. The sampling must consist of students.
6. They must examine the effect of the flipped learning model on success.
7. They must have an experimental design.
8. They must have pretest/posttest experimenting and a control group design.
9. They must include data such as pretest and posttest standard deviation, arithmetic average, and sample size.

Initially, the search for articles was carried out in accordance with the criteria below via Web of Science, Taylor & Francis, SpringerLink, Scopus, ScienceDirect, Education Source, ERIC, EBSCO, PubMed, Sobiad, ULAKBIM, the ASOS Index, the Turkish Education System Index, and Google Academic:

- √ Key words: Flipped Learning, Flipped Classroom, Lesson at home – Homework at school
- √ Years: 2014-2018
- √ Source Type: Peer-reviewed Journal, Thesis
- √ Language: Turkish, English

As a result of the search, 3675 articles were listed. Of those, 111 presented studies performed in Turkey. Of these studies, 26 experimental studies examining the effects of the flipped learning model on success were determined. Articles produced from thesis works were not included in the study group if the full text of the thesis itself could be accessed. The contents of the experimental studies were examined in detail and 19 articles having a pretest/posttest experimental control group design were identified. The authors of seven articles whose arithmetic average and standard deviation values were not provided were contacted by e-mail to request those values. The necessary values were obtained from only 2 authors. As a result, 14 articles were included in the study group.

A flow diagram summarizing the process of selecting the studies is presented in Table 1.

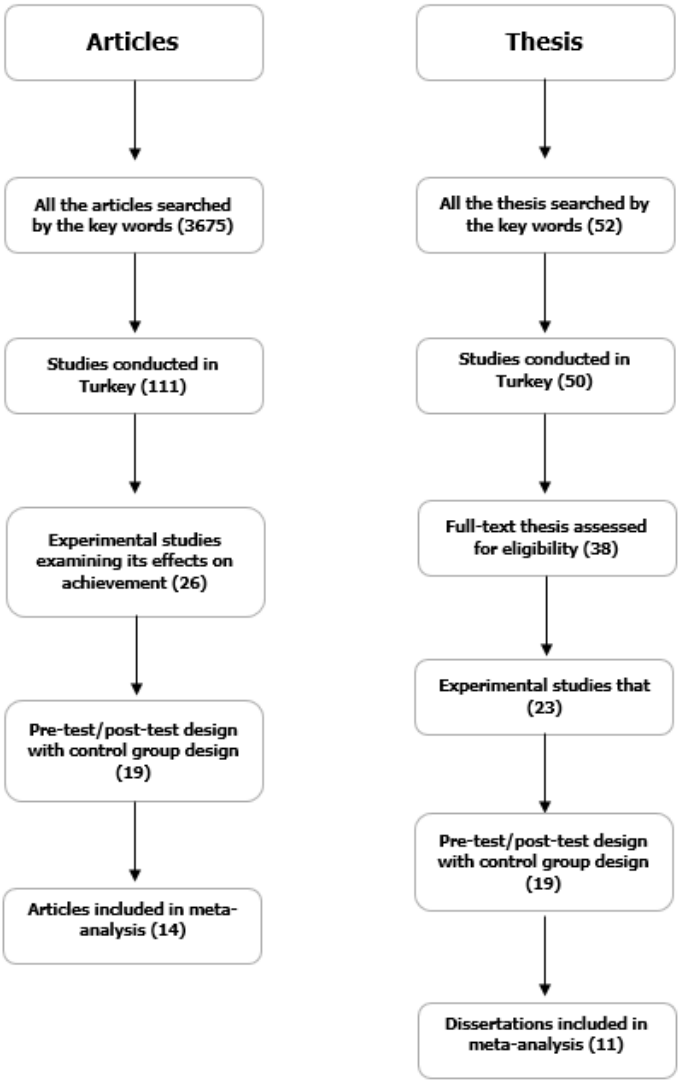


Figure 1. The Flow Diagram of Selecting the Studies

In the process of selecting theses, the search was initially carried out via the National Thesis Center in accordance with the following criteria:

- √ Key words: Flipped Learning, Flipped Classroom, Lesson at home – Homework at school
- √ Years: 2014-2018
- √ Language: Turkish, English
- √ Place: Turkey

As a result of the search, 52 theses were listed and 50 of them were completed in Turkey. Twelve of them could not be obtained due to access restrictions. Of the 38 theses that could be accessed, 23 experimental studies examining the effect of the flipped learning model on success were determined. The contents of these experimental studies were examined in detail and in 12 theses a pretest/posttest experimental control group design was determined. One of these did not provide the arithmetic average and standard deviation values and so an e-mail was sent to the author requesting them. The author did not provide the necessary data and, as a result, 11 theses were included in the study group.

Comparing the selected articles with the theses whose full text had been obtained, only one article produced from those theses had been considered for the study group. Thus, with 14 articles and 11 theses, 25 studies formed the study group.

When these studies were examined, the effect size of each study was calculated separately considering that in some cases the flipped learning model was carried out in "social science" and "science" lessons with 2 separate experiment groups for each lesson. As a result, 28 datasets were included in the study group.

The frequencies and percentage values of the studies included in the research for variables such as "year of the study," "study type," and "sampling level" are presented in Table 1.

Table 1. Descriptive Statistics

Studies		f	%
Year	2014	1	3.57
	2015	1	3.57
	2016	6	21.43
	2017	8	28.57
	2018	12	42.86
	Total	28	100
Study Type	Article	14	50
	Post Graduate thesis	8	28.57
	Doctoral Thesis	6	21.43
	Total	28	100
Sampling level	Primary School	4	14.29
	Secondary School	4	14.29
	High School	1	3.57
	Associate Degree	2	7.14
	Undergraduate	17	60.71
	Total	28	100

As seen in Table 1, 28 datasets obtained between 2014 and 2018 were included in the study. Many of them were obtained in 2018. Several of the them were postgraduate theses. It was seen that 60.71% of the studies had data collected from among undergraduate students when the sampling levels were examined. Studies of high school and primary school students were least common in the sampling.

Data Collection

As a data collection technique, document reviewing has been used. Document reviewing is the process of reaching independently verified data by reviewing the available sources. The process of document reviewing presents a systematical format to researchers to acquire, analyze, and produce beneficial information from the available documents (Kilic et al., 2019). In this research, the reviewed documents are articles and theses.

Developed by the researchers in accordance with the research problems, a meta-analysis form has been used as a data collection tool. For the data input of the coding form, Microsoft Excel has been used.

The information below was included in the form:

- √ Information about the study (title of the study, the name of the author(s), the year when the study was carried out, the city where the study was carried out, study type, educational level of the sampled students, where the study was published).
- √ Statistics from the study (pretest standard deviation, pretest arithmetic average, pretest sampling size, posttest standard deviation, posttest arithmetic average, posttest sampling size).

Initially, to avoid publication bias in the scope of reliability studies:

- √ The literature was reviewed in detail.
- √ Inclusion criteria and exclusion criteria were determined in detail objectively.
- √ A coding form was created.
- √ The theses were searched and coded by one researcher while the articles were searched and coded by another researcher.

Data Analysis

For data analysis, meta-analysis has been used. Meta-analysis is a quantitative technique that uses specific measures to indicate the strength of variable relationships for the studies included in the analysis. The technique emphasizes results across multiple studies as opposed to results from a single investigation (Shelby & Vaske, 2008). Meta-analysis studies are seen as studies creating significance for the whole of the literature and readers as they present the sampling size for each study included, compare the sampling sizes to others, and present a final sampling size (Kilic et al., 2019).

Initially, a heterogeneity test was carried out, and then effect size values and unified effect sizes were calculated using Comprehensive Meta-Analysis (CMA) Software. For calculating effect sizes, a format was selected where pretest and posttest calculations of the experimental and control groups (arithmetic average, standard deviation values, sampling quantities) could be included. For calculating effect size, Hedge's g-factor was used. Whether or not there was publication bias in the studies included in the meta-analysis was then examined by funnel plot, classic fail-safe N analysis, and Begg and Mazumdar rank correlation test. To provide symmetry, Duval and Tweedie's "trim and fill" method was used.

FINDINGS

Heterogeneity

Basically, there are two sources of variability explaining the heterogeneity in a meta-analysis. One of them is within-run variability, which results from sampling error. Sampling error is possible in every meta-analysis study because every study uses different samplings. Another source of heterogeneity is the variability between studies. This situation results from the effects of the changes made in the research and the quality and features of the research (Tania et al., 2016). While determining the present heterogeneity, the criteria below were examined:

- √ In the analysis of Q statistics expressed as the sum of weighted squares, the hypothesis that all studies share the general influence was tested. As a result of this analysis, it is determined whether there is heterogeneity by examining the p-value (Borenstein et al., 2009).
- √ If the level of significance is below the p-value, it is concluded that there is a significant difference between the studies. That means that there is no heterogeneity between the studies (Dincer, 2014).
- √ The I^2 statistics give information about the rate of heterogeneity. If the I^2 value is higher than 75%, it means that influence quantities are heterogenic (Higgins & Green, 2011).
    - 0-40%: Very low level of heterogeneity
    - 30-60%: Medium level of heterogeneity
    - 50-90%: Sufficient level of heterogeneity
    - 75-100%: High level of heterogeneity

The values related to these calculations are presented in Table 2.

Table 2. The Results of Heterogeneity Test

Q-value	Sd (Q)	p-factor	I^2
148.026	27	0.000	81.76

p<0.05

According to the results of the heterogeneity test, the Q statistics (Q=148.026; p<0.00) showed that the influence quantities of the studies did not have a homogeneous distribution. The value of I^2 calculated as a supplement for Q statistics is a high-level indicator of heterogeneity.

Effect Size

First of all, it was determined whether effect size would be calculated according to the fixed effects model or random effects model. Which statistical model will be used is generally a complicated and subjective decision. However, there are some criteria to direct the decision about which model to use. The first criterion is to consider the aim of the statistical inference. If there is an aim of generalizing beyond the studies whose results are included, the random effect model is a suitable statistical model for meta-analysis. The second criterion to be considered is related to the number of studies included in the meta-analysis. The fixed effects model is a suitable model when the number of studies is less than 5. The third criterion is whether there is statistical heterogeneity between effect sizes or not. If there is heterogeneity, the fixed effects model is not suitable. In this case, the random effects model can be used (Tufanaru et al., 2015). In this research, the usage of the random effects model is suitable as it is seen that there is generalization beyond the studies whose results are included, the number of the studies included in the meta-analysis is greater than 5, and the rate of heterogeneity is high.

The findings related to each study in the sampling acquired by analysis via the random effects model and the general effect level of the studies are presented in Table 3.

Table 3. Findings of Influence Quantity

Name of the Study	Hedges's g	Standart Error	Variance	Lower Limit	Upper Limit	z Value	p Value
Akgun & Atici, 2017	0.887	0.254	0.064	0.390	1.384	3.498	0.000
Aydin, G., 2016	0.368	0.344	0.118	0.307	1.042	1.069	0.285
Aydin, B., 2016	1.382	0.332	0.110	0.732	2.032	4.165	0.000
Balikci, 2015	0.523	0.341	0.116	0.145	1.191	1.535	0.125
Boyraz & Ocak, 2017	0.952	0.331	0.110	0.303	1.601	2.876	0.004
Cabi, 2018	0.275	0.259	0.067	0.231	0.782	1.065	0.287
Cakir, 2017	1.024	0.288	0.083	0.459	1.590	3.552	0.000
Cavdar, 2018	0.225	0.204	0.042	0.175	0.624	1.103	0.270
Cetinkaya, 2017	0.596	0.235	0.055	0.135	1.057	2.535	0.011
Debbag, 2018	1.592	0.258	0.067	1.086	2.098	6.168	0.000
Demir, 2018Fa	1.731	0.365	0.134	1.014	2.447	4.736	0.000
Demir, 2018Fb	2.696	0.432	0.187	1.849	3.544	6.236	0.000
Demir, 2018Sa	1.836	0.372	0.138	1.107	2.565	4.939	0.000
Demir, 2018Sb	1.334	0.344	0.118	0.660	2.009	3.879	0.000
Ekmekci, 2017	2.066	0.374	0.140	1.334	2.799	5.528	0.000
Hava & Gelibolu, 2018	0.383	0.261	0.068	0.129	0.895	1.466	0.143

Iyitoglu, 2018	0.873	0.321	0.103	0.244	1.503	2.719	0.007
Koroglu & Cakir, 2017	1.413	0.319	0.102	0.788	2.037	4.433	0.000
Ozpinar et al., 2016	0.924	0.293	0.086	0.349	1.499	3.149	0.002
Saglam, 2016	0.862	0.276	0.076	0.321	1.403	3.125	0.002
Sarigoz, 2017	1.251	0.263	0.069	0.736	1.766	4.762	0.000
Sengel, 2014	0.160	0.231	0.063	0.293	0.613	0.691	0.490
Sengel, 2016	0.764	0.212	0.045	0.349	1.180	3.606	0.000
Sezer & Abay, 2018	4.629	0.619	0.383	3.416	5.841	7.481	0.000
Sezer, 2017	0.794	0.249	0.062	0.306	1.283	3.186	0.001
Sirakaya & Ozdemir, 2018	0.274	0.245	0.060	0.205	0.753	1.121	0.262
Yavuz, 2016	0.173	0.374	0.140	0.561	0.906	0.461	0.644
Yurtlu, 2018	2.159	0.388	0.151	1.398	2.920	5.562	0.000
Fixed	0.895	0.055	0.003	0.788	1.002	16.359	0.000
Random	1.068	0.130	0.017	0.812	1.324	8.184	0.000

When Table 3 is examined, it is seen that the relationship between success and the flipped learning model in all 28 datasets acquired from the 25 studies included in the research is positive and in 20 of these studies it is statistically significant ($p<0.05$). According to the fixed effects model, the value of effect sizes between the flipped learning model and success is 1.068, while it is 0.895 according to the random effects model. Both effect sizes are positive, at high levels, and statistically significant ($p<0.05$). Based on the values of the effect sizes, it can be said that there is a high-level positive relationship between the flipped learning model and success. Information on the effect sizes of each study is given in Table 4.

Table 4. Influence Quantity Levels

Influence Quantity Level		Studies	f
Lower than0,15	Trivial effect	-	-
0,15-0,40	Small effect	Sengel, 2014; Yavuz, 2016; Cavdar, 2018; Sirakaya & Ozdemir, 2018; Cabi, 2018; Aydin, G., 2016; Hava & Gelibolu, 2018	7
0,40-0,75	Medium effect	Balikci, 2015; Cetinkaya, 2017	2
0,75-1,10	Large effect	Sengel, 2016; Sezer, 2017; Saglam, 2016; Iyitoglu, 2018; Akgun & Atici, 2017; Ozpinar et al., 2016; Boyraz & Ocak, 2017; Cakir, 2017	8
1,10-1,45	Very large effect	Sarigoz, 2017; Demir, 2018Sb; Aydin, B., 2016; Koroglu & Cakir, 2017	4
Higher than1,45	Perfect effect	Debbag, 2018; Demir, 2018Fa; Ekmekci, 2017; Demir, 2018Sa; Yurtlu, 2018; Demir, 2018Fb; Sezer & Abay, 2018	7

As is seen in Table 4, 7 of 28 datasets are at a perfect level, 4 of them are at a very high level, 2 of them are at a medium level, and 7 of them are at a low level. Among the studies, there are none having effect size at a trivial level.

To determine whether there is a significant difference between effect sizes according to the level, the study type, and the year of the study, homogeneity tests were carried out. Regarding the years of the studies, the years of 2014 and 2015, each of whose subgroup number is 1, have not been counted in the homogeneity analysis. The results acquired from this test are given in Table 5.

Table 5. The Results of Homogeneity Test

Moderator	Variable	N	Influence quantity (d)	S. Error	Sampling size		(Q)	df	p
					Below	Above			
Level	Associate, Undergraduate degree	19	1.017	0.164	0.695	1.339	0.377	1	0.539
	Primary, Secondary, High School Degree	9	1.182	0.213	0.764	1.600			
Study Type	Article	14	0.969	0.179	0.618	1.319	0.590	1	0.442
	Thesis	14	1.170	0.192	0.794	1.546			
Year	2016	6	0.773	0.150	0.478	1.067	4.598	2	0.100
	2017	8	1.072	0.144	0.789	1.355			
	2018	12	1.408	0.283	0.853	1.962			

According to the results of the homogeneity test in Table 5, there is no statistically significant difference between groups according to the level of education (Q=0.377, p>0.05), study type (Q=0.590, p>0.05), and year of the study (Q=4.598, p>0.05). When the results of moderator analysis are considered, it is seen that variables such as the level of education, study type, and year of the study on average do not have a moderator role at the level of influence calculated for the flipped learning model.

Publication Bias

The possible existence of publication bias in the studies included in this meta-analysis was evaluated via funnel plot. Funnel plots are based on the reality that precision in estimating the common effect of studies increases as long as the sampling size increases. The results acquired from small studies will be scattered under large-scale plots and this will be narrowed moving toward bigger studies. In the event that there is no publication bias, the resulting graphic will resemble a symmetrically inverted funnel. On the contrary, funnel plots will be generally curved and asymmetrical in the event of publication bias (Egger et al., 1997). The funnel plot acquired from this research is presented in Figure 2 below.

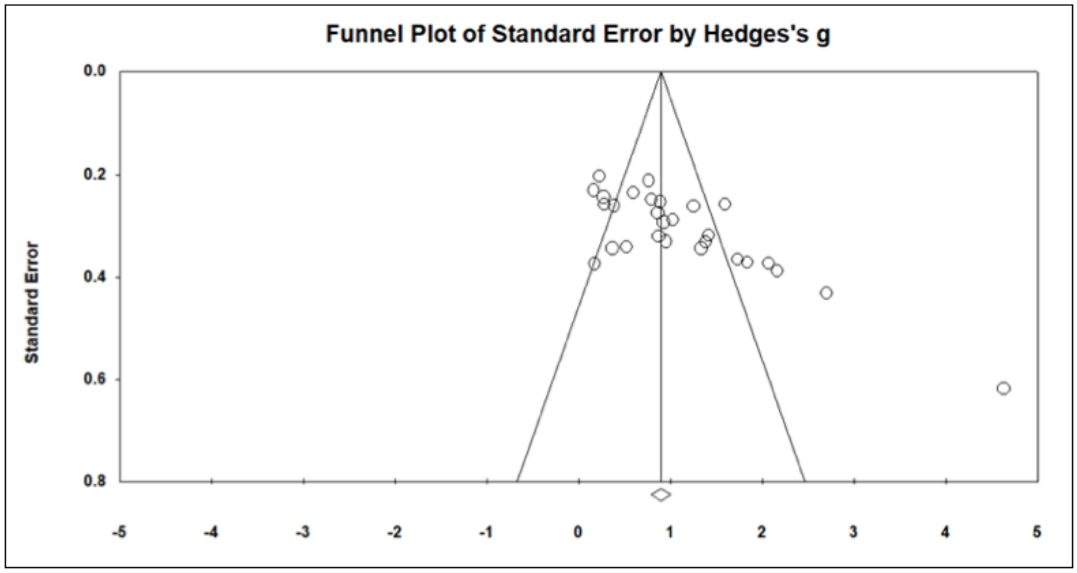


Figure 2. Funnel Plot

When the funnel plot in Figure 2 is examined, it can be said that the studies are not in symmetry and there is publication bias, but the effect size of the studies differs between 0.16 and 4.629. Thus, there is not a big deviation, except for the study coded as M10, whose publication bias deviated more substantially from the limit value and whose effect size is 4.629.

Another way to determine the bias is by calculating the classic fail-safe N value. By doing this, an effort is made to determine how many studies are necessary to invalidate the effect size (Borenstein et al., 2009). Values related to this analysis are presented in Table 6.

Table 6. Classic Fail-Safe N Value

Meta-analysis Power	
Z-score	17.886
p-value	0.00
Alfa value	0.05
Z score for Alfa value	2.00
N	28
p> the number of necessary studies for the result of alfa	2304

In classic fail-safe N analysis, the p-value being smaller than the alpha value shows that the study is strong and reliable. As seen in Table 6, the p-value is smaller than the alpha value for this research. The necessary value to invalidate the result of the meta-analysis is 2304. This value represents that there should be 2304 studies having opposite findings in the related literature. When it is considered that the effect size of 28 studies has been calculated, it is seen that the number 2304 is too high. These 28 studies included in the sampling are the absolute amount of studies reached according to the criterion of including all the studies aimed at this research question in Turkey. This case decreased the publication bias in this meta-analysis study.

To present the bias of the study sample statistically, the rank correlations of Begg and Mazumdar have been applied. The rank correlation of Begg and Mazumdar is a test of publication bias. The Kendall tau values between standardized effect size values and their variances are calculated. The values acquired show the relationship between effect size and sampling size. If there is a significant correlation ($p<0.05$), it can be said that there is publication bias (Begg & Mazumdar, 1994). The results of the analysis acquired from this test are presented in Table 7.

Table 7. The results of Begg and Mazumdar Rank Correlations

Case of Nias	
Tau	0.534
Tau's Z score	3.99
p value (1-tailed)	0.000
p value (2-tailed)	0.000

As the p-value (one-tailed p-value) acquired in the analysis is >0.05, it can be said that there is publication bias in the examined studies.

To provide symmetry, corrections have been made using the "trim and fill" method of Duval and Tweedie. The trim and fill algorithm is based on formalizing the case by using a funnel plot. After determining that this study was asymmetrical, the asymmetrical parts of the funnel were determined and this correction was added on the opposite side to provide symmetry (Duval & Tweedie, 2000).The new graphic is presented in Figure 3.

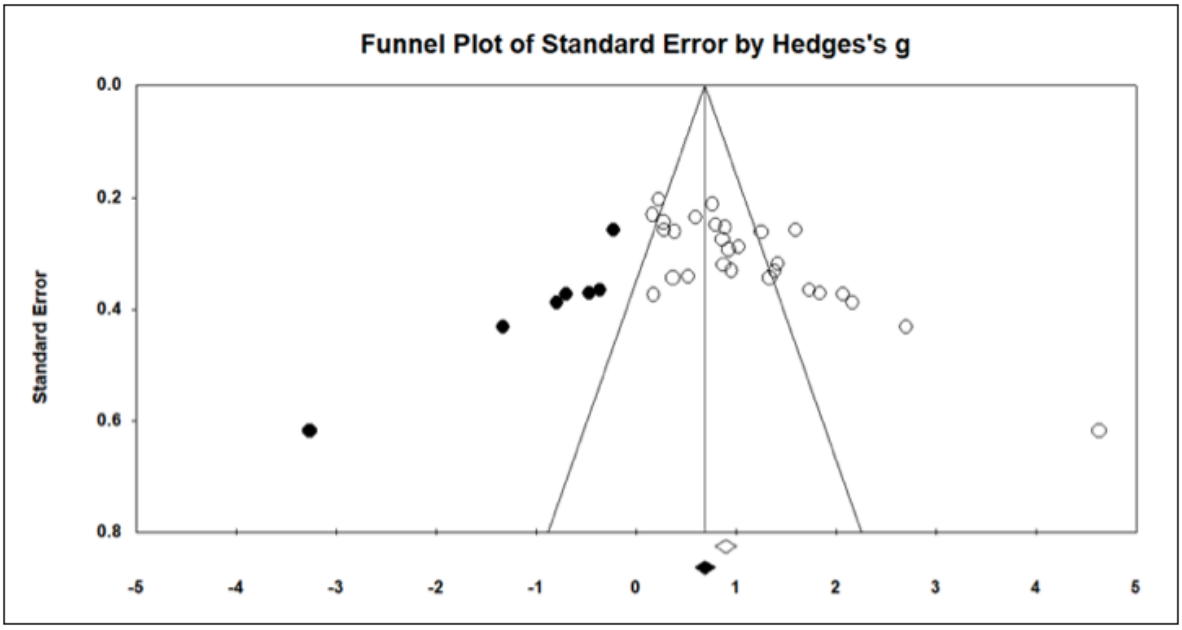


Figure 3. The Graphic resulted from Trim and Fill Method

As it is seen on Figure 3, it is seen that the symmetry has been formed by adding 7 studies to the left side as a result of correction made. By using this method, -being formed to correct the effect resulted from publication bias according to random effects model – new effect value is 0.713.The final value expresses the medium level effect size. By comparing the first analysis based on random effects model, the difference resulted from the effect size has shown that the possibility of research to be published is higher than the studies examining the effect of flipped learning model on success.

As seen in Figure 3, symmetry was achieved by adding 7 studies to the left side as a result of the correction made. By using this method to correct for the effect of publication bias according to the random effects model, the new effect value is 0.713. This final value expresses a medium-level effect size. Compared to the first analysis based on the random effects model, the difference resulting from the effect size shows that the possibility of research being published is higher than the studies examining the effect of that flipped learning model on success.

DISCUSSION

In this meta-analysis study, the aim was to examine the effect of the flipped learning model on success. After analysis was conducted based on the random effects model, it was determined that the effect of the flipped learning model on students' success is medium (Hedge's g=0.713) as a result of additional analysis being conducted based on publication bias. The results acquired from the research demonstrate that instructional activities carried out according to the flipped learning model increase students' success with a standard deviation of 0.71. For example, the increase for a test whose average is 550 and standard deviation is 100 (621 points instead of 550) seems fairly effective. It has been seen that this effect size, which is seen to be important within the context of education, is higher (d>0.4) than the Hattie critical effect size required to focus on the success of students. The confidence intervals related to the effect size acquired from the studies examined show that the results are reliable (Borenstein et al., 2009).

Karagol and Esen (2019) reviewed the results acquired from foreign studies and studies published in Turkey and included 55 studies (both articles and theses) on the effects of flipped learning activities on academic success in their meta-analysis. The average effect size related to those studies was calculated as 0.56. Orhan (2019) found the effect size as 0.74 in a meta-analysis study conducted with a total of 13 studies (8 theses and 5 articles). However, it was seen that the heterogeneity value of the results was very low as a limited number of studies were included in the research. In a study conducted in Korea, Choe and Lee (2018)

evaluated 95 research studies conducted among different educational levels (59 of them were theses and 36 of them scholarly articles) regarding the effects of flipped learning activities on academic success via meta-analysis. According to the results, they inferred that the effects of flipped learning activities on students' learning levels are at a medium level (d=0.58). It is stated that the contributions of flipped learning activities to students' cognitive, affective, and interpersonal learning outcomes are at different levels. As a result of a meta-analysis study conducted based on the results of 46 studies, most of which were carried out in the field of health sciences, Chen et al. (2018) inferred that flipped learning activities yielded more successful results than teacher-centered activities and these activities had a medium-level effect (d=0.47) on students' success. They also reported that flipped learning activities generated different results in information and skill-based evaluations of success. Hew and Leo (2018) counted flipped learning activities published for the health sciences and found 28 studies comparing traditional class activities in terms of students' success in a meta-analysis. With this research conducted comparatively, they inferred that flipped learning had a small effect (d=0.33) on increasing students' success. As a result of meta-analysis studies conducted with 11 works on the effects of flipped learning activities on students' success and satisfaction levels, Van Alten et al. (2019) inferred that flipped learning activities had a low-level effect size (g=0.36) on students' success. In the meta-analysis study of Tutal and Yazar (2017) involving 52 empirical studies conducted in Turkey and abroad on the flipped learning model, it was concluded that flipped learning had a moderate and positive effect on the academic achievement of the students compared to the traditional method. In the study conducted by Margulieux, McCracken, and Catrambone (2015), it was concluded that students' academic achievement increased in most of 21 studies using the flipped learning model.

In comparison with the other studies in the literature, Chen et al. (2018) gathered works conducted in different disciplines together in their meta-analysis. In this study where the results of flipped learning activities were considered, the results of 55 studies on this subject were presented as a result of research in 17 different databases. As a result of the effect size calculations, they emphasized that these activities had a low-level effect (d=0.19) on students' success. Compared to other studies, this study is interesting as it was conducted with works from different disciplines and because of its low-level effect size. It was seen that a large amount of these studies from the international literature were carried out in the fields of medicine and health science. In one such study, Gilette et al. (2018) inferred that the effects of flipped learning activities on students' success were not statistically significant, while the existence of studies in the literature with high-level effect sizes like 1.06 and 1.68 has drawn attention (Hu et al., 2018; Tan et al., 2017). Likewise, Betihavas, Bridgman, Kornhaber, and Cross (2016), who systematically examined 21 articles on flipped learning usage in nursing education, concluded that flipped learning affected academic achievement in one of three experimental studies that they included in their research. No significant difference was found between the traditional method and flipped learning in terms of academic achievement in two of them. As a result of the research, it was concluded that the effect of flipped learning activities on students' success is not clear enough. However, it can be said that a medium-level effect size is a common result. In this regard, it can be said there is a similar effect in this study carried out in Turkey.

In this research, it has been seen that the variables of study type, educational level, and year do not have a significant effect on success ($p>0.05$). When the effect sizes were examined by year, newer studies had larger effect sizes, while the studies conducted with students at primary-secondary levels and with high school degrees had larger effect size averages. The nonsignificant results in terms of educational level and study type are consistent with other meta-analysis results determined in terms of educational level (Cheng et al., 2019; Val Alten et al., 2019) and publication (Lag & Sæle, 2019). On the other hand, Xu et al. (2019) inferred that there is a significant difference in favor of secondary school degree in the comparison of higher education and secondary education. Chen et al. (2018) reported a significant difference in terms of year and publication type as a result of moderator analysis limited to studies carried out at the undergraduate level in the field of health. When the significant results in the literature as a result of moderator analysis were examined, it was seen that newer research by years, articles and conference proceedings in terms of publication types, and primary and secondary school degrees had a high-level effect. Tan, Yue, and Fu (2017) concluded that there is no significant difference between the effect size of studies on flipped learning with associate degree students and the effect size of those on flipped learning with undergraduate students.

It has been seen that there was publication bias in 28 studies examining the relationship between flipped learning and success in Turkey. The final effect size value (d=0.713) reached in the research was calculated by considering the publication bias. When the bias level in the studies about the effects of flipped learning activities on success in the literature was examined, it was seen that there were biased results in the research conducted by Lag and Saele (2019). Comparing the first analysis results to the final results, a serious decrease in effect size values was observed (from d=0.35 to d=017). While in the results of the research having low-level effect size results (d=0.19) conducted by Chen et al. (2018) it was stated that there was no bias, in another study having low effect size (d=0.20) conducted by Van Alten et al. (2019) bias was reported. As a result of research having low-level effect size results (d=0.19) Chen et al. (2018) found no bias, while in by. In large effect size studies conducted by Xu et al. (2019), Hu et al. (2018), and Tan et al. (2017), the risk of low-level bias resulting from the quality of the included works (design of the research) was noted. However, statistically significant bias values were not encountered, although statistically significant bias values were found in research having very large effect size values (d=1.79) conducted by Xu et al. (2019). Meta-analysis studies have mostly reported significant results and so they are open to the risk of having publication bias as they include published studies. The low or high number of studies included in the research will not be a solution to overestimating that may occur due to publication bias. A minority or a majority of the studies included in the research cannot be the solution to the studied hypothesis because of publication bias (Nuijten et al., 2015). It has been seen that a serious difference occurs in estimating the effect size of publication bias in both this research and the literature. If the studies included in meta-analysis as in this study are not resistant to publication bias, integral secondary analysis is necessary by applying analysis techniques regarding publication bias (Augusteijn et al., 2019).

CONCLUSION AND SUGGESTIONS

This research has shown us that studies related to flipped learning model applications in Turkey reveal that flipped learning activities can contribute to the success of Turkish students. According to the international literature, the impact of the flipped learning model on student achievement has a medium effect size. In this regard, it can be said there is a similar effect in this study carried out in Turkey. In this research, it has further been seen that variables of study type, level of education, and year do not have a significant effect on success and that there has been publication bias in Turkey.

In consideration of the results of the works included in this meta-analysis and conducted within many different disciplines, the assessment types used by researchers in relation to the efficiency of the flipped learning model (information tests, skill tests, etc.) are different from each other in terms of the learning outcomes seen as students' success (cognitive, affective, etc.) and in class activities. Particularly in higher education, the effect of flipped learning activities on students' success is not completely clear yet (O'Flaherty & Phillips, 2015). However, it is clear that meta-analysis and meta-synthesis studies have important contributions to new studies. According to the results of this research, the following suggestions were developed:

1. In this study, comparisons were made over a common effect size value. Research dealing with variables such as flipped learning activities, learning outcomes, etc. can also be done. This will present a different perspective in understanding the rising effect. Also, such research will contribute to the results of in-class activities in research where flipped learning activities are carried out to be understood and the strategic approaches contributing to the students' performance in the teaching and learning process are to be realized.
2. This study examines the effect of flipped learning on only academic achievement. The effects of flipped learning on factors such as attitude, self-efficacy, and motivation can also be analyzed through meta-analysis in future studies.
3. After further studies are carried out to increase the diversity of the sample group, meta-analysis can be repeated and healthier results can be obtained regarding the results of the effect size of the sample group's education level.
4. A meta-analysis study can be carried out with studies investigating the impact of the flipped learning model on academic achievement outside of Turkey and the results can be compared with this study.

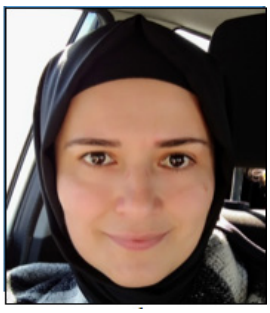
BIODATA and CONTACT ADDRESSES of AUTHORS

Dr. Mustafa AYDIN is an Assistant Professor at Ahmet Kelesoglu Faculty of Education, Necmettin Erbakan University. He completed the PhD requirements the curriculum and instruction program. He has been teaching Curriculum Development, Teaching Principles for the last 10 years. His areas of interest include large-scale assessments, literacy, needs analysis, curriculum and instruction. He has over than 15 journal articles published in national and international indexes, 2 international book chapters, a book and other national and international articles, papers submitted to international meetings.

Mustafa AYDIN
Department of Educational Sciences, Ahmet Kelesoglu Faculty of Education
Address: Necmettin Erbakan University, 42090, Konya, Turkey
Phone: +90 332 323 82 20 (ext. 5685)
E-mail: maydin@erbakan.edu.tr

Dr. Burcu OKMEN graduated from Mehmet Akif Ersoy University English Language Teaching department in 2012. Between 2013 and 2015, she completed her master's degree in Duzce University, Curriculum and Instruction department. In 2020, she gained her Ph.D. degree at the same university and in the same field. She has been working as an English teacher in Duzce since 2012. Her academic interest areas are English teaching, program development, needs analyses, values education, student-centered education, instructional models. She has a book, 21 national and international articles, and 10 papers submitted to international meetings.

Burcu OKMEN
Ministry of Education
Address: Sehit Yalcin Guzeler Middle School, 81100, Duzce, Turkey
Phone: 05557021616
E-mail: burcuokmen91@hotmail.com



Dr. Seyma SAHIN graduated from Ankara University Department of Landscape Architecture in 1998 and from Ankara University, Faculty of Theology in 2012. Between 2013 and 2015, she completed her master's degree in Duzce University, Curriculum and Instruction department. In 2020, she gained her Ph.D. degree at the same university and in the same field. She has been working as a Religious Culture and Moral Knowledge course teacher since 2014. Her academic interest areas are program development, needs analyses, democracy, values education, student-centered education, instructional models. She has a book, 27 national and international articles, and 14 papers submitted to international meetings.

Seyma SAHIN
Ministry of Education
Address: Konuralp Middle School, 81100, Duzce, Turkey
Phone: 05063860194
E-mail: seyymasahin@gmail.com

Dr. Abdurrahman KILIC is a Professor at the Curriculum and Instruction department at the Education Faculty of Duzce University. He gained his Ph.D. degree in the field of Curriculum and Instruction at Hacettepe University in 2000. He became an associate professor in 2009 and a professor in 2014. His academic interest areas are program development, needs analyses, democracy, values education, student-centered education, instructional models. He has 3 books, 2 book chapters, over 60 national and international articles, and so many papers submitted to international meetings.

Abdurrahman KILIC
Educational Sciences, Faculty of Education
Address: Duzce University, 81100, Duzce, Turkey
Phone: 05554430300
E-mail: abdurrahmankilic@duzce.edu.tr

REFERENCES

Acarol, K. (2019). A study on the effectiveness of flipped learning model. *Science Journal of Turkish Military Academy, 29*(2), 267-295.

Augusteijn, H. E., Van Aert, R., & Van Assen, M. A. (2019). The effect of publication bias on the Q test and assessment of heterogeneity. *Psychological methods*, 24(1), 116.

Avci, U., Usluel, Y. K., Kurtoglu, M., & Uslu, N. (2013). Yeniliklerin benimsenmesi surecinde rol oynayan degiskenlerin betimsel tarama yontemiyle incelenmesi. *Pamukkale Universitesi Egitim Fakultesi Dergisi*, *33*(33), 53-71.

Baepler, P., Walker, J. D., & Driessen, M. (2014). It's not about seat time: Blending, flipping, and efficiency in active learning classrooms. *Computers & Education,* 78, 227–236.

Baker, J. W. (2000). "The 'classroom flip': Using web course management tools to become the guide by the side," *11th International Conference on College Teaching and Learning*, Jacksonville, Florida, United States.

Barak, M., & Shakman, L. (2008). Reform based science teaching: Teachers' instructional practices and conceptions. *Eurasia Journal of Mathematics, Science & Technology Education, 4,* 11-20.

Begg, C. B., & Mazumdar, M. (1994). Operating characteristics of a rank correlation test for publication bias. *Biometrics, 50*(4), 1088-1101.

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

Betihavas, V., Bridgman, H., Kornhaber, R. & Cross, M. (2016). The evidence for 'flipping out': A systematic review of the flipped classroom in nursing education. *Nurse Education Today, 38*, 15–21.

Borenstein, M., Hedges, L. V., Higgins, J. P. T., & Rothstein, H. R. (2009). *Introduction to meta-analysis.* USA: John Wiley & Sons, Ltd.

Boyraz, S. (2014). Ingilizce ogretiminde tersine egitim uygulamasinin degerlendirilmesi (Yayinlanmamis yuksek lisans tezi). Afyon Kocatepe Universitesi Sosyal Bilimler Enstitusu, Afyonkarahisar.

Bozkurt, A., & Ucar, H. (2018). Flipped classroom 2.0: Producing and synthesising the knowledge. *Journal of Qualitative Research in Education, 6*(3), 143-157.

Chen, K. S., Monrouxe, L., Lu, Y. H., Jenq, C. C., Chang, Y. J., Chang, Y. C., & Chai, P. Y. C. (2018). Academic outcomes of flipped classroom learning: a meta-analysis. *Medical education, 52*(9), 910-924.

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, 67*(4), 793-824.

Cho, B., & Lee, J. (2018). A meta analysis on effects of flipped learning in Korea. *Journal of Digital Convergence, 16*(3), 59-73.

Cakir, E., & Yaman, S. (2018). The effect of flipped classroom model on students' science success and computational thinking skills. *GEFAD/GUJGEF,* 38(1), 75-99.

Cetinkaya, M. (2017). Designing and applying web assisted activities to be used in flipped classroom model. *International Journal of Evaluation and Research in Education, 6*(2), 128-137.

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

Dincer, S. (2014). *Egitim bilimlerinde uygulamali meta-analiz.* Ankara: Pegem Akademi.

Donovan, J. D., & Lee, S. Y. (2015). How we flipped: Student and instructor reflections of a flipped-class model in a sensory evaluation laboratory course. *NACTA Journal, 59*(4), 335-342.

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,* 455-463.

Egger, M., Smith, G. D., Schneider, M., & Minder, C. (1997). *Bias in meta-analysis detected by a simple, graphical test.* BMJ, 315, 629-634.

Ekmekci, E. (2014). *Harmanlanmis ogrenme odakli tersten yapilandirilmis yazma sinifi modeli* (Yayimlanmamis doktora tezi). Gazi Universitesi, Egitim Bilimleri Enstitusu, Ankara.

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

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.

Flumerfelt, S., & Green, G. (2013). Using lean in the flipped classroom for at risk students. *Educational Technology and Society, 16*(1), 356-366.

Green, T. (2015). Flipped classrooms: An agenda for innovative marketing education in the digital era. *Marketing Education Review, 25*(3), 179–191.

Grover, K., & Stovall, S. (2013). Student-centered teaching through experiential learning and its assessment. *NACTA Journal*, *57*(2), 86.

Hamdan, N., McKnight, P., McKnight, K., & Arfstrom, K. M. (2013). *The flipped learning model: A white paper based on the literature review titled a review of flipped learning.* Arlington, VA: Flipped Learning Network.

Harvey, S. (2014). The "flipped" latin classroom: A case study. *Classical World, 108*(1), 117–127.

Hattie, J. (2012). *Visible learning for teachers: Maximizing impact on learning.* Routledge.

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.

Higgins, J., & Green, S. (2011). *Cochrane handbook for systematic reviews of interventions* (Version 5.1.0). The Cochrane Collaboration. Available from www.cochrane-handbook.org.

Hu, R., Gao, H., Ye, Y., Ni, Z., Jiang, N., & Jiang, X. (2018). Effectiveness of flipped classrooms in Chinese baccalaureate nursing education: A meta-analysis of randomized controlled trials. *International Journal of Nursing Studies*, 79, 94-103.

Karagol, I., & Esen, E. (2019). The effect of flipped learning approach on academic achievement: A meta-analysis study. *Hacettepe University Journal of Education*, *34*(3), 708-727. doi: 10.16986/HUJE.2018046755

Karasar, N. (2015). *Bilimsel arastirma yontemleri.* Ankara: Nobel.

Kilic, A., Aydin, M., Sahin, S., Okmen, B. (2019). *Kuramdan uygulamaya ihtiyac belirleme.* Ankara. Pegem Kitabevi

Lag, T., & Sæle, R. G. (2019). Does the Flipped Classroom Improve Student Learning and Satisfaction? A Systematic Review and Meta-Analysis. *AERA Open, 5*(3), 2332858419870489.

Margulieux, L. E., McCracken, W. M., and Catrambone, R. 2015. Mixing In-Class And Online Learning: Content Meta-Analysis Of Outcomes For Hybrid, Blended, And Flipped Courses. In O. Lindwall, P. Hakkinen, T. Koschmann, P. Tchounikine, & S. Ludvigsen (Eds.) *Exploring the Material Conditions of Learning: The Computer Supported Collaborative Learning (CSCL) Conference*, 220-227.

Marlowe, C. A. (2012). *The effect of the flipped classroom on student achievement and stress* (Unpublished master dissertation). Montana State University, Bozeman, Montana.

McCallum, S., Schultz, J., Sellke, K., & 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.

Moravec, M., Williams, A., Aguilar-Roca, N., & O'Dowd, D. K. (2010). Learn before lecture: A strategy that improves learning outcomes in a large introductory biology class. *CBE-Life Sciences Education, 9*(4), 473-481.

Mueller, M., D'Addario, M., Egger, M., Cevallos, M., Dekkers, O., Mugglin, C., & Scott, P. (2018). Methods to systematically review and meta-analyse observational studies: A systematic scoping review of recommendations. *BMC Medical Research Methodology 18*(44), 1-18.

Nuijten, M. B., van Assen, M. A., Veldkamp, C. L., & Wicherts, J. M. (2015). The replication paradox: Combining studies can decrease accuracy of effect size estimates. *Review of General Psychology, 19*(2), 172-182.

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.

Orhan, A. (2019). The Effect of Flipped Learning on Students' Academic Achievement: A Meta-Analysis Study. Cukurova *University Faculty of Education Journal*, 48(1).

Orhan, D., Kurt, A. A., Ozan, S., Vural, S. S., & Turkan, F. (2014). Ulusal egitim teknolojisi standartlarina genel bir bakis. *Karaelmas Egitim Bilimleri Dergisi, 2*(1), 65-79.

Oyman N., Orkun, S., & Turan, S. (2013). Egitimde yeni bir donusum: Z kusagi. *Marmara Universitesi 8. Ulusal Egitim Yonetimi Kongresi*, Istanbul.

Ozpinar, I., Yenmez, A., & Gokce, S. (2016). An application of flipped classroom method in the instructional technologies and material development course. *Journal of Education and Training Studies, 4*(12), 213-226.

Pinnelli, S., & Fiorucci, A. (2015). University and flipped learning Tic & Dil project: Framework and design. *12th International Conference on Cognition and Exploratory Learning in Digital Age,* Italy.

Reyna, J. (2015). Active learning and the flipped classroom. *Training & Development*, 30-31.

Ritchie, J., Lewis, J., & Elam, G. (2003). Designing and selecting sample. In J. Ritchie & J. Lewis (Eds.), *Qualitative research practice: A guide for social science students and researchers* (pp. 77-108). London: Sage.

Russo, M. W. (2007). How to review a meta-analysis. *Gastroenterol Hepatol,* 3(8), 637–642.

Saglam, D., & Arslan, A. (2018). The effect of flipped classroom on the academic achievement and attitude of higher education students. *Journal of Education,* 8(4), 170-176.

Sarigoz, O. (2017). An analytical study related learning with flipped classroom model. *Mustafa Kemal University Journal of Social Sciences Institute, 14*(38), 1-11.

Sariyer, D. (2015). Z kusagi nasil olacak?. *Ulastirma ve Iletisim Dergisi*, 80.

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

Shelby, L. B., & Vaske, J. J. (2008). Understanding meta-analysis: A review of the methodological literature. *Leisure Sciences,* 30(2), 96-110.

Sirakaya, D. A., & Ozdemir, S. (2018). The effect of a flipped classroom model on academic achievement, self-directed learning readiness, motivation and retention. *Malaysian Online Journal of Educational Technology, 6*(1), 76-91.

Staton-Spicer, A., & Wulff, D. (1984). Research in communication and instruction: Categorization and synthesis. *Communication Education, 33,* 377-391.

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

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.

Tan, C., Yue, W. G., & Fu, Y. (2017). Effectiveness of flipped classrooms in nursing education: Systematic review and meta-analysis. *Chinese Nursing Research, 4*(4), 192-200.

Tania, H. M., Julio, S. M., Fulgencio, M. M., & Juan, B. (2006). *Assessing heterogeneity in meta-analysis: Q statistic or I2 index?.* CHIP Documents, 19, 1-38.

Tetreault, P. L. (2006). *The flipped classroom: Cultivating student engagement* (Unpublished master dissertation). University of Victoria, Kanada.

Topal, A., & Akhisar, U. (2018). Effect of flipped learning approach on academic achievement of students: Application of microprocessor/microcontroller II course. *Kocaeli University Journal of Education,* 1(2), 135-148.

Tufanaru, C., Munn, Z., Stephenson, M., & Aromataris, E. (2015). Fixed or random effects meta-analysis? Common methodological issues in systematic reviews of effectiveness. *International Journal of Evidence-Based Healthcare, 13*, 196–207.

Tutal, O. ve Yazar, T. 2017. Ters-Yuz Sinif Yaklasiminin Akademik Basariya Etkisi: Bir Meta-Analiz Calismasi. *5th International Curriculum and Instruction Congress* Mugla, Turkiye.

Van Alten, D. C., Phielix, C., Janssen, J., & Kester, L. (2019). Effects of Flipping the Classroom on Learning Outcomes and Satisfaction: a Meta-Analysis. *Educational Research Review*, *28*.

Xu, P., Chen, Y., Nie, W., Wang, Y., Song, T., Li, H., ... & Zhao, L. (2019). The effectiveness of a flipped classroom on the development of Chinese nursing students' skill competence: A systematic review and meta-analysis. *Nurse education today, 80*, 67-77.

Westermann, E. B. (2014). A half-flipped classroom or an alternative approach?: Primary sources and blended learning. *Educational Research Quarterly*, *38*(2), 43-57.

Whitman Cobb, W. N. (2016). Turning the classroom upside down: Experimenting with the flipped classroom in American government. *Journal of Political Science Education, 12*(1), 1-14.

Wu, H. W., & Li, C. W. (2015). The research of effectiveness of blending flipped classroom mode and service learning to core capability training. 6th Annual International Conference on Computer Science Education: Innovation & Technology, Singapore.

Zappe, S., Leicht, R., Messner, J., Litzinger, T., & Lee, H. (2009). "Flipping" the classroom to explore active learning in a large undergraduate course. *American Society for Engineering Education Annual Conference and Exhibition.*

THE SATISFACTION LEVEL OF UNDERGRADUATE SCIENCE STUDENTS TOWARDS USING E-LEARNING AND VIRTUAL CLASSES IN EXCEPTIONAL CONDITION COVID-19 CRISIS

Dr. Ali Khaled BAWANEH
ORCID: 0000-0002-0507-1743
Deanship of Academic Development
Imam Abdulrahman Bin Faisal University
Eastern Province, SAUDI ARABIA

Received: 01/04/2020 **Accepted:** 28/05/2020

ABSTRACT

The study aimed at investigates the science students' satisfaction level of using e-learning and virtual classes in exceptional condition COVID-19 Crisis, in light of three demographic variables: students' specialization, educational level, and GPA. The population consisted of all science students (Physics, Chemistry, Biology, and Mathematics) in the college of science at a university from Eastern Province, Saudi Arabia. The sample comprised of 116 science students. The researcher developed a questionnaire and verified its validity and reliability for collecting data. Some statistical analyses such as mean, standard deviations, and ANOVA tests were conducted to analyze the questionnaire. The results indicated that the satisfaction level of using e-learning and virtual classes by science students is medium in general but with varying degrees from one item to another. The results did not show significant statistical differences at the level ($\alpha = 0.05$) of the use of e-learning and virtual classes for all independent variables: students' specialization, educational level, and GPA. The study included several recommendations; the most important of which is the necessity of providing infrastructure in the university (all colleges) concerning e-learning and educational technology, providing training programs for all university professors and students on how to use e-learning efficiently to boost their competences and skills in utilizing these innovative models.

Keywords: COVID-19, satisfaction level, e-learning, virtual classes, science students.

INTRODUCTION

Education today has become a continuous and endless process. Therefore, it was necessary to work on transforming teaching methods to meet expectations and maintain the continuity of the educational process (Zydney, McKimmy, Lindberg, & Schmidt, 2019). Learning that initially relied on face-to-face educational environments is now being carried out in an environment driven by computers and digital technologies (Koller, Ng, Do, & Chen, 2013).

The demand for virtual education is growing more today than ever before (Lakhal, Bateman, & Bedard, 2017). Today one can hardly find a student or teacher who does not use or know how to use the available virtual learning programs (Koller, Ng, Do, & Chen, 2013). Some research that focused on learning through virtual learning environments has shown that university heads and faculty see this type of education as a way to reach a larger number of students (Zydney, et al., 2019). However, professors suffer a heavy workload due to high expectations from students who have expressed on the other hand that they appreciate the opportunity offered by virtual learning environments (Cain, Bell, & Cheng, 2016; Cain, 2015), where education is carried out in a manner that is more independent from the constraints of time and space, and away from traditional education on campus, and they are looking for better educational quality for study programs that use the Internet being less quality (Lakhal, De Sherbrooke, & Bateman, 2017).

In the virtual learning environment, learners see more opportunities to connect with professors than in traditional classrooms (Olt, 2018). Hundreds of years ago, the first president of the University of Chicago, William Rainer Harper, said:

"The student who prepared a certain number of lessons through methods similar to what happens in school knows about the topics related to the lessons and can handle those lessons, better than the student who is retired in the classroom." (Nicholas V. Longo. (2007): P37)

With great technical progress and the spread of the Internet at competitive prices, Internet-based education is rapidly developing in universities all over the world (Zydney, et al., 2019; Marshall, 2018; McSweeney, 2010). Higher education institutions are constantly seeking to employ new technologies to become more productive, to manage their development strategies, in addition to effectively rebuilding the curriculum to meet the diverse needs and expectations of students and involve students in learning (Lakhal, De Sherbrooke, & Bateman, 2017; Ramsey, Evans, & Levy, 2016; Cain, Bell, & Cheng, 2016).

E-learning is not only an alternative that is resorted to in times of hardship (Cain, 2015). But rather the principle is that it is seen as a basis of the foundations and pillars of education systems in our countries and that it is employed in a manner that ensures the achievement of the educational return, especially at a time when educators are busy achieving new starting points such as the role of education in achieving sustainable development and implementation of ambitious visions of countries (Raes, Detienne, Windey, & Depaepe, 2019; Lakhal, De Sherbrooke, & Bateman, 2017).

In times of crises and hardships, all hands and minds rush to search for alternatives in all fields to overcome these crises and avoid their damages, and education is one of the most important of these areas (Ozgur, 2015; Tami, 2016). Perhaps what is happening today in the world from the spread of viruses and pandemic prompted many governments to stop studying in educational institutions to protect? the learners and the instructors (Kyungmee, 2020). To prevent this harm, several voices called for searching for alternatives that the learning process can continue taking into consideration the dimension and circumstance that the world lives in today, and many opponents of e-learning are convinced that it is the best solution to this crisis (Kyungmee, 2020).

Today, we live in a state of dismay at the spread of Coronavirus in the world. This has led to the disruption of all life in societies, including education and higher education. Countries and educational systems resorted to activating e-learning and virtual classes in completing the rest of the curricula and thinking about effective, enjoyable and practical mechanisms in providing curricula, in addition to thinking about making the final evaluation of students automatic and in a manner that achieves the public interest in achieving the intended learning outcomes (MIT Technology Review, 2020). Where people interested in academic affairs note that the spread of the Coronavirus has made e-learning and virtual classes more prevalent and practiced, and has pushed traditional academics and decision-makers to seriously consider the importance of activating this type of teaching and learning after years of neglect and default, and making it a basic educational pattern alongside the prevailing pattern applicable in normal circumstances (Bawaneh, 2020; MIT Technology Review, 2020).

According to the statistics of the United Nations Educational, Scientific and Cultural Organization (UNESCO) and to preserve the safety of students and teaching staff, more than 61 countries in the world have closed their schools and universities in specific regions or throughout the country and transferred to digital and electronic education for more than 421.4 million students in the world, including (1620491) University student in the Kingdom of Saudi Arabia. The Saudi government authorities announced the closure of universities from March 9, 2020, until further notice (MIT Technology Review, 2020).

Hence, this study came to find out the degree of satisfaction of students of the College of Science at Imam Abdulrahman Bin Faisal University in the Eastern Region of the Kingdom of Saudi Arabia on activating e-learning and teaching methods, direct and indirect virtual classes in providing academic content. Teaching and learning practices at Imam Abdulrahman Bin Faisal university mainly depend on the conventional method, although some courses are offered by employing technology like e-learning, and virtual classes that are embedded within the blackboard. Although the university has been heading for several years to automate the majority of the courses in different colleges, to achieve the goal to make the e-learning a basic pattern alongside regular education. In general, the study aimed to answer the following questions:

1. What is the satisfaction level of the college of science students at Imam Abdulrahman Bin Faisal University towards the use of e-learning and virtual classes in their learning?
2. Do the science students at Imam Abdulrahman Bin Faisal University satisfaction level differ about the use of e-learning and virtual classes in their learning according to their specialization, educational level, and GPA?

Objectives of the Study

Measuring the degree of satisfaction of students of the College of Science at Imam Abdulrahman Bin Faisal University about activating e-learning and virtual classes.

Disclosing the presence of statistically significant differences for the satisfaction of students of the College of Science at Imam Abdulrahman Bin Faisal University regarding the activation of e-learning and virtual classes with different variables (Specialization, Academic Level, and GPA).

Operational Definitions

E-learning

One of the modern learning methods that provide educational content with a variety of modern electronic media such as the computer, the Internet, the university's academic electronic portal (Blackboard-Learning Management System) and virtual classes that facilitate the process of communication between professors and students, between students themselves and between students and the university; further, it includes simultaneous and asynchronous meetings, multiple media: voice/audio, image, graphics, and electronic libraries, to communicate information to the learner in the best, fastest, least effort consumption and most beneficial way. Further, it promotes students' self-learning and gives freedom in time and space to parties to the educational learning process. Because of the Corona epidemic that sweeps the whole world and the effect of preventing students and teachers from going head-to-head/face-to-face at Imam Abdulrahman Bin Faisal University, the university has to provide the content of science courses for all courses electronically.

Virtual Classes

An online educational technology that provides a highly interactive classroom environment; allowing learners to engage with meetings; ask questions, whether using written or audio windows; receiving direct responses to these inquiries; conducting discussions; uploading files and other reception; assigning students to manage the classroom and practice discussion processes with their colleagues, and implementing many activities with the efficiency of the classroom without the need for physical presence in the classroom.

Satisfaction Level

What students of the College of Science at Imam Abdulrahman Bin Faisal University feel, accept and level of happiness of the expected performance towards the use of e-learning and virtual classes at the time of the Corona crisis, which was measured through the questionnaire that the researcher prepared for this purpose.

Context of the Study

Place Boundaries

Imam Abdulrahman Bin Faisal University – Dammam, Eastern Province, Saudi Arabia

Human Frontiers

College of Science – This collage included Female students only.

Time Limits

The second semester of the academic year 2019/2020.

Situational Boundaries

The spread of the Corona pandemic COVID-19.

LITERATURE REVIEW

Some educators object to e-learning on the pretext of poorly adjusting its tools accurately compared to traditional learning, but the follower of the e-learning journey realizes that the more technology and Internet tools and technologies develop the more the educational employment develops to serve learning goals (Cain, Bell, & Cheng, 2016; Zydney, et al., 2019; Ramsey, Evans, & Levy, 2016; Tami, 2016).

The control of teaching and attendance operations and the processes of simultaneous and synchronous interaction became widely available in the learning management systems (LMS) efficiently and easily (Lakhal, De Sherbrooke, & Bateman, 2017; Bateman, 2017), in addition to the means of controlling the electronic evaluation processes remotely in a way that fulfills the expectations of those in charge of achieving the principle of measurement and evaluation without cheating or Fraud (Cain, Bell, & Cheng, 2016; Zydney, et al., 2019; Ramsey, Evans, & Levy, 2016). Control and regulating procedures are still ongoing and have criteria that achieve real learning outcomes (Raes, et al., 2019).

Here, it must be noted that LMS can manage the educational institution and the teaching-learning processes in a coordinated and largely disciplined manner; and enable students to interact and perform all learning tasks interactively (Zydney, et al., 2019; Alshorman and Bawaneh, 2018). Through Content Management Systems (CMS), various educational resources can be arranged and organized in a way that can help the university faculty and the learner achieve distinctive educational goals (Alshorman and Bawaneh, 2018).

Many tools, applications, and technologies can be employed such as virtual learning: augmented reality, mixed reality, virtual learning environment, personal learning environments (PLEs), and learning platforms for online courses available via the Internet MOOCs; in addition to employing motivational Gamification and Interactive video, as well as artificial intelligence, which is expected to play a big role soon, in addition to many other educational technology developments that are developing rapidly related to the development and acceleration of the spread of digital technology (McSweeney, 2010; Annelies et al., 2020).

Benefits of a Virtual Classroom

Many researchers and those interested in the educational technology (Walden University, 2020; Lakhal, De Sherbrooke, & Bateman, 2017; Bateman, 2017; Cain, 2015; Raes, et al., 2019) have pointed out many of the benefits of e-learning and virtual classes, summarized as follows:

1. **Access to coursework from anywhere at any time.**

   A student has the freedom to study and complete his lessons 24/7 from anywhere and at any time that suitable for the busy schedule. All you need is a laptop or another smart device. Once you log in to the student portal, you can access assignments, send homework, cover faculty presentations, join classmates' discussions, do research, communicate with your teacher and classmates, get assistance, receive feedback, and access test grades.

2. **Combination of structure and freedom.**

   Coursework built on a structure of weekly assignments and due dates that you have to meet, like an online test; posting homework, articles, and projects; watching a faculty presentation; or participating in a student portal discussion. You are free to choose a suitable time to participate that aligns with your schedule.

3. **Management your time effectively**

   E-learning provides a rich environment for working adults who need to balance work and family with the new demands of going back to university

4. **Expanded world view**

   Attract students around the world; bring diversity perspectives from different cultures.

5. **Asynchronous discussions with classmates**

   Students can attend class from anywhere, participating in discussions, adding posts, submitting lessons, and working perfectly.

6. **Immediate feedback on tests**

   You don't have to worry and wait for days for test results. You take your tests online, and they are usually scored when you finish. You can quickly see where you did well and where you need development.

7. **Sharpened digital skills**

   While increasing your knowledge and skills in your area of study, you'll also enhance your digital skills on the most updated online learning technology.

Kind of Technologies Using in E-Learning and Virtual Classes

A recent survey on the use of learning technologies highlighted a range of technologies in use in higher education institutes in the region. These included:

1. Audio/Podcasting (Voice Recorders)
2. Video (Video Conferencing, Echo360)
3. Collaborative Learning Tools (Blogs, Voting Tools)
4. Resource Development Tools (Articulate, Wimba Create)
5. Web Tools (YouTube, Delicious)
6. SMART Technologies (Interactive Whiteboards)
7. Assessment Tools (Moodle, Blackboard)
8. Synchronous Learning Tools (Breeze, Blackboard)
9. Portfolio Tools

Some Reasons for Using E-Learning and Virtual Classes

McSweeney (2010) mentioned the facilities for how it is easy to use the e-learning and educational technologies in teaching and learning like:

1. Ease of setting up the environment
2. Ease of connection and enter the room.
3. Ease of participant's communication.
4. Ease of sharing documents.
5. Ease of collaboration.
6. Ease of recording and archiving the classes.
7. Customization of the interface.

Regarding the study of the effect of e-learning and virtual synchronous or asynchronous on student achievement and determining their attitudes towards them in various courses, several studies (Ozgur, 2015; Miltiadou & Savenye, 2003; Wang & Newlin, 2012; Glenda, Joslyn, & Mariel, 2019) found that e-learning and virtual classes are effective in enhancing students' achievement, increasing their motivation and self-confidence, and enhancing communication skills with colleagues and professors. These studies also praised the importance of re-sending the registration for the concurrent virtual class as it allows students to refer to it many times at the appropriate time and place for them; this increases students' understanding of the content and improves their attitudes towards learning in general. This is confirmed by several studies, including (Abu Aqel, 2012; Trotter, 2007; Al-Shammari, 2007), as they emphasized that e-learning improves university students' learning of science courses, with the emergence of statistically significant differences between males and females in favor of females, this may be caused by the commitment of females in the home more, and their interest in the study is superior to that of males. On the other hand, Al-Huthaifi's (2008) study of the effectiveness of e-learning did not improve the students' attitudes towards learning. Recently, Alakharas (2018) studied the effect of e-learning on student achievement in mathematics compared to the usual method. The findings indicated the positive impact of e-learning on students' achievement in mathematics; while the findings did not show differences due to the gender of the teacher and his/her specialization. In the same

context, AlSaedy et. al (2017) studied the effect of e-learning in teaching mathematics on achievement and student attitudes towards the course in the Sultanate of Oman. The findings of this study were in line with the Alakharas (2018) study and other studies with the positive impact of e-learning on students' achievement and enhancing their attitudes towards the course. Very recently, Annelies Raes et. al (2020) studied the effect of the use of hybrid and virtual classes on the degree of integration and interaction of students and their performance. Although the hybrid and virtual classes are promising and support student achievement, they give them flexibility and freedom to choose the time and place they prefer to attend lectures (being online). However, the findings showed that students' motivation and integration with colleagues were very little in virtual learning. This may be because the current generation is digital native, and initiative always looking for modern, fast, advanced applications that contain fun, achieve benefit and increase the interaction of all parties to the teaching-learning process. This in itself is considered by the study point of view to be one of the challenges facing the educational process.

To study the requirements and obstacles of e-learning, some researchers (Al Saif, 2009; Alshahrani, 2010) have found out the importance of e-learning despite the many administrative and teaching burdens as well as the overlap of administrative and academic burdens and the lack of opportunities to attend professional development programs for university professors about e-learning, virtual classes, and technology employment in teaching and learning. All of these factors reduce their ability and motivation to use technology in higher education.

In the same context, Tami's (2016) study came to confirm the importance of virtual university learning and showed that it is a manifestation of scientific and technological progress, as it contributes to human development. The study recommended the importance of holding training programs to enable university professors to employ e-learning and virtual classes and their tools to enhance teaching and learning.

METHOD AND PROCEDURES

To achieve the objectives of the study, the researchers followed the descriptive-analytical method.

Study Population

The population of the study is composed of all students in the college of science at Imam Abdulrahman Bin Faisal University for the academic year 2019/2020. The number of students is (2100). The study sample was selected by stratified random sampling according to the study variables. The results were analyzed in the light of the sample as shown in table (1).

Table 1. Study sample of students

Variable		Number	%
Specialization	Physics	33	28%
	Chemistry	38	33%
	Biology	37	32%
	Math	08	7%
	Total	116	100%
Edu_Level	1st Year	07	6%
	2nd Year	25	22%
	3rd Year	29	25%
	4Th Year	55	47%
	Total	116	100%
GPA	Excellent	28	24%
	V. good	57	49%
	good	26	23%
	Less than good	5	4%
	Total	116	100%

Table (1) shows that the sample included 116 students, 33 of which are Physics, 38 Chemistry, 37 Biology, and 08 Mathematic students. They were distributed over the four years by 06%, 22%, 25%, and 47%, respectively. As regards GPA, they represent 24% from the excellent level, 49% from the very good level, 23% from the good level, and only 04% from the less than good level. The decrease in the response rate to the questionnaire may due to the coincidence of the data collection period with the mid-term test, the presence of many researchers collecting data for different research purposes as well as students' anxiety and fear of the epidemic.

Instrumentation

The researcher reviewed the theoretical literature related to teaching and e-learning that employs the e-learning and virtual classes. He elaborated on the research instrument according to the Likert Scale with six levels (strongly agree, agree, slightly agree, slightly disagree, disagree, strongly disagree). The tool aimed at measuring the satisfaction level of science university students towards the use of e-learning and virtual classes in students' learning.

Validation of the Instrument

To check the validity of the research instrument, the initial version was consisting of 32 items validated by six experts who are members of the teaching staff (three of them in science education, two in educational technology, and one in psychology) at Imam Abdulrahman Bin Faisal University. Some items were deleted, and the wording of several items as amended. The number of items in the developed version was 27.

Reliability of the Instrument

To calculate the reliability of the instrument, the researcher applied the tool one time only for 35 science students from the Deanship of preparatory year and supporting studies. Then, he calculated the Cronbach Alpha coefficient, the reliability coefficient was 0.86. This value was considered acceptable in the social sciences to achieve the purpose of the current study (Obiedat et al., 2016; Al-Kellani; and Al-Shraifeen, 2011).

Statistical Standard

The following equation was adopted for paragraphs classification (Al-Rashidi, 2018; Bawaneh, & Moumene, 2020).

= (Upper limit of scale - minimum scale) / number of required categories

= (6 – 1)/ 3

= 1.67

The categories are (1 - 2.67: Weak (W), 2.68 – 4.35: Medium (M), and 4.36 – 6.0: Strong (S)).

RESULTS

To answer the first question of the study: "What is the satisfaction level of the college of science students at Imam Abdulrahman Bin Faisal University towards the use of e-learning and virtual classes in their learning?" The researcher calculated the Mean and the standard deviation of the instrument items prepared for this purpose, and the results were cast on Table (2).

Table 2. Means, SD, and the Category for all instrument items (N=116)

No	Items	Mean	SD	Category
1.	I love learning via the computer and the internet	4.15	1.16	M
2.	I think knowledge of e-learning skills and virtual classes is necessary for every student	5.08	0.94	S
3.	E-learning lectures and virtual classes save my time and effort	4.33	1.50	M
4.	I think e-learning and virtual classes motivate me to think creatively	2.96	1.66	W
5.	Feel enjoying learning through e-learning and virtual classes	3.75	1.59	M
6.	I think e-learning and virtual classes give me more self-confidence	3.85	1.64	M
7.	E-learning and virtual classes develop my research and investigation skills	4.37	1.47	S
8.	Using e-learning and virtual classes is a suitable solution at a time of the pandemic	5.43	1.01	S
9.	Using e-learning and virtual classes help with self-learning in science	4.49	1.26	S
10.	I prefer using e-learning and virtual classes in normal circumstances	3.62	1.60	M
11.	Using e-learning and virtual classes help in learning scientific concepts	3.80	1.43	M
12.	Using e-learning and virtual classes help in cooperative learning (groups)	3.31	1.57	M
13.	Using e-learning and virtual classes develop my ability to solve problems	3.98	1.42	M
14.	Learning through e-learning and virtual classes increase the interaction between the student and the instructor	3.32	1.63	M
15.	E-learning and virtual classes do not take into account the diversity among learners (individual differences, patterns of thinking, motivation, ...)	4.27	1.36	M
16.	I think that learning with conventional teaching methods gives better results than e-learning and virtual classes	4.67	1.36	S
17.	I think e-learning and virtual classes limit freedom of thinking	3.72	1.37	M
18.	The use of e-learning and virtual classes adds a new burden to students	3.98	1.55	M
19.	E-learning and virtual classes weaken social cohesion among students	4.31	1.44	M
20.	I do not feel comfortable assigned to a job/assignment through e-learning and virtual classes	3.73	1.69	M
21.	Regular learning methods are preferred over e-learning and virtual classes	4.36	1.44	S
22.	I don't trust e-learning and virtual classes	3.42	1.51	M
23.	I am concerned and afraid of e-learning and virtual classes	3.43	1.53	M
24.	I believe the money spent on e-learning and virtual classrooms being wasted	2.51	1.34	W
25.	The large number of courses offered by e-learning and virtual classes increased my anxiety, tension, and fear over my results	4.56	1.46	S
26.	I have a real conviction of the usefulness of e-learning and virtual classes	4.25	1.20	M
27.	I need training programs to help me use e-learning systems and virtual classes efficiently	3.48	1.55	S
	(Overall)	**3.97**		**M**

The results on Table (2) show that the Mean for the students of the science college is generally (3.97), this shows that their satisfaction level towards using the e-learning and virtual classes in learning was Medium. And when we look to the Category for all instrument items, we can see that there are 8 items strong, 17 items with 63% Medium, and only two out of 27 items were weak. The highest Mean is 5.43 corresponding to the eighth item, which indicates that using e-learning and virtual classes is a suitable solution at a time of the pandemic. This was followed directly by the items number two and sixteen with a calculation Mean of 5.08, and 4.67 respectively. The second item indicates that the students think the knowledge of e-learning skills and virtual classes is necessary for every student, whereas item sixteen indicates that the students prefer the conventional teaching methods comparative with the e-learning and virtual classes.

However, the twenty-fourth item came in the last order in terms of the calculation Mean of 2.51. This item addresses that the money spent on e-learning and virtual classrooms being wasted. This followed by item number four with a Mean of 2.96, which shows learning by using e-learning and virtual classes did not enhance creative thinking. These results support each other.

To answer the second question: "Do the science students' at Imam Abdulrahman Bin Faisal University satisfaction level differ about the use of e-learning and virtual classes in their learning according to their specialization, educational level, and GPA?" The researcher calculated the statistical Means and standard deviations associated with the independent variables as shown in Table (3).

Table 3. Means and standard deviations of students' satisfaction level towards e-learning and virtual classes

Variable		Mean	SD
Specialization	Physics	4.03	0.477
	Chemistry	3.90	0.510
	Biology	3.96	0.465
	Math	4.05	0.716
	Total	3.97	0.499
Edu_Level	1st Year	4.11	0.303
	2nd Year	4.01	0.578
	3rd Year	3.90	0.628
	4Th Year	3.96	0.403
	Total	3.97	0.499
GPA	Excellent	3.97	0.637
	V. good	3.94	0.413
	good	3.93	0.406
	Less than good	4.45	0.837
	Total	3.97	0.499

Table (3) refers to the calculation Mean and standard deviations of students' satisfaction towards using the e-learning and virtual classes according to the variables: specialization, educational level, and GPA.

We find a difference in the calculation Mean between students' specialization. Where the calculation Mean of math students is the highest with 4.05 and the standard deviation is 0.716. Whereas the lowest mean is 3.90 for Chemistry students with a standard deviation of 0.510. The results showed that the Mean of the students in the first year level was the highest among all the educational level with a Mean of 4.11 and a standard deviation of 0.303. The 2nd year scored 4.01 with a standard deviation of 0.578. The lowest Mean 3.90 was attributed to the 3rd year students with a standard deviation of 0.628.

Regarding the satisfaction of students' use of e-learning and virtual classes according to their GPA, Table (3) indicates that the category of students with less than good is the most satisfaction group towards the use of the e-learning and virtual classes with Mean of 4.45 and a standard deviation of 0.499. Yet, the satisfaction of the good and very good categories was the lowest with Mean of 3.93, and 3.94 respectively, and a standard deviation of 0.406, and 0.413. By reading the above results, we find that there are apparent differences in the calculation Mean of the satisfaction level of the science students at Imam Abdulrahman Bin Faisal University according to the variables of specialization, educational level, and GPA. To ascertain the validity of the differences, the researcher performed the ANOVA analysis, and the results were presented in Table (4).

Table 4. ANOVA test of students' satisfaction level towards e-learning and virtual classes

	Sum of Squares	df	Mean Square	F	Sig.
Specialization					
Between Groups	.392	3	.131	0.517	0.672
Within Groups	28.340	112	.253		
Total	28.732	115			
Educational Level					
Between Groups	.339	3	.113	0.446	0.721
Within Groups	28.393	112	.254		
Total	28.732	115			
GPA					
Between Groups	1.226	3	.409	1.665	0.179
Within Groups	27.506	112	.246		
Total	28.732	115			

Table (4) shows that there are no statistically significant differences for all the independent variables in the current study: students' specialization, educational level, and their GPA on the satisfaction level towards the use of e-learning and virtual classes. The statistical significance values at ($\alpha = 0.05$) were (0.672, F = 0.517), (0.721, F= 0.446), and (0.179, F= 1.665) respectively.

DISCUSSION

To answer the findings of the first question, which states "What is the satisfaction level of the college of science students at Imam Abdulrahman Bin Faisal University towards the use of e-learning and virtual classes in their learning?" The average satisfaction level for students of the College of Science at Imam Abdulrahman Bin Faisal University about e-learning and virtual classes is (3.97). This can be explained that this type of learning has come as an appropriate solution at an exceptional time to provide the remaining courses, postpone them, or cancel the entire semester. Therefore, the efforts of students and instructors are kept from the beginning of the semester. This was confirmed by many students in their tweets on social media, thanks to the efforts made by the university and the great eagerness to present the courses continuously and with high professionalism, smoothness, and organization.

At the same time, this type of learning did not meet with sufficient acceptance and did not meet the expectations and needs of students; as they are used to direct face-to-face learning; conducting operations in laboratories; cooperative work; and direct discussion with colleagues and the professor; in addition to peer learning. On the other hand, the emergence of infrastructure-related problems with e-learning requirements such as increased demand on the Internet and pressure on the university network, which faces difficulty in accessing virtual hours at times. Furthermore, learning has become essentially dependent on students, which requires more duties along with multiple courses, and a shortage of time led to a decline in the level of students' satisfaction with e-learning. Moreover, the psychological state of students should be taken into consideration due to the fear of infection with the COVID-19, and concern about the mechanisms of evaluation using the calculation of their grades. This is confirmed by many students in their tweets on social media regarding their concerns about the evaluation of their learning, the mechanisms for providing various tests, as well as a large number of burdens and duties.

E-learning and virtual classes deal with all spectrums of students with the same mechanism. Some students may not like to learn using technology while others are willing and constantly seek to use technology in their learning. This is in addition to the differences between the level of faculty members' mastery of technology; diversification of activities; and learning aids that may help students learn; such as videos, analogy, some modern applications that use brainstorming, structural evaluation, dry laboratories, and others.

All of the above can be considered as an explanation of the average level of students' satisfaction with the use of e-learning and virtual classes in their learning, and this, of course, reflects the high responsibility of students in the exceptional conditions and their respect of the efforts of the university in overcoming the difficulties and obstacles that face this type of learning, and facilitating students' access to the university's learning platforms, and obtaining their right to learn appropriately to achieve the learning outcomes as in normal circumstances.

By reviewing student tweets on social media regarding e-learning, we find different opinions. Some students complain about the weakness of the Internet and the great pressure on the Internet, which prevents attending lectures and virtual classes. Some of them say the voice is not clear at all. Some also say that the explanation is not clear, and that many subjects – in physics, chemistry, and biology - need laboratories and practice. This is in addition to the fact that many students are very concerned about the final exam, and they hope that it will be in the normal way instead of online tests. On the other hand, we find some students thanking the university for its great efforts in providing all the necessary electronic services to continue their teaching and describe the services as world-class. They also thank the efforts of the instructors and the Deanship of E-Learning and Distance Learning for the great efforts, day and night, to overcome difficulties and facilitate students' learning.

This result supported by many types of research that targeted the students' attitudes and satisfaction levels about using technology and blackboard in teaching and learning (Ozgur, 2015; Miltiadou & Savenye, 2003;

Wang & Newlin, 2012; Glenda, Joslyn, & Mariel, 2019; Abu Aqel, 2012; Trotter, 2007; Al-Shammari, 2007).

To answer the second question of the study which states "Do the science students' at Imam Abdulrahman Bin Faisal University satisfaction level differ about the use of e-learning and virtual classes in their learning according to their specialization, educational level, and GPA?". The findings showed that there are no statistically significant differences in the level of satisfaction level of students of the College of Science at Imam Abdulrahman Bin Faisal University about e-learning and virtual classes attributed to all the independent variables of the study: scientific specialization (physics, chemistry, biology, and mathematics), academic level (first year, second, third, and fourth-year), and GPA (excellent, very good, good, less than good). This can be attributed by many reasons, the most important of which are:

1. All members of the study sample from the College of Science and the programs in this college (physics, chemistry, biology, and mathematics) programs are fairly close with some minor differences. Where the requirements and needs of students related to content coverage. For achieving some of them and decreasing others were the same for everyone, therefore, no differences with statistical significance appear.
2. Students' way of thinking is close (from one college), and their technical information and dealings with technology are also close.
3. According to the system and rules at the University of Imam Abdulrahman Bin Faisal, the acceptance and admission criteria apply to everyone/ candidates, hence, all students who join the College of Science have similar characteristics when entering the college. During their studies in the various departments in the college, changes occur in maturity, and the acquisition of knowledge and skills, however, they did not rise to make significant differences in their level of satisfaction with the use of e-learning and virtual classes in the exceptional time represented by the spread of the pandemic COVID-19.
4. E-learning and virtual classes were applied to everyone suddenly, and in the same circumstance, which is the spread of the pandemic COVID-19, although there was a previous application of technology and e-learning from some professors to some courses at different levels even they were individual experiences.
5. Lack of experience for most of the students, regardless of specialization, academic level and GPA in how to use e-learning and virtual classes. This, of course, puts all students at the same level of contentment.
6. All students have the same concerns and anxieties because of the required tasks, duties, and projects to complete different requirements as well as grades at the end of the semester.

The findings of this study are consistent with the results of some studies (Abu Aqel, 2012; Trotter, 2007; Al-Shammari, 2007; AlSaedy et. al., 2017; Alakharas, 2018; Annelies Raes et. al., 2020). They also differ from the findings of the study of Al-Huthaifi's (2008) and Annelies Raes et. al (2020).

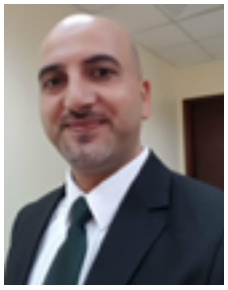
CONCLUSION

The current study aimed to measure the level of satisfaction of students of the College of Science at the University of Imam Abdulrahman Bin Faisal towards the use of e-learning and virtual classes in the exceptional circumstance, which is the spread of the pandemic COVID-19, this led to a decision to convert all teaching and learning activities and practices into electronic. The average students' satisfaction level towards using e-learning and virtual classes was Medium, and there were no statistically significant differences due to the difference in specialization, academic level, and GPA. Furthermore, many problems are accompanying this procedure; the most important of which is the weakness of the Internet and the difficulty of accessing the virtual classes; the large number of burdens required from students and instructors; and the lack of familiarity of students with this type of learning, in addition to anxiety and fear of the disease and its impact on the psychological status of students, their academic performance and their achievement of success in the courses of the semester.

Recommendations

1. Accrediting higher education institutions (universities) for e-learning along with conventional education
2. Providing infrastructure in the university (all colleges) concerning teaching and e-learning.
3. Providing training programs for all faculty members at the universities on how to use e-learning efficiently.
4. Training students at the university during the preparatory year period on the mechanisms of using e-learning and employing technology in learning.
5. Conducting various studies on the effectiveness of e-learning on student learning from the viewpoint of students, professors, challenges, and solutions mechanisms.

BIODATA and CONTACT ADDRESSES of AUTHOR



Dr. Ali Khaled BAWANEH is an Assistant Professor in the Deanship of Academic Development, Imam Abdulrahman Bin Faisal University. Dr. Bawaneh gained his Ph.D in Curriculum and Instruction/Science Education at Augest, 2011. He has achieved the status of Fellow (FHEA) based on UK Standerds Framework for teaching and learning. Dr. Bawaneh Certified as a Senior Trainer. His academic interest areas are teaching principles and methods, curriculum development, teacher training, misconceptions in science, teaching and learning, academic profisional development, educational technology. He has over than 23 journal articles published in international indexes, one international book and other national and international articles, papers submitted to international meetings.

Ali Khaled BAWANEH
Deanship of Academic Development
Address: Imam Abdulrahman Bin Faisal University
P.O. Box 10674, Dammam 31443,
Eastern Province, Saudi Arabia
Phone: +966595636690
E-mail: akbawaneh@iau.edu.sa; akbawaneh@gmail.com

REFERENCES

Abu Aqel, W. (2012). The effect of using e-learning in teaching science on academic achievement for Al-Quds Open University students. Palestinian Journal of Open Education, 3(6), 115-138.

Al-Akharas, Y. (2018). The Impact of the Application of e-Learning Strategy on Academic Achievement in Mathematics in Basic Grades in the Capital Governorate From the Perspective of Teachers of Mathematics, Dirasat: Educational Sciences, 45(4), 70-80.

Al-Kellani and Al-Shraifeen. (2011). Introduction to research in education and social sciences. Third Edition, Dar Al Masirah for Publishing, Distribution, and Printing. Amman, Jordan.

Al-Huthaifi, K. (2008). The effect of teaching electronically on students' achievement, mental ability, and attitude science of the 9th Grade students, Journal of educational sciences, King Saud University, 20(3), 675-715.

Al-Rashidi, F. (2018). The level of using the reflective practices among secondary school teachers-from their points of view- in the Baredah governorate. Journal of Faculty for Basic Education in Educational and Human Sciences / Babel University, April (38), 284-294.

Al-Saedy, M., Alkahaly, Kh., Alpraky, M., Albloshy, A., & Alkhrousy, H. (2017). The Effect of e-Learning in Teaching Mathematics on Academic Achievement and Attitude towards the Subject for Grade 5 Students in the Sultanate of Oman, International Journal of Educational Specialist. 6(4), 227-239.

Al Saif, M. (2009). The availability of the e-learning competencies, challenges, and methods of development from the viewpoint of faculty members in the College of Education at King Saud University, unpublished master's thesis, College of Education, King Saud University, Saudi Arabia.

Al-Shahrani, N. (2010). The demands of using e-learning in teaching natural sciences in higher education from specialists, unpublished Ph.D. thesis, College of Education, Umm Al-Qura University, Saudi Arabia.

Al-Shammari, M. (2007). The effect of using integrated learning in teaching geography on the attainment and attitudes of middle school students in Hafar Al-Batin Governorate. Ph.D. thesis, University of Jordan, Amman, Jordan.

Al-Shorman, B., & Bawaneh, A. (2018). Attitudes of Faculty Members and Students towards the Use of the Learning Management System in Teaching and Learning. The Turkish Online Journal of Educational Technology, 17 (3), 1-15. https://files.eric.ed.gov/fulltext/EJ1184192.pdf.

Annelies, R., Pieter, V., Marieke, P., Ine, W., Wim, V., & Fien, D. (2020). Learning and instruction in the hybrid virtual classroom: An investigation of students' engagement and the effect of quizzes. Computers & Education. https://doi.org/10.1016/j.compedu.2019.103682.

Bawaneh, A. (2020). Science Teachers' Satisfaction Level of Professional Development Programs in Enhancing their Teaching Practices. Talent Development & Excellence, 12, (3s), 1848-1865.

Bawaneh, A. K., Moumene, A. B. H., & Aldalalah, O. (2020). Gauging the Level of Reflective Teaching Practices among Science Teachers. International Journal of Instruction, 13(1), 695-712. https://doi.org/10.29333/iji.2020.13145a.

Cain, W. (2015). Technology navigators: An innovative role in pedagogy, design, and instructional support. In P. Redmond, J. Lock, & P. Danaher (Eds.). Educational innovations and contemporary technologies: Enhancing teaching and learning (pp. 21–35). UK: Palgrave Macmillan.

Cain, W., Bell, J., & Cheng, C. (2016). Implementing robotic telepresence in a synchronous hybrid course. Proceedings - IEEE 16th international conference on Advanced learning technologies, ICALT: Vol. 2016, (pp. 171–175). https://doi.org/10.1109/ICALT.2016.79.

Glenda, K., Joslyn, H., & Mariel, P. (2019). Virtually connected. International Teacher Magazine (IMT). It was accessed on 20/03/2020. https://consiliumeducation.com/itm/2019/06/22/virtually-connected/.

Koller, D., Ng, A., Do, C., & Chen, Z. (2013). Retention and intention in massive open online courses: In-depth. Educause Review. Retrieved from http://er.educause.edu/articles/2013/6/retention-and-intention-in-massive-open-onlinecourses-in-depth.

Kyungmee, L. (2020). Coronavirus: universities are shifting classes online – but it's not as easy as it sounds. It was accessed on 22/03/2020. Website link: https://theconversation.com/coronavirus-universities-are-shifting-classes-online-but-its-not-as-easy-as-it-sounds-133030.

Lakhal, S., Bateman, D., & Bedard, J. (2017). Blended synchronous delivery modes in graduate programs: A literature review and its implementation in the master teacher program. Collected Essays on Learning and Teaching, 10, 47–60. https://doi.org/10.22329/celt.v10i0.4747.

Lakhal, S., De Sherbrooke, U., & Bateman, D. (2017). The blended synchronous delivery mode in graduate programs: A literature review and its implementation in the master teacher program. Collected Essays on Learning and Teaching, 47–60. https://doi.org/10.22329/celt.v10i0.4747.

Marshall, S. J. (2018). Shaping the university of the future: Using technology to catalyze change in university learning and teaching. Retrieved from https://link.springer.com/book/10.1007%2F978-981-10-7620-6.

McSweeney, D. (2010). A framework for the comparison of virtual classroom systems. NAIRTL/ LIN Conference on Flexible Learning at the Royal College of Surgeons. Dublin, Ireland. October 2010.

Miltiadou M., & Savenye W. C. (2003). Applying Social Cognitive Constructs of Motivation to Enhance Student Success in Online Distance Education, *Educational Technology Review*, 11 (1).

MIT Technology Review. (2020). Arab countries resort to distance education to face the repercussions of the Coronavirus. It was accessed on 22/03/2020. https://technologyreview.ae/

Nicholas V. Longo. (2007). Why community matters connecting education with civic life. State University of New York Press, 194 Wahington Avenue, Suite 305, Albany, NY12110-2384.

Obiedat, D. H; Kayed, A; & Adass, A. (2016). Scientific research: understandable, tools and methods. Dar Alfiker: Publishers and distributors. Amman, Jordan.

Olt, P. A. (2018). Virtually there: Distant freshmen blended in classes through synchronous online education. Innovative Higher Education, 43(5), 381–395. https://doi.org/10.1007/s10755-018-9437-z.

Ozgur, Y. (2015). The Effects of "Live Virtual Classroom" on Students' Achievement and Students' Opinions about "Live Virtual Classroom" at Distance Education. The Turkish Online Journal of Educational Technology, 14(1).108 – 115. https://www.researchgate.net/publication/282889631.

Raes, A., Detienne, L., Windey, I., & Depaepe, F. (2019). A systematic literature review on synchronous hybrid learning: gaps identified. Accepted for publication in Learning Environments Research.

Ramsey, D., Evans, J., & Levy, M. (2016). Preserving the seminar experience. Journal of Political Science Education, 12(3), 256–267. https://doi.org/10.1080/15512169.2015.1077713.

Tami, Th. (2016). Academic Virtual Learning (Towards Virtual University). Journal of Diyala. 71, 47-68.

Trotter, A.(2007). School Subtracts Math Texts Add E-Lessons, Tests. Education Week, 26 (36) 10-11.

Walden University. (2020). Online learning has many benefits, one of which is the flexibility afforded by the virtual classroom. It was accessed on 18/03/2020. https://www.waldenu.edu/programs/resource/seven-benefits-of-a-virtual-classroom.

Wang, A. Y. & Newlin, M. H. (2012). Online Lectures: Benefits for the Virtual Classroom. T.H.E. Journal. It was accessed on 20/03/2020, http://www.thejournal.com/articles/15513.

Zydney, J. M., McKimm, P., Lindberg, R., & Schmidt, M. (2019). Here or their instruction: Lessons learned in implementing innovative approaches to blended synchronous learning. Tech Trends, 63(2), 123–132. https://doi.org/10.1007/s11528-018-0344-z.

THE IMPACT OF FLIPPED CLASSROOM APPROACH ON THE WRITING ACHIEVEMENT AND SELF-REGULATED LEARNING OF PRE-SERVICE ENGLISH TEACHERS

Dr. Ezgi Aydemir ALTAS
ORCID: 0000-0002-0460-3322
School of Foreign Languages
Yildiz Technical University
Istanbul, TURKEY

Dr. Enisa MEDE
ORCID: 0000-0002-6555-5248
Faculty of Educational Sciences
Bahcesehir University
Istanbul, TURKEY

Received: 19/12/2019 **Accepted:** 28/05/2020

ABSTRACT

The major purpose of this study is to investigate the impact of flipped classroom on pre-service English teachers' Advanced Writing achievement. The study also aims at exploring whether flipped classroom approach makes a difference, if any, on the self-regulated learning of the participants. The participants of this study were selected by convenience sampling method and consisted of fifty-five *(N=55)* pre-service ELT teachers attending Advanced Writing course and studying at English Language Teaching Department (ELT) at a foundation university in the fall semester of 2017-2018 academic year. Two intact classes were selected as control (*N=28*) and experimental group (*N=27*). The control group was exposed to traditional lecture based instruction, whereas the experimental group received the flipped classroom approach. In this quasi-experimental study, data were gathered through pre-post-tests of advanced writing and self-regulated learning scale. Mixed ANOVA analysis was used for data analysis. The obtained results demonstrated that the implementation of flipped classroom approach resulted in better writing achievement, yet self-regulated learning showed no significant difference between groups. Based on these findings, the study provides pedagogical implications and suggestions for integrating flipped classroom approach in the undergraduate programs.

Keywords: Flipped classroom approach, self-regulated learning, ELT, writing achievement

INTRODUCTION

Writing is considered as a cognitively challenging task which is not learned naturally (Pavanelli, 2018). As writing is quite complex and is affected by "layers of context", successful academic writing teaching is mainly based on a complete comprehension of the challenging nature of writing in academic settings, and considering faculty perceptions on academic writing and writing instruction shows efforts to comprehend one part of the complexity (Zhu, 2004).

However, for most Turkish foreign language learners, writing is one of the hardest skills to accomplish as they lack of adequate and necessary knowledge. They are expected to reach a proficient level of English in order to comprehend the course content in their departments and write essays at a good level. Yet, improving the writing performance of the learners is an issue for most teachers as they face problems regarding the materials, design of the course, timing, allocating time for feedback etc. Therefore, students are expected to be self-regulated learners in order to manage their own learning process, which could help both the instructor and the learners to use their time more efficiently and fulfill the necessities of the course. Lastly

and most importantly, students need to receive ample feedback regarding their writings to be able to review and reflect on their own academic writing, which also requires students to practice profoundly, collaborate with their peers, self-correct based on the reflections they receive from their teachers (Pavanelli, 2018). However, the time allocated for lecturing during the traditional lecture based instruction restricts the time that could be used for more practice and feedback, which in turn results in not being able to use the class time as efficiently as expected or desired.

Therefore, in order to eliminate such problems and improve learning process recent trends in education attempt to reinforce student-centered instruction which enables students to take control of their own learning via establishing a learning environment where they are encouraged to participate, think critically, improve their problem-solving skills, engage in various activities, work collaboratively, and form meaningful interactions rather than memorizing and being passive learners (Alsowat, 2016). Over the past two decades, there have been immense changes regarding instructional technology and how teachers perceived the role of technology in education, which enabled the teacher to allocate more time for in-class activities and use the technology to enable a supportive, manageable and personalized learning environment (Wiginton, 2013). Furthermore, considering the fact that students frequently use technology in various ways, teachers have been integrating technology into their teaching in order to keep up with the recent trends and the needs of the students. One of these technologies is the blended learning which is a combination of face-to-face and online interactions (Alsowat, 2016). Blended learning can be defined as combining face to face learning and electronic or distance learning, making use of different learning theories, methodologies and techniques in a single place and promoting learning with numerous online technologies throughout the learning process in the classroom (Rossett, Douglis, & Frazee, 2003; Singh, 2003; Neumeier, 2005). According to Rasmussen (2003), blended learning is a distance education method involving the use of technology combined with traditional education and teaching. Horton (2000) stated that "combining more strong and advantageous aspects of online learning and the learning in classroom" is the fundamental target of blended learning and it was also stated that "blended learning provides the opportunity to integrate advantages offered by online learning with the best practice and benefits of traditional learning" (Tselios, Daskalakis, & Papadopoulou, 2011, p.225) In parallel with the descriptions so far, Trinder (2012) claimed that blended learning is "a combination of face-to-face and online learning, with usually one of the two functioning as a lead mode" (p.1). However, George-Walker and Keefe (2010) argues that blended learning is beyond a simple combination of new knowledge and interaction technologies with face-to-face activities. It is rather an "organic integration of thoughtfully selected and complementary face-to-face and online approaches and technologies (Garrison & Vaughan, 2008, p. 148). In a sense, it reaps the advantages of both face-to-face and online learning environments. Therefore, it can be stated that blended learning requires a harmonized and meticulous design of teaching in order to make the best use of both traditional and online learning. In this regard, the necessity of teacher student interaction both with and without the use of technology was emphasized (Garrison & Vaughan, 2008; Tselios, Daskalakis, & Papadopoulou, 2011). Blended learning aims at enhancing student learning and promoting learner-centered paradigm (Shibley, 2014). Blended learning has gained significance considering the latest trends in education and a growing body of research comparing the differences between blended learning and traditional face-to-face instruction considering their effect on student achievement has revealed that blended instruction is quite more effective than the other one (Barkley, 2010; Condie & Livingston, 2007; Means, Toyoma, Murphy, Bakia, and Jones, 2010; Watson, 2008). Along with the latest improvements in technology, creating and streaming high definition videos via comparatively inexpensive devices through cellular and wireless networks has contributed to the development a new type of blended learning (Quint, 2015). Resulting from the increase in technology options to be integrated into education, the flipped classroom is one of the options of applying new ideas in schools and classrooms (Kenna, 2014). Flipped classroom approach is a version of blended learning and enables the use of lesson time more effectively and efficiently compared to traditional classrooms (Ucar & Bozkurt, 2018). It is quite similar to blended learning as it also consists of face-to-face and online learning, yet it is different in the way that outside activities utilized in flipped classroom can either be online or include paper and hard copy materials, which means that videos are not obligatory in flipped classrooms and the use of instructional videos does not necessarily indicate flipping a classroom (Alsowat, 2016).

The flipped classroom was called inverted classroom in the late 1900s and early 2000s, replaced what was traditionally done in the classroom with what was done at home (Lage, Platt, & Treglia, 2000; Bergmann &

Sams, 2012). One of the most extensive definitions of the flipped classroom is that students are prepared for face-to-face time via reading and watching materials before the in-class time in order to be able to use that knowledge they have gained from the materials for activities instead of explicit instruction (Quint, 2015). Emerging developments in computers and software has made it easier for instructors to record, annotate, and post video lessons online and they can carry out these tasks without needing any formal professional development or training (Wang & Reeves, 2003), and also it is quite easy and inexpensive. The videos prepared by the instructors are mostly 10-15 minutes in length and consist of images, narration, video and interactive components (Wiginton, 2013). The content provided in the video is actually the same with what they would learn in a traditional lecture classroom. Additionally, recent technologies enabled students to access the videos prepared by the instructors easily by clicking a link on a learning management system used by the school or watch them from social media websites such as YouTube® (Wiginton, 2013). For instance, Bergmann and Sams (2012) created their videos by utilizing screen-capture software and shared it with their students online or in a downloadable format for their mobile devices. As the students born in the 21st are already competent in the digital world (Barone, 2003), the use of videos prepared by the course instructor is not even crucial (Kenna, 2014) as they can also autonomously find videos and information on websites such as Google®, YouTube®, Wikipedia® (Carlisle, 2010), Khan Academy, and Ted (Tucker, 2012) themselves. Flipped classroom approach brings along various benefits. One of them is that students learn the topic at their own pace as they are able to pause and rewind the lecture videos, meanwhile search for information related to unclear and confusing parts, and gain the basic necessary fundamental knowledge about the topic to be covered in the class time (Bergmann & Sams, 2012). Additionally, the videos can be viewed by the students individual (Kenna, 2014), which promotes individualized learning. In return, it provides time for incorporating more active learning strategies into the class time (Gannod, 2007; Kellogg, 2009; Warter-Perez & Dong, 2012). In this respect, Gannod, Burge, & Helmick (2008) pointed out that the advantages of providing an online learning management system where students can access the lecture content and study it in their self-paced learning environment is that "the learner can access the information at their own pace and continually reference recorded material" (p. 779). However, in traditional classrooms, the subject is provided by the instructor in a lecture format. During the lecture, students are mostly passive learners and try to listen, take notes and learn at the same time. Additionally, courses taught via traditional methods require students to learn at the same pace with all students in the classroom regardless of their mastery (Wiginton, 2013). For some students, the topic covered in the lesson might be familiar, yet the other might have difficulty in taking in information so quickly or lack the background knowledge needed to understand the content presented (Goodwin & Miller, 2013). Due to time constraint, the practices regarding the lecture are assigned as homework. Besides, as lecturing takes up most of the class time, usually, there is not much time left for the teacher to help each student in the classroom. The situation is the same at home as there is often no one to help students to do their homework at home, which leads students to feel frustrated and fail at completing or doing their homework properly. In the end, repeated incidents such as these often causes low self-efficacy and loss of enthusiasm and effort (Bandura, 1997). Considering the mentioned problems and necessities, the reviewed literature indicated that flipped classroom approach (FCA) would be quite effective in order to improve the writing skills of the learners.

A plethora of research has been carried out regarding the implementation and efficacy of flipped classroom approach regarding various sciences (Strayer, 2007; Johnson & Renner, 2012; Szparagowski, 2014; Soliman, 2016). There is scarce research related to the implementation of flipped classroom approach in EFL education, yet there are some studies focusing on English instruction (Snowden, 2012; Baranovic, 2013; Hung, 2015; Webb & Doman, 2016) most of which are conducted in higher education (Strayer, 2007; Pierce & Fox, 2012; Ruddick, 2012; Zappe, Leicht, Messner, Litzinger Lee, 2009; Baranovic, 2013).

Ahmed (2016) for example, studied the perceptions of learners on the flipped classroom approach and its impact on their writing achievement at Qassim University. The study aimed at investigating the impact of flipped classroom approach on writing skills in English a foreign language and the attitudes of learners towards the approach. The participants consisted of 60 students: 30 for control group and 30 for experimental group. The findings from an EFL writing text and a questionnaire measuring the attitudes of learners towards the flipped classroom approach and which were both applied twice as pre- and posttests revealed that the experimental group who were taught via the flipped classroom approach outperformed the control group in the post-test of EFL writing. Additionally, the findings of the questionnaires indicated that there was a statistically significant difference between the attitudes of learners in favor of the experimental group.

In another study, Ekmekci (2017) studied the flipped writing classroom in Turkish EFL context. The study aimed at investigating the impact of flipped classroom approach on the foreign language writing skills of Turkish learners studying at a university. The study compared flipped and traditional face-to-face writing classes with regard to the writing performances of learners and applied a pre- and post-test true experimental design with a control group. The findings obtained from the pre- and posttests revealed that there was a statistically significant difference between the experimental and control groups regarding their writing performances. In other words, the learners in the flipped classroom outperformed the learners in the traditional classroom. Additionally, it was found out that most of the learners presented positive attitude towards Flipped Writing Model.

Another benefit of the flipped classroom is that students learn the topic at their own pace as they are able to pause and rewind the lecture videos, meanwhile search for information related to unclear and confusing parts, and gain the basic necessary fundamental knowledge about the topic to be covered in the class time (Bergmann & Sams, 2012). Therefore, it can be stated that learners are expected to be self-regulated learners. Self-Regulated learning (SRL) has been defined by plenty of researchers in various ways. The term became popular in the 1980s due to the emphasis put on emerging autonomy and the responsibilities to be done by students for their own learning (Bandura, 1986). The two fundamental names studying SRL to a large extent were Zimmerman and Pintrich. Zimmerman (2000) defined SRL as generating thoughts, feelings and actions which are planned and cyclically arranged in order to meet personal goals. As for Pintrich (2000), SRL meant "an active, constructive process whereby learners set goals for their learning and then attempt to monitor, regulate, and control their cognition, motivation, and behavior, guided and constrained by their goals and the contextual features of the environment" (p.453). However, little research has been conducted regarding the integration of FCA and SRL and the impact of FCA on the SRL of students (Sun, Wu, & Lee, 2017). Additionally, the findings of the relevant studies yielded inconsistent results (Cakiroglu & Ozturk, 2017; Sun et al., 2017; Elakovich, 2018; El-Senousy & Alquda, 2018).

Based on the reviewed literature and the requirements of learners and teachers, this study aims at exploring the impact of flipped classroom approach on the self-regulated learning and writing levels of pre-service English teachers. In the light of the above discussion, this study aims at investigating these research questions:

1. Is there any difference between the pre-service ELT teachers exposed to flipped classroom approach (experimental group, EG) and the ones engaged in traditional lecture-based instruction (control group, CG) in terms of their self-regulated learning?
2. Is there any difference between CG and EG in terms of their L2 Advanced Writing achievement after the implementation of FCA?

THEORETICAL FRAMEWORK OF THE STUDY

The flipped classroom differs from the traditional classroom in which the teacher provides lecture about the new topic in class and then have students comprehend their knowledge via doing assignments (Brame, 2013). In this study, FCA was implemented in an Advanced Writing course and the course was designed in accordance with Bloom's Taxonomy. The new version of Bloom's Taxonomy developed by Anderson et al (2001) is as following:

1. remembering - retrieving, recognizing, and recalling relevant knowledge from long-term memory;
2. understanding - constructing meaning from oral, written, and graphic messages through interpreting, exemplifying, classifying, summarizing, inferring, comparing, and explaining;
3. applying - carrying out or using a procedure through executing, or implementing; analyzing - breaking material into constituent parts, determining how the parts relate to one another and to an overall structure or purpose through differentiating, organizing, and attributing;
4. evaluating - making judgments based on criteria and standards through checking and critiquing; creating - putting elements together to form a coherent or functional whole;
5. reorganizing elements into a new pattern or structure through generating, planning, or producing (p. 67-68).

It is stated that applying Bloom's revised taxonomy to a flipped course increases students' learning outcomes, enables student-paced lectures, more personalized learning (Srivastava, 2014), and as passive learning (remembering and understanding) is covered through students' studying the fundamental course material provided with video lectures prior to class, students are more prepared to apply the knowledge and participate in higher-level discussions with their peers and the course instructor, which also enables them to have the support of their peers and the course instructor (Brame, 2013). In this respect, students are expected to be able to manage their own learning process, be self-regulated learners and active in the lesson.

Self-Regulated learning (SRL) has been defined by plenty of researchers in various ways. The term became popular in the 1980s due to the emphasis put on emerging autonomy and the responsibilities to be done by students for their own learning (Bandura, 1986). The two fundamental names studying SRL to a large extent were Zimmerman and Pintrich. Zimmerman (2000) defined SRL as generating thoughts, feelings and actions which are planned and cyclically arranged in order to meet personal goals. As for Pintrich (2000), SRL meant "an active, constructive process whereby learners set goals for their learning and then attempt to monitor, regulate, and control their cognition, motivation, and behavior, guided and constrained by their goals and the contextual features of the environment" (p.453). Furthermore, Hadwin (2008) described it as "deliberate planning, monitoring, and regulating of cognitive, behavioral, and affective or motivational processes toward completion of an academic task" (p.187).

Although flipped classroom approach is not a newly found concept, there is little research investigating the effect of self-regulated learning on the learners even though it is claimed to increase the motivation and self-efficacy of learners. The studies conducted mostly focus on the relationship between SRL and online learning environments. Compared to the traditional lecture classroom where there is a passive learning environment the self-directed online learning environment is claimed to foster self-regulation (Barak, 2009). Self-Regulated learning (SRL) has been defined by plenty of researchers in various ways. The term became popular in the 1980s due to the emphasis put on emerging autonomy and the responsibilities to be done by students for their own learning (Bandura, 1986). The two fundamental names studying SRL to a large extent were Zimmerman and Pintrich. Zimmerman (2000) defined SRL as generating thoughts, feelings and actions which are planned and cyclically arranged in order to meet personal goals. As for Pintrich (2000), SRL meant "an active, constructive process whereby learners set goals for their learning and then attempt to monitor, regulate, and control their cognition, motivation, and behavior, guided and constrained by their goals and the contextual features of the environment" (p.453). Furthermore, Hadwin (2008) described it as "deliberate planning, monitoring, and regulating of cognitive, behavioral, and affective or motivational processes toward completion of an academic task" (p.187).

Despite the diverse perceptions of researchers regarding the explanations of SRL, the theories rely on three common features. First, SRL requires deliberate use of particular processes, strategies or replies, by students in order to develop their academic success (Zimmerman, 2001). In other words, students are expected to be aware of the potential benefits of self-regulation processes in improving their academic success (Abd Majid, 2007). Secondly, as the practice of SRL involves the need for self-oriented feedback (Abd Majid, 2007), SRL involves a cyclical process of feedback in which students participate in observing how effective the strategies they use while learning are and the various ways they respond to feedback (Almazloum, 2018). These strategies include time, the study environment, the place where they study, and asking for help from peers and teachers. Thirdly, self-regulation of motivation for selecting certain SRL strategies and the rationale behind the choice of students is a common feature of SRL (Almazloum, 2018). Additionally, Zimmerman (2001) stated that it is necessary for students to have extra time to prepare, to participate in tasks, and they need struggle with adequately satisfying outcomes in order to self-regulate their learning process.

Flipped classroom is stated to be quite beneficial (Kellogg, 2009; Warter-Perez & Dong, 2012); however, little research has been conducted regarding the integration of FCA and SRL and the impact of FCA on the SRL of students (Sun, Wu, & Lee, 2017). Additionally, flipped classrooms are regarded as more self-centred as students practice autonomy and manage their own responsibilities, especially in asynchronous learning environments (Artino, 2008). It was also claimed that as self-regulated learners are efficient in time and space management, observing their learning process and analyzing their own curricular or extracurricular learning outputs, enhancing their engagement in the class via discussion, analysis, synthesis, and problem solution, FCA model can be used profoundly in these contexts (Cigdem, Ozturk, & Topcu, 2016). In parallel with this

statement, it was also claimed that via forming the temporal "space" for metacognition FCA could improve self-efficacy and motivation (Hewitt et al., 2014) and that the temporal space provided by the flipped video content urges learners to reflect on and self-evaluate their learning process, which can be interpreted as FCA supplies an environment useful for metacognition, a fundamental component of SRL (Zimmerman, 1990). In fact, Strayer (2012) deduced that learners in a flipped classroom become more conscious about their own learning process compared to learners in a traditional lecture classroom.

Control over learning is a requirement of SRL (Bergamin, et al., 2012). In this respect, it was pointed out that students consider the control over learning that occurs due to the flexibility provided by FCA quite beneficial (Cole & Kritzer, 2009; Hewitt et al., 2014). In addition, FCA is claimed to increase student motivation (Hewitt et al., 2014), which is a crucial element of SRL, (Zimmerman, 1990) and their self-confidence. Self-confident students are also expected to have stronger self-efficacy perceptions, which promotes motivation in turn and perhaps the most significant factor ensuring valuable outputs (Nodoushan, 2012).

As for the perceptions of students, it was found out that students preferred implementing SRL strategies in online learning environments compared to the traditional learning setting (Lee & Tsai, 2011). In this respect, Liaw and Huang (2013) investigated how satisfied students were regarding online learning contexts (i.e. acceptance of system and feeling of comfort utilizing system) and how it affected SRL. The findings revealed that SRL in online contexts was perceived as satisfying by learners; in other words, the attitudes of students about online settings had an impact on their learning behaviours.

In this respect, it can be concluded that applying Bloom's taxonomy to a flipped course is expected to increase self-regulated learning of students as passive learning (remembering and understanding) is provided through video lectures and students are able to acquire the knowledge by watching the videos at their own pace, as many times they need or want. Furthermore, FCA enhances active learning stages of Bloom's taxonomy (applying, evaluating, reorganizing) as students are required to participate in higher-order thinking tasks such as analysis, synthesis, evaluation, and reflection through various activities done in the classroom (Tabrizi & Rideout, 2017).

In this course, the lower-order thinking skills, which also comprise passive learning stages (remembering and understanding) of Bloom's taxonomy, are provided via video lectures that students watch prior to class (Sams & Bergmann, 2013). In other words, remembering and understanding skills are completed out of the classroom without teacher supervision, and students can watch the video lectures at their own pace and as many times as they want or need to remember information and understand the concepts (Eppard & Rochdi, 2017). As for analyzing and applying skills, the students apply the information and concepts by working collaboratively with their peers or with the help of their teacher. Lastly, for evaluating and creating, the higher order thinking skills, students can still work collaboratively, yet they are expected to complete the tasks individually and accurately in the end (Eppard & Rochdi, 2017). Therefore, the video lectures which consisted of explanations related to essay writing rules and strategies corresponded to the lower-order thinking skills, and the higher-order thinking skills (applying, analyzing, evaluating, creating) were carried out in the classroom through pair work, discussions, group work, exercises, writing essays, etc.

In this study, flipped advanced writing course aims at teaching pre-service English teachers to learn fundamental essay writing rules through video lectures. Additionally, it aims at enabling participants to engage in higher-level discussions, write meaningful and accurate essays in a structured way by using the knowledge they have gained, participate in classroom discussions, and get assistance from their peers and the course instructor in the classroom. In this respect, considering the aims of the course, Bloom's taxonomy integrated flipped classroom approach was preferred for the design of the course.

METHOD

This study adopted a pretest-posttest quasi-experimental design. As the participants were purposefully chosen, quasi-experimental research was chosen. According to Johnson and Christensen (2004) the aim of a quasi-experimental research design is to discover whether an intervention has the expected impact on a study's participants.

Participants

The participants of this study consisted of fifty-five (N=55) pre-service ELT teachers attending Advanced Writing course and studying at English Language Teaching Department (ELT) at a foundation (non-profit, private) university in the fall semester of 2017-2018 academic year. Advanced Writing course is a compulsory course required by the Council of Higher Education for English Language Teaching departments. The course consists of four hours in total (two hours theory, two hours practice) per week and lasts 14 weeks in both fall and spring terms. This course aims at providing students with the fundamental writing skills they need to undertake academic work at a university successfully.

The first day of the first week, the instructor asked all the students to attend the class on Monday and announced them that the course will be run on two days: Monday and Friday, and that the students were going to be randomly divided into two groups, experimental (EG) vs control (CG). The group on Monday was identified as the CG and the one on Friday as the EG. Simple random sampling was preferred in order to provide each participant equal chance to be in the classroom where a new approach would be carried out. Furthermore, the instructor of the study also participated by reflecting on the process, her teaching and application of the flipped classroom approach. Whereas, the EG was expected to watch the videos uploaded on ItsLearning every Tuesday morning before coming to the classroom on Friday and the CG was expected to do their homework before coming to the classroom on Monday. For the CG, the instructor focused on providing the content and doing as much practice as she could in the classroom and the practice left was given as assignment. As for the EG, the instructor focused on doing the practice, guiding learners, and facilitating collaborative work in the classroom. Demographic characteristics of the participants are given in Table 1:

Table 1. Distribution of participants regarding their age, gender and educational background

	Overall	
Gender	N	%
Female	40	73
Male	15	27
Total	55	100
Age		
18	14	25
19	22	40
20	12	22
21	5	9
22	2	4
Educational Background		
Attended Prep. Class	28	51
Did Not Attend Prep Class	27	49
Total	55	100
State Primary School	43	78
Private Primary School	12	22
Total	55	100
State Secondary School	34	62
Private Secondary School	21	38
Total	55	100
State High School	32	58
Private High School	23	42
Total	55	100

Data Collection and Analysis

In order to gather the necessary data for the study, two quantitative data collection instruments were utilized: Self-Regulated Learning Scale adopted from the study of Erdogan and Senemoglu (2016) and writing pre- and post-tests.

As one of the aims of this study was to find out whether the application of flipped classroom approach had any effect on the self-regulated learning levels of the participants, self-regulation in learning (SSRL) was conducted. The scale was adopted from the study carried out by Erdogan & Senemoglu (2016) and it aimed at developing and validating a scale on self-regulation in learning. This scale was preferred due to its convenience for university level students and its detailed items questioning self-regulated learning and considering it from various angles. The scale consisted of two main parts: self-regulated learning skills/ strategies and motivational dimension. The first part included 3 subheadings, which are before study, during study and after study. In the "before study part" goal setting and planning, and environmental structuring skills were investigated. As for the "during study part", the items studied organization and transforming, seeking information, rehearsing and memorizing, keeping record and self-monitoring, seeking peer, teacher or adult assistance, and reviewing skills. Lastly, "after study part" questioned self-evaluation and self-consequences skills. Additionally, motivational dimensions of the scale consisted of five subheadings, which are self-efficacy, goal-orientations, task value, attributions for failure, and anxiety. The questionnaire consisted of 67 questions with 5-point Likert-type response format. The participants were asked to evaluate themselves between (1) corresponds exactly and (5) does not correspond at all. The questionnaire was administered to the students as pre-test in the second week of the term and as post-test at the end of the term. The questionnaire was pilot tested in the first week of the term with 10 students in order to measure the reliability of the questionnaire items. Cronbach's alpha coefficiency test was conducted and it was measured .881. Therefore, it can be concluded that the items were statistically reliable to be administered to pre-service ELT teachers (Ary, Jacobs, Sorenson, & Walker, 2013).

This study aimed at investigating the impact of FCA on the writing achievements of the participants. Therefore, two different writing exams were conducted. The first one, the pre-test, was conducted in the first week of 2017-2018 academic year spring term, and the post test was administered in the last week of the spring term. Both exams were prepared by the instructor and the researcher following the objectives of the course and the materials used in the lesson. Although the essay types and topics of the exams differ, both writing parts required being able to follow the rules of writing a proper and meaningful essay and apply the correct structure in accordance with the type of the essay. The writing part included a few topics and the students were asked to choose one of the topics provided and write an essay based on the type they are asked to and in both exams, the writing sections were graded out of 50.

The treatment process started in the spring term. The participants were divided into two groups: Experimental Group (EG) and Control group (CG). The EG were taught via Flipped Classroom Approach, which meant watching the video lessons prepared shared and reading the articles or texts if shared any by the instructor before coming to the lesson each week. The students were supposed to follow ItsLearning regularly as the video lessons, texts and announcements were shared via this learning management system. The instructor and the researcher worked together each week in order to prepare the PowerPoint providing the lecture content each week. Additionally, they prepared the questions that they would embed in the video via using EdPuzzle. The instructor recorded the screen of her laptop while narrating the PowerPoint via Camtasia, uploaded the video to EdPuzzle and embedded the questions in the video, and finally shared it on ItsLearning 5-6 days before the lesson each week. All the participants were required to watch the videos regularly prior to class in order to come to the class having acquired the knowledge. Therefore, as the researcher and the course instructor aimed at increasing the video viewing rates of the participants, they checked the data obtained through EdPuzzle at the end of the term. The analysis of the data obtained from EdPuzzle yielded that 85% of the pre-service English teachers watched the videos. As for the in-class practice, the exercises of each topic were covered during the in-class hours in the classroom. During this whole process, implementing the stages of Bloom's Taxonomy was cared. As for the CG, the lecture was provided in the classroom and the instructor did as much practice as she could during the lesson hour and the rest was given as homework to the students. Especially, essay writing parts were not covered in the classroom due to time constraints and students wrote their essays at home as homework.

In the treatment process, firstly, to measure the impact of FCA on students' Advanced Writing skills, the writing exam was conducted in the first week of the second term as pre-test. Additionally, in the first week of the term, the researcher pilot tested the self-regulated learning scale with 10 (N=10) randomly selected students from both groups in order to ensure the reliability of the items. Cronbach's alpha coefficiency test results with a .881 score indicated that the items were reliable. Therefore, the scale was administered in the second week to the participants as pre-test. The scale was transferred to google forms and the shareable link was uploaded to ItsLearning, and the participants were asked to complete it until the next lesson. In the last week, the participants were asked to complete the self-regulated learning scale again as post-test. The questionnaire was prepared via google forms and the link was shared on ItsLearning. The instructor asked the students to fill in the questionnaire until final exam. And lastly, in the last week, the final writing exam was administered as post-test.

As for the data analysis, in this study, the quantitative data which were collected via Advanced Writing test scores, and Self-Regulated Learning scale were analyzed by means of SPSS 23 (Statistics Package for Social Sciences) data analysis program. In order to determine the significance level of pre-tests and post-tests, ANOVA was utilized to analyze whether there was statistically significant difference regarding the data. The significance level was accepted as $p<0.05$ in this study and comments and discussions on the findings of the study were carried out based on this significance level. In order to analyze quantitative data, descriptive statistics were conducted using SPSS 23 (Statistical Package for the Social Sciences) and ANOVA was applied to compare pre-post advanced writing exam scores and self-regulated learning scores between and within groups. The level of significance for the statistical analyses was accepted as .05.

The Scale

In order to conduct a study with reliable findings, ensuring reliability and validity are fundamentally significant for a researcher (Ary et al., 2010). Creswell (2012) defined validity as "the development of sound evidences to demonstrate that the test interpretation of (scores about the concept or construct that the test is assumed to measure) matches its proposed use" (p.159).

In the present study, the data collection instruments were the self-regulated learning scale and the advanced writing pre- and post-tests. First of all, the writing part was evaluated based on a rubric and answer key prepared by the instructor and was graded by the researcher and the instructor of the course. The average score coming from both raters were accepted as the grade, which enabled more reliable interpretation. When reliability is concerned, "the effect of error on the consistency of scores" was taken into consideration (Ary et al., 2010, p. 237). The main issues leading to scoring reliability concerns are random errors, which are the results of "the individual being measured, the administration of the measuring instrument, and the instrument" (p. 237). As the tests were conducted and scored by the same instructor and the researcher, it can be put forward that administration of measuring the instrument did not lead to any error. Furthermore, the exams were shown to two other instructors who run this course in the previous years in order to contribute to the face validity of the questions. As for the self-regulated learning scale, a pilot study was conducted for each before the treatment to check their reliability scores, which were found to be .884 and .881 respectively and were high enough to consider them as reliable tools (Gliem & Gliem, 2003).

Validity needs to be supported with reliability which is an indicator of how stable and consistent the data collection tools are. Mertler and Charles (2005) stated that there were two sides of experimental validity: internal and external validity. Internal validity indicates to what extent a study can make inferences about the causal relationship between dependent and independent variables. Additionally, Jiménez-Buedo & Miller (2010) stated that "if an experiment is not internally valid, then, we cannot say that the treatment given in the experiment is the cause of the effect we observe" (p. 301). The major threats to internal validity are history, testing, maturation, selection bias and unstable instrumentation (Mertler & Charles, 2005). In this study, in order to eliminate the history effect, the pre-post tests were administered to both groups simultaneously. Additionally, testing effect was defined as the effect of pre-test results on the post-test results (Jha, 2014), which increases due to the time interval between the pre and posttests. Additionally, the risk of testing effect has been taken into consideration as there was a 12-week interval between the utilization of pre-tests and post-tests. Most importantly, the essay types asked in the pre-test and post-test were utterly

different from each other as the writing achievements of the learners were assessed before and after the treatment. As for the risk of maturation effect, since the students were between 17-22 years old and were all university students at a private university, it was at minimum level. Lastly, the levels of the experimental and control groups were almost equal, which also assisted in establishing a high external validity in this study. However, the sample size being quite small has an impact on the external validity, which makes it hard for the results of the study to be generalized.

Significance and Limitations

Although the use of technology in the classrooms has increased in recent years, many instructors tend to integrate technology into their teaching without truly understanding the effect of it, the need for it and failing to consider whether it will meet the needs of the students and the course and have a positive impact on the attitudes, level of achievement and learning experience of the learners.

Considering the tendency to integrate technology into teaching, research on flipped classroom approach has gained significance in recent years. However, it was noticed that the results does not show a consistent increase in student academic growth. While some studies have indicated that computer-assisted instruction leads to academic growth (Engin & Donanci, 2014; Farah, 2014; Ahmed, 2016) the research exploring the academic growth of students provided with flipped teaching strategy has shown inconsistent results (Finkel, 2012; Heredia, 2015; Cashin, 2016). Additionally, studies on the effect of flipped teaching strategy are scarce (Findlay-Thompson & Mombourquette, 2014), especially in the field of English language teaching at undergraduate levels. However, the majority of recent studies focusing on the effect of flipped teaching strategy with regard to the writing performance of students are in favor of flipped teaching strategy and attribute the increase of the achievement scores to flipped classroom approach when compared to traditional lecture-based teaching strategy (Baranovic, 2013; Farah 2014; Leis, Cooke, & Tohei, 2015; Ekmekci, 2014).

This study will offer a new perspective by expanding the conducted studies on the use of flipped classroom approach in order to improve the advanced writing performance and self-regulated learning levels of pre-service ELT teachers provided within Turkish setting. Furthermore, this study will contribute to the implementation of flipped teaching strategy in foreign language schools, undergraduate and graduate level schools. Lastly, it will be guidance to the teachers, administrators and schools willing to apply flipped classroom approach in their classrooms and schools.

Although the study has achieved its objectives thanks to detailed and thorough data collection and analysis procedure, some limitations with regard to its implementation should also be considered. Firstly, the amount of data was sometimes insufficient to reach concrete arguments. For instance, the test data collected to compare the EG and CG in terms of their advanced writing achievement scores could have been supported with their portfolio grades, yet some of the pre-service teachers in the CG did not submit their essays, the researcher lacked the data necessary to make a proper comparison. In that case, the study could provide more comprehensive results. To prevent this case, pre-service teachers might have been informed about the significance of their portfolios in terms of their grading process and warned to bring them on time. Moreover, the number of participants was small (N=55). With a larger number of participants, a higher external validity and more reliable results could be ensured and the study could be more generalizable. Additionally, the study was conducted with only pre-service ELT teachers in a foundation university and examined one course only. The results might show difference if the study is applied in another university, specifically a state university or in higher grades or if the flipped classroom approach was implemented in another course, which would also increase the external validity of the study. Lastly, some of the participants in the control group might have had the chance to access the videos and watch them, which might have a negative impact on the comparative analysis of the study. Therefore, the findings of this study should be considered as suggestive rather than conclusive, and attempts should be made to replicate and expand these findings into further research in the field.

FINDINGS

This chapter presents the findings of this study which aimed at investigating the effect of FCA on the writing levels, self-regulated learning levels of pre-service English teachers. The following sections will provide the detailed results of quantitative data respectively.

Finding about Detailed Writing Scores

The following section demonstrates advanced writing achievement of the control and experimental groups. A comparative analysis was made and the between-group statistics were displayed to discover whether there was a difference between the writing achievement scores of the groups due to the different teaching methods: traditional and flipped.

According to the rubric, the essays of the learners were analyzed regarding six main categories: 1) Introduction & Thesis Statement, 2) The Body, 3) Conclusion, 4) Coherence & Cohesion, 5) Vocabulary, and 6) Mechanics and Use of English (punctuation, spelling, capitalization, grammar). The learners who fulfilled the necessities of each category well received max 9 points for the first three categories, and max 8 points for the 4th and 5th categories, and lastly max 7 points in the 6th category, which in total made 50 if a learner fulfilled all the requirements of a well-organized essay based on the rubric.

Table 2 displays that there is statistically significant difference between the groups with regard to the pre and post-tests of the writing part in the exams ($p=0.05$, $\eta_p^2= .071$). Therefore, it can be stated that flipped classroom had a positive impact on the writing achievement of the experimental group. Additionally, based on the findings, it could be interpreted that both groups made progress in the post-test (CG: M=35.74, SD= 13.84 / EG: M=40.53, SD= 8.75) compared to the pre-test (CG: M= 34.07, SD= 9.71 / EG: M= 37.96, SD= 9.07).

Table 2. Comparison of writing achievement with mixed ANOVA

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Between Groups						
Group (CG/ EG)	518.427	1	518.427	4.033	.050*	.071
Error	6812.537	53	128.538			

*Note. *p<.05, **p<.01*

Furthermore, table 3 displays that there is statistically significant difference between the groups with regard to the pre (CG: M=6.07, SD=1.96 / EG: M=6.82, SD= 2.03) and post-test scores (CG: M=5.40, SD=2.20 / EG: M=7.14, SD= 1.93) of the introduction part in the exams ($p=0.005<0.05$, $\eta_p^2= .108$). Therefore, it can be stated that flipped classroom had a positive impact on the writing achievement of the experimental group.

Table 3. Comparison of introduction part writing achievement with mixed ANOVA

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Between Groups						
Group (CG/ EG)	42.366	1	42.366	8.510	.005*	.108
Error	263.853	53	4.978			

*Note. *p<.05, **p<.01*

As for the body part of the participants' essays, table 4 presents that there is statistically significant difference between the groups with regard to the pre (CG: M=5.92, SD=2.14 / EG: M=6.78, SD= 2.18) and post-tests scores (CG: M=5.92, SD=2.36 / EG: M=7.10, SD= 1.37) of the body parts in the exams (p=0.019<0.05, η_p^2= .080), which can be interpreted as the positive impact of FCA on the writing achievement of the experimental group.

Table 4. Comparison of body part writing achievement with mixed ANOVA

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Between Groups						
Group (CG/ EG)	28.630	1	28.630	5.858	.019*	.080
Error	259.043	53	4.888			

*Note. *p<.05, **p<.01*

According to table 5, it can be stated that there is statistically significant difference between the groups with regard to the pre (CG: M=5.92, SD=1.96 / EG: M=6.53, SD= 1.97) and post-test scores (CG: M=5.96, SD=2.32 / EG: M=7.10, SD= 1.31) of the conclusion part in the exams (p=0.029<0.05, η_p^2= .070), which can indicate that FCA has a positive impact on the writing achievement of the experimental group.

Table 5. Comparison of conclusion part writing achievement with mixed ANOVA

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Between Groups						
Group (CG/ EG)	21.143	1	21.143	5.013	.029*	.070
Error	223.548	53	4.218			

*Note. *p<.05, **p<.01*

When the coherence and cohesion of the participants' essays analyzed and compared between groups and within groups, the results presented in table 6 revealed that there is statistically significant difference between the scores of the coherence and cohesion pre-test (CG: M=5.40, SD=1.62 / EG: M=5.96, SD= 1.73) and post-test scores (CG: M=6.00, SD=2.40 / EG: M=7.35, SD= 1.68) of the groups (p<.05, η_p^2= .077).

Table 6. Comparison of coherence & cohesion-writing achievement with mixed ANOVA

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Between Groups						.077
Group (CG/EG)	25.178	1	25.178	5.013	.029*	
Error	230.313	53	4.346			

*Note. *p<.05, **p<.01*

As for the vocabulary progress of the groups, table 7 demonstrates that there is statistically significant difference between the groups based on the comparison of their vocabulary scores in the pre-test (CG: M=5.66, SD=1.38 / EG: M=6.10, SD= 1.59) and post-test (CG: M=5.77, SD:2.17 / EG: M=6.85, SD= 1.53) scores of the groups($p=0.04<0.05$, $\eta_p^2= .073$). These findings could be interpreted as the positive effect of FCA on the vocabulary progress of the experimental group.

Table 7. Comparison of vocabulary-writing achievement with mixed ANOVA

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Between Groups						
Group (CG/ EG)	15.875	1	15.875	4.364	.042*	.073
Error	192.815	53	3.638			

*Note. *p<.05, **p<.01*

Lastly, table 8 displays that there is statistically no significant difference between the groups with regard to their correct use of English and mechanics considering their pre (CG: M=5.63, SD=1.04 / EG: M=5.21, SD= 1.19) and post-tests (CG: M=5.37, SD=1.98 / EG: M=6.57, SD= 1.45) ($p=0.183>0.05$, $\eta_p^2= .076$), which can be interpreted as FCA has equal impact on the use of English, and mechanic progress of students as traditional lecture instruction.

Table 8. Comparison of mechanics and use of English achievement with mixed ANOVA

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Between Groups						
Group (CG/ EG)	4.243	1	4.243	1.823	.183	.076
Error	123.357	53	2.327			

*Note. *p<.05, **p<.01*

Findings about the Influence of FCA on Self-Regulated Learning Levels

To investigate the impact FCA on the self-regulated learning levels of the experimental group, to find out if there will be statistically significant difference between the pre-test and post-test scores of the control and experimental group after the treatment, a self-regulated learning scale (Erdogan & Senemoglu, 2016) was applied as pre-test in the second week of the term, and post-test in the final week of the term.

The scale consists of 2 main parts: Self-Regulated learning skills and Motivational Factors. Additionally, self-regulated learning consists of 3 parts which are before, during and after study. Furthermore, before study part includes goal setting, planning, and environmental structuring subheadings, whereas during study part involves organization and transforming, seeking information, rehearsing and memorizing, keeping records and self-monitoring, seeking peer, teacher and adult assistance, and reviewing subheadings. Lastly, after study part consists of self-evaluation and self-consequences subheadings. As for the motivational factors, self-efficacy, goal orientations, task value, attributions for failure and anxiety are the subheadings.

A comparative analysis was made and the between-group statistics were displayed to discover whether there was a difference between the self-regulated learning levels of the groups due to the different teaching methods: traditional and flipped.

Table 9. Comparison of overall self-regulated learning scores with mixed ANOVA

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Between Groups						
Group (CG/ EG)	.214	1	.214	1.127	.294	.023
Error	9.133	48	.190			

*Note. *p<.05, **p<.01*

Table 9 presents that there was not statistically significant difference between the groups with regard to their pre and post-tests of self-regulated learning levels (p=0.294>0.5, η_p^2= .023). Hence, it can be concluded that flipped classroom approach did not create any difference between the experimental and control groups' self-regulated learning pre-test (CG: M=3.29, SD=0.38 / EG: M=3.31, SD= 0.40) and post-test (CG: M=3.29, SD=0.38 / EG: M=3.45, SD= 0.43) scores.

As for the first part of the scale, self-regulated learning skills, a comparative analysis was made and the between-group statistics were represented in table below.

Table 10. Comparison of self-regulated learning skills scores with mixed ANOVA

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Between Groups						
Group (CG/ EG)	.336	1	.336	1.302	.259	.026
Error	12.392	48	.258			

*Note. *p<.05, **p<.01*

According to table 10 it can be inferred that there was statistically no significant difference between the groups with respect to their pre- (CG: M=3.20, SD=0.47 / EG: M=3.27, SD= 0.48) and post- self-regulated learning skills scores (CG: M=3.24, SD=0.44 / EG: M=3.41, SD= 0.51) (p=0.259>0.05, η_p^2= .026). Therefore, it can be deduced that flipped classroom approach did not cause any difference between the experimental and control group's self-regulated learning skills scores.

The self-regulated learning skills part consists of 3 subparts: before, during, and after study. In this respect, a comparative analysis was conducted between the before, during, and after study parts scores of the groups.

Table 11. Comparison of before study scores with mixed ANOVA

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Between Groups						
Group (CG/ EG)	.026	1	.026	.066	.798	.001
Error	18.989	48	.396			

*Note. *p<.05, **p<.01*

Table 11 indicated that there was statistically no significant difference between the groups with respect to their "before study" scores (p=0.798>0.05, η_p^2= .001). Hence, it can be deduced that flipped classroom approach did not cause any difference between the experimental and control group's "before study" pre-test (CG: M=3.28, SD=0.65 / EG: M=3.22, SD= 0.54) and post-test scores (CG: M=3.31, SD=0.53 / EG: M=3.43, SD= 0.57).

Table 12. Comparison of during study scores with mixed ANOVA.

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Between Groups						
Group (CG/ EG)	.655	1	.655	2.109	.153	.042
Error	14.896	48	.310			

*Note. *p<.05, **p<.01*

As for table 12, the findings presented that there was not any statistically significant difference between the groups regarding their "during study" pre-test (CG: M=3.26, SD=0.44 / EG: M=3.34, SD= 0.58) and post-test (CG: M=3.24, SD=0.45 / EG: M=3.49, SD= 0.55) scores (p=0.153>0.05, η_p^2= .042), which can be interpreted as the fact that FCA did not create any difference between the experimental and control group's "during study" scores.

Table 13. Comparison of after study scores with mixed ANOVA

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Between Groups						
Group (CG/ EG)	.433	1	.433	1.240	.271	.025
Error	16.782	48	.350			

*Note. *p<.05, **p<.01*

Lastly, the findings presented in Table 13 indicated that there was not a statistically significant difference between the groups regarding their "after study" pre-test (CG: M=3.02, SD=0.54 / EG: M=3.17, SD= 0.48) and post-test (CG: M=3.14, SD=0.51 / EG: M=3.26, SD= 0.61) scores (p=0.271>0.05, η_p^2= .025). Hence, it can be deduced that FCA did not create any difference between the experimental and control group's "after study" scores.

As for the second part of the study, the motivational factors, a comparative analysis was applied and the between-group statistics were presented to explore whether there was a statistically significant difference between the motivational factors scores of the groups due to the different teaching methods: traditional and flipped.

Table 14. Comparison of motivational factors scores with mixed ANOVA

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Between Groups						
Group (CG/ EG)	.047	1	.047	230	.634	.005
Error	9.893	48	.206			

*Note. *p<.05, **p<.01*

The findings displayed in Table 14 showed that there was no statistically significant difference between the groups with respect to their motivational factors scores (p=.634>0.05, η_p^2= .005). Therefore, the findings might indicate that FCA did not cause any difference between the experimental and control group's motivational factors pre-test (CG: M=3.48, SD=0.40 / EG: M=3.41, SD= 0.41) and post-test (CG: 3.39, SD=0.37 / EG: M=3.55, SD= 0.47) scores.

DISCUSSIONS AND CONCLUSION

The purpose of this study was to investigate the impact of FCA on pre-service ELT teachers' overall L2 advanced writing achievement. In addition to this, the present study sought to explore its impact on students' self-regulated learning in a university setting. In an attempt to reach the objectives of the present study, the quantitative data of the study were gathered with the instruments of advanced writing pre-post-tests and self-regulated learning scale. Regarding whether there was a difference between EG and CG pre-service ELT teachers in terms of their self-regulated learning due to FCA, the quantitative results indicated that there was not any significant difference between the self-regulated learning pre-test and post-tests in CG and EG, which suggests that both CG and EG gave rise to an increase in their self-regulated learning. To put it differently, FCA did not lead to a statistically significant difference in self-regulated learning of EG and CG.

In the literature, studies related to the impact of FCA on self-regulated learning provide inconsistent results. In other words, in some studies it was stated that FCA had a positive impact on self-regulated learning of learners (Cakiroglu & Ozturk, 2017; El-Senousy & Alquda, 2018) and FCA both cultivates requires self- regulated learning (Hewitt, Journell, & Zilonka, 2014). Ironically, some other studies indicated no impact of FCA on the self-regulated learning of learners (Sun et al., 2017; Elakovich, 2018). In this study, the insignificant difference of self-regulated learning levels between CG and EG may be attributed to the sampling characteristics. This argument conforms to the findings of the study (Alsancak-Sirakaya, 2015), which has shown that self-regulated learning results could have been different with different participants whose scores are average or below average. In this study, the pre-test scores of both groups were already high, which might have caused insignificant increase in self-regulated learning after the implementation. In a similar vein, Elakovich (2018) conducted a quasi-experimental research to compare students in a lecture remedial math course by applying the Motivated Strategies Learning Questionnaire (MSLQ) of Pintrich and Garcia (1991) in order to measure control of learning, self-efficacy and self-regulation. The results revealed that there was not a significant difference between the classes, which was interpreted as the requirements of the flipped classroom did not encourage learners to become more independent learners than the learners in the control group.

In conclusion, as there are a limited number of researches available in L2 setting, there is still a need for further investigation into the impact of FCA on self-regulated learning. As for the impact of FCA on the writing achievement of the participants, the results indicated that there was a significant difference between the scores of pre-test and post-test both in control and experimental groups, which suggests that both traditional lecture instruction and FCA gave rise to an increase in terms of participants' writing achievement. However, it was found out that the difference is higher in experimental group compared to the control group.

First of all, it can be concluded that implementation of FCA in writing classes enhances the writing ability of EFL learners. The data confirmed that FCA improves learners' writing proficiency. This study has also offered similar results with numerous current studies and research in the literature (Ekmekci, 2014; Ahmed, 2016; Leis, Cooke, & Tohei, 2015; Abdelrahman, DeWitt, Alias, & Rahman, 2017; Aji, 2017).

The improvement in the participants' writing achievement might be attributed to FCA enabling individualized learning. To put it differently, as the learners were able acquire the knowledge by watching the videos whenever and wherever they wanted and as many times as they needed in accordance with their self-pacing, FCA had a positive impact on their writing achievement. This argument conforms to the findings of the study of Ekmekci (2017), which sought to explore the impact of FCA on learners' EFL writing skill which is often considered as boring, complicated and challenging by learners. The results of the study revealed that the students in the experimental had higher writing scores compared to the scores of the control group after the implementation of FCA. The study also indicated that learning is personalized in flipped learning environment and also, during the treatment process it was observed that almost each student learned at their self-pace and this model enabled them to discover their needs and styles. For instance, some students expressed that they watched the videos more than once while the others watched only once, which may be due to their self-pacing. In a similar vein, Ahmed (2016) found students benefited from critically analyzing key topics at their own pace in their comfort zones such as their homes and also that the experimental group outperformed the control group in the post-test of EFL writing and also the participants displayed positive attitudes towards flipping the writing class.

Another reason why FCA had a positive effect on the writing ability of the pre-service ELT teachers might be due to the fact that the learners were able to receive more and immediate feedback during the lesson as they did the exercises and wrote their essays in the classroom under the supervision of the course instructor. In this aspect, the results of this study are in accordance with those of the relevant studies (Leis et al., 2015; Ahmed, 2016; Ekmekci, 2017). Namely, the study aligns with Ahmed (2016) who found that FCA allows more in-class time to write in class, apply the things they have learned, and receive immediate feedback and guidance from the course instructor. Furthermore, Leis et al. (2015) conducted a study discussing the empirical results of a study comparing two English courses, one of which was taught via FCA and the other with traditional way at a Japanese university and discovered that FCA improves writing proficiency of learners and enables the teacher to provide more personalized advice and instruction as students wrote in the classroom. In a similar vein, in his study, Ekmekci (2017) discovered that promoting feedback options and time was an advantage of FCA and the results of his study revealed that the students in the flipped classroom were able to receive more immediate feedback via individual conferences, oral teacher feedback, and written comments, and also the in-class time was used more effectively and productively by dealing with each student individually and each student could receive peer, individual, and teacher feedback.

On the other hand, the results of this study indicated that FCA did not create and difference between the CG and EG in terms of their mechanics and use of English achievement. Regarding what led to this result, it is probably because the course mostly focused on the essay structure and content. Additionally, the fact that they attend a grammar lesson might have had a positive impact on the grammatical performance of both groups. However, the students in the flipped classroom outperformed the students in the traditional classroom in terms of their performance in introduction, body, and conclusion parts of the essay and coherence and cohesion, and vocabulary elements of the essay, which might be due to the advantages yielded by FCA based on the aforementioned researches.

In short, these findings are in accordance with the relevant literature. The results of the students confirmed that FCA is better than traditional writing class regarding writing achievement. However, further research is required for the detailed comparison of the parts in essays in order to find out whether it will lead to any increase in the mechanics and use of English part in other settings with other participants from various levels.

Suggestions

The present study significantly contributes to the literature by investigating the impact of flipped classroom approach on EFL writing achievement and self-regulated learning of pre-service English teachers. The results revealed that FCA makes a difference in writing achievement of the experimental group pre-service ELT teachers who were taught via FCA as compared to the control group taught via traditional lecture based instruction. However, it was discovered that flipped classroom approach does not create any difference between the self-regulated learning of the control and experimental groups.

As for recommendations for further research, the study can be replicated by training the students before the implementation of FCA and observing and measuring their use of self-regulated learning strategies by carrying out a comparative analysis of data gathered from an experimental group taught via FCA and a control group taught via traditional lecture instruction. Additionally, a larger sample with different proficiency levels studying

at elementary, secondary or high schools, or prep classes at universities could also alter the results, which is suggested to be researched. Implementing FCA for a longer period of time could also impact the outcome.

Another important point to be considered is that before implementing FCA in a course, the teacher should receive training for FCA and learn how to adapt a course according to the FCA. The first step should be to set the objectives of the course clearly and design the syllabus based on these objectives and the FCA. Furthermore, during the whole process the objectives and the expected outcomes should be considered along with the reactions and reflections of the students. Additionally, before implementing FCA in a course, the teacher should make sure that the students are ready to use and for the use of technology in their lessons. Furthermore, all learners should be able to access internet and computer out of the classroom, whenever and wherever they want or need, and technical problems should also be eliminated. Otherwise, if the student cannot watch the videos before the classroom due to technical problems or absence, this problem may cause learning and student engagement hindrances.

Briefly, the findings of the present study illustrated that implementing flipped classroom approach for teaching writing could be regarded as an efficient way of instruction to support the development of writing skills in EFL classrooms. Therefore, it would be worth implementing FCA into EFL and ELT curriculum to assist with the development of writing. As a result, learners could be encouraged to perform better in their writing products and regulate their own learning process.

BIODATA and CONTACT ADDRESSES of AUTHORS

Dr. Ezgi Aydemir ALTAS is an English instructor at the School of Foreign Languages and Department of English Language Teaching (ELT), Yildiz Technical University, Istanbul, Turkey. She has been in the academic world for 11 years. Her research interests are teacher education, educational technology and the relationship between language and culture. She has authored a few articles in indexed journals and presented research studies in some distinguished conferences. She has been offering Basic English, English Language Programs and English for Mass Communication courses at the undergraduate level.

Ezgi Aydemir ALTAS
School of Foreign Languages, Department of Basic English
Address: Yildiz Technical University, 34210, Istanbul, Turkey
Phone: +90 5367317099
E-mail: ezgaydmr@yildiz.edu.tr

Dr. Enisa MEDE is an Associate Professor at the Department of English Language Teaching (ELT), Bahcesehir University, Istanbul, Turkey. She has been in the academia for 14 years. Her research interests lie in the area of program design and evaluation, bilingual education and first/second language development in young learners. She has authored numerous articles in indexed journals, published national and international book chapters and presented action research studies in numerous distinguished conferences. She has been offering Teaching Young Learners, School Experience and Teaching Practicum courses at the undergraduate level and Curriculum Development in Language Education, Syllabus Design and Second Language Acquisition courses at the graduate level.

Enisa MEDE
English Language Teaching, Faculty of Educational Sciences
Address: Bahcesehir University, 34353, Istanbul, Turkey
Phone: +90 5363957295
E-mail: enisamede@es.bau.edu.tr

REFERENCES

Abdelrahman, L. A. M., DeWitt, D., Alias, N., & Rahman, M. N. A. (2017). Flipped learning for ESL writing in a Sudanese school. *Turkish Online Journal of Educational Technology- TOJET, 16*(3), 60-70.

Abd Majid, F. (2007). SRL: Effective practices in ESL writing classes. *Journal of Language Studies, 3*, 115-128.

Ahmed, M. A. E. A. S. (2016). The effect of a flipping classroom on writing skill in English as a foreign language and students' attitude towards flipping. *US-China Foreign Language*, *14*(2), 98-114.

Aji, M. P. P. (2017). Promoting flipped classroom model in teaching writing of EFL learners. *KnE Social Sciences, 1*(3), 279-291.

Almazloum, M. (2018). A Mixed Methods Study: The Impact of Self-Regulated Learningon L2 Writing and Strategy Use. *Electronic Thesis and Dissertation Repository,* 5355.

Alsancak-Sirakaya, D. (2015). *The effect of flipped classroom model on academic achievement, self-directed learning readiness and motivation* (Unpublished doctoral dissertation). Gazi University, Ankara.

Alsowat, H. (2016). An EFL flipped classroom teaching model: Effects on English language higher-order thinking skills, student engagement and satisfaction. *Journal of Education and Practice*, *7*(9), 108-121.

Anderson, L. W., Krathwohl, D. R., Airasian, P. W., Cruikshank, K. A., Mayer, R. E., Pintich, P. R., et al. (2001*). A taxonomy for learning, teaching and assessing. A revision of Bloom's taxonomy of educational objectives*. (Abridged edition ed.). New York: Longman.

Artino, A.R. (2008). Promoting academic motivation and self-regulation: Practical guidelines for online instructors. *TechTrends, 52*(3), 37–45.

Ary, D., Jacobs, L. C., Sorenson, C. K. & Walker, D. (2013). *Introduction to research in education.* Belmont*:* Cengage Learning.

Bandura, A. (1986). *Social foundation of thought and action.* Englewood Cliffs: Prentice Hall.

Bandura, A. (1997). *Self-efficacy: The exercise of control*. Macmillan.

Barak, M. (2009, August). Fostering self-regulated learning in technological projects. In *Conference proceeding, PATT—22, strengthening technology education in the school curriculum—delft, the Netherlands*.

Baranovic, K. (2013). *Flipping the first-year composition classroom: Slouching toward the pedagogically hip* (Doctoral dissertation, Southeast Missouri State University).

Barkley, B.W. (2010). The effects of blended online versus face-to-face learning environments on student outcomes for eighth grade algebra I students. (Doctoral dissertation). Retrieved from ProQuest. 3413019

Barone, C. A. (2003). Technology and the changing teaching and learning landscape: Meeting the needs of today's internet-defined students. *American Association of Higher Education Bulletin*.

Bergman, J., & Sams, A. (2012). *Flip your classroom: Reach every student in every class every day*. n/l: ISTE–International Society for Technology in Education.

Brame, C., (2013*). Flipping the classroom*. Vanderbilt University Center for Teaching. Retrieved from http://cft.vanderbilt.edu/guides-sub-pages/flipping-the-classroom/.

Cakiroglu, U., & Ozturk, M. (2017). Flipped classroom with problem based activities: Exploring self-regulated learning in a programming language course. *Journal of Educational Technology & Society, 20*(1), 337.

Carlisle, M. C. (2010). In G. Lewandowski (Chair). *Using Youtube to enhance student participation in an introductory Java course.* Paper presented at 41st ACM Technical Symposium on Computer Science Education. doi: 10.1145/1734263.1734419

Cashin, M. (2016). *The Effect of Flipped Classrooms on Elementary Students' Reading Scores* (Doctoral dissertation, Northcentral University).

Cigdem, H., Ozturk, M., & Topcu, A. (2016). Self-regulation and interactivity types as the predictors of learner satisfaction with flipped courses: Evidence from a vocationalcollege. *The Eurasia Proceedings of Educational & SocialSciences*, *5*, 135-138.

Cole, J. E., & Kritzer, J. B. (2009). Strategies for success: Teaching an online course. *Rural Special Education Quarterly*, *28*(4), 36-40.

Condie, R., & Livingston, K. (2007). Blending online learning with traditional approaches: Changing practices. *British Journal of Educational Technology, 38(*2), 337-348. doi: 10.1111/j.1467-8535.2006.00630.x

Ekmekci, E. (2014). *Flipped writing class model with a focus on blended learning.* Unpublished PhD Dissertation. Gazi University Graduate School of Educational Sciences, Ankara.

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

Elakovich, D. M. (2018). *Does a student's use of self-regulation change in the flipped classroom?* (Doctoral dissertation, Montana State University-Bozeman, College of Education, Health & Human Development).

Eppard, J., & Rochdi, A. (2017). A Framework for Flipped Learning. *International Association for Development of the Information Society*.

El-Senousy, H., & Alquda, J. (2017). The Effect of Flipped Classroom Strategy Using Blackboard Mash-Up Tools in Enhancing Achievement and Self-Regulated Learning Skills of University Students. *World Journal on Educational Technology: Current Issues, 9*(3), 144-157.

Engin, M., & Donanci, S. (2014). Flipping the classroom in an academic writing course. *Journal of Teaching and Learning with Technology*, 94-98.

Erdogan, T., & Senemoglu, N. (2016). Development and validation of a scale on self-regulation in learning (SSRL). *SpringerPlus, 5*(1), 1686.

Farah, M. (2014). *The impact of using flipped classroom instruction on the writing performance of twelfth grade female Emirati students in the applied technology high school (ATHS)* (Doctoral dissertation, The British University in Dubai (BUiD)).

Findlay-Thompson, S., & Mombourquette, P. (2014). Evaluation of a flipped classroom in an undergraduate business course.

Finkel, E. (2012). Flipping the script in K12. *District Administration*, *48*(10), 28.

Gannod, G. C. (2007). *Work in progress: Using podcasting in an inverted classroom.* Paper presented at Annual Frontiers in Education Conference, Milwaukee, WI.

Gannod, G. C., Burge, J. E., & Helmick, M. T. (2008). *Using the inverted classroom to teach software engineering* (Technical Report No. MU-SEAS-CSA-2007-001). Oxford, OH: Miami University.

Garrison, D. R., & Vaughan, N. D. (2008). *Blended learning in higher education: Framework, principles, and guidelines*. John Wiley & Sons.

George-Walker, L. D., & Keeffe, M. (2010). Self-determined blended learning: a case study of blended learning design. *Higher Education Research & Development*, *29*(1), 1-13.

Goodwin, B., & Miller, K. (2013). Evidence on flipped classrooms is still coming in. *Educational leadership*, *70*(6), 78-80.

Hadwin, A.F. (2008*). Self-regulated learning. In T.L. Good (Ed.), 21stcentury education: A reference handbook* (pp. 175-183). Thousand Oaks, CA: Sage Publications.

Heredia, K. (2015). The effects of the flipped classroom model on student academic growth in flipped and traditional community college classrooms. Unpublished PhD Dissertation. *Aurora University College of Education, Illinois*

Hewitt, K. K., Journell, W., & Zilonka, R. (2014). What the flip: impact of flipped instruction on self-regulated learning. *IJSMILE, 2*(4), 303-325.

Horton, W. K. (2000). *Designing web-based training: How to teach anyone anything anywhere anytime* (Vol. 1). New York, NY: Wiley.

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

Johnson, R. B., & Christensen, L. B. (2004). *Educational research: Quantitative, qualitative, and mixed approaches*. Boston: Allyn and Bacon.

Johnson, L., & Renner, J. (2012). *Effect of the flipped classroom model on a secondary computer applications course: Student and teacher perceptions, questions and student achievement.* (Unpublished doctoral dissertation. University of Louisville, Louisville, Kentucky).

Kellogg, S. 2009. *Developing online materials to facilitate an inverted classroom approach.* Paper presented at the annual Frontiers in Education Conference, San Antonio, TX.

Kenna, D. C. (2014). *A study of the effect the flipped classroom model on student self-efficacy* (Doctoral dissertation, North Dakota State University).

Lage, M. J., Platt, G. J., & Treglia, M. (2000). Inverting the classroom: A gateway to creatingan inclusive learning environment. *Journal of Economic Education, 31*(1), 30-43. Retrieved from http://www.journalofeconed.org

Lee, S. W. Y., & Tsai, C. C. (2011). Students' perceptions of collaboration, self-regulated learning, and information seeking in the context of Internet-based learning and traditional learning. *Computers in human behavior*, *27*(2), 905-914.

Leis, A., Cooke, S., & Tohei, A. (2015). The effects of flipped classrooms on English composition writing in an EFL environment. *International Journal of Computer-Assisted Language Learning and Teaching (IJCALLT), 5*(4), 37-51.

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.

Means, B., Toyama, Y., Murphy, R., Bakia, M., & Jones, K., (2010). Office of Planning, Evaluation, and Policy Development. Evaluation of evidence-based practices in online learning: A meta-analysis and review of online learning studies. Retrieved from U.S. Department of Education website: www.ed.gov/about/offices/list/opepd/ppss/reports.html

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.

Nodoushan, M. A. S. (2012). Self-regulated learning (SRL): Emergence of the RSRLM model. *Online Submission*, *6*(3), 1-16.

Pavanelli, R. (2018). The Flipped Classroom: A Mixed Methods Study of Academic Performanc and Student Perception in EAP Writing Context. *International Journal of Language and Linguistics, 5*(2), 16-26.

Pierce, R., & Fox, J. (2012). Vodcasts and active-learning exercises in a "flipped classroom" model of a renal pharmacotherapy module. *American journal of pharmaceutical education, 76*(10), 196.

Pintrich, P. R. (1995). Understanding self-regulated learning. *New directions for teaching and learning, 1995*(63), 3-12.

Pintrich, P. R. (2000). The role of goal orientation in self-regulated learning. *In Handbook of self-regulation* (pp. 451-502). Academic Press.

Pintrich, P. R., & Garcia, T. (1991). Student goal orientation and self-regulation in the college classroom. *Advances in motivation and achievement: Goals and self-regulatory processes, 7*(371-402).

Quint, C. L. (2015). *A study of the efficacy of the flipped classroom model in a university mathematics class* (Doctoral dissertation, Teachers College, Columbia University).

Rasmussen, R. C. (2003). *The quantity and quality of human interaction in a synchronous blended learning environment*(pp. 1-156). Brigham Young University.

Rossett, A., Douglis, F., & Frazee, R. V. (2003). Strategies for building blended learning. *Learning circuits*, *4*(7), 1-8.

Ruddick, K. (2012). *Improving chemical education from high school to college using a more hands-on approach.* Unpublished doctoral dissertation, University of Memphis.

Sams, A., & Bergmann, J. (2013). Flip your students' learning. *Educational leadership, 70*(6), 16-20.

Shibley, I. (2014). Putting the Learning in Blended Learning. In M. Bart (Eds.), *Blended and Flipped: Exploring New Models for Effective Teaching &Learning* (pp. 4-5). Wisconsin: Magna Publications, Inc.

Singh, H. (2003). Building effective blended learning programs. *Educational Technology-Saddle Brook Then Englewood Cliffs NJ-*, *43*(6), 51-54.

Snowden, K. E. (2012). *Teacher perceptions of the flipped classroom: Using video lectures online to replace traditional in-class lectures* (pp. 1-71). Denton, TX: University of North Texas.

Soliman, N. A. (2016). Teaching English for academic purposes via the flipped learning approach. *Procedia-Social and Behavioral Sciences*, *232*, 122-129.

Srivastava, K. (2014). Role of flipped classroom in education. *Paripex Indian Journal of Research, 3*(4), 81-83. https://doi.org/10.15373/22501991/APR2014/27

Strayer, J. (2007). *The effects of the classroom flip on the learning environment: A comparison of learning activity in a traditional classroom and a flip classroom that used an intelligent tutoring system* (Doctoral dissertation, The Ohio State University).

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

Sun, J. C. Y., Wu, Y. T., & Lee, W. I. (2017). The effect of the flipped classroom approach to Open Courseware instruction on students' self-regulation. *British Journal of Educational Technology, 48*(3), 713-729.

Szparagowski, R. (2014). The Effectiveness of the Flipped Classroom Exploring the Effectiveness of the Flipped Classroom. *Honors Projects.*

Tabrizi, S., & Rideout, G. (2017). Active Learning: Using Bloom's Taxonomy to Support Critical Pedagogy. *International Journal for Cross-Disciplinary Subjects in Education (IJCDSE), 8*(3).

Trinder, R. (2012). Relating students' perceptions and use of ICT to their language learning aims. In Proceedings International Conference ICT for Language Learning (5th ed.) Retrieved from http://conference.pixelonlinenet/ICT4LL2012/common/download/Paper_pdf/136-LSP13-FPTrinder-ICT2012.pdf

Tselios, N., Daskalakis, S., & Papadopoulou, M. (2011). Assessing the acceptance of a blended learning university course. *Journal of Educational Technology & Society*, *14*(2), 224-235.

Tucker, B. (2012). The flipped classroom. *Education next*, *12*(1), 82-83.

Ucar, H., & Bozkurt, A. (2018). Donusturulmus sinif 2.0: bilginin uretimi ve sentezlenmesi. *Egitimde Nitel Arastirmalar Dergisi - Journal of Qualitative Research in Education, 6*(3), 143-157. DOI:10.14689/issn.2148-2624.1.6c3s7m

Wang, F., & Reeves, T. C. (2003). Why do teachers need to use technology in their classrooms? Issues, problems, and solutions. *Computers in the Schools*, *20*(4), 49-65.

Warter-Perez, N., & Dong, J. (2012). Flipping the classroom: How to embed inquiry and design projects into a digital engineering lecture. In *Proceedings of the 2012 ASEE PSW Section Conference* (Vol. 39). Washington DC: American Society for Engineering Education.

Watson, J., (2008). *Blended learning: The convergence of online and face-to-face education*. Vienna, VA: North American Council for Online Learning.

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.

Wiginton, B. (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).

Zappe, S., Leicht, R., Messner, J., Litzinger, T., & Lee, H. W. (2009). *Flipping. In the classroom to explore active learning in a large undergraduate course.* In Paper presented at the American society for engineering education annual conference and exhibition, Austin, TX.

Zhu, W. (2004). Faculty views on the importance of writing, the nature of academic writing, and teaching and responding to writing in the disciplines. *Journal of second language Writing, 13*(1), 29-48.

Zimmerman, B. J. (1990). Self-regulated learning and academic achievement: An overview. *Educational psychologist*, *25*(1), 3-17.

Zimmerman, B. J. (2000). Attaining self-regulation: A social cognitive perspective. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), Handbook of self-regulation (pp. 13-39). San Diego: Academic Press.

Zimmerman, B. J. (2001). Theories of SRL and academic achievement: An overview and analysis. In B. J. Zimmerman and D. H. Schunk (Eds.), SRL and academic achievement: Theoretical perspectives (pp. 1-37). New York, NY: Lawrence Erlbaum Associates.

MOTIVATIONAL FACTORS UNDERLYING THE USE OF ONLINE LEARNING SYSTEM IN HIGHER EDUCATION: AN ANALYSIS OF MEASUREMENT MODEL

Dr. Ridwan Daud MAHANDE
Orcid: 0000-0001-8427-978X
Faculty of Engineering
Universitas Negeri Makassar
Makassar, INDONESIA

AKRAM
Orcid: 0000-0002-1843-585X
Faculty of Teacher Training and Education
Universitas Muhammadiyah Makassar
Makassar, INDONESIA

Received: 20/02/2020 **Accepted:** 08/06/2020

ABSTRACT

Online learning is a flexible and distributed distance learning system. The motivation of lecturers and students is one of key factors determining the acceptance and use of online learning in higher education. This research is aimed at empirically developing and testing a measurement model of several motivational constructs with the assumptions of indicators that build it. This research proposes a theoretical model which can be integrated into three motivational theories: ARCS, McClelland's needs, and Self-Determination Theory (SDT). The construct indicators were developed and then validated empirically at two universities in Makassar, Indonesia. A quantitative method with survey approach was used. The research sample consisted of 71 lecturers and 210 students selected purposively. The analysis of measurement models used partial least square (PLS). The results show that the construct of motivation with indicators that built it met validity and reliability requirements. The results of this research present two alternative instruments for explaining the relationship between motivational factors including the indicators that influence the use of online learning systems in tertiary institutions.

Keywords: Online learning system, motivational measurement; ARCS, McClelland's needs, SDT.

INTRODUCTION

Online learning has been prevalent throughout the world because it is considered potential to reduce time and distance problems in traditional education (Panigrahi et al., 2018; Bakia, Shear, Toyama, & Lasseter, 2012; Hartnett, St. George, & Dron, 2011). Nevertheless, studies conducted by researchers and literature studies confirm that motivation has been one of key factors inhibiting online learning (Hartnett et al., 2011; Shih, Chen, Chen, & Wey, 2013). Motivation is a fundamental factor that requires further research and investigation. It is essential to understand and identify whether online learning can motivate lecturers and students (Huang & Hew, 2016). Motivation is the inner power that moves and drives individuals to achieve goals (Mohamad, Salleh, & Salam, 2015; Zainuddin, 2018; Vanslambrouck, Zhu, Lombaerts, Philipsen, & Tondeur, 2018). The motivation of lecturers and students, which includes needs, beliefs, desires, and inner strengths, will stimulate certain activities (Raeisi et al., 2012). Therefore, every lecturer must have a high motivation to change teaching and learning styles in class, so that students' learning activities are more active, interesting, fun and competitive (Mohamad et al., 2015).

Research on online learning motivation with various topics, problems and methods has been conducted. Online learning motivation has been examined using the social cognitive theory (SCT) and attention-relevance-confidence-satisfaction (ARCS) integration model (Taha & Thang, 2014); self-regulated learning (SRL) and

self-determination theory (SDT) integration models (Lin et al., 2017); motivation-opportunity-ability (MOA) and SDT (Lai et al., 2018); a single ARCS model (Mohamad et al., 2015); integrated models of ARCS and McLelland's theory of needs (Jokelova, 2013); a unique SDT model (Vanslambrouck et al., 2018; Zainuddin, 2018; Sergis, Sampson, & Pelliccione, 2018a; Jacobi, 2018). This research integrated three motivational models, namely ARCS, McLelland's theory of needs and Self-Determination Theory (SDT). According to Keller (2008), the relevance factor of the ARCS model in accordance is by McClelland's theory of needs, and the confidence especially competence by SDT theory. The provides information that the three models can be integrated. Nevertheless, the integration of these three models has not attracted the attention of previous researchers. In this research, the researcher used three factors/constructs of the motivational model because the three motivational models complement each other and reinforce the assumptions of the indicators needed in the context of the problems that occur in the setting where this research was conducted. Specifically, this research aimed to empirically develop and test the measurement model of several motivational constructs on the assumptions of the indicators that built it. This research provides alternative instruments to investigate and obtain information related to online learning system motivation based on three basic theories of motivation.

This article is part of research on "Model of integrated motivation to explain the factors that influence the use of online learning systems in Higher Education". This research was funded by the Ministry of Research, Technology and Higher Education through National Competitive Basic Research grant. In the first year, this research aimed to develop and test motivational instruments by analyzing measurement models (reported in this article). The development of a questionnaire on motivation is very important for gathering information about factors that influence the use of online learning. Therefore, the focus of the first-year research is to provide alternative instruments to investigate and obtain information related to motivation for using online learning system based on indicators from three fundamental theories of motivation. After that, in the second year, the research aims to produce an integrated motivation model through structural equation models that are explored through qualitative methods (in the process). In the second year, the instruments that have been produced will be used to collect data about the use of online learning. Then, the structural relationships will be analysed (hypothesis testing). Hypothesis test results are confirmed through qualitative methods and analysis to produce an integrated motivation model that has been tested empirically.

THEORETICAL FOUNDATIONS

Online Learning

Online learning is a learning environment that is supported by the Internet. Online learning consists of various programs that use internet on and off-campus. Online learning can be fully online or mixed (blended) with face-to-face interaction (f2f) (Bakia et al., 2012). Online learning must provide learning. Therefore, institutions must ensure that lecturers and students are involved in the online learning process. The ideal online learning design should help lecturers and students maximize their intrinsic and extrinsic motivation, especially the hopes and needs of lecturers (Sarsar, 2012). Intrinsic motivation is presented when lecturers and students actively seek and participate in activities without having to be valued by the materials or activities outside the teaching assignment. Extrinsic motivation refers to motivation that comes from outside the individual (Mohamad et al., 2015).

ARCS

ARCS (Attention, Relevance, Confidence, Satisfaction) is a motivational model developed by John Keller (2008). The ARCS model effectively promotes online motivation, achievement, and independent learning (Chen & Jang, 2010). Attention focuses on attention, builds curiosity, interest and is actively involved in learning activities (Keller, 2008; Keller, 2017). This attention is closely related to the interests of lecturers and students. Relevance focuses on concepts and strategies for building relationships in learning, which include content, teaching strategies, and social organization, as well as the objectives of teaching and learning, compatible with learning styles, and connected past experiences (Keller, 2017). According to Kellers, other motivational concepts that help explain relevance are motives such as the need for achievement, affiliation, and power (McClelland theory of needs) and competence. Competence in this study was taken from Self-Determination Theory (SDT).

Furthermore, the focus of relevance is to show the usefulness of content so that lecturers can bridge the gap between the content and real world. Confidence combines variables related to self-control and expectations for success. There is a correlation between the level of trust and positive expectations of success (Keller, 2017). Furthermore, Keller (2008) states that confidence covers some of the most popular motivational research areas, such as self-efficacy, attribution theory, and SDT. This research only used SDT. Satisfaction is needed by lecturers and students to have positive feelings about learning experiences and develop ongoing motivation for the learning process (Keller, 2008). Furthermore, Kellers states that extrinsic motivation, such as appreciation and recognition, must be used, and must not have a detrimental effect on intrinsic motivation. Lecturers and students must be satisfied with what they have achieved during the online learning process.

ARCS is important to be integrated based on concepts related to the value of needs and expectations (Sarsar, 2012), which have not been fully covered in ARCS theory. According to Sarsar (2012) that the concept of value refers to caring by explaining how certain types of goals are important for lecturers and students and influence their behavior (McCelland Integration Theory-Need for Achievement). Meanwhile, the concepts related to expectations refer to attention to questions about expectations for success (Integration with SDT-self efficacy and competence).

Theory of McClelland's Needs

McClelland's Theory of Needs is one of the most important theories for managers/leaders and academics to understand motivation (Turabik & Baskan, 2015). McClelland mentions three basic needs that people get from life experiences: Need for Affiliation, Need for Power and Need for Achievement (Turabik & Baskan, 2015; Vero & Puka, 2017). Need for Affiliation is the desire to be friends and establish a warm relationship with others. Passive individuals will try to forgive and avoid interpersonal conflict at any time, even when it may be needed to fulfil a task (Turabik & Baskan, 2015; Vero & Puka, 2017; Jokelova, 2013). Need for Power is the desire to control others and influence behaviour (Vero & Puka, 2017). Individuals have a desire to expand the source of power and authority and control all materials, spiritual resources (Turabik & Baskan, 2015). Need for Achievement includes the desire to do better and to solve problems by taking personal responsibility, managing projects, showing full performance, needing fast feedback, and mastering complex or challenging tasks (Vero & Puka, 2017; Turabik & Baskan, 2015).

Self-Determination Theory

Self-determination Theory (SDT) is the framework of Ryan and Decy's motivational theory that offers provisions that enhance a sense of Autonomy, Competency, and Relatedness, which are supported by internal motivational factors, called intrinsic motivation (Zainuddin, 2018; Sergis et al., 2018b). SDT can be employed as a theoretical framework that integrates problems in online learning (Chen & Jang, 2010). According to Ryan and Decy (quoted from Sergis et al. 2018b), Competency is related to the ability of lecturers and students to be involved in the learning process. Competence has a motivational aspect because individuals tend to feel competent and tend to find effective ways to deal with the environment (Jokelova, 2013). Autonomy related to the need to be involved with assignments autonomously in a context that is relevant to lecturers and students. Relatedness refers to the need to be involved in assignments that allow collaboration and communication with lecturers or among other students (Sergis et al., 2018b).

These three needs are essential for lecturers and students (Vero & Puka, 2017). SDT is related to increasing interest, educational assessment, and confidence in the capacity and possessed technological attributes. These results are also the manifestations of motivation and internalization of intrinsic values and regulatory processes (Vero & Puka, 2017).In SDT theory, motivation is divided into extrinsic and intrinsic motivation (Zainuddin, 2018). In this research, the researchers only used intrinsic motivation, because extrinsic motivation has been addressed by previous theories. More specifically, the resilience of SDT theory has not well established in online learning (Chen & Jang, 2010). So, SDT should be integrated with other theories such as ARCS and McClelland's needs.

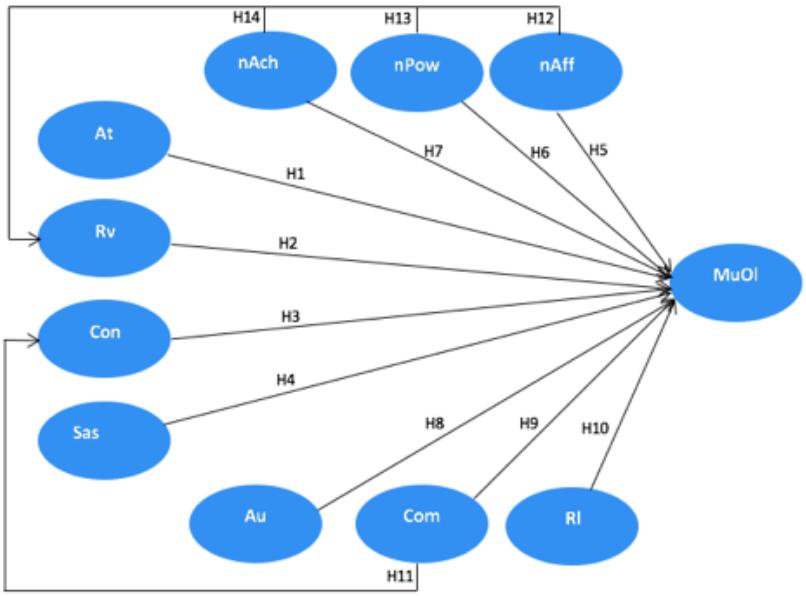
RESEARCH METHODOLOGY

This research used quantitative method with survey approach. Survey approach is aimed to obtain information about a group of people to study their characteristics, opinions, attitudes, or experiences by asking them

questions and compiling their answers (Leedy & Ormrod, 2016). The survey was conducted at two universities in Indonesia, namely Universitas Negeri Makassar (UNM) and Universitas Muhammadiyah Makassar (Unismuh). The research respondents consisted of 71 lecturers and 210 students selected purposively.

Purposive sampling technique was used for selecting the participants. The requirements for determining the participants were lecturers and students who had and or always used online learning services in teaching and learning activities, also lecturers and students who had attended training related to online learning.

The variables of this study consisted of eight exogenous variables; those were variables that influenced other variables and three endogenous variables; those were influenced by other variables. The eight exogenous variables are attention (AT), satisfaction (Sas), need for affiliation (nAff), need for power (nPow), need for achievement (nAch), Autonomy (Au), Competency (Com), and Relatedness (RL). Meanwhile, the three endogenous variables are Motivation for using online learning (MuOL), Relevance (Rv), and Confidence (Con). The proposed structural equation model of online learning motivation is presented in Figure 1 below:



Note: At=Attention; Rv=Relevance; Con=Confidence; Sas=Satisfaction; nAff=need for Affiliation; nPow=need for Power; nAch=need for Achievement; Au=Autonomy; Com=Competency; Rl=Relatedness; MuOl=Motivation of use online learning

Figure 1. Structural equation model of motivation for using online learning

This research developed and validated the survey research instrument in the form of questionnaire, which assessed the construct of motivation for using online learning in tertiary institutions. The questionnaire used derived from the integration of three motivational theories of ARCS, McClelland needs, and Self-Determination Theory (SDT). The questionnaire consisted of the constructs/factors of attention, relevance, confidence, satisfaction (ARCS theory), need for affiliation, need for power, need for achievement (Theory McClelland needs), autonomy, competence and relatedness (SDT theory) and motivation of using online learning.

The development of the research questionnaire focused on the items/indicators of each construct (see Table 1). Items/indicators were developed without changing the constructs of the three fundamental theories of motivation used. The questionnaire used a 4-point Likert scale from strongly disagree to strongly agree. After the questionnaire was developed, then content validity was measured. Content diversity was carried out by three experts from different fields: (1) ICT-based learning, (2) online learning, cognitive systems, self-regulated learning, and (3) informatics engineering education-technology acceptance education.

Furthermore, empirical data collection used a questionnaire. The questionnaire was provided online (on Google form). The data were collected using the questionnaire online. All respondents were informed about the aims and contributions of the research, so that the respondents agreed voluntarily to participate. The questionnaire was completely anonymized. No personal information was requested from respondents and no tracking system was used. To recruit the respondents and minimize bias, personal identities and data were kept confidentially.

Table 1. The construct of motivation integrated into the use of online learning

Theoretical Supports	Constructs	Indicators/items
ARCS theory (Keller, 2008); Taha & Thang, 2014); Huang & Hew, 2016)	Attention (At)	Online learning system and design attract attention (At1)
		Online learning content can build curiosity (At2)
		More interactive online learning (At3)
		Online learning using learning methods that are of interest (At4)
		More interesting online assignments and exercises (At5)
	Relevance (Rv)	Online learning relevant to the demands of current learning (Rv1)
		Online learning strategies and methods in accordance with the learning achievements (Rv2)
		Online learning content relevant to learning outcomes (Rv3)
		Adaptive-engaging online learning content (Rv4)
	Confidence (Con)	Online learning increases knowledge (Con1)
		Online learning is the key to success in the future (Con2)
		Online learning provides a good learning experience (Con3)
		Online learning userfriendly learning (Con4)
		Online learning provides meaningful feedback (Con5)
	Satisfaction (Sas)	The convenience of learning through online learning (Sas1)
		Received an award/recognition from online learning implementation (Sas2)
		The pleasure of completing an online learning course (Sas3)
		Structured and systematic online learning design (Sas4)
McClelland's needs theory (Turabik & Baskan, 2015; Raeisi, Hadadi, Faraji, & Salehian, 2012power and affiliation; Moore, Grabsch, & Rotter, 2010; Vero & Puka, 2017)	Need for Affiliation (nAff)	The desire to collaborate through online learning (nAff1)
		The desire to fulfil tasks through online learning (nAff2)
		The desire to build close relationships through online learning (nAff3)
	Need for Power (nPow)	The desire of institutions that require online learning (nPow1)
		Desire yourself to use online learning (nPow2)
		The desire to obtain the highest position from the use of online learning (nPow3)
		The desire to become an online learning system manager at an institution (nPow4)
	Need for Achievement (nAch)	The desire to do something more than ordinary learning (nAch1)
		Solve online learning problems (nAch2)
		Taking personal responsibility in using online learning (nAch3)
		Demonstrating good performance in online learning (nAch4)
Self-Determination (SDT) Theory (Sergis, Sampson, & Pelliccione, 2018; Jacobi, 2018)	Autonomy (Au)	Essential and useful online learning (Au1)
		Online learning is very flexible (Au2)
		Have control of learning to decide what should and should not be done (Au3)
		An explanation is provided along with examples of using online learning (Au4)
	Competency (Com)	Have the ability to engage in online learning (Com1)
		Able to meet the learning achievements that are the targets of online learning (Com2)
		Able to access and spell questions online (Com3)
	Relatedness (Rl)	Collaboration and communication related to learning and assignments through online education (R1)
		Feel closer to and/or fellow lecturers (Rl2)
		Interact more often with friends (Rl3)
		Actively contributing throughout the class in group activities (R4)
	The motivation to use the online learning system (MuOl)	Attention to online learning (MuOl1)
		The relevance of online learning (MuOl2)
		Trust in online learning (MuOl3)
		Satisfaction with online learning (MuOl4)
		Affiliated needs through online learning (MuOl5)
		The need to control through online learning (MuOl6)
		Achievement needs of using online learning (MuOl7)
		Autonomy online learning (MuOl8)
		Online learning competencies (MuOl9)
		Linkages online learning (MuOl10)

Note. Using a four-point scale 1=strongly disagree, 2=disagree, 3=agree, 4=strongly agree, the constructs were to be measured by asking lecturers and students to rate their perceptions of online learning system in higher education

ANALYSIS AND RESULTS

Data analysis in this research used structural equation modelling (SEM) with SmartPLS software. PLS-SEM is a powerful method for analyzing complex models with smaller samples (Meyliana et al., 2019). In SEM analysis, there are two stages. First, the analysis of the measurement models was to test the validity and reliability of the instrument. Second, the analysis of structural models was to test hypotheses (Meyliana et al., 2019). In this article, SEM analysis was only applied to the presentation of measurement model results. Measurement models were used to establish appropriate indicators for measuring latent constructs (Jöreskog & Sörbom, 1993). In this view, the analysis of measurement model was used to test the validity and reliability of the instrument by considering the relationship of latent constructs of motivation with the indicators that build it. The measurement model used a reflective indicator model.

Reflective Measurement Model Analysis

The analysis of measurement model used reflective indicator model. Reflective indicators are manifestations of a latent construct (Santosa, 2018). Reflective indicators are used to constructs (Cidral et al., 2018). The quality of the reflective measurement model is determined based on validity and reliability (Ringle et al., 2012). The assessment of the validity and reflective reliability is based on the reliability indicator seen from item/indicator loading; the internal reliability consistency is seen from composite reliability and Cronbach's alpha. Convergent validity is seen from AVE, and discriminant validity is through Fornell-Larcker criteria and cross-loadings (Ringle et al., 2012; Hair, 2017). Internal consistency values are in the range of 0 and 1 (Hair, 2017). The higher the internal consistency value, the higher the level of reliability. Internal consistency criteria through construct reliability of 0.70 (Nunnaly & Bernstein, 1994; Barclay, Higgins, & Thompson, 1995; Hair, 2017) are interpreted similar to Cronbach's alpha. Likewise, the reliability indicator is determined by an outer loading value higher than 0.70 (Hair, 2017). Convergent validity is a measure that shows how far an indicator is positively correlated with other indicators in the same construct (Santosa, 2018). Convergent validity through average variance extracted (AVE) must be higher than 0.50 (Hair, 2017). Discriminant validity is a measure that shows a construct that is different from other constructs (Santosa, 2018). Discriminant validity is tested at the indicator and construct levels. Discriminant validity is at the indicator level with cross-loadings. Outer loading indicators for a construct must be higher than all cross-loadings in other constructs (Barclay et al., 1995; Hair, 2017). At the construct level, the discriminant validity is tested by comparing the square root AVE of a construct with the correlation of construct with other constructs. Specifically, the square root

Table 2. The result analysis of reflective measurement model

Constructs/ Factors	Items	Outer Loadings		Composite Reliability (CR)		Cronbach's Alpha		Average Variance Extracted (AVE)	
		Lecturers	Students	Lecturers	Students	Lecturers	Students	Lecturers	Students
Attention (At)	At1	*Out*	0.789	0.876	0.883	0.725	0.824	0.780	0.665
	At2	*Out*	0.833						
	At3	0.844	0.784						
	At4	0.921	0.829						
	At5	*Out*	*Out*						
Relevance (Rv)	Rv1	*Out*	0.770	0.896	0.900	0.826	0.852	0.741	0.694
	Rv2	0.830	0.857						
	Rv3	0.874	0.877						
	Rv4	0.878	0.824						
Confidence (Con)	Con1	0.789	0.751	0.882	0.838	0.823	0.744	0.653	0.565
	Con2	*Out*	*Out*						
	Con3	0.873	0.768						
	Con4	0.767	0.741						
	Con5	0.798	0.745						
Satisfaction (Sas)	Sas1	0.846	0.770	0.872	0.872	0.806	0.805	0.632	0.631
	Sas2	0.798	0.813						
	Sas3	0.775	0.822						
	Sas4	0.757	0.770						
Need for Affiliation (nAff)	nAff1	0.874	0.819	0.918	0.870	0.865	0.776	0.788	0.690
	nAff2	0.888	0.830						
	nAff3	0.901	0.843						
Need for Power (nPow)	nPow1	*Out*	0.848	0.869	0.884	0.780	0.804	0.688	0.718
	nPow2	0.823	0.852						
	nPow3	0.843	0.841						
	nPow4	0.823	*Out*						
Need for Achievement (nAch)	nAch1	0.838	0.748	0.888	0.895	0.810	0.844	0.726	0.682
	nAch2	0.914	0.836						
	nAch3	0.801	0.852						
	nAch4	*Out*	0.863						
Autonomy (Au)	Au1	0.878	0.858	0.868	0.884	0.771	0.803	0.688	0.718
	Au2	0.848	0.867						
	Au3	0.757	0.816						
	Au4	*Out*	*Out*						
Comptency (Com)	Com1	0.850	0.886	0.862	0.918	0.798	0.866	0.713	0.788
	Com2	0.811	0.905						
	Com3	0.871	0.873						
Relatedness (Rl)	Rl1	*Out*	0.766	0.902	0.878	0.836	0.817	0.755	0.642
	Rl2	0.838	0.798						
	Rl3	0.933	0.819						
	Rl4	0.832	0.821						
The motivation to use the online learning system (MoUl)	MuOl1	0.729	0.789	0.934	0.943	0.918	0.932	0.638	0.622
	MuOl2	*Out*	0.783						
	MuOl3	0.732	0.790						
	MuOl4	0.790	0.775						
	MuOl5	0.811	0.764						
	MuOl6	*Out*	0.816						
	MuOl7	0.850	0.817						
	MuOl8	0.810	0.789						
	MuOl9	0.827	0.771						
	MuOl10	0.833	0.788						

Note. The loading value of items marked "out" is excluded because they do not meet the criteria <0.70.

The results of the reflective measurement model analysis presented in Table 2 show that the outer loading value for each construct item/indicator from the results of the lecturer and student assessment was above the minimum value of 0.70. Because all results were higher than 0.70, the indicators are proven reliable (Hair, 2017). However, there were some items/indicators that were marked "out" (See Table 2 for lecturer and student outer loadings columns). These items did not meet the loading value that had become the criterion, or the held value that was only around 0.50-0.69. Indicators with outer loading between 0.40 and 0.70 should be considered as eliminated only if the deletion leads to an increase in composite reliability and AVE, more than the recommended threshold value (Hair, 2017). This happens after the data had been analyzed. Besides, the outer loading value does not meet the standard; the outer loading value also leads to an increase in composite reliability and AVE. If it is not removed, it will have a negative impact on reliability. Therefore, indicators with outer loading must be removed/deleted.

However, taking into account different opinions about loading criteria, namely the internal consistency value of 0.50 for new instruments that have not been tested (Fornell & Larcker, 1981), the internal consistency value of 0.60–0.70 is acceptable for exploratory research (Hair, 2017). Therefore, the researchers presented the outer loading value of item/indicator as a reference for future research. Besides, there was one item/indicator on the student assessment that the researchers excluded despite the value of 0.70 (nPow4). This was because these items affected the validity of discriminant, both constructs and indicators. After exploring through further verification, the question was less relevant and biased to be empirically assessed by students. All constructs had composite reliability and Cronbach alpha above 0.70 which means that all constructs are reliable because they meet the criteria (Nunnaly & Bernstein, 1994; Barclay et al., 1995; Hair, 2017). Analyzing convergent validity, the researchers calculated AVE. The results of the analysis in Table 2 show that all AVE was higher than 0.50. The AVE value must be greater than 0.50 to explain more than half of the indicator variants (Hair, 2017).

The next, was discriminant validity. Discriminant validity at the construct level is presented in Table 3 (lecturer) and Table 4 (student), and at the indicator level is presented in Appendix B. To analyze discriminant validity at the indicator level, the researchers compared all loading items (bold) with cross-loadings such as shown in Appendix B. As a result, all items/indicators that met the criteria of outer loading indicator for constructs must be higher than all cross-loadings in other constructs (Barclay et al., 1995; Hair, 2017). At the construct level (see Tables 3 and 4), it showed that all constructs meet the validity criteria which require that all square roots of AVE (bolded) must be higher than correlations among other constructs (Fornell & Larcker, 1981)

Table 3. Descriptive, correlation constructs, and the square root of AVE of Lecturers data analysis

	Mean	SD	At	Au	Com	Con	MuOl	Rl	Rv	Sas	nAch	nAff	nPow
At	6.57	1.261	**0.883**										
Au	10.65	1.445	0.446	**0.829**									
Com	10.38	1.467	0.554	0.594	**0.844**								
Con	13.25	2.054	0.527	0.524	0.589	**0.808**							
MuOl	26.46	3.898	0.596	0.646	0.727	0.595	**0.799**						
Rl	8.85	1.892	0.567	0.469	0.491	0.410	0.654	**0.869**					
Rv	9.93	1.718	0.639	0.493	0.626	0.588	0.588	0.539	**0.861**				
Sas	13.32	1.962	0.547	0.708	0.791	0.562	0.774	0.626	0.640	**0.795**			
nAch	10.52	1.491	0.506	0.629	0.703	0.511	0.751	0.415	0.437	0.694	**0.852**		
nAff	10.42	1.713	0.449	0.568	0.613	0.561	0.657	0.539	0.561	0.685	0.605	**0.888**	
nPow	10.141	1.650	0.536	0.557	0.628	0.525	0.712	0.473	0.506	0.674	0.769	0.633	**0.830**

Note. Attention (At), Relevance (Rv), Confidence (Con), Satisfaction (Sas), need for Affiliation (nAff), need for Power (nPow), need for Achievement (nAch), Autonomy (Au), Competency (Com), Relatedness (Rl), Motivation of Use online learning (MoUl)

Table 4. Descriptive, correlation constructs, and the square root of AVE of Students data analysis

	Mean	SD	At	Au	Com	Con	MuOl	Rl	Rv	Sas	nAch	nAff	nPow
At	13.362	2.278	**0.809**										
Au	9.971	1.711	0.559	**0.847**									
Com	9.924	1.710	0.580	0.649	**0.888**								
Con	13.081	2.023	0.698	0.666	0.623	**0.751**							
MuOl	32.000	5.503	0.677	0.750	0.723	0.726	**0.788**						
Rl	12.324	2.677	0.601	0.572	0.687	0.630	0.736	**0.801**					
Rv	12.819	2.337	0.773	0.627	0.585	0.732	0.697	0.563	**0.833**				
Sas	13.243	2.099	0.669	0.611	0.663	0.721	0.749	0.676	0.684	**0.794**			
nAch	13.229	2.385	0.556	0.717	0.645	0.677	0.759	0.596	0.607	0.637	**0.826**		
nAff	9.848	1.743	0.615	0.633	0.585	0.690	0.716	0.588	0.619	0.745	0.683	**0.831**	
nPow	9.629	1.893	0.614	0.662	0.623	0.655	0.764	0.643	0.620	0.720	0.668	0.773	**0.847**

Note. Attention (At), Relevance (Rv), Confidence (Con), Satisfaction (Sas), need for Affiliation (nAff), need for Power (nPow), need for Achievement (nAch), Autonomy (Au), Competency (Com), Relatedness (Rl), Motivation of Use online learning (MoUl)

CONCLUSION, LIMITATIONS AND IMPLICATIONS

This article has presented theoretical background that includes the barriers toward acceptance and online learning usage caused by motivational factors. Based on the integrated motivation theory, the measurement model was proposed and validated empirically. This research shows that the constructs of motivation with the indicators that built them fulfilled the validity and reliability requirements. The results of research presented two alternative instruments (See Appendix C and D) to explain the relationship among motivational factors including the indicators that influenced the online learning system usage in tertiary institutions. These two instruments begin with a common motivational construct and the items/indicators that build it. However, the results of the analysis show that the items/indicators of construct motivation for lecturers and students are different. This means, there are items/indicators that better represent the construct of motivation when when both by the lecturers and students. Therefore, the results of this study indicate that lecturers' instruments are only used to collect information from lecturers. Likewise, student instruments are used to obtain information from students. The instrument was used separately in the context of this study only. However, in other research contexts, this instrument could have been used to collect data from the same and different objects but had to go through a re-measurement analysis.

This study has some limitations. First, it only involved two institutions with a small sample, making it challenging to generalise the results to broader contexts. Nevertheless, the results of this study provide a reference instrument that can be developed, used and tested on a large scale. Second, this first-year research was only focused on the analysis of the measurement model and the presentation of the structural model (Figure 1), it has not dealt with the empirical analysis of the structural model. So, the motivational factors for the use of online learning systems cannot be answered. Further research (second year) will conduct an empirical analysis of structural models and confirm the results of the investigation through a qualitative approach. Nevertheless, this study also presents a structural model so that other researchers can adopt the model and test it in different research contexts.

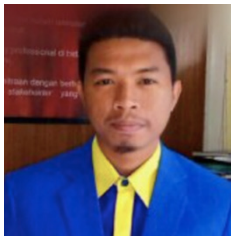
This research presents theoretical and practical implications. In terms of theoretical implications, this study integrates ARCS theory, McLelland's needs theory, and Self-Determination Theory. The integration of items/indicators of the three motivational theories can represent the information needed to answer the motivational factors for using an online learning system. In terms of practical implications, this study validates three motivational theories consisting of ten constructs with indicators that build them through research focusing on the use of online learning systems in the context of two tertiary institutions in Makassar, Indonesia. Thus, the instrument can be used as a reference for higher education to investigate and obtain information related to motivation for using online learning system based on three fundamental theories of motivation.

Acknowledgements: This research was funded by the Ministry of Research, Technology and Higher Education through National Competitive Basic Research grant. The authors also thanks to Prosemantic.com for proofreading the manuscript.

BIODATA and CONTACT ADDRESSES of AUTHORS

Dr. Ridwan Daud MAHANDE, M.Pd., is an assistant professor in the Informatics and Computer Engineering Education Department, Universitas Negeri Makassar, Indonesia. He is a temporary lecturer in Educational Technology Department, Universitas Muhammadiyah Makassar, Indonesia. He received his doctorate degree in the field of Technology and Vocational Education from Graduate School Universitas Negeri Yogyakarta, Indonesia. His research interest is learning of vocational information technology, e-learning, technology acceptance, multimedia learning.

Ridwan Daud MAHANDE
Department of Informatics and Computer Engineering Education,
Faculty of Engineering
Address: Universitas Negeri Makassar, Faculty of Engineering,
Jl. Dg. Tata Raya Parangtambung Makassar, South Sulawesi.
Phone: (+62) 81355425094
Email: ridwandm@unm.ac.id



AKRAM, S.Pd., M.Pd., is an assistant professor in Educational Technology Department, Universitas Muhammadiyah Makassar, Indonesia. He received his Bachelor degree in the field of Educational Technology from Universitas Muhammadiyah Makassar, Indonesia. He earned his Master degree in the field of Technology and Vocational Education from Postgraduate Program, Universitas Negeri Makassar, Indonesia. His research interest is multimedia learning and computer education

AKRAM
Department of Education Technology,
Faculty of Teacher Training Education
Address: Universitas Muhammadiyah Makassar, Faculty of Teacher Training Education,
Jl. Sultan Alauddin No. 259 Makassar, South Sulawesi. Postal Code 90221
Phone: (+62) 85399353128
Email: akram@unismuh.ac.id

REFERENCES

Bakia, M., Shear, L., Toyama, Y., & Lasseter, A. (2012). Understanding the Implications of Online Learning for Educational Productivity. *Office of Educational Technology, US Department of Education*.

Barclay, D., Higgins, C., & Thompson, R. (1995). The Partial Least Square (PLS). Approach to causal modeling: Personal computer adoption and use as an illustration. Technol. *Stud*, *2*(2), 2.

Chen, K.-C., & Jang, S.-J. (2010). Motivation in online learning: Testing a model of self-determination theory. *Computers in Human Behavior*, *26*(4), 741–752. https://doi.org/10.1016/j.chb.2010.01.011

Cidral, W. A., Oliveira, T., Di Felice, M., & Aparicio, M. (2018). E-learning success determinants: Brazilian empirical study. *Computers & Education*, *122*, 273–290. https://doi.org/10.1016/j.compedu.2017.12.001

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, *18*(1), 39–50.

Hair, J. F. (Ed.). (2017). *A primer on partial least squares structural equation modeling (PLS-SEM)* (Second edition). Sage.

Hartnett, M., St. George, A., & Dron, J. (2011). Examining motivation in online distance learning environments: Complex, multifaceted and situation-dependent. *The International Review of Research in Open and Distributed Learning*, *12*(6), 20. https://doi.org/10.19173/irrodl.v12i6.1030

Huang, B., & Hew, K. F. T. (2016). Measuring learners' motivation level in massive open online courses. *International Journal of Information and Education Technology*, *6*(10), 759–764.

Jacobi, L. (2018). What Motivates Students in the Online Communication Classroom? An Exploration of Self-Determination Theory. *Journal of Educators Online*, *15*(2), 1–16. https://doi.org/10.9743/jeo.2018.15.2.1

Jokelova, A. (2013). ARCS motivational model: Theoretical concepts and its use in online courses. *2013 IEEE 11th International Conference on Emerging ELearning Technologies and Applications (ICETA)*, 189–194. https://doi.org/10.1109/ICETA.2013.6674427

Jöreskog, K. G., & Sörbom, D. (1993). *LISREL 8: Structural equation modeling with the SIMPLIS command language*. Scientific Software International.

Keller, J. M. (2008). First principles of motivation to learn and e ^{3} -learning. *Distance Education*, *29*(2), 175–185. https://doi.org/10.1080/01587910802154970

Keller, J. M. (2017). The MVP Model: Overview and Application: The MVP Model: Overview and Application. *New Directions for Teaching and Learning*, *2017*(152), 13–26. https://doi.org/10.1002/tl.20265

Lai, H.-M., Hsiao, Y.-L., & Hsieh, P.-J. (2018). The role of motivation, ability, and opportunity in university teachers' continuance use intention for flipped teaching. *Computers & Education*, *124*, 37–50. https://doi.org/10.1016/j.compedu.2018.05.013

Leedy, P. D., & Ormrod, J. E. (2016). *Practical research: Planning and design* (Eleventh edition). Pearson.

Lin, C.-H., Zhang, Y., & Zheng, B. (2017). The roles of learning strategies and motivation in online language learning: A structural equation modeling analysis. *Computers & Education*, *113*, 75–85. https://doi.org/10.1016/j.compedu.2017.05.014

Meyliana, Fernando, E., & Surjandy. (2019). The Influence of Perceived Risk and Trust in Adoption of FinTech Services in Indonesia. *CommIT (Communication & Information Technology) Journal*, *13*(1), 31–37.

Mohamad, S. N. M., Salleh, M. A. M., & Salam, S. (2015). Factors Affecting Lecturers Motivation in Using Online Teaching Tools. *Procedia - Social and Behavioral Sciences*, *195*, 1778–1784. https://doi.org/10.1016/j.sbspro.2015.06.378

Moore, L. L., Grabsch, D. K., & Rotter, C. (2010). Using Achievement Motivation Theory to Explain Student Participation in a Residential Leadership Learning Community. *Journal of Leadership Education*, *9*(2), 22–34. https://doi.org/10.12806/V9/I2/RF2

Nunnaly, J. C., & Bernstein, I. (1994). *Psychometric theory*. McGraw-Hill.

Panigrahi, R., Srivastava, P. R., & Sharma, D. (2018). Online learning: Adoption, continuance, and learning outcome—A review of literature. *International Journal of Information Management*, *43*, 1–14. https://doi.org/10.1016/j.ijinfomgt.2018.05.005

Raeisi, M., Hadadi, N., Faraji, R., & Salehian, M. H. (2012). *McClelland's motivational needs: A case study of physical education teachers in West Azarbaijan*. 4.

Ringle, Sarstedt, & Straub. (2012). Editor's Comments: A Critical Look at the Use of PLS-SEM in "MIS Quarterly." *MIS Quarterly*, *36*(1), iii. https://doi.org/10.2307/41410402

Santosa, P. I. (2018). *Metode Penelitian Kuantitatif-Pengembangan Hipotesis dan Pengujiannya Menggunakan SmartPLS* (1st ed.). ANDI.

Sarsar, F. (2012). Motivation and Online Adult Learners: How do we do that? *Anadolu Journal of Educational Sciences International*, 8.

Sergis, S., Sampson, D. G., & Pelliccione, L. (2018a). Investigating the impact of Flipped Classroom on students' learning experiences: A Self-Determination Theory approach. *Computers in Human Behavior*, *78*, 368–378. https://doi.org/10.1016/j.chb.2017.08.011

Sergis, S., Sampson, D. G., & Pelliccione, L. (2018b). Investigating the impact of Flipped Classroom on students' learning experiences: A Self-Determination Theory approach. *Computers in Human Behavior*, *78*, 368–378. https://doi.org/10.1016/j.chb.2017.08.011

Shih, H.-F., Chen, S.-H. E., Chen, S.-C., & Wey, S.-C. (2013). The Relationship among Tertiary Level EFL Students' Personality, Online Learning Motivation and Online Learning Satisfaction. *Procedia - Social and Behavioral Sciences*, *103*, 1152–1160. https://doi.org/10.1016/j.sbspro.2013.10.442

Taha, A. M., & Thang, S. M. (2014). A Preliminary Study on the Influence of a Literature Online Support System (LitOSS) on Malaysian Learners' Motivation. *Procedia - Social and Behavioral Sciences*, *118*, 251–258. https://doi.org/10.1016/j.sbspro.2014.02.034

Turabik, T., & Baskan, G. A. (2015). The Importance of Motivation Theories in Terms Of Education Systems. *Procedia - Social and Behavioral Sciences*, *186*, 1055–1063. https://doi.org/10.1016/j.sbspro.2015.04.006

Vanslambrouck, S., Zhu, C., Lombaerts, K., Philipsen, B., & Tondeur, J. (2018). Students' motivation and subjective task value of participating in online and blended learning environments. *The Internet and Higher Education*, *36*, 33–40. https://doi.org/10.1016/j.iheduc.2017.09.002

Vero, E., & Puka, E. (2017). The Importance of Motivation in an Educational Environment. *FORMAZIONE & INSEGNAMENTO. Rivista Internazionale Di Scienze Dell'educazione e Della Formazione*, *15*(1), 57–66.

Zainuddin, Z. (2018). Students' learning performance and perceived motivation in gamified flipped-class instruction. *Computers & Education*, *126*, 75–88. https://doi.org/10.1016/j.compedu.2018.07.003

APPENDIX A

The Results of the Initial Analysis of the Measurement Model

Constructs/ Factors	Items	Outer Loadings		Composite Reliability (CR)		Cronbach's Alpha		Average Variance Extracted (AVE)	
		Lecturers	Students	Lecturers	Students	Lecturers	Students	Lecturers	Students
Attention (At)	At1	0.577	0.764	0.820	0.883	0.731	0.834	0.484	0.602
	At2	0.550	0.811						
	At3	0.747	0.794						
	At4	0.880	0.810						
	At5	0.674	0.693						
Relevance (Rv)	Rv1	0.629	0.770	0.870	0.878	0.799	0.852	0.629	0.694
	Rv2	0.784	0.857						
	Rv3	0.869	0.877						
	Rv4	0.866	0.824						
Confidence (Con)	Con1	0.755	0.745	0.876	0.845	0.824	0.771	0.589	0.522
	Con2	0.639	0.693						
	Con3	0.871	0.746						
	Con4	0.768	0.714						
	Con5	0.785	0.714						
Satisfaction (Sas)	Sas1	0.844	0.770	0.872	0.872	0.806	0.805	0.631	0.631
	Sas2	0.800	0.813						
	Sas3	0.771	0.822						
	Sas4	0.760	0.770						
Need for Affiliation (nAff)	nAff1	0.873	0.819	0.917	0.870	0.865	0.776	0.788	0.690
	nAff2	0.885	0.830						
	nAff3	0.904	0.843						
Need for Power (nPow)	nPow1	0.536	0.779	0.831	0.882	0.728	0.820	0.558	0.651
	nPow2	0.797	0.830						
	nPow3	0.832	0.859						
	nPow4	0.785	0.756(not relevan)						
Need for Achievement (nAch)	nAch1	0.773	0.748	0.874	0.895	0.808	0.844	0.637	0.682
	nAch2	0.905	0.836						
	nAch3	0.832	0.852						
	nAch4	0.661	0.863						
Autonomy (Au)	Au1	0.833	0.810	0.841	0.868	0.748	0.797	0.574	0.624
	Au2	0.821	0.844						
	Au3	0.769	0.820						
	Au4	0.583	0.676						
Comptency (Com)	Com1	0.853	0.885	0.881	0.918	0.798	0.866	0.713	0.788
	Com2	0.809	0.906						
	Com3	0.869	0.872						
Relatedness (Rl)	Rl1	0.648	0.766	0.869	0.878	0.797	0.817	0.625	0.642
	Rl2	0.762	0.798						
	Rl3	0.873	0.819						
	Rl4	0.831	0.821						
The motivation to use the online learning system (MoUl)	MuOl1	0.761	0.789	0.935	0.943	0.922	0.932	0.591	0.622
	MuOl2	0.642	0.783						
	MuOl3	0.725	0.791						
	MuOl4	0.769	0.776						
	MuOl5	0.797	0.764						
	MuOl6	0.693	0.816						
	MuOl7	0.842	0.817						
	MuOl8	0.805	0.788						
	MuOl9	0.820	0.771						
	MuOl10	0.811	0.789						

Note. outer loading that is given a thick red color is issued

APPENDIX B

The Discriminant Validity-Cross Loadings

Cross loading -Lecturers

	At	Au	Com	Con	MuOl	Rl	Rv	Sas	nAch	nAff	nPow
At3	0,844	0,425	0,303	0,436	0,435	0,526	0,482	0,423	0,344	0,351	0,417
At4	0,921	0,376	0,629	0,492	0,599	0,488	0,631	0,532	0,527	0,435	0,520
Au1	0,292	0,878	0,498	0,364	0,525	0,279	0,345	0,573	0,595	0,443	0,441
Au2	0,458	0,848	0,503	0,571	0,590	0,490	0,424	0,636	0,502	0,454	0,480
Au3	0,348	0,757	0,476	0,347	0,482	0,387	0,462	0,544	0,469	0,525	0,464
Com1	0,392	0,478	0,850	0,536	0,609	0,324	0,491	0,606	0,588	0,508	0,498
Com2	0,473	0,470	0,811	0,392	0,626	0,334	0,573	0,662	0,581	0,467	0,530
Com3	0,538	0,554	0,871	0,554	0,610	0,577	0,526	0,737	0,611	0,574	0,564
Con1	0,379	0,523	0,577	0,789	0,505	0,400	0,531	0,570	0,420	0,574	0,482
Con3	0,471	0,403	0,496	0,873	0,524	0,340	0,564	0,525	0,434	0,505	0,417
Con4	0,483	0,334	0,305	0,767	0,441	0,278	0,361	0,264	0,326	0,302	0,393
Con5	0,387	0,406	0,477	0,798	0,441	0,287	0,407	0,397	0,457	0,381	0,392
MuOl1	0,489	0,459	0,613	0,535	0,729	0,475	0,445	0,542	0,657	0,480	0,512
MuOl10	0,481	0,564	0,653	0,507	0,833	0,545	0,495	0,646	0,598	0,556	0,662
MuOl3	0,404	0,384	0,518	0,491	0,732	0,476	0,516	0,530	0,526	0,580	0,465
MuOl4	0,600	0,598	0,550	0,423	0,790	0,625	0,530	0,669	0,599	0,631	0,528
MuOl5	0,503	0,490	0,504	0,429	0,811	0,618	0,472	0,645	0,520	0,493	0,557
MuOl7	0,500	0,588	0,664	0,532	0,850	0,450	0,479	0,690	0,643	0,598	0,688
MuOl8	0,380	0,445	0,531	0,351	0,810	0,467	0,363	0,528	0,616	0,390	0,521
MuOl9	0,433	0,565	0,597	0,527	0,827	0,511	0,448	0,671	0,632	0,456	0,593
Rl2	0,494	0,497	0,407	0,353	0,536	0,838	0,470	0,514	0,370	0,455	0,397
Rl3	0,522	0,437	0,479	0,381	0,638	0,933	0,552	0,624	0,424	0,555	0,516
Rl4	0,462	0,282	0,386	0,334	0,520	0,832	0,367	0,481	0,275	0,381	0,302
Rv2	0,564	0,512	0,525	0,351	0,463	0,474	0,830	0,607	0,327	0,445	0,404
Rv3	0,553	0,390	0,514	0,539	0,465	0,388	0,874	0,503	0,334	0,415	0,392
Rv4	0,538	0,382	0,570	0,605	0,573	0,515	0,878	0,545	0,449	0,567	0,495
Sas1	0,593	0,659	0,723	0,603	0,739	0,560	0,558	0,846	0,691	0,645	0,650
Sas2	0,416	0,502	0,639	0,463	0,617	0,508	0,483	0,798	0,572	0,518	0,544
Sas3	0,260	0,483	0,569	0,314	0,498	0,513	0,386	0,775	0,404	0,540	0,504
Sas4	0,411	0,583	0,559	0,350	0,567	0,399	0,588	0,757	0,487	0,454	0,415
nAch1	0,550	0,510	0,603	0,476	0,679	0,364	0,400	0,631	0,838	0,521	0,667
nAch2	0,422	0,608	0,643	0,462	0,670	0,365	0,400	0,622	0,914	0,585	0,695
nAch3	0,299	0,484	0,545	0,357	0,560	0,328	0,306	0,508	0,801	0,427	0,595
nAff1	0,380	0,506	0,524	0,550	0,604	0,473	0,508	0,618	0,540	0,874	0,552
nAff2	0,393	0,444	0,468	0,422	0,558	0,507	0,434	0,590	0,503	0,888	0,611
nAff3	0,422	0,556	0,632	0,513	0,584	0,459	0,544	0,614	0,564	0,901	0,528
nPow2	0,533	0,587	0,588	0,523	0,674	0,440	0,555	0,634	0,730	0,635	0,823
nPow3	0,353	0,437	0,437	0,398	0,535	0,394	0,365	0,550	0,557	0,557	0,843
nPow4	0,414	0,303	0,515	0,346	0,527	0,320	0,278	0,457	0,589	0,327	0,823

Note. Attention (At), Relevance (Rv), Confidence (Con), Satisfaction (Sas), need for Affiliation (nAff), need for Power (nPow), need for Achievement (nAch), Autonomy (Au), Competency (Com), Relatedness (Rl), Motivation of Use online learning (MoUl)

Cross loading -Students

	At	Au	Com	Con	MuOl	Rl	Rv	Sas	nAch	nAff	nPow
At1	0,789	0,405	0,539	0,592	0,565	0,508	0,552	0,549	0,488	0,531	0,468
At2	0,833	0,465	0,513	0,546	0,533	0,468	0,603	0,543	0,436	0,531	0,509
At3	0,784	0,448	0,369	0,512	0,516	0,426	0,685	0,476	0,398	0,452	0,468
At4	0,829	0,490	0,450	0,602	0,574	0,537	0,663	0,591	0,473	0,473	0,541
Au1	0,498	0,858	0,505	0,601	0,649	0,498	0,569	0,515	0,636	0,610	0,598
Au2	0,471	0,867	0,528	0,592	0,603	0,454	0,562	0,549	0,617	0,555	0,555
Au3	0,451	0,816	0,613	0,500	0,650	0,498	0,464	0,490	0,568	0,444	0,526
Com1	0,505	0,550	0,886	0,538	0,616	0,606	0,477	0,577	0,620	0,510	0,551
Com2	0,510	0,594	0,905	0,573	0,664	0,608	0,555	0,614	0,505	0,503	0,543
Com3	0,530	0,582	0,873	0,549	0,644	0,617	0,523	0,572	0,597	0,547	0,567
Con1	0,516	0,502	0,552	0,751	0,577	0,527	0,601	0,581	0,560	0,518	0,550
Con3	0,504	0,405	0,424	0,768	0,461	0,441	0,493	0,555	0,478	0,483	0,457
Con4	0,532	0,568	0,407	0,741	0,599	0,376	0,566	0,462	0,497	0,604	0,551
Con5	0,542	0,512	0,474	0,745	0,529	0,539	0,525	0,566	0,488	0,463	0,398
MuOl1	0,534	0,637	0,562	0,537	0,789	0,637	0,521	0,544	0,628	0,589	0,679
MuOl10	0,550	0,605	0,618	0,600	0,788	0,617	0,583	0,615	0,594	0,577	0,574
MuOl2	0,575	0,624	0,620	0,630	0,783	0,592	0,569	0,577	0,655	0,614	0,609
MuOl3	0,516	0,597	0,591	0,612	0,790	0,600	0,520	0,575	0,599	0,554	0,564
MuOl4	0,569	0,538	0,571	0,526	0,775	0,582	0,532	0,594	0,501	0,510	0,589
MuOl5	0,475	0,478	0,523	0,544	0,764	0,581	0,536	0,594	0,513	0,481	0,509
MuOl6	0,541	0,563	0,624	0,566	0,816	0,585	0,569	0,615	0,607	0,570	0,602
MuOl7	0,549	0,653	0,578	0,592	0,817	0,539	0,557	0,607	0,659	0,607	0,643
MuOl8	0,524	0,616	0,436	0,548	0,789	0,478	0,572	0,573	0,583	0,619	0,603
MuOl9	0,500	0,584	0,562	0,562	0,771	0,585	0,539	0,610	0,623	0,510	0,639
Rl1	0,564	0,576	0,739	0,642	0,710	0,766	0,557	0,574	0,576	0,579	0,614
Rl2	0,430	0,374	0,467	0,414	0,503	0,798	0,414	0,520	0,400	0,367	0,433
Rl3	0,458	0,411	0,458	0,443	0,509	0,819	0,362	0,526	0,418	0,449	0,462
Rl4	0,441	0,423	0,467	0,463	0,581	0,821	0,426	0,529	0,470	0,444	0,507
Rv1	0,589	0,537	0,412	0,564	0,540	0,384	0,770	0,457	0,490	0,490	0,536
Rv2	0,668	0,481	0,492	0,604	0,577	0,495	0,857	0,580	0,472	0,475	0,439
Rv3	0,660	0,554	0,471	0,606	0,598	0,472	0,877	0,651	0,483	0,575	0,570
Rv4	0,655	0,515	0,567	0,659	0,603	0,518	0,824	0,584	0,572	0,517	0,515
Sas1	0,552	0,447	0,461	0,534	0,533	0,561	0,526	0,770	0,407	0,543	0,501
Sas2	0,571	0,542	0,562	0,649	0,637	0,563	0,534	0,813	0,559	0,646	0,673
Sas3	0,551	0,478	0,536	0,543	0,611	0,531	0,583	0,822	0,488	0,594	0,529
Sas4	0,453	0,470	0,538	0,558	0,589	0,496	0,530	0,770	0,559	0,576	0,574
nAch1	0,430	0,531	0,511	0,501	0,550	0,431	0,429	0,509	0,748	0,472	0,501
nAch2	0,411	0,539	0,530	0,564	0,615	0,552	0,457	0,502	0,836	0,553	0,539
nAch3	0,479	0,561	0,532	0,577	0,638	0,478	0,511	0,546	0,852	0,590	0,576
nAch4	0,510	0,719	0,558	0,588	0,691	0,506	0,591	0,547	0,863	0,626	0,585
nAff1	0,588	0,564	0,555	0,665	0,635	0,537	0,544	0,721	0,596	0,819	0,699
nAff2	0,468	0,517	0,466	0,522	0,597	0,448	0,492	0,567	0,565	0,830	0,569
nAff3	0,467	0,491	0,428	0,523	0,545	0,475	0,503	0,556	0,536	0,843	0,652
nPow1	0,481	0,525	0,497	0,518	0,642	0,536	0,520	0,532	0,495	0,686	0,848
nPow2	0,599	0,601	0,575	0,648	0,657	0,542	0,572	0,686	0,588	0,687	0,852
nPow3	0,476	0,553	0,509	0,493	0,644	0,557	0,481	0,608	0,615	0,587	0,841

Note. Attention (At), Relevance (Rv), Confidence (Con), Satisfaction (Sas), need for Affiliation (nAff), need for Power (nPow), need for Achievement (nAch), Autonomy (Au), Competency (Com), Relatedness (Rl), Motivation of Use online learning (MoUl)

APPENDIX C

The Valid and Reliable Research Instruments for Lecturers

Using a four-point scale 1=strongly disagree, 2=disagree, 3=agree, 4=strongly agree, the variables are to be measured by asking lecturers to rate their perceptions of the online learning system in higher education

Strongly disagree 1 – 2 – 3 – 4 strongly agree

Constructs	Codes	Items/indicators
Attention	At3	Online learning is more interactive
	At4	Online learning uses learning methods that attract interest
Relevance	Rv2	Online learning strategies and methods in accordance with learning achievements
	Rv3	Online learning content is relevant to learning outcomes
	Rv4	Adaptive-engaging online learning content
Confidence	Con1	Online learning increases knowledge
	Con3	Online learning provides a good learning experience
	Con4	Online learning userfriendly learning
	Con5	Online learning provides meaningful feedback
Satisfaction	Sas1	The convenience of learning through online learning
	Sas2	Obtain awards/recognition from online learning implementation
	Sas3	The pleasure of completing an online learning course
	Sas4	Structured and systematic online learning design
Need for Affiliation	nAff1	The desire to collaborate through online learning
	nAff2	The desire to fulfil tasks through online learning
	nAff3	The desire to build close relationships through online learning
Need for Power	nPow2	Desire yourself to use online learning
	nPow3	The desire to obtain the highest position from the use of online learning
	nPow4	The desire to become an online learning system manager at an institution
Need for Achievement	nAch1	The desire to do something more than ordinary learning
	nAch2	Solve online learning problems
	nAch3	Take personal responsibility in using online learning
Autonomy	Au1	Online learning is essential and useful
	Au2	Online learning is very flexible
	Au3	Have control of learning to decide what should and should not be done
Competency	Com1	Having the ability to engage in online learning
	Com2	Able to meet the learning achievements that are the targets of online learning
	Com3	Able to access and spell questions online
Relatedness	Rl2	Feel closer to and/or fellow lecturers
	Rl3	Interact more often with friends
	Rl4	Actively contributing throughout the class in group activities
The motivation to use the online learning system	MuOl1	Attention to online learning
	MuOl3	Trust in online learning
	MuOl4	Satisfaction with online learning
	MuOl5	The need for affiliation through online learning
	MuOl7	Achievement needs of using online learning
	MuOl8	The autonomy of online learning
	MuOl9	Online learning competence
	MuOl10	Linkages to online learning

Note. The loading value of items marked "out" is excluded

APPENDIX D

The Valid and Reliable Research Instruments for Students

Using a four-point scale 1=strongly disagree, 2=disagree, 3=agree, 4=strongly agree, the variables are to be measured by asking students to rate their perceptions of the online learning system in higher education

Strongly disagree 1 – 2 – 3 – 4 strongly agree

Constructs	Codes	Items/indicators
Attention	At1	Online learning system and design attract attention
	At2	Online learning content can build curiosity
	At3	Online learning is more interactive
	At4	Online learning uses learning methods that attract interest
Relevance	Rv1	Online learning is relevant to the demands of current learning
	Rv2	Online learning strategies and methods in accordance with learning achievements
	Rv3	Online learning content is relevant to learning outcomes
	Rv4	Adaptive-engaging online learning content
Confidence	Con1	Online learning increases knowledge
	Con3	Online learning provides a good learning experience
	Con4	Online learning userfriendly learning
	Con5	Online learning provides meaningful feedback
Satisfaction	Sas1	The convenience of learning through online learning
	Sas2	Obtain awards/recognition from online learning implementation
	Sas3	The pleasure of completing an online learning course
	Sas4	Structured and systematic online learning design
Need for Affiliation	nAff1	The desire to collaborate through online learning
	nAff2	The desire to fulfil tasks through online learning
	nAff3	The desire to build close relationships through online learning
Need for Power	nPow1	The desire of institutions that require online learning
	nPow2	Desire yourself to use online learning
	nPow3	The desire to obtain the highest position from the use of online learning
Need for Achievement	nAch1	The desire to do something more than ordinary learning
	nAch2	Solve online learning problems
	nAch3	Take personal responsibility in using online learning
	nAch4	Shows good performance in online learning
Autonomy	Au1	Online learning is essential and useful
	Au2	Online learning is very flexible
	Au3	Have control of learning to decide what should and should not be done
Competency	Com1	Having the ability to engage in online learning
	Com2	Able to meet the learning achievements that are the targets of online learning
	Com3	Able to access and spell questions online
Relatedness	Rl1	Collaboration and communication related to learning and assignments through online learning
	Rl2	Feel closer to and/or fellow lecturers
	Rl3	Interact more often with friends
	Rl4	Actively contributing throughout the class in group activities
The motivation to use the online learning system	MuOl1	Attention to online learning
	MuOl2	The relevance of online learning
	MuOl3	Trust in online learning
	MuOl4	Satisfaction with online learning
	MuOl5	The need for affiliation through online learning
	MuOl6	The need to control through online learning
	MuOl7	Achievement needs of using online learning
	MuOl8	The autonomy of online learning
	MuOl9	Online learning competence
	MuOl10	Linkages to online learning

Note. The loading value of items marked "out" is excluded

MODELING THE CONTRIBUTION OF DISTANCE EDUCATION TO STUDENTS' PREPARATION FOR THE PROFESSIONS

Dr. Mustafa CAVUS
ORCID: 0000-0002-6172-5449
Department of Statistics, Eskisehir Technical University
Eskisehir, TURKEY

Dr. Betul KAN KILINC
ORCID: 0000-002-3746-2327
Department of Statistics, Eskisehir Technical University
Eskisehir, TURKEY

Dr. Berna YAZICI
ORCID: 0000-0001-9843-7355
Department of Statistics, Eskisehir Technical University
Eskisehir, TURKEY

Dr. Seda TEKELI
ORCID: 0000-0003-1839-8291
Department of Labor Economy and Industrial Relations, Anadolu University
Eskisehir, TURKEY

Dr. Guler GUNSOY
ORCID: 0000-0002-0104-9784
Department of Economy, Anadolu University
Eskisehir, TURKEY

Dr. Bulent GUNSOY
ORCID: 0000-0001-6370-189X
Department of Economy, Anadolu University
Eskisehir, TURKEY

Dr. Caglar KARADUMAN
ORCID: 0000-0002-4956-6684
Department of Economy, Anadolu University
Eskisehir, TURKEY

Received: 08/05/2019 **Accepted:** 26/08/2019

ABSTRACT

There is an increasing interest in predicting the contribution level of open and distance learning to students' career, in order to perceive the pathway for higher quality standards. For this purpose, Anadolu University Faculty of Open Education, which can be considered a leader in its field, to learners' professions and their career goals, organized a research project in which a questionnaire was conducted involving approximately 17,000 associate and undergraduate students to build a database of responses. The data was used to determine the contribution level of the open education programs. The five ordered-level contributions were recorded to a response variable. Demographical, educational and economic variables were successfully used in mapping the categorical responses using the ordinal logistic regression analysis method (OLR). The results, unlike other studies, indicate that there is a positive relationship between family size and the contribution level of distance education on students' preparation for the professions. In a novel way, the socioeconomic level of the students is considered in the OLR model as an economic factor. As a consequence, the students with moderate and higher socioeconomic levels demonstrated superior levels of contribution.

Keywords: Distance education, life goals, profession, ordinal logistic regression.

INTRODUCTION

In the field of economics of education, much of the literature points out that the education system of a country is directly related to its labor market. The quality and scope of the education are of great importance considering the demand in a labor market and the structural adjustment capability. In addition, education provides people with the ability to improve themselves and their ability to enjoy equal opportunities. All these achievements increase the possibility of acquiring a profession and forging ahead in a profession (Allmendiger, 1989; Boccanfuso, Larouche, & Trandafir, 2015).

Educational institutions, especially for higher education, are of the greatest importance when it comes to social, economic, technological, scientific and cultural change. Organizations for higher education help to improve the quality of personal and social life by their valuable contributions and services. These organizations also provide people with both technical and professional knowledge, so that they are able to break into the upper levels of society and, thereby, dynamize the society (Scott, 2002).

Increasing and accelerating technological developments with globalization have brought many changes in social, economic and environmental areas. These changes; while sometimes causing people to face some difficulties; also brought new opportunities for humanity to progress. However, education is perhaps the only way to evaluate and use opportunities (OECD, 2018). Today's children who are new to education, are going to become young people after ten years and adults after fifty years. In this context, schools prepare children for working life; which consists of continuous changes that is expected to take place. Thus, education should also be continuous and it should continue after a student completes the formal school period. Therefore, the demand for a better and more inclusive open and distance education system is expected to increase.

Different student profiles, rapid changes in education technologies and a contemporary understanding of professional developments entail individuals planning to enter the labor market or to stay there to update their knowledge, abilities, and competence. Therefore, distance education is an important opportunity, especially for individuals with limited access to conventional education.

In this context, education delivered only within educational institutions has remained incapable of determining quality and, therefore, learner satisfaction, attitudes, needs, and experience have become more important. This situation is known as 'educational satisfaction' in the related literature. This transformation has caused universities to investigate how to fulfil the expectations and satisfaction of students and, ultimately, all of society (Sahin & Shelley, 2008).

The motivation for preferences when choosing college programs differ among students. The main incentives for choosing programs include a fear of not being enrolled on any program, of acquiring a profession, and of securing a future. In this context, many students at some point have to choose programs that may not attract them, and instead choose less enticing ones. In other words, nowadays, the main concerns of a typical student may be seen as enrolling on a college program and graduating from that program with a successful degree. A third important goal may be to realize life expectations. Graduating from a suitable college program may easily be translated into a satisfied society (Sahin & Shelley, 2008).

Jacobs and Newstead studied 336 psychology students studying at universities in Southern England in 2000. The results of the study show that the knowledge and skills gained by university education have a significant place in the students' motivation to study. In the acquisition of these knowledge and skills, the self-discipline that the university education brings to students plays an effective role (Jacobs & Newstead, 2000).

The binary logistic regression model is used when possible answers after examining an outcome variable may be either 'yes' or 'no'. However, we are frequently confronted with questions that cannot be answered with a simple yes or'no; a range of possible responses may apply, such as 'unhappy', 'somewhat happy' or 'very happy'. In such cases, the ordinal logistic regression model is used to identify the effect on the level of contribution. Maheswari & Sudeep Kumar (2010) investigated the contribution of open and distance learning programs on the job performance of veterinary practitioners. They analyzed the ordinal outcome as a contribution of the program through descriptive statistics. However, there have been numerous studies in distance education research to model the effects on a variable. Sahin & Shelley (2008) used Structural

Equation Analysis to test the relationships among computer knowledge, flexibility of distance education, usefulness of distance education, and distance education satisfaction. Kuo, Walker, Belland, & Schroder (2013) intended to investigate the degree of student satisfaction in on-line learning settings using the multiple regression model. Ozturk (2018) used Logistic Regression models to investigate factors affecting enrollment decisions of prospective students of distance education programs. Trehan & Joshi (2018) built Logistic Regression models to explain choices when adopting on-line open courses in India.

This study concerns a survey that has been conducted in order to model the contribution of distance education to students' preparation for the professions. Firstly, the ordinal logistic regression model is reviewed, after which the participants are introduced. Next, the demographic structure of the students, the OLR models for the data set and the interpretations of the models are given. Finally, the results are discussed in the final section.

ORDINAL LOGISTIC REGRESSION MODEL

Ordinal logistic regression analysis is an extension of the generalized linear model for ordinal categorical data. In many studies, the variables of interest are ordinal-scaled where the ordering of the categories of the variable is important. For example, happiness can be graded from strongly unhappy to strongly happy. Similarly, diseases can be scaled from least severe to most severe. In this study, the levels of contribution of distance education for the preparation for the professions are graded from 'strongly disagree (1)', 'disagree (2)', 'undecided (3)', 'agree (4)', and 'strongly agree (5)'.

Generally, when the dependent variable is nominal, researchers prefer the logistic regression method to fit the data. However, when the order of the categories of the dependent variable cannot be ignored, then the ordinal logistic regression analysis is usually preferred.

In ordinal logistic regression, the category of interest observes a particular score or less, given in Eq. (1). The odds are of the form:

$$Q_i = prob(score \leq i) / prob(score > i) \quad (1)$$

or equally $Q_i = prob(score \leq i) / (1-prob(score \leq i))$ from complementary property.

The ordinal logic is a linear function of k independent variables given in Eq. (2)

$$\log(Q_i) = \alpha_i - (\beta_1 X_1 + \ldots + \beta_j X_j) \quad (2)$$

where i,j=1: number of categories-1. Each logit has its intercept and the same coefficient which are used to calculate predicted values. This indicates that the independent variables have the same influence on each logit function.

The probabilities for the individual scores can be calculated by subtraction, using the formula:

$$prob(score = i) = prob(score \leq i) - prob(score < i) \quad (3)$$

To calculate the cumulative probabilities from the logistic model for each score, Eq. (4) is used:

$$P_i = prob(score\ i) = 1/(1 + e^{-(\alpha_i + \beta_j X_j)}) \quad (4)$$

This probability gives the value for the i^{th} subject of X_i' s.

Participants

The population is defined as students of the Faculty of Open Education, Faculty of Economics and Faculty of Business Administration at Anadolu University in Turkey. 45% of the students in the study were male and 55% were female. The demographic structure of the students is summarized in Table 1.

Table 1. Demographic structure of the students

Variables	%	Variables	%
Gender		Faculty	
Male	45.4	Open Education	81.9
Female	54.6	Economics	8.8
Marital Status		Business Administration	9.3
Single	62.4	Class	
Married	37.6	1	24.2
Working Status		2	29.7
Working	58.8	3	17.2
Not working	41.2	4	28.9
Income		Second University Status	
1-1500 TL	15.9	Yes	21.3
501-1000 TL	8.8	No	78.7
1001-1500 TL	19.5	Mother's Education Level	
1501-2000 TL	18.5	Non-literate	24.6
2001 TL and more	37.3	Compulsory degree	67.4
Family Income		High degree	8
1000 TL and less	21.0	Father's Education Level	
1001-2000 TL	34.4	Non-literate	10.5
2001-3000 TL	23.3	Compulsory degree	74.8
3001-4000 TL	11.2	High degree	14.7
4001 TL and more	10.1	Department	
Settlement		Jurisprudence	9.9
Village	8.7	Labor Ec. and Ind. Rel.	2.7
Town	31.3	Theology	7.3
Province	60.0	Economics	3.2
Socioeconomic Level		Business Administration	19.0
Very bad	9.0	Public Administration	13.1
Bad	19.4	Public Finance	3.8
Moderate	51.0	Social Services	5.0
Good	15.4	Sociology	6.2
Very good	5.2	Turk. Lang. and Lit.	2.3
		International Relations	5.0
		Others (46)	22.5

The percentage of the students studying a second university education was 21%. Only 8.7% of the respondents lived in a village, while the others lived in a town or province.

Data Collection and Analysis

Data was obtained through an on-line questionnaire conducted over approximately one year, between February 2016 to April 2017. The questionnaire was completed by around 17,000 students of the Faculty of Open Education, Faculty of Economics and Faculty of Business Administration at Anadolu University, in order to determine the contribution level of distance education toward students' life goals. In this study, OLR analysis was used, since the dependent variable has five ordered categories; 'strongly disagree', 'disagree', 'undecided', 'agree', 'strongly agree'. The predictor variables are grouped as demographical, educational and economic in the models; hence, three OLR models are considered. MASS package in R is used to construct the OLR model.

FINDINGS

The opinions of the students regarding the contribution level of Open Education on preparation for the professions is modeled by OLR. In this section, three OLR models are considered for demographic, educational and economic factors, respectively. Settlement, gender, marital status and number of households of the students are demographic factors which are considered as independent variables, whereas the contribution to the students' preparation for the professions as independent variable (ordered as strongly disagree, disagree, undecided, agree, and strongly agree) in the OLR model. The outputs of the model are shown in Table 2.

The results indicate that four independent variables for all of the categories were statistically significant. Interpretations of the intercepts are not of much interest and are used to predict values. Firstly, the intercept in Eq. (5) is -0.5952. Secondly, the reference category for the gender variable is female, which has coefficient of 0.24. One way to interpret the coefficients for the independent variable is using an odds ratio. The odds ratio in Table 2 for gender is exp(0.2481)=1.2816. In other words, female students who supported the contribution of distance education toward students' professions were 1.28 times greater in number than male students. Similarly, the students who lived in a province supported the contribution of distance education toward students' professions 1.47 times more than the students who lived in a village. The students living with more than five in a household supported the contribution of distance education toward students' professions 2.47 times more than the students living in households of two to four. The interpretation of the odds ratios for the remaining independent variables is straightforward.

Table 2. Outputs of the OLR model for demographic factors

Variables	$\hat{\beta}$	std. error	t value	odds ratio	p-value
Dependent					
1|2	-0.5952	0.0572	-1.0413	0.5515	0*
2|3	0.5972	0.0571	1.0451	1.8171	0*
3|4	1.3482	0.0581	2.3202	3.8505	0*
4|5	3.3725	0.0677	4.9780	2.9152	0*
Independent					
Gender(female)	0.2481	0.0321	7.7344	1.2816	0*
Settlement(town)	0.3355	0.0617	5.4400	1.3987	0*
Settlement(province)	0.3863	0.0585	6.6017	1.4715	0*
Marital status(married)	0.1816	0.0331	5.4789	1.1991	0*
Households(2-4)	0.6996	0.1594	4.3879	2.0129	0*
Households(5+)	0.8235	0.3776	2.1807	2.2785	0.0292*

Note. *$p<.05$

OLR models for outcomes of the contribution levels are given in Eqs. (5, 6, 7, 8), respectively.

$$\log(Q_1) = -0.5952 + (0.2481) * Gender_{female} + (0.3355) * Site_{town} + (0.3863) * Site_{province} + (0.1816) * Marital\ status_{married} + (0.6996) * Households_{2-4} + (0.8235) * Households_{5+} \quad (5)$$

$$\log(Q_2) = 0.5972 + (0.2481) * Gender_{female} + (0.3355) * Site_{town} + (0.3863) * Site_{province} + (0.1816) * Marital\ status_{married} + (0.6996) * Households_{2-4} + (0.8235) * Households_{5+} \quad (6)$$

$$\log(Q_3) = 1.3482 + (0.2481) * Gender_{female} + (0.3355) * Site_{town} + (0.3863) * Site_{province} + (0.1816) * Marital\ status_{married} + (0.6996) * Households_{2-4} + (0.8235) * Households_{5+} \quad (7)$$

$$\log(Q_4) = 3.3725 + (0.2481) * Gender_{female} + (0.3355) * Site_{town} + (0.3863) * Site_{province} + (0.1816) * Marital\ status_{married} + (0.6996) * Households_{2-4} + (0.8235) * Households_{5+} \quad (8)$$

As can be seen in these equations, the left side of the equation is called logit. This is the logarithm of the odds of a category occuring. The coefficients in each logistic regression model indicate the amount of logit changes on the values of the predictors. Each logit model has its own intercept. For instance, the coefficient (-0.5952) is the intercept (or threshold) of Eq. (5). On the other hand, the remainder of the coefficients, except the intercept term in each equation (0.5973, 1.3482, 3.3725, respectively), means that the effect of the predictor variable is the same for different logit functions and, hence, the model is called proportional odds model.

The calculated predicted probabilities of the model for demographic factors are shown in Table 3.

Table 3. Predicted probabilities of the OLR model for demographic factors

				Contribution Level				
Gender	Marital Status	Settlement	Households	1	2	3	4	5
Male	Single	Village	1	.355	.290	.148	.174	.033
			2-4	.215	.259	.181	.280	.065
			5+	.195	.249	.184	.300	.073
		Town	1	.283	.282	.168	.222	.046
			2-4	.164	.228	.184	.335	.088
			5+	.148	.216	.183	.355	.099
		Province	1	.273	.280	.170	.229	.048
			2-4	.157	.223	.184	.344	.092
			5+	.141	.210	.182	.363	.103
	Married	Village	1-2	.294	.284	.165	.213	.043
			3-4	.171	.234	.185	.326	.084
			5+	.155	.221	.184	.347	.094
		Town	1-2	.229	.266	.179	.266	.060
			3-4	.129	.199	.179	.380	.113
			5+	.116	.185	.175	.398	.127
		Province	1-2	.221	.262	.180	.274	.063
			3-4	.123	.193	.178	.387	.119
			5+	.110	.180	.173	.404	.132
Female	Single	Village	1	.315	.287	.159	.199	.040
			2-4	.186	.244	.184	.310	.077
			5+	.168	.231	.184	.330	.086
		Town	1	.247	.273	.176	.250	.054
			2-4	.140	.209	.182	.364	.104
			5+	.126	.196	.179	.383	.116
		Province	1	.238	.269	.177	.258	.057
			2-4	.134	.204	.181	.372	.109
			5+	.121	.191	.177	.391	.121
	Married	Village	1-2	.258	.276	.173	.241	.052
			3-4	.147	.215	.183	.356	.099
			5+	.132	.202	.180	.375	.110
		Town	1-2	.199	.251	.183	.296	.071
			3-4	.110	.179	.173	.405	.133
			5+	.098	.166	.167	.421	.148
		Province	1-2	.191	.246	.184	.304	.074
			3-4	.105	.174	.170	.412	.139
			5+	.094	.161	.164	.427	.155

Note. Contribution levels 1: strongly disagree, 2: disagree, 3: undecided, 4: agree, 5: strongly agree

The predicted probabilities shown in Table 3 are calculated using Eqs. (5, 6, 7, 8). For example, a single male student living in a village strongly disagrees with the probability of 33.5% on the contribution of distance education toward preparation for the professions. According to predicted probabilities, the contribution of distance education to the preparation for a profession is higher than that of female students. Students living

in a province stated that their contribution level was higher than for those living in districts and villages, respectively. Single students thought that the level of contribution was higher than for married students. An increase in the numbers per household also increases the contribution for students in preparation for a profession. As a result, students who stated that the contribution level was highest were married women living in provinces. The lowest were single male students living in villages.

The status of the second university, faculty, class, and parental educational levels of the students are educational factors which are considered in the OLR model. The output of the model are shown in Table 4.

Table 4. Outputs of the OLR model for educational factors

Variables	$\hat{\beta}$	std. error	t value	odds ratio	p-value
Dependent					
1|2	-1.2213	0.0893	-1.3682	0.2948	0*
2|3	-0.0566	0.0880	-0.6435	0.9449	0.5199
3|4	0.7248	0.0883	8.2059	2.0642	0*
4|5	2.7847	0.0983	2.8342	1.6194	0*
Independents					
Class(2)	-0.2218	0.0589	-3.7655	0.8011	0.0002*
Class(3)	-0.3643	0.0678	-5.3729	0.6947	0*
Class(4)	-0.3090	0.0598	-5.1702	0.7342	0*
Father edu. (c.e.)	0.2467	0.0811	3.0413	1.2798	0.0024*
Father edu. (h.e.)	0.4554	0.0936	4.8640	1.5769	0*

*Note. *p<.05, c.e.: compulsory educated, h.e.: high educated*

Class and fathers' educational levels are statistically significant variables in this model. However, the status of the second university, faculty, and mothers' educational levels of the students are not significant. Therefore, the OLR model is constructed using only significant variables. Similarly, the OLR models for educational factors can be constructed as in Eq. (5-8). The odds ratio in Table 4 for the level of fathers' education (h.e.) is exp(0.4554)=1.5769. In other words, students whose fathers' educational levels were of a higher degree supported the contribution of distance education on students' professions 1.57 times more than students whose fathers' educational levels were compulsory degrees.

The predicted probabilities of the model for educational factors are shown in Table 5 to interpret the model.

Table 5. Predicted probabilities of the OLR model for educational factors

		Contribution Level				
Father's education level	Class	1	2	3	4	5
Non-literate	1	.228	.258	.188	.268	.058
	2	.269	.272	.179	.232	.047
	3	.298	.278	.172	.211	.041
	4	.287	.276	.175	.219	.043
Compulsory degree	1	.187	.238	.193	.309	.073
	2	.223	.256	.189	.272	.060
	3	.249	.266	.184	.249	.052
	4	.239	.263	.186	.258	.055
Higher degree	1	.158	.217	.192	.344	.089
	2	.189	.239	.192	.307	.072
	3	.212	.251	.190	.283	.063
	4	.203	.246	.191	.293	.067

Note. Contribution levels 1: strongly disagree, 2: disagree, 3: undecided, 4: agree, 5: strongly agree

According to the probabilities given in Table 5, the contribution of distance education to preparation for the professions increases with an increase in the level of the father's education. In addition, the idea that this contribution decreases in upper classes increases.

Working status, income and socio-economic levels of the students are economic factors which are considered as an OLR model for economic factors which can be easily constructed using the coefficients in Table 6. All of the variables given in the table are found to be statistically significant.

Table 6. Outputs of the OLR model of economic factors

Variables	$\hat{\beta}$	std. error	t value	odds ratio	p-value
Dependent					
1|2	-0.2214	0.0630	-3.5169	0.8014	0.0004*
2|3	0.9893	0.0637	1.5535	2.6895	0*
3|4	1.7528	0.0648	2.7052	5.7709	0*
4|5	3.7995	0.0739	5.1428	4.4681	0*
Independents					
Income(501-1000 TL)	0.1592	0.0557	2.8571	1.1725	0.0043*
Income(1001- 1500 TL)	0.1806	0.0553	3.2645	1.1980	0.0011*
Income(1501- 2000 TL)	0.2931	0.0608	4.8195	1.3405	0*
Income(2001 TL and more)	0.3206	0.0571	5.6130	1.3779	0*
Socioeconomic level(bad)	0.6618	0.0683	9.6884	1.9382	0*
Socioeconomic level(moderate)	0.9173	0.0637	1.4408	2.5025	0*
Socioeconomic level(good)	1.0734	0.0737	1.4564	2.9253	0*
Socioeconomic level(very good)	0.7395	0.0972	7.6074	2.0949	0*
Working status(yes)	-0.1470	0.0373	-3.9447	0.8633	0.0001*

Note. *$p<.05$

Here, the students with good economic conditions stated that the contribution of distance education on students' professions was 2.92 times more than for other students.

The predicted probabilities of the model for economic factors are shown in Table 7 to interpret the model.

Table 7. Predicted probabilities of the OLR model for economic factors

			Contribution Level				
Working status	Income	Socioeconomic level	1	2	3	4	5
Yes	1-500 TL	Very bad	.445	.284	.123	.126	.022
		Bad	.293	.289	.167	.210	.042
		Moderate	.243	.275	.180	.249	.053
		Good	.215	.264	.185	.275	.061
		Very good	.277	.285	.172	.222	.045
	501-1000 TL	Very bad	.382	.293	.142	.155	.028
		Bad	.242	.275	.180	.250	.053
		Moderate	.198	.255	.187	.292	.068
		Good	.174	.240	.189	.318	.078
		Very good	.228	.270	.182	.263	.057
	1001-1500 TL	Very bad	.401	.291	.136	.146	.026
		Bad	.257	.280	.176	.238	.049
		Moderate	.211	.262	.185	.279	.063
		Good	.186	.248	.188	.305	.073
		Very good	.242	.275	.180	.250	.053

	1501-2000 TL	Very bad	.374	.293	.144	.159	.029
		Bad	.236	.273	.181	.256	.055
		Moderate	.193	.252	.187	.298	.070
		Good	.170	.237	.189	.324	.081
		Very good	.222	.267	.183	.268	.059
	2001 TL and more	Very bad	.368	.293	.146	.163	.030
		Bad	.231	.271	.182	.260	.056
		Moderate	.189	.250	.188	.302	.072
		Good	.166	.234	.189	.328	.083
		Very good	.217	.265	.184	.273	.061
No	1000 TL and less	Very bad	.481	.276	.113	.111	.019
		Bad	.324	.293	.159	.189	.036
		Moderate	.271	.284	.173	.226	.046
		Good	.241	.275	.180	.251	.053
		Very good	.307	.291	.163	.200	.039
	1001-2000 TL	Very bad	.417	.289	.131	.138	.024
		Bad	.270	.284	.173	.227	.046
		Moderate	.223	.267	.183	.268	.059
		Good	.197	.254	.187	.294	.068
		Very good	.255	.280	.177	.239	.050
	2001-3000 TL	Very bad	.437	.286	.126	.129	.023
		Bad	.286	.287	.169	.215	.043
		Moderate	.236	.273	.181	.255	.055
		Good	.209	.261	.185	.281	.063
		Very good	.270	.284	.173	.227	.046
	3001-4000 TL	Very bad	.409	.290	.134	.142	.025
		Bad	.263	.282	.175	.232	.048
		Moderate	.217	.265	.184	.273	.061
		Good	.191	.251	.188	.299	.070
		Very good	.248	.277	.178	.244	.051
	4001 TL and more	Very bad	.403	.291	.136	.145	.026
		Bad	.258	.280	.176	.236	.049
		Moderate	.212	.263	.185	.278	.062
		Good	.187	.249	.188	.304	.072
		Very good	.243	.276	.179	.249	.053

Note. Contribution levels 1: strongly disagree, 2: disagree, 3: undecided, 4: agree, 5: strongly agree

According to the results shown in Table 7, the contribution of distance education in preparation for the professions is higher than for students who do not work in any job. An increase in income level and socio-economic level also positively affects the thoughts of students. As a result, the students who stated that the contribution level was highest were students who did not work in any job and who had high income and socio-economic levels. Those who stated that the contribution was lowest were workers on low incomes from poor socio-economic levels.

DISCUSSIONS AND CONCLUSION

A questionnaire was conducted on a sample of approximately 17,000 students of the Faculty of Open Education, Faculty of Economics and Faculty of Business Administration at Anadolu University. The contribution level of distance education to preparation for the professions was modelled by three ordinal logistic regression tests using demographic, educational and economic factors. Predicted probabilities of each model were interpreted to show the effect of these factors. In addition, the results were compared with previous studies from the literature.

Certain studies investigated the relationship between family size and/or family structure and educational attainment. For instance, Maralani (2008) suggests that for Indonesia, no consistent positive or negative relationship exists between family size and children's educational attainment. According to the results, despite the fact that the relationship between two variables had not reached a significant level in rural areas for the considered time period, the same relationship appeared to have changed from positive to negative for urban areas during the same period. A number of studies suggest either no relationship or an inconsistent relationship, such as those conducted by Dayioglu et al. (2009), Fitzsimons and Malde (2014), and Sandberg and Rafail (2014). A few researchers found a negative relationship between family size and educational attainment. These include Baez (2008), Rosenzweig and Zhang (2009), Bagger et al. (2013), Dumas and Lefranc (2013), Bougma et al. (2015) and Kugler and Kumar (2015). Blaabæk et al. (2017) adopted a different approach and argue that from a causality centered point of view, previous research studies that had found a negative relationship between family size and educational attainment were invalid. In addition to these studies, our results show that there is a positive relationship between family size and the contribution level of distance education to prepare students for the professions. A student, living in a more crowded family, thinks more positively than others about the contribution of distance education, as shown in Table 3.

Dumas and Lambert (2005) found that the education levels of fathers rather than mothers had an effect on the educational demands of individuals. Handa et al. (2004) show that the education of the father in a household is one of the main determinants of the education demands of an individual. In this study, it was concluded that the education level of the father had an effect on the education demands of other family members. The study examines the effect of parents' educational levels, wealth, gender, rural region, and numbers in households on education demand. Tansel (1997) suggests that maternal and paternal education are both effective on individuals' education, especially for individuals older than 15 years, using data from Ghana and the Ivory Coast. Another study suggesting that the educational level of the father is decisive with regard to demand for education is the work of Haan and Plug (2006). The results in our study show that the educational level of the father has a significant effect, while the educational level of the mother is not found to be significant in the OLR model. In addition, the contribution of distance education regarding preparation for the professions increases with the level of the father's education.

Holmes (1999) investigated the demand for education in terms of income, rather than the education of parents, using the Pakistan Integrated Household Surveys. Gurler et al. (2007) concludes that there is a direct relationship between the position of individuals and their household incomes. Accordingly, individuals with household incomes of individuals living in urban areas with a high demand for education in Turkey are higher than others.

The novelty of our study is that the socio-economic level of students is considered to be an explanatory variable. As a consequence, students whose socio-economic levels are moderate and good state that the contribution level of distance education is higher than for other students.

Authors' Note: This study is supported by the Anadolu University Scientific Research Projects Commission under grant No. 1601E034.

BIODATA and CONTACT ADDRESSES of AUTHORS

Dr. Mustafa CAVUS is a Research Assistant of Faculty of Science, Eskisehir Technical University. Dr. Cavus gained his Ph.D. in Applied Statistics at November, 2020. His academic interest areas are Design of Experiment, Statistical Machine Learning, Explainable Artificial Intelligence and Robust Statistics. He has 8 journal articles published in international indexes, 1 international book chapters and other national and international articles, papers submitted to international meetings.

Mustafa CAVUS
Department of Statistics, Faculty of Science
Address: Eskisehir Technical University, 26555, Eskisehir, Turkey
Phone: +90 222 321 35 50,
E-mail: mustafacavus@eskisehir.edu.tr

Dr. Betul KAN KILINC is an Prof. in Faculty of Science, Eskisehir Technical University. Dr. Kan Kilinc, gained her Ph.D. in Statistics at December, 2010. Her academic interest areas are data science, supervised-unsupervised learning algorithms, data mining, nonparametric regression, multivariate statistics, open and distance learning and R statistical programming. She has over than 20 journal articles published in international/national indexes, 2 international book chapters, and other international/national proceedings submitted to international meetings.

Betul KAN KILINC
Department of Statistics, Faculty of Science
Address: Eskisehir Technical University, 26555, Eskisehir, Turkey
Phone: +90 222 321 35 50,
E-mail: bkan@eskisehir.edu.tr

Dr. Berna YAZICI is a Professor of Statistics in Faculty of Science, Eskisehir Technical University. Dr. YAZICI got her Ph.D. from Statistics in 2001 and became Professor in 2013. She studies and gives the courses on Design of Experiments, Regression Analysis, Statistics. She has more than 40 papers in international indexes, 2 international, 1 national book chapters and more than 50 proceeding papers. She currently works for Eskisehir Technical University, Department of Statistics.

Berna YAZICI
Department of Statistics, Faculty of Science
Address: Eskisehir Technical University, 26555, Eskisehir, Turkey
Phone: +90 222 321 35 50,
E-mail: bbaloglu@eskisehir.edu.tr

Dr. Seda TEKELI is an Associate Professor of Faculty of Labor Economics, Anadolu University. Dr. Tekeli gained her Ph.D. in Economics at 2010. Her academic interest areas are macroeconomics, economic development, growth, poverty, women empowerment, open and distance learning, the effect of distance education on development. She has over than 15 journal articles published in international indexes, 5 international book chapters and other national and international articles, papers submitted to international meetings.

Seda TEKELI
Department of Labor Economics and Industrial Relations, Faculty of Economy
Address: Anadolu University, 26470, Eskisehir, Turkey
Phone: +90 222 335 0580,
E-mail: sakyalcin@anadolu.edu.tr

Dr. Guler GUNSOY is a Professor of Economy at Economy Faculty, Anadolu University. Dr. Gunsoy gained her Ph.D. in Economy at September, 1999. Her academic interest areas are macroeconomics, economic development, growth, poverty, women empowerment, open and distance learning, the effect of distance education on development. She has over than 10 journal articles published in international indexes, 3 national books, 5 national book chapters and other national and international articles, papers submitted to international meetings.

Guler GUNSOY
Department of Economics, Faculty of Economics
Address: Anadolu University, 26470, Eskisehir, Turkey
Phone: +90 222 335 0580,
E-mail: gcinier@anadolu.edu.tr

Dr. Bulent GUNSOY is a Professor of Economy at Faculty of Economics. He completed his Ph.D. in Economics at June, 1997. His academic interest areas are microeconomics, macroeconomics, globalization, structural reforms, development economics, open and distance learning. He has 12 journal articles published in international indexes, 6 national books, 9 national book chapters and other national and international articles, papers submitted to international congress.

Bulent GUNSOY
Department of Economics, Faculty of Economics
Address: Anadolu University, 26470, Eskisehir, Turkey
Phone: +90 222 335 0580,
E-mail: bgunsoy@anadolu.edu.tr

Dr. Caglar KARADUMAN is a research assistant at Faculty of Economics, Anadolu University. Dr. Karaduman gained his Ph.D. in Economics in April, 2018. His academic interest areas are macroeconomic productivity, technology diffusion, economic growth and development and macroeconomic performance. Karaduman has an interest also in the field of open and distance education from the perspective of economics. He has over than 10 journal articles published in international indexes, 1 book chapter and papers submitted to international meetings.

Caglar KARADUMAN
Department of Economics, Faculty of Economics
Address: Anadolu University, 26470, Eskisehir, Turkey
Phone: +90 222 335 0580, 2564-5870,
E-mail: caglarkaraduman@anadolu.edu.tr

REFERENCES

Allmendiger, J. (1989). Educational systems and labor market outcomes. European Sociological Review, 5(3), 231-250. Retrieved from https://www.jstor.org/stable/pdf/522338.pdf?refreqid=excelsior%3A08741828201010 760f17550232ee988c

Baez, J. E. (2008). Does more mean better? sibling sex composition and the link between family size and children's quality. IZA Discussion Paper Series, No. 3472. Retrieved January 21, 2019 from http://ftp.iza.org/dp3472.pdf

Bagger, J., Birchenall, J. A., Mansour, H., & Urzúa, S. (2013). Education, birth order, and family size. IZA Discussion Paper Series, No. 7454. Retrieved January 21, 2019 from http://ftp.iza.org/dp7454.pdf

Blaabæk, E. H., Jæger, M. M., Molitoris, J. (2017). Family size and children's educational attainment: identification from the extended family. Population Association of America Annual Meeting. 2017. Retrieved from https://paa.confex.com/paa/2017/mediafile/ExtendedAbstract/Paper12491/PAA_Blaab aek_Jaeger_Molitoris.pdf

Boccanfuso, D., Larouche, A., & Trandafir, M. (2015). Quality of higher education and the labor market in developing countries: evidence from an education reform in Senegal. World Development, 74(1), 412-424. doi.org/10.1016/j.worlddev.2015.05.007.

Bougma, M., LeGrand, T. K., & Kobiané, J. F. (2015). Fertility decline and child schooling in urban settings of Burkina Faso. Demography, 52(1), 281-313. doi: 10.1007/s13524- 014-0355-0.

Clark, A. E., Frijters, P. & Shields M. A. (2006). Income and happiness: Evidence, explanations and economic implications, Paris-Jourdan Sciences Economiques, Working Paper No: 2006-24, 1-35. Retrieved from https://halshs.archives-ouvertes.fr/halshs-00590436

Dayiouglu, M., Kirdar, M. G., & Tansel, A. (2009). Impact of sibship size, birth order and sex composition on school enrolment in urban Turkey. Oxford Bulletin of Economics and Statistics, 71(3), 399-426. doi.org/10.1111/j.1468-0084.2008.00540.

Dumas, C. & Lambert, S. (2005). Patterns of intergenerational transmission of education: the case of Senegal. Retrieved 21 January from http://cep.lse.ac.uk/seminarpapers/28-03-06-DUM.pdf

Dumas, C., & LeFranc, A. (2013). Sex in marriage is a divine gift: for whom? evidence from the manila contraceptive ban. IZA Discussion Paper, No. 7503. Retrieved January 21, 2019 from http://ftp.iza.org/dp7503.pdf

Fitzsimons, E., & Malde, B. (2014). Empirically probing the quantity–quality model. Journal of Population Economics, 27, 33-68. doi.org/10.1007/s00148-013-0474-8.

Haan, M. & Plug, E. (2006). Estimates of the effect of parents' schooling on children's schooling using censored and uncensored samples. IZA Discussion Paper, No. 2416. Retrieved January 21, 2019 from http://ftp.iza.org/dp2416.pdf

Handa, S., Simler, R. K. & Harrover, S. (2004). Human capital, household welfare, and children's schooling in Mozambique. International Food Policy Research Institue Research Report, No. 134. Retrieved January 21, 2019 from

https://ageconsearch.umn.edu/bitstream/37896/2/rr134.pdf

Holmes, J. (1999). Measuring the determinants of school completion in Pakistan: analysis of censoring and selection bias. Yale University Center Discussion Paper, No. 794. Retrieved January 21, 2019 from https://pdfs.semanticscholar.org/9e42/f5d074d53b7beca4011cffe9261b71d92088.pdf

Jacobs, P. A. & Newstead S.E. (2000). The nature and development of student motivation, British Journal of Educational Psychology, (70), 243-254. doi.org/10.1348/000709900158119.

Kugler, A. D., & Kumar, S. (2015). Preference for boys, family size and educational attainment in India. Demography, 54(3), 835-859. doi.org/ 10.3386/w21138

Kuo. Y. C. Walker. A. E.. Belland. B. R. & Schroder. K. E. E. (2013). A predictive study of student satisfaction in online education programs. The International Review of Research in Open and Distance Learning, 14(1), 17-39. doi.org/10.19173/irrodl.v14i1.1338

Maralani, V., (2008). The changing relationship between family size and educational attainment over the course of socioeconomic development: evidence from Indonesia. Demography, 45(3), 693–717. doi.org/10.1353/dem.0.0013

OECD. (2018). The future of education and skills, Education 2030, 1-23. Retrieved from https://www.oecd.org/education/2030/E2030%20Position%20Paper%20(05.04.2018).pdf

Ozturk. O. (2018). A logistic regression analysis of factors affecting enrollment decisions of prospective students of distance education programs in Anadolu University. Turkish Online Journal of Distance Education, 20(1), 145-160. doi.org/ 10.17718/tojde.522459

Rosenzweig, M. R., & Zhang, J. (2009). Do population control policies induce more human capital investment? twins, birth weight and China's "One-Child" policy. Review of Economic Studies Limited, 76, 1149-1174. Retrieved from https://www.jstor.org/stable/40247636

Sahin, I. & Shelley, M. (2008). Considering students' perceptions: the distance education student satisfaction model. Educational Technology & Society, 11(3), 216-223. Retrieved from https://lib.dr.iastate.edu/cgi/viewcontent.cgi?article=1006&context=pols_pubs

Sandberg, J., & Rafail, P. (2014). Family size, cognitive outcomes, and familial interaction in stable, two-parent families: United States, 1997–2002. Demography, 51(5), 1895-1931. doi.org/ 10.1007/s13524-014-0331-8

Tansel, A. (1997). Schooling attainment, parental education and gender in Cote d'Ivoire and Ghana. Economic Development and Cultural Change, 45(4), 825-856. Retrieved from https://www.jstor.org/stable/10.1086/452309

ONLINE COURSE DESIGN: TAKING A RIGHT TURN!

Ishaq AL-NAABI
ORCID: 0000-0001-8829-2922
English Language Center
University of Technology and Applied Sciences
Nizwa, OMAN

Dr. Thuwayba AL BARWANI
ORCID: 0000-0003-4123-8552
College of Education
Sultan Qaboos University
Muscat, OMAN

Dr. Salma AL-HUMAIDI
ORCID: 0000-0001-8579-7749
Curriculum and Instruction Department
Sultan Qaboos University
Muscat, OMAN

Dr. Otherine NEISLER
ORCID: 0000-0001-7610-7312
Center for Excellence in Teaching and Learning
Sultan Qaboos University
Muscat, OMAN

Received: 11/04/2020 **Accepted:** 28/05/2020

ABSTRACT

Guided by Nation and Macalister's (2010) eight-step language curriculum design model, a 5-week online course was designed to teach critical thinking skills for foundation students at the Arab Open University (Oman). The course was conducted with 11, level two foundation students, after which it was evaluated by the participating students, the course instructor and three course reviewers using three different research instruments (an end-of-course evaluation form, semi-structured interviews and a course evaluation rubric), the analyses from which revealed that most were satisfied with the course design, but some modifications and additions were needed. The reflection on the online course design process along with the course evaluation results led to several amendments to the course design to make it more conducive to online delivery. The study provides course developers with an evidence-based, enhanced online course design model that will help create online courses.

Keywords: Online course design, online course evaluation, online curriculum, distance learning, critical thinking, Oman.

INTRODUCTION

To function in today's volatile, uncertain, complex, ambiguous world (Bennett & Lemoine, 2014), critical thinking and problem-solving skills are essential for communication and employability, which is why they have been recognized as important parts of curricula in the 21st century (Alismail & McGuire, 2015; Johnson, 2009; P21 Partnership for 21st Century Learning, 2006). Critical thinking, in particular, is considered vital to student success in higher education and language development. It has been observed that students with sophisticated critical thinking skills are able to "ask appropriate questions, gather relevant information, efficiently and creatively sort through this information, reason logically, and come to reliable and trustworthy

conclusions" (Qing, 2013, p.7). Renner (1996) (cited in Liawv, 2007) confirmed that higher-order thinking skills develop into higher-order learning skills that eventually assist students in attaining better language proficiency.

In a longitudinal study, Neisler et al. (2016) used the California Critical Thinking Skills Test (CCTST) to examine the critical thinking skills development in Sultan Qaboos University students in Oman within the first 3 years after completing their university studies and found that they had unexpectedly low critical thinking skills and that there was a small but positive correlation between the students' CCTST scores and their cumulative GPA. In a similar study, Kumar and James (2015) used the Watson-Glaser Critical Thinking Appraisal to identify the critical thinking skills of diploma students at the Oman Nizwa College of Technology, also finding that overall critical thinking skills were very low and there were few variations across different majors. As research has shown that students at higher education institutions in Oman have weak critical thinking skills, it is obvious that these need to be improved, suggesting that special critical thinking skill courses are required to address this deficit.

This study developed and evaluated a 5-week online course focused on two critical thinking reading skills—analysis and inference—for foundation students at the Arab Open University (Oman) (henceforth AOU-Oman), for which Nation and Macalister's (2010) language curriculum design model was applied. After the implementation, the course was evaluated by the students, the course instructor, and several course reviewers.

Therefore, this paper reports on the course design process, reflects on the design model used for online course designs and suggests some additions to the design model to make it more suitable.

ONLINE COURSE DESIGN PROCEDURES

The online course was designed using Nation and Macalister's (2010) eight-step language curriculum design model, as shown in Figure 1, and the details for which are given in the following section.

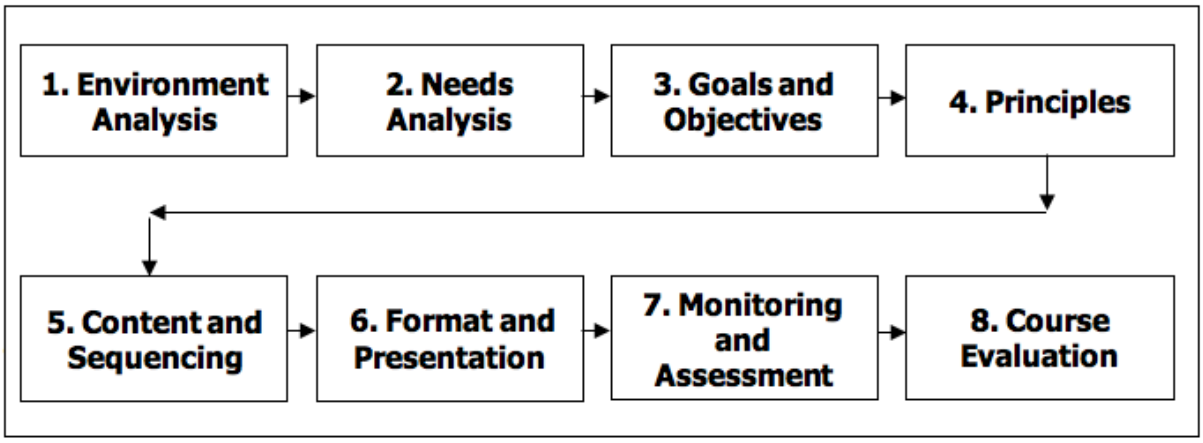


Figure: 1 Nation and Macalister's (2010) language curriculum design model

The first curriculum design step was the environment analysis, which was when all factors influencing the course design (Nation & Macalister, 2010) were considered (i.e., the instructor, the learners, and the learning situation); the instructor sub-factors identified (i.e., online teaching characteristics, technical proficiency, teaching experience, and subject-matter knowledge); and other elements determined (i.e., experience level of the course instructor, language level of the students and course duration).

A needs analysis was conducted based on the previously discussed Omani critical thinking skills research (Kumar & James, 2015; Neisler et al., 2016). Because of the time limits of the study and the course duration, it was decided that the course would only focus on two cognitive critical thinking skills for reading: analysis and inference. Similar procedures have been used in previous online course design research studies. For instance, a target learner needs assessment was conducted by Hsu et al. (2014) for an online continuing education course for Taiwanese nurses. Similarly, to develop a blended General Chemistry course, Shibley et al. (2011) began by assessing the students' learning characteristics and analyzing the learning environment.

After the environment and needs analyses, the course goals and objectives were determined (Brown, 1995; Graves, 1999, 2000; Nation & Macalister, 2010) based on the needs analysis results, as was also reported in Hsu et al. (2014), Shibley et al. (2011) and Croxton & Chow (2015) who decided on a MOOC course learning goals based on identified learner needs. To assist in developing the course learning objectives, Paul and Elder's list of skills (2004) required for critical reading and close reading was also consulted. Finally, five outcome-based learning objectives were determined:

1. Locate main ideas and supporting details in a reading passage.
2. Separate facts and opinions in a reading passage.
3. Infer the hidden meaning in a reading passage.
4. Recognize the arguments in a reading passage.
5. Identify the assumptions used in a reading passage to support an argument.

The fourth step in Nation and Macalister's language curriculum design model (2010) was principles, which was related to the learning theories that guided the course design flow, content, strategies, and assessment. In this case, four different theories drove the course design, behaviorism, constructivism, schema theory, and motivation theory, each of which has different influences on the course design and structure. Following the behaviorist principles stated by Alzaghoul (2012), the course used measurable outcome-based behavioral objectives, which were provided in the course outline. Furthermore, formative assessment was used to monitor students' progress and to motivate them to undertake the course. In addition, feedback was provided to students following the completion of most activities in the course. With respect to constructivist principles, the study followed Olusegun's (2015) views on learning as "social construction of knowledge." Consequently, the course used discussion and help forums; further, to aid the construction of knowledge, instructions and assessment rubrics were written in clear, simplified language. Based on schema theory, pictures and videos were used to aid students in activating their prior knowledge (Fisher et al., 2012). To motivate students, graded formative assessments were used, and feedback was provided after each assessment; a help forum was available for students to voice out any concerns (Shroff & Vogel, 2009).

Based on the course principles, the course content was selected from various resources, such as reading-based textbooks and online websites, and included readings, multimedia files, and discussion forums, after which it was adapted to the students' language level. Then, following Richards' (2001) course sequencing principles and guided by the course learning objectives, the course content was sequenced based on difficulty and prerequisite learning.

For the fifth step, course format and presentation, a linear approach was taken, with the course being divided into five teaching modules, each of which was focused on a specific skill except for the introductory module 1; module 2 focused on main ideas and supporting materials; module 3 focused on facts and opinions; module 4 focused on inference; and module 5 focused on recognizing and evaluating arguments. Each module for each of the 5 weeks included three main activities and two supporting optional activities. The first main activity introduced the new skill in a short video, which was followed by some practice questions. The second activity was a discussion forum wherein students were asked to read and discuss some questions, after which there was a short quiz to test the students' understanding of the week's topic. The supporting optional activities included a help forum the students could use if they had had any difficulties and a self-evaluation check so they could assess their own learning. The course also employed the automatic restriction feature in Moodle, which meant that students could only access the weekly course activities if they had completed the previous activities.

Two formative forms were used to monitor and assess the student learning: weekly discussions and weekly quizzes. The formative course assessment included four discussion forums and four quizzes each week, where each discussion forum (20% of the total course marks) was worth five marks and each quiz was worth ten marks (40% of the total course marks). The students were given 45 min to complete the quiz, which they could only attempt once. The summative assessment involved a final exam, which was worth 40% of the total course marks.

The students, the course instructor, and the three reviewers evaluated the course using different instruments. The students completed an end-of-course evaluation form that had been validated by a group of academics, which was designed to gage student satisfaction and gather course feedback. A semi-structured interview was

conducted with the course instructor to get course feedback, for which an interview guide was developed to make the interview process easier and to ensure that detailed responses were gathered. The clarity and appropriateness of the questions were reviewed by an academic specialized in English Language and Literature. The Course Construction and Evaluation Rubric developed by Ternus et al. (2007) was used by the course instructor and the course reviewers to review the course after its implementation, which had four main dimensions, structure, content, processes, and outcomes, each of which has various elements. The rubric gathered quantitative and qualitative data for each element of the four main rubric dimensions and also provided space for the course instructor and reviewers to give an overall evaluation of each main dimension. The formative and summative student assessments also provided some feedback on course design and content.

Methods

Participants

Students

Using convenience sampling, students from level two of the foundation program were selected for the online course. The group originally consisted of 20 students; however, only 18 students agreed to voluntarily take part in the study by signing an informed consent, and 7 students decided to drop out of the course after the first week; therefore, only 11 students were active throughout the course. The students' English language proficiency ranged from 1 to 20 on the Oxford Online Placement Test, with the average score being 17.2. When benchmarked with the Common European Framework of Reference for Languages (CEFR), their English level was determined to be A1 (basic level).

Instructor

A female instructor with 6 years teaching experience on the foundation program at AOU-Oman volunteered to teach the course. She was familiar with the students' language levels, their cultural background, and their modes of study in terms of their study schedules and assessment patterns.

Reviewers

Expert purposive sampling was used to select the course reviewers based on two factors: language learning and teaching experience and online learning and instructional design experience. Three course reviewers evaluated the online course after its implementation. Reviewer 1 was a specialist in applied linguistics, had taught English to Omani students for many years, had overseen two foundation programs in two Omani higher education institutions and had an awareness of the Omani students' English levels and their learning characteristics. Reviewer 2 was a language and literature specialist, with 8 years teaching experience at AOU-Oman, and had coordinated blended-learning English for Specific Purposes language courses for post-foundation students at AOU-Oman. Reviewer 3 was a specialist in instructional design and had taught different courses in instructional design at the College of Education at Sultan Qaboos University.

Procedures

The course was designed using Nation and Macalister's language curriculum design model (explained earlier in this paper) (2010). Data collection instruments were designed, reviewed and validated. After finalizing these steps, the course was hosted in Moodle Cloud, and students were selected for enrolment. The course instructor was given training on administering the course, which was going to be delivered fully online, with no face-to-face classroom instructions. Students were to access the course from home using their computers, tablets, and smartphones. After its implementation, the course was reviewed by the course instructor and a group of course reviewers. In addition, an interview was conducted with the course instructor.

Data Collection Instruments

The study employed four research instruments to gather data about course validation and implementation: the course evaluation rubric, instructor semi-structured interview, student end-of-course evaluation form and in-course student learning formative and summative assessment.

Course Evaluation Rubric

A Course Construction and Evaluation Rubric (Ternus et al., 2007) was used by the course instructor and reviewers to review the course after its implementation. The rubric included four main dimensions—structure, content, processes and outcomes—with different elements under each dimension. Each element can be given a score of 1–4 based on the descriptor given for each point. Apart from the quantitative score, the rubric allowed reviewers to provide qualitative comments and feedback on each element. It provided the reviewers with a space to make an evaluation of each main dimension. The rubric was designed on the basis of an extensive review of literature on online course construction, teaching and evaluation (Ternus et al., 2007). The validity of the rubric was established by three experts in online teaching who had more than five years of experience in online teaching and learning and were not part of the pilot study (Ternus et al., 2007). The three developers of the rubric determined its reliability using test-retest reliability. To ensure the reliability of the form in this study, the inter-rater reliability among the three course reviewers was assessed using the inter-class correlation method in SPSS. The level of agreement among the three reviewers was found to be 67%. Based on the guidelines for interpreting intraclass correlation coefficients levels, the reliability level was moderate (Koo & Li, 2016).

A Semi-Structured Interview

A semi-structured interview was conducted with the course instructor to obtain feedback on the course, allowing the exploration of complex issues and providing in-depth data (Creswell, 2012). The researcher developed an interview guide, including a general opening and a set of probing questions to make the interview flexible and to leave space for the interviewee to give open and detailed responses. Three academics reviewed the questions for appropriateness and clarity.

Student End-of-Course Evaluation Form

A student end-of-course evaluation form was developed to gauge learners' satisfaction and obtain their feedback on course content, structure, and assessment and on their instructor. Different institutional evaluation instruments and pools of questions were adopted from Gravestock and Gregor-Greenleaf (2008) to construct the evaluation form. The form consisted of 41 items, divided into five sub-categories: course outline and course objectives (3 items), course structure and course content (11 items), course assessment (7 items), course instructor (5 items), and general feedback (7 items). Students were asked to rate the items on a five-point Likert scale. In addition, the form included three open-ended questions that sought to identify strengths, issues, and suggestions for improving the course. A group of academics reviewed and validated the form. Its internal consistency was 0.91 as measured by Cronbach's alpha in SPSS.

In-Course Formative and Summative Assessments

Students' learning in the course was monitored through formative and summative assessments, including four quizzes, four discussions, and a final exam. Apart from monitoring the students' progress in the course, they helped evaluate the course by indicating whether its outcomes were achieved and whether students had benefited from the activities.

The course included four graded discussion forums that provided students with guided practice of the skills taught to them; each one accounted for five marks. In each discussion forum, students were asked to apply the skills that they developed on a given reading passage; their posts were scored using a rubric that was designed for this purpose. Two language teachers checked the clarity of the questions in the discussion posts.

The quizzes were aimed at monitoring students' progress in the course, and students were able to take them once they completed the lesson activities and the discussion post. Students were given one chance to take the quizzes, which included various types of questions and were reviewed by three language teachers for language clarity. As measured using Cronbach's alpha in SPSS, the internal consistency reliability of the quizzes ranged from 0.37 to 0.81. According to Rudner and Schafer (2002), the acceptable reliability of teacher-made tests should range between 0.50 and 0.60.

The final exam of the course was developed to measure students' achievements with regard to the course outcome-based learning objectives. Students were given 90 minutes to complete the final exam, and they had one attempt to take the exam within 5 days. The exam was divided into three main parts; each part included a reading passage that was followed by a set of questions. There were different types of questions in the final exam, such as matching, true/false, multiple choice, and open-ended questions. Two language teachers reviewed the final exam for its clarity and level of difficulty. Its internal consistency reliability was 0.67 as measured using Cronbach's alpha in SPSS.

Data Analysis

Various quantitative and qualitative analysis procedures were used in the study. Means and standard deviations were used to analyze the numerical data obtained from the course evaluation rubric. Descriptive statistics is used because it gives a general indications and tendencies in the data (Creswell, 2012). In addition, content analysis was conducted on the qualitative data gathered through the rubric. Data were simplified and tabulated based on the elements of the rubric and then analyzed using frequency counts and percentages. Means and standard deviations were used to analyze the quantitative data obtained from the student end-of-course evaluation. The data derived from the open-ended questions in the form were qualitatively analyzed using content analysis. Data were first summarized and grouped into three areas: course strengths, issues and solutions, and suggested improvements. In addition, frequency counts and percentages were used in the analysis of the qualitative data of the form to identify the strengths of the course, the issues faced by the students and their suggestions for improving the course. Data obtained from the instructor's semi-structured interview were analyzed qualitatively using content analysis. Content analysis, as Creswell (2012) stated, helps in mapping the patterns of behavior and thinking in the data to draw solid inferences and conclusions. The data obtained from the course formative and summative assessments were analyzed using range, means, standard deviations, and item difficulty.

RESULTS AND DISCUSSION

Students' Performance in Course Assessments

Means, standard deviations, and ranges were used to analyze the student performances. A three-point performance scale (low, average, and high) was developed to report, understand, and interpret the results of the student course assessments.

As shown in Figure 2, the discussion forums had a total number of 88 posts over the 5 weeks, and it was evident that their posts began to increase in Week 3 (N = 33 posts) and Week 4 (N = 30 posts) compared to the first few weeks at only 25 posts in total. This was because the students had not been accustomed to the course in Weeks 1 and 2 and also because they had been doing final examinations at the university at the same time. In general, it was considered that the number of posts was acceptable because it was a short course, there were only 11 students, and this had been their first online course experience.

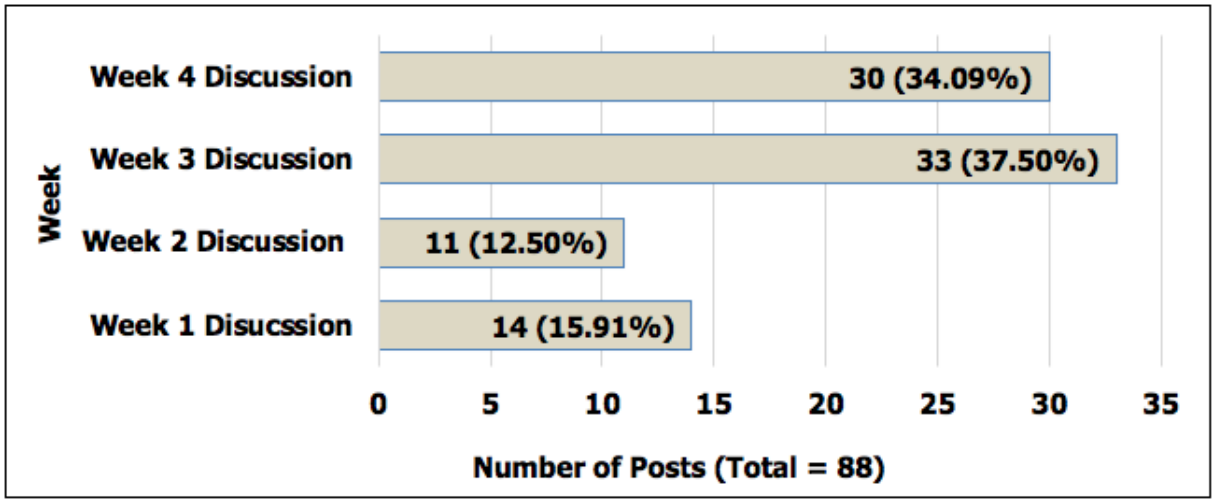


Figure: 2 Number of weekly discussion forum posts

Overall, the student performances in the discussion forums were average (M = 3.66). Their performances were also average in the first 2 weeks but scored low in the Week 4 discussion (M = 2.67), possibly because the Week 4 topic (recognizing and evaluating arguments) was more complex than the previous topics. The highest mean (M = 4.77) was for the Week 3 discussion (making inferences); therefore, it could be concluded that the students possibly understood the Week 3 content better than in the other weeks or possibly because the Week 3 video and lesson activities were more effective.

Student performances in the quizzes were average. There were slightly significant improvements from Week 1 to Week 4, with high results in Week 3 (M = 7.36) and Week 4 (M = 7.73), possibly because the students were more familiar with the quizzes by Weeks 3 and 4. Overall, the mean for the course was 6.8 out of 10. Student performances in the final exam were average (M = 23.73) ranging from 20 to 28.5, with an average of 23.73 (SD = 3.09).

These results indicated that the student achievement of the course learning objectives was average. This might have been because it was the students' first experience of an online course, which might have affected their performance; however, it had been expected that the novelty would have increased student motivation to explore new learning experiences. The results for all assessment components suggested that Week 4 was difficult.

Student Evaluations

The means and standard deviations were computed to analyses the student responses to the end-of-course evaluation. The overall average on all items was high (M = 4.06, out of 5). The students reported that the course objectives were included in the course outline and that the outline gave the necessary information and the assessment tasks (M = 4.30). However, they were neutral about the course videos, the course color choices and the clarity of the quiz instructions (M = 3.64). The overall response to the course instructor was positive (M = 4.18), with the lowest mean being for timely feedback. There were also student responses related to the low performance in Week 4, which correlated to the Week 4 scores in the discussion forum. However, the high results in the Week 4 quiz indicated that the discussion forum had helped the students learn for the quiz.

Instructor Evaluation

The thematic analysis of the course instructor interview revealed four major themes: good aspects of the course, course issues, student performance and learning, and suggestions for improvements. The course instructor had a positive view of the course structure, content sequence and organization, the language used in the course, and the variation in the readings. However, the course instructor felt that the student–student

interactions were very limited and that the student critical thinking skills' development was not very evident in the student responses in the discussion forums. She also claimed that some students had been unable to comprehend all parts in the course, and in particular, many students found the final week topic "argument analysis" difficult. The instructor suggested that optional activities, such as videos and readings related to the course topics, could be added for the active students who finished early, that the videos could include more examples and explanations and that more details and instructions could be given to the students before they attempted the quizzes.

Reviewer Evaluations

The course reviewers gave an average score of three for all four evaluation rubric dimensions, structure, content, processes, and outcomes, with only slight variations in some elements. All reviewers felt that the course was easy to navigate and it clearly matched the course outline. However, they suggested that the content be supplemented with external links and additional resources. The reviewers also commented on the limited interactions in the course, which they felt could have negatively affected the student performances in some parts of the course.

These results revealed that the students were satisfied with the course outline, course objectives, course structure, and course content, which could have positively benefited their learning. This finding was consistent with Polloff and Pratt (2001), who claimed that high student perceptions of online courses were most often related to course structure and course organization (as stated in Song, 2004). All students had accessed the course only once and had finished all activities in one sitting, which meant that they were unable to view the feedback on their work and were unable to reply to their friends' posts on the course. Although this finding differed from previous research studies (Orlich et al., 2010; Overholser, 1993; Shen & Yodkhumlue, 2016; Wright, 2016), which claimed that to develop critical thinking skills, discussion, questioning, and interactions were important in both traditional and online courses, it is consistent with that of Morss (1999), who reported student feelings of isolation and lack of interaction in an online course. Although previous research has found that online discussions can enhance critical thinking skills (Rathakrishnan et al., 2017), the student benefits from the discussion forums were limited, which was possibly because most students were unavailable for discussions throughout the entire week or possibly because of inadequate prior experience with online group discussions, as also reported in Garside (1996).

As student interactions were limited, the course instructor was not able to use Socratic questioning techniques or group discussions as in previous research studies (Orlich et al., 2010; Shen & Yodkhumlue, 2016; Wright, 2016; Zhao et al., 2016) to nurture students' critical thinking skills. The limited student–student interactions could also have been due to the low language proficiency levels of the students (A1 level: basic users of English) or due to students' limited online availability in the online course. To resolve this issue, the instructor and reviewers advised that other activities be included to encourage students to access the course more often. Even though the instructor considered the videos "useful" and "informative," she also commented that some lacked clarity and had insufficient examples and explanations. To maintain student interest, the videos were simple and short as advised by Berk (2009) and Hartsell and Yuen (2006). However, this issue affected student learning negatively in Week 4 because videos were the only medium used to introduce and teach weekly skills.

CONCLUSION

The study developed and evaluated a short online course in critical thinking skills for foundation students in AOU-Oman. The study revealed that Nation and Macalister's (2010) language curriculum design model worked well when designing the online course, as without the first two steps, the course would have been unsuitable because the learning objectives would not have focused on the student needs or the course environment. The model was also useful in guiding the selection and organization of the course content. However, based on the study results, some additional steps to the model might make it more appropriate for online course design. Figure 3 shows an enhanced version of the online course design model.

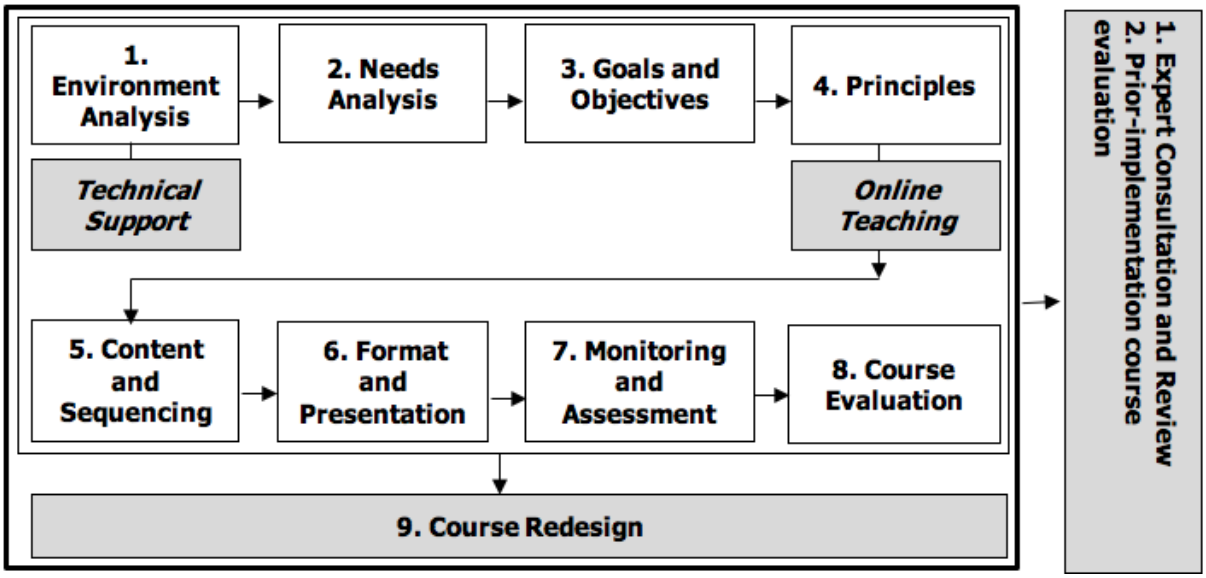


Figure 3. Enhanced version of online course design model

The enhanced version of the model includes five additional steps, as shown in Figure 2. First, using subject-matter and course design experts could enhance the course design process of from environmental analysis to course redesign as they could assist and review the work with the course developer to ensure it is appropriate and meaningful for the students. Second, having a section on online teaching principles in the fourth stage of the model could help online course designers consider different ways to motivate the students to participate in the online discussions and to better engage them in the course activities. Failing to consider methods for motivating the students could possibly explain the limited interactions in the developed course. Third, since formative and summative course evaluations while the course is being implemented may be insufficient, prior evaluation of the online course could also assist in the model design and ensure that issues were identified and solved before the implementation of the course. Because this course used Moodle Cloud, there was no need for any technical and administrative institutional support; however, the design model could also include technical support in the environmental analysis. While it could be argued that this is part of the environmental analysis, it should be more prominent in online design models because technical support is crucial to online learning and should not be overlooked. The final addition is the course redesign step (step 9) when all changes and modifications are incorporated based on the results of the course expert review results, the prior-implementation evaluation results, the course evaluation results, and the course assessment.

Several limitations in this study need to be considered. First, previous expertise was not considered in designing the online course. Second, the sample size was relatively small. Therefore, it is recommended that the enhanced version of the online course design be used by online course designers and online course instructors when designing online courses and that further studies implement and evaluate the enhanced version of the course design model to measure its effectiveness for online course design. Future studies could also compare this design model to existing online course design models. Further work is required to establish whether this enhanced online design model is suitable for designing content courses that are different from that of EFL skills-based courses. Designing and implementing an online course using the suggested desing model in this study across different institutions is another scope for future research that might indicate strengths and weaknesses of online course design. Finally, the suggesstred design model in this study might be a very helful model to be used to evaluate and ensure the quality of existing online courses.

Acknowledgements: Ishaq Al-Naabi expresses his gratitude to Prof. Thuwayba Al-Barwani, Dr. Otherine Neisler and Dr. Salma Al-Humaidi for their guidance and supervision in conducting this study. The author would like to thank Enago (www.enago.com) for the English language review.

BIODATA and CONTACT ADDRESSES of AUTHORS

Ishaq AL-NAABI is a language lecturer in the English Language Center at the University of Technology and Applied Sciences-Nizwa, Oman. Mr. Al-Naabi gained his M.Ed. in Curriculum and Teaching Methods of English from Sultan Qaboos University in 2019. His academic interest areas are online curriculum development and evaluation, e-learning, online pedagogy, distance learning, teaching methods, professional development and research in higher education. He has several publications and he has presented at some international and national conferences and seminars. He has provided some training workshops on the use of online management systems and online course design.

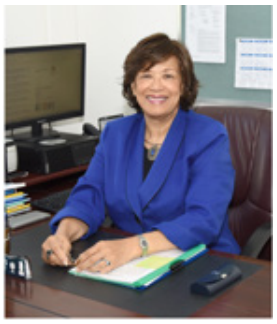
Ishaq AL-NAABI
English Language Center
Address: University of Technology and Applied Sciences
P.O. Box 477, P. C. 611, Nizwa, Sultanate of Oman
Phone: +968 92534667
E-mail: aladeeb001@gmail.com

Dr. Thuwayba AL BARWANI is a Professor of Curriculum and Instruction at the College of Education (ELT) and the Director of the Center for Excellence in Teaching and Learning at Sultan Qaboos University. She served in key government positions as well as administrative positions at SQU. She currently serves in a number of committees, boards, and think tanks at the national level and consultant in other national and international organizations. She is a principal investigator and co-investigator in several research projects funded by the HM grants, TRC grants, and SQU internal grants and has published extensively at the Local, regional and international level in areas such as: English Language Teaching, Accreditation and Quality in Higher Education, Teacher Education and Gender and Family.

Thuwayba AL BARWANI
Department of Curriculum & Instruction, College of Education
Address: Sultan Qaboos University
P.C.123, Muscat, Sultanate of Oman
Phone: (+968) 99839222
E-mail: thuwaiba49@gmail.com

Dr. Salma AL-HUMAIDI is an associate professor of English language teaching at Sultan Qaboos University. Dr. Salma Al-Humaidi gained her Ph.D. in English Education from Indiana University, USA in 2002. Her academic interest areas are learning, teaching, learner-centered instruction and teacher education. She has over than 20 journal articles published in international indexes, two international book chapters and other articles and papers submitted to conferences and newsletters. She has participated in many national and international conferences. She has taught different courses and supervised many master program students at SQU.

Salma AL-HUMAIDI
Curriculum and Instruction Department, College of Education
Address: Sultan Qaboos University, P.C.123, Muscat, Sultanate of Oman
Phone: (+968) 97278572
E-mail: salmahumaidi@gmail.com



Dr. Otherine J. NEISLER, Deputy Director of the Center for Excellence in Teaching and Learning at Sultan Qaboos University, is an Associate Professor of Curriculum and Instruction working on special projects in Oman since 2007. She previously taught at Boston College, Yale University and University of Saint Joseph. Her research interests include university readiness, especially critical thinking in Oman; higher education teaching, learning, and assessment; and accreditation processes.

Otherine J. NEISLER
Deputy Director Center for Excellence in Teaching and Learning
Address: CETL, Sultan Qaboos University. Box 50, P.C.123, Muscat, Sultanate of Oman
Phone: (+968) 24141021
Email: oneisler@gmail.com

REFERENCES

Alismail, H. A., & McGuire, P. (2015). 21st century standards and curriculum: Current research and practice. *Journal of Education and Practice, 6*(6), 150–155. http://files.eric.ed.gov/fulltext/EJ1083656.pdf

Alzaghoul, A. F. (2012). The implications of the learning theories on implementing e-learning courses. *The Research Bulletin of Jordan ACM, 11*(11), 27–30.

Bennett, N., & Lemoine, G. J. (2014). What VUCA really means for you. *Harvard Business Review*. https://hbr.org/2014/01/what-vuca-really-means-for-you

Berk, R. A. (2009). Multimedia teaching with video clips: TV, movies, YouTube, and mtvU in the College Classroom. *International Journal of Technology in Teaching and Learning, 5*(1), 1–21.

Brown, J. (1995). *The elements of language curriculum: A systematic approach to program development.* Heinle & Heinle.

Creswell, J. W. (2012). *Educational research: Planning, conducting and evaluating quantitative and qualitative research (4th Edition)*. Pearson.

Croxton, R. A., & Chow, A. S. (2015). Using ADDIE and systems thinking as the framework for developing a MOOC: A case study. *Quarterly Review of Distance Education, 16*(4), 83–96. https://libproxy.library.unt.edu:2165/docview/1786249888/fulltextPDF/E04000D5016C483EPQ/1?accountid=7113

Fisher, D., Frey, N., & Lapp, D. (20S12). Building and activating students' background knowledge: It's what they already know that counts. *Middle School Journal, 43*(3), 22–31. https://doi.org/10.1080/00940771.2012.11461808

Garside, C. (1996). Look who's talking: A comparison of lecture and group discussion teaching strategies in developing critical thinking skills. *Communication Education, 45*(3), 212–227. https://doi.org/10.1080/03634529609379050

Graves, K. (1999). *Designing language courses: A guide for teachers*. Heinle & Heinle.

Graves, K. (2000). *Teachers as course developers.* Cambridge University Press.

Gravestock, P., & Gregor-Greenleaf, E. (2008). *Student course evaluations: Research , models and trends.* Higher Education Quality Council of Ontario.

Hartsell, T., & Yuen, S. C. Y. (2006). Video streaming in online learning. *AACE Journal, 14*(1), 31–43. http://digitalvideooverview.weebly.com/uploads/2/0/1/9/2019204/article_6152.pdf

Hsu, T. C., Lee-Hsieh, J., Turton, M. A., & Cheng, S. F. (2014). Using the ADDIE model to develop online continuing education courses on caring for nurses in Taiwan. T*he Journal of Continuing Education in Nursing, 45*(3), 124–131. https://doi.org/10.3928/00220124-20140219-04

Johnson, P. (2009). *The 21st century skills movement. Educational Leadership*. http://ipkt.org:8080/modul/DPLI/index_htm_files/21ST CENTURY SKILLS.pdf

Koo, T. K., & Li, M. Y. (2016). A guideline of selecting and reporting intraclass correlation coefficients for reliability research. *Journal of Chiropractic Medicine, 15*(2), 155–163. https://doi.org/10.1016/j.jcm.2016.02.012

Kumar, R., & James, R. (2015). Evaluation of critical thinking in higher education in Oman. *International Journal of Higher Education, 4*(3), 33–43. https://doi.org/10.5430/ijhe.v4n3p33

Liaw, M. (2007). Content-based reading and writing for critical thinking skills in an EFL context. *English Teaching and Learning, 2*(Summer), 45–87.

Morss, D. A. (1999). A study of student perspectives on web-based learning: WebCT in the classroom. *Internet Research, 9*(5).

Nation, I. S. P., & Macalister, J. (2010). *Language curriculum design*. Routledge.

Neisler, O., Clayton, D., Al-Barwani, T., Al-Kharusi, H., & Al-Sulaimani, H. (2016). 21st Century teacher education: Teaching, learning and assessment of critical thinking skills at Sultan Qaboos University. In F. M.Assuncao & T. Al Barwani (Eds.), *Redefining Teacher Education for the Post-2015 Era* (pp. 77–95). Nova Science Publishers, Inc.

Olusegun, S. (2015). Constructivism learning theory: A paradigm for teaching and learning. *IOSR Journal of Research & Method in Education Ver. I, 5*(6), 66–70. https://doi.org/10.9790/7388-05616670

Orlich, D. C., Harder, R. J., Callahan, R. C., Trevisan, M. S., & Brown, A. H. (2010). *Teaching strategies: A Guide for effective instruction (9th Edition).* Wadsworth Cengage Learning.

Overholser, J. C. (1993). Elements of the Socratic method: Systematic questioning. *Psychotherapy, 30*(1), 67–74. http://www.tandfonline.com/doi/full/10.1080/00098659809602729

P21 Partnership for 21st Century Learning. (2006). *Framework for 21st Century Learning.* http://www.p21.org/our-work/p21-framework

Qing, X. U. (2013). Fostering critical thinking competence in EFL classroom. *Studies in Literature and Language, 7*(1), 6–9. https://doi.org/10.3968/j.sll.1923156320130701.2717

Rathakrishnan, M., Ahmad, R., & Suan, L. (2017). Online discussion : Enhancing students' critical thinking skills. *The 2nd International Conference on Applied Sciences and Technology 2017 (ICAST'17) Proceedings.* https://doi.org/10.1063/1.5005453

Richards, J. C. (2001). *Curriculum development in language teaching*. Cambridge University Press. https://doi.org/10.1111/j.1540-4781.2007.00543_2.x

Rudner, L. M., & Schafer, W. D. (2002). *What teachers need to know about assessment.* National Education Association. https://doi.org/10.21832/adger0186

Shen, P., & Yodkhumlue, B. (2016). Teacher's questioning and students' critical thinking in EFL classroom interaction. *The 8th International Postgradduate Research Colloquium: Interdisciplinary Approach for Enhancing Quality of Life IPRC Proceedings, 2*(2016), 44–53.

Shibley, I., Amaral, K. E., Shank, J. D., & Shibley, L. R. (2011). Designing a blended course: Using ADDIE to guide instructional design. *Journal of College Science Teaching, 40*(6), 80–85.

Shroff, R. H., & Vogel, D. R. (2009). Assessing the factors deemed to support individual student intrinsic motivation in technology supported online and face-to-face discussions. *Journal of Information Technology Education, 8*, 59–85.

Song, H. (2004). The perceptions of college students regarding the instructional quality of online courses delivered via WebCT. In *E-Learn: World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education* (pp. 2141-2146). Association for the Advancement of Computing in Education (AACE).

Ternus, M. P., Plamer, K. L., & Faulk, D. R. (2007). Benchmarking quality in online teaching and learning: A rubric for course construction and evaluation. *The Journal of Effective Teaching, 7*(2), 51–67.

Wright, B. M. (2016). Display and referential questions: Effects on student responses. *Nordic Journal of English Studies, 15*(4), 160–189.

Zhao, C., Pandian, A., Kaur, M., & Singh, M. (2016). Instructional strategies for developing critical thinking in EFL classrooms. *English Language Teaching, 9*(10), 14–21. https://doi.org/10.5539/elt.v9n10p14

CAN SOCIAL MEDIA PROMOTE SOCIAL PRESENCE AND ATTITUDE IN EFL CLASSES?

Dr. Sibel Ergun ELVERICI
ORCID:0000-0002-6921-5013
School of Foreign Languages
Yildiz Technical University
Istanbul, TURKEY

Received: 20/01/2020 **Accepted:** 20/05/2020

ABSTRACT

It is true that social media has a significant presence in today's world and has become an integral part of our lives. Researchers have been trying to find ways to integrate social media to language classes to take advantage of the possibilities social media can offer such as fostering students' engagement with the language, increasing their motivation and making them socially and collaboratively connected. The underlying idea behind this is to take advantage of the possibilities social media can offer to achieve a better learning environment resulting with more effective learning outcomes. Thus, this study seeks to understand and reveal the effects of integrating social media on students' social presence and their attitudes to it when social media is integrated in foreign language classes. Facebook was used as part of high school students' curriculum in English lessons. Explanatory mixed design was used. Data were analysed by using paired samples t-test and content analysis. The results of the study showed that there was no significant difference in students' attitude to social media but there was a significant difference in their social presence.

Keywords: Social media, social presence, Facebook, EFL classes, technology integration.

INTRODUCTION

Rapid developments in technology and communication have made the communication through the internet essential part of people's lives in today's world. There is no doubt that the internet provides the fastest and easiest way to achieve information. Millions of people and therefore groups which are constantly growing and developing are connected to each other through the internet. Since more and more people have access to the internet, more and more people have started use the social media. In this respect, social media is considered to be one of the best ways of communication and has been referred to with different names and affecting socialisation. Social media's growing attraction for the educators and researchers to investigate its contributions to education is attributed to its enabling communication and having millions of users. When considering people's using social media to stay in touch, get social support, get information based on cooperation and share it, create content and form it by bringing it together, social media sites can be considered as pedagogical tools as well and they have the potential to support teaching and learning activities (Leong, Ibrahim, Dalvi-Esfahani, Shahbazi & Nilashi, 2018; Chen, 2018; Nagel, Remillard, Aucoin, & Takenish, 2018) which should not be underestimated in especially EFL classes to explore and meet the diverse learning needs of students. Yet, social media research can still be considered to be relatively new but is definitely developing and some suggest the need for a solid framework for social media in particular using Facebook in education (Manca & Ranieri, 2016; Zhang, & Gupta, 2018). Consequently, Facebook is taken as the social media tool in this study which is still the most popular social media tool and enables fast and efficient communication (Facebook, 2019). Yet, the primary focus of Facebook is believed to provide social interaction which is also in line with social presence as part of the main focus of this study.

LITERATURE REVIEW

Since the terms web 2.0, social media and social networking sites are usually used interchangeably (Greenhow & Lewin, 2016; Peeters, 2018) why the term 'social media' is used in this study is explained to get a better look at this issue. When the literature is considered, it is seen that web 2.0 is usually considered to be a technical term and referred to as the common name of the places where information is generated and developed by their users first and then easily shared (Chugh & Ruhi ,2017; Greenhow & Askari, 2017). The improvements of web 2.0 paved way to the changes in the internet applications and they have been given different names such as social networks, social sites and online communities. One of the definitions of the term 'social media' is "applications, services, and systems that allow users to create, remix, and share content" Junco (2014, p.6). While enabling connectivity, communication and collaboration social media appears in different forms such as blogs, vlogs and instant messaging (Zincir, 2017; Chugh & Joshi 2017). The majority of social media sites help individuals who have common features like interests, needs and political ideas to have a contact and communicate with each other. People use social sites for various purposes such as making new friends, staying in touch, communicating with people with similar interests, organizing social events or joining them, sharing pictures and playing games. Apart from this socialization feature, social media sites help users to restructure their learning in an open-ended social context. They do this by going beyond the access of content which means their restructuring information in an ongoing process while giving opportunities that would allow social application of this information. Social media sites are informal places that play an important role in the continuation of interaction outside class whose users are usually young people. They are expected to increase group interactions and co-operations while connecting users in web-mediated environment with a great deal of information exchange. Using social media for educational purposes has been a matter of interest for a long time on the part of the researchers, one of which was about Facebook dating back to 2006 (Hewitt & Forte, 2006). Social media as part of technology integration for educational purposes has surely involves challenges and since then there have been disappointing findings about social media use, especially Facebook as well (Madge, Meek, Wellens & Hooley, 2009; Wood, 2014). However, today social media is widely used in educational settings and social media is believed to support school related tasks and improve student's performance (Greenhow & Robelia, 2009; Anankulladetch, 2017).Social media's enabling socializing easily and becoming an inevitable fact of our lives led to its increasing use and research in education (Huang, Wu, She & Lin, 2014; Ma, 2017; Akbari, Naderi, Simons & Pilot, 2016). This may be because social media provides students a place where they can interact about their studies. They also have the opportunity of participating in collaborative settings outside of school and it can help students to direct their interest to academic subjects (Lau, Lui, & Chu, 2016; Lantz-Andersson, 2018). Social media differs from learning management systems in that learning management systems students already use do not allow any place for social communication tools and their personal profiles. However, students require more and more autonomy, interaction and social communication opportunities and the literature regarding this subject indicates that social media tools support activities used in education in terms of interaction, cooperation, information and resource sharing, communication and critical thinking (Ha, Joa, Gabay & Kim, 2018; Sheeran & Cummings, 2018). It can be argued that social media has the potential like improving students', teachers' and parents' communication skills as well as other community members' while allowing to form online professional learning communities (Cox & McLeod, 2014; Nalbone et.al., 2016). In this respect, as well as offering a wide range of topics in terms of entertainment, being a social media tool, it can be suggested that Facebook also keeps the potential for learning and gathering information from different fields and promotes collaborative learning (Menzies, Petrie & Zarb, 2017). This can be considered as a suggestion that Facebook can be used as a complementary tool (Hong & Gardner, 2019). This is also supported in other research which suggest that Facebook enables users to discuss on a subject that they are interested in by giving them an endless space and sharing opportunity which ultimately results in supporting students in their learning and can be used for educational activities (Luke, 2019; Ware, Kern, & Warschauer, 2016). Involving social media tools in education is considered to be a valuable and significant asset for socializing and supporting collaboration in the lives of young people. This aspect can be linked to social presence and although they were designed for other purposes it can be said that social media sites have started to appear to a great extent in young people's education life.

How is social presence connected to social media then? Among many other reasons, the importance of social presence also comes from its influence in learning. Social presence is believed to help participants form relationships based on mutual trust suggesting a positive effect on learning (Lin, Kang, Liu, & Lin, 2016; Sung & Mayer, 2012), for students the absence of which may lead to a high level of frustration, an unreasonably critical attitude toward the professor's efficacy as well as a low level of affective learning (Wei, Chen, and Kinshuk, 2012). The definitions of social presence are continuous at least for the researchers investigating this term. In this continuity researchers tend to conceptualize social presence as the degree of an individual's being "real" and "there". These definitions have usually focused on the degree of an individual's ability to reflect themselves as real and be real in online environments. Social presence was developed by Short, Williams and Christie in 1976 and one of the definitions of Williams (1978a) described social presence as the feeling of communicating. These researchers defined social presence as the degree of being there when two people are communicating through a communication tool which can also be interpreted as the quality of being there. Yet, contextual and individual factors as well as the individual features of participants play an important role in perceiving the degree of social presence (Kang and Gratch, 2014; Oh, Bailenson & Welch, 2018). In that matter, being the most popular social media tool and a large component of the global world, Facebook is believed to naturally support social presence (Rap & Blonder, 2016; Gordon, 2016). Its providing different areas for both teachers and students for communication makes social media more embedded in our lives and is expected to support successful learning and social presence.

Given the growing role of emerging technologies in education, it is important for educators to understand the role of social media in the foreign language classroom and of course using social media for educational purposes is not free from limitations. Some of the concerns attributed to using technology in educational settings are inactive behaviour, lack of academic language use, teacher interest/training, teacher workload and privacy concerns (Aydin, 2014; Bahati, 2015; Godwin-Jones, 2019). However, as aforementioned, since the emerging technologies in education is growing day by day, their integration to the language classroom needs to be taken into consideration more especially regarding different skills by the educators and this idea finds itself a large place in the related literature (Zheng, Yim & Warschauer, 2018; Chugh & Ruhi, 2018; Cetinkaya & Sutcu, 2019). While providing young people with both interesting and encouraging tools, social media can create fun and interactive content and allow young people to reach effective and comfortable learning process (Imlavi & Gregg, 2014¸Kawachi, 2019). Social media's supporting collaborative learning and critical thinking, by allowing their members to work in personalized environments, can be a way to improve its members' skills such as communication and writing (Dizon, 2016; Suswati & Saleh, 2019; Chandran, Plaindaren, Pavadai & Yunus, 2019).

THE IMPORTANCE AND PURPOSE OF RESEARCH

It can be argued that today's students are more apprehensive and technologically knowledgeable than in the past and due to growing advances in technology constant change in many aspects of life is inevitable. Since social media sites include many people as readers and at the same time writers and appear with their socialization features like personalized content, information sharing and cooperation, it brings with itself the necessity to investigate the role of social media in education. Therefore, as mentioned before, this study takes Facebook, as being the most popular and known social media tool, and investigates its effects in relation to students' social presence and students' attitudes in in the context of learning a foreign language, English.

The hypotheses that have been formed in line with the aims of the study is:

1. In foreign language lessons where social media is used, the social presence levels of students are higher compared to the ones whose foreign language lessons do not use social media.
2. In foreign language lessons where social media is used, the attitude of students to social media is higher compared to the ones whose foreign language lessons do not use social media.

As for the qualitative part the question is:

What are the opinions of students about the effects of the use of social media in foreign language lessons on their attitude to social media?

THE STUDY

The study aimed to find whether using social media affects students' social presence as well as their attitude to social media in foreign language teaching, in this study English by using mixed method model.

Study Group

The study group was comprised of a 32 high school students who attended a private school in different campuses in Istanbul. The students were in their second year at high school and followed the same curriculum. Experimental group had 8 boys and 8 girls and the control group had 9 boys and 7 girls. The quantitative part of the study was conducted according to the principles of quasi-experimental design since the classes were already formed. The teacher of the experimental group had 16 years of teaching experience and was working in the school the study was conducted for 10 years. The teacher of the control group had 19 years of teaching experience and was working in the school the study was conducted for 12 years.

Data Collection Tools

In compliance with the set goal of this study, explanatory mixed pattern was used. Quantitative data were collected before the qualitative data. For the quantitative part of the study, to measure students' perceptions of social presence and to be as comprehensive as possible 5-point Likert social presence scale was used (Arbaugh,et al., 2008). As for their attitude to social media, social media attitude scale developed for teenagers was used (Otrar & Argin, 2015). Although the social presence scale was translated into Turkish and its validity and reliability was worked on, considering the ages of the students, the scale was translated into Turkish again and its validity and reliability was re- evaluated by different professionals both in English and in Turkish. A pilot study was also carried out with 49 students from 8th grades in a different school. Cronbach's Alpha was found to be 0.96 and KR-20 was found to be 0.86. Social media attitude scale (Otrar & Argin, 2015) consisting of 23 items and its Cronbach's Alpha was .85. Semi-structured interview was used for the qualitative part of the study. The interview was conducted with 7 boys and 6 girls who volunteered to take part in the interview. Since the students answered the questions in great detail in the surveys, in the interview they were not asked to answer questions like how much time they spend on the social media or for what purposes they use it unless part of the sub-questions in line with the nature of the semi-structured interview. Instead, the questions asked in the interview aimed to find out the students' reflections on the use of social media both in their private lives and as part of the English lessons and encouraged them to comment on it. Some of the questions asked are "How did you feel when you shared your views on the topics?" and "Do you find it worth using Facebook in the English lessons? Why/Why not?" The interviews were recorded and later transcribed in accordance with the procedures of content analysis.

Implementation

Before the implementation started the students were given brief information about the study. They were then given the social presence scale and the social media attitude scale and asked to fill in. The same process was applied at the end of the implementation. The implementation process was carried on for 7 weeks. In addition to their technology supported foreign language education the students in the experimental group used social media for their foreign language lessons, English, while the control group on another campus of the same school continued their usual technology supported foreign language education. First the students were asked to join the Facebook page created by the researcher. They were then asked to actively share their ideas in the discussions which were prepared according to the topics of their English lessons stated in the curriculum. During the course of the experiment, the students were motivated and encouraged by their teacher. The discussion questions which were aligned with their weekly syllabus were given at the end of every week. Some of the questions presented at the page were "What is the best way of shopping? Do you prefer online shopping? Why/Why not? How would you describe digital era?" The researcher regularly observed the lessons and met the students in person.

Data Analysis

For the quantitative part of the study, in order to find out the difference between the experimental and control groups in terms of their social presence and their attitudes to social media, t- test was used.

For the qualitative part of the study, content analysis which included coding, categorization, description and interpretation was used (Patton, 2002). In the coding stage, students' responses to interview questions were examined and meaningful parts were determined from which codes were formed and then put into categories during which data were divided into different meaningful sections and these sections were given different names. The students' real names were not used and given codes. K for girls, and E for boys was used, which are the first letters of sexes in Turkish. Then the data were coded in a general framework. In order to ensure reliability and to eliminate any wrongdoings resulting from the researcher, the support of another researcher in the field were referred to. The data gained from the interview were first coded and after waiting for a week recoded, checked and compared by both researchers for the reasons of ensuring reliability. Next, main ideas were summarized and listed in the description stage and final conclusions were drawn in the interpretation stage. The researcher and the other researcher met and discussed their ideas regularly during the whole process aiming to reach a consensus on emerging themes, the inter-rater reliability of which was found to be ,87. There were two themes that would explain the ideas appeared in the interviews in general. In the last section, both codes and themes were put into tables.

FINDINGS

Findings Regarding Homogeneity for Social Presence

Table 1. Experimental Group's Homogenity for Social Presence

Values		Social Presence	
		Pre-test	Post-test
N		16	16
Normal	$\bar{x}$	25.31	38.25
Par.	ss	5.12	1.80
Z		.972	.935
P		.870	.293

To find out whether the data were distributed homogenically Shapiro-Wilk test was applied and the results of the experimental group for social presence pre- test (z= .972;p >.05) ; post- test (z= .935; p > .05)showed that data were distributed normally.

Table 2. Control Group's Homogenity for Social Presence

Values		Social Presence	
		Pre-test	Post-test
N		16	16
Normal	$\bar{x}$	23.13	25.38
Par.	ss	1.31	5.85
z		.932	.958
p		.259	.634

To find out whether the data were distributed homogenically Shapiro-Wilk test was applied and the results of the control group for social presence pre- test (z= .932;p >.05) ; post- test (z=.958; p > .05) showed that data were distributed normally.

Table 3. Experimental Group's Homogenity for Social Media Attitude Scale

Values		Social Media Attitude Scale	
		Pre-test	Post-test
N		16	16
Normal	$\bar{x}$	56.75	57.06
Par.	ss	3.53	3.60
z		.977	.951
p		.939	.508

To find out whether the data were distributed homogenically for the experimental group Shapiro-Wilk test was applied and the results for social presence pre- test (z= .977; p >.05); post- test (z=.951; p > .05) showed that data were distributed normally.

Table 4. Control group social media attitude scale Shapiro-Wilk test results

Values		Social Media Attitude	
		Pre-test	Post-test
N		16	16
Normal	$\bar{x}$	61	53.46
Par.	ss	11.01	10.63
z		.982	.920
p		.980	.170

To find out whether the data were distributed homogenically for the experimental group Shapiro-Wilk test was applied and the results for social presence pre-test (z= .982;p >.05) ; post-test (z=.920; p > .05) showed that data were distributed normally.

Table 5. Comparison of Pre-tests

Point	**Groups**	N	$\bar{x}$	ss	$Sh_{\bar{x}}$	t Test		
						t	Sd	p
Social Presence Pre tests	Exper.	16	25.31	5.12	1.28	1.655	1.32	.108
	Control	16	23.13	1.31	.328			

To find out whether there was a significant difference between the pre-tests of experimental and control groups for social presence scale, independent samples t-test was applied. The results with (t=1.655; p < .05) showed that there was not a significant difference.

Table 6. Comparison of pre-tests of social media attitude scale for experimental and control groups

Puan	Groups	N	$\bar{x}$	ss	$Sh_{\bar{x}}$	t Test		
						t	Sd	p
SMTO Pre test	Exper	16	56.75	3.53	.883	-1.470	121	.152
	Control	16	61	3.89	.974			

To find out whether there was a significant difference between the pre-tests of experimental and control groups for social media attitude scale, independent samples t-test was applied. The results with (t= -1.470; p < .05) showed that there was not a significant difference.

Comparison of Social Presence Scale Results for Pre and Post-Tests For Experimental and Control Groups

Table 7. Comparison of experimental group's pre and post-tests

Points	Groups	*N*	$\bar{x}$	*ss*	$Sh_{\bar{x}}$	*t* Test		
						t	*Sd*	*p*
Social Presence Pre- test Post- test	Pre-test	16	25.31	5.12	1.28	-9.295	5.56	,000
	Post-test	16	38.25	1.80	4.52			

To find out whether there was a significant difference between experimental group's pre-test and post-test results paired samples t-test was applied. The results for arithmetic mean for social presence were found to be significant with (t=-9.295; p <.05) This difference was for post-tests which meant after the treatment the experimental group's social presence level increased significantly.

Table 8. Comparison of control group's pre and post-test points

Points	Groups	*N*	$\bar{x}$	*ss*	$Sh_{\bar{x}}$	*t* Test		
						t	*Sd*	*p*
Social Presence Pre test- Post test	Pre-test	16	23.13	1.31	.328	-1.434	6.27	.172
	Post-test	16	25.38	5.85	1.46			

To find out whether there was a significant difference between control group's pre-test and post-test results paired samples t-test was applied. The results for arithmetic mean for social presence were not found to be significant with (t=-1.434; p < .05).

Table 9. Comparison of Experimental group's SMTO Pre-test-Post-test Points

Points	Groups	*N*	$\bar{x}$	*ss*	$Sh_{\bar{x}}$	*t* Testi		
						t	*Sd*	*p*
SMTO Pre-test Post-test	Pre-test	16	56.75	3.531	.883	-1.232	1.014	.237
	Post-test	16	57.06	3.605	.901			

To compare experimental group's s social media attitude points and find out whether there was a significant difference, paired samples t-test was applied. the results with (t=-1.232; p < .05) showed that there was not a significant difference.

Table 10. Comparison of Control Group's SMTO Pretest-Postest Points

Points	Groups	N	$\bar{x}$	ss	$Sh_{\bar{x}}$	t Test		
						t	Sd	p
SMTO Pre-test Post-test	Pre-test	16	61	11.01	2.754	.473	15.84	.643
	Post-test	16	59.13	10.63	2.660			

To compare control group's social media attitude scale points for pre-tests and post-tests paired samples t test was applied. The results with (t=.473; p < 05) showed that the difference was not significant. Control group's points did not increase significantly.

Table 11. Comparison of Experimental and Control Groups' post-tests for social presence

Points	Groups	N	$\bar{x}$	ss	$Sh_{\bar{x}}$	t Test		
						t	Sd	p
Social Presence Post test	Exper.	16	38.25	1.80	.45	8.408	1.53	,000
	Control	16	25.38	5.85	1.46			

To compare experimental and control groups' social media attitude scale points for post-tests independent samples t test was applied. The results with (t=8.408; p < 05) showed that the difference was for the experimental group and significant.

Table 12. Comparison of Experimental and Control Groups' post tests for social media attitude scale points

Points	Groups	N	$\bar{x}$	ss	$Sh_{\bar{x}}$	t Test		
						t	Sd	p
SMTO Post test	Exper.	16	57.06	3.60	.901	-,734	2.808	.468
	Control	16	59.13	10.63	2.66			

To compare experimental and control groups' social media attitude scale points for post-tests independent samples t test was applied. The results with (t=-,734; p < 05) showed that the difference was not for the experimental group and not significant.

Drawing on the Data from the Students' Interviews

To find out students' opinions about the effects of the use of social media in foreign language lessons in the qualitative part of the study, semi-structured interviews were conducted. After the implementation of social media supported lessons for 7 weeks with the experimental group, 13 students were volunteered to take part in the interview. Data gathered from the interview were brought together in codes first and themes that would cover these codes were formed. The opinions of students about the impact of using social media in foreign language classrooms on students' social presence were examined in detail and the themes which were found by using content analysis were as follows: communication and fun. Only some of the students' own expressions are given place here due to the richness of data as well as the space limitations. The tables showing students' responses and both the codes and themes are given below.

Table 13. Some of the students' responses that led way to the theme "communication"

Student	Response
K5	"I go on Facebook almost every day and so do my friends and I think it sort of helped us know each other better. I now know different things about my mates thanks to this. I don't know why we didn't before but we started to talk to each other in class more also"
E1	"I wasn't very happy about it first but later it was different. I could catch up on what was going on around more and felt like I should check more although it was still again more work"
E4	"To me it was still English lesson but how can I say.. I started to be more involved in the whole thing and be more open. I wish it continued more".

Table 14. Some of the students' responses that led way to the theme "fun"

Student	Response
K2	"I mean it was really different to see Facebook in the class and I have enjoyed it very much. I think we all liked it anyway.. And our teacher as well"
E3	"I don't know what to say .. It was like having a break while you are learning English.. and I think it was a lot of fun".
E5	"Well to be honest, at the beginning I wasn't really sure and I was afraid. What would my friends think about my posts? And OK it was still homework and project and staff but I had a lot of fun. I usually checked it with my friend (E6) and it was good, it was a laugh"

Table 15. Codes and Themes

CODE	FREQUENCY	THEME
Enabled easy communication	10	Communication
More communication opportunities	10	
Sharing (posts, videos, etc.) leading to better communication	9	
Total	29	
Chance to have more enjoyable time	9	Fun
Chatting, joking about daily issues	9	
Having fun outside school	8	
Having more enjoyable activities	4	
Total	30	

DISCUSSION AND CONCLUSION

How social media is used and what students think of these practices have been addressed by a number of scholars as aforementioned. The internet, mobile phones and social media are the complementary part of the students' environment in which they grew up and therefore today's students differ from the previous generations to a great extent in many ways such as thinking, learning and processing information. Yet, socialization and interaction features of the social media coming from its own nature can increase interaction among students which can contribute to their social presence and increase the quality of participation in learning process in a more effective learning environment. This may also be true for attitude (Lewis and Nichols, 2016). Consequently, it is usually the assumption that if students have high social presence, their attitudes toward using social media in the classroom will be more positive as well, which was the underlying idea behind this study.

However, when looked at the findings of this study, it is interesting to note that while there was a significant increase in students' social presence after the implementation, the difference was insignificant for the students' attitude to social media. Yet, students mentioned the effects of using Facebook in EFL classes, some of which were categorized in themes as communication and fun. So what happened and how come students' social presence increased but their attitude was not affected at the end of this study? This may be attributed to several reasons including but not limited to a) students valued the content of the course enriched with social media for their education but they did not see it encouraging enough in terms of their attitude b) the fact that they knew each other for a long time and considered the social media tool only as part of the curriculum c) the fact that they used other forms of social media as well to communicate and were already comfortable with their environment. All students in this study reported use of more than one social media tool. While their standard modes of social communication with other students and instructors were through Facebook, they did not necessarily use it to socially communicate with each other or with instructors or better say they did not need an integrated social media tool in their curriculum to make them communicate more which would ultimately result in having a more positive attitude to social media.

Taking specifically, it is true that when a social media tool is introduced, it is welcomed by the majority of students and embraced readily (Albayrak & Yildirim, 2015; Ramirez, 2017). As expected the students in this study considered Facebook as part of the curriculum, welcomed and valued it but this did not contribute to their attitude significantly. The social media tool offered outside the students' regular classroom environment was interesting and exciting in their academic realm, increased their social presence significantly but it kept its place there. Yet, it can still be argued that the advantages of using social media for educational purposes in EFL classes outweigh the disadvantages and the negative attributes can be controlled and one way of achieving this might be keeping and maintaining professionalism as well as setting boundaries and modelling appropriate use of social media. A plausible explanation might be that the students may have not felt the need for the introduction of a social media tool for non-academic connections which ultimately may have led them to remain neutral. This could also be interpreted as students had already positive attitude to social media and they did not need an extra intervention to make their attitude more positive, especially knowing that they are constantly monitored by their teachers. As some of the literature regarding this subject indicated students may have wanted to keep their privacy to themselves (Donlan, 2014; Prescott, Wilson, & Becket, 2013; Voivonta and Avraamidou, 2018).

Despite the limited scope of current study, the results of this study indicate that students were happy to use a social media tool as part of their curriculum as it helped them have better communication with their peers in the academic realm and was enjoyable which ultimately resulted in increased social presence. The implementation for this study was designed for academic communication and the students showed high level of social presence after the implementation period and to this end, the results of this study is aligned with prior research (Akcaoglu & Lee, 2018; Keles, 2018; Law, Geng & Li, 2019). Why social presence is important has been revealed in many studies suggesting the use of social media tools to foster development of social presence via self-disclosure, leading to better student motivation, perceived learning and a comfortable classroom climate. Since the social presence levels of students increased significantly after the implementation, it is still possible to argue that social media tools enhance social interactions with and among students and help to form effective learning environments (Sato & Ballinger, 2016; Tarchi & Pinto, 2017). Consequently, integration of new technologies to current educational environments caused significant changes in learning processes as a whole and learning outcomes. Students need communication opportunities like they have in their daily lives and mention the lack of such opportunities. It is suggested that the lack of impersonal course content does not answer the needs of students even if it is applied with different methods. Whether social media is adopted in academia or not, it is possible to say that social media can enhance student learning and should not be disregarded (Lim & Richardson, 2016; Naghdipour, 2017; Balaman & Sert, 2017; Dung & Ouynh, 2018).

On the whole, it is true that students who learn English as a foreign language have to struggle through different types of learning difficulties which include a lack of motivation, self-efficacy and high anxiety (Chu, Wang & Wang, 2019; Cheng & Chen, 2019). In this context, research about using social media for the purposes of education signify the benefits as well as the potentials of it where students can have the opportunity of sharing resources and developing communication among other skills such as making meaning

in an authentic learning environment that would decrease the potential problems. This also underlines the importance of embedding language learning in stimulative and communicative environments which gives users a chance to gain interaction and language socialization outside the formal learning environments. (Pavlović & Prokopović, 2015; Kesici, 2019; Muls et.al., 2019). To be more specific, it can be said that social media research is still young and more research is needed to get more insight into students' interaction in social media environments (Wirtz & Gottel, 2016). Integrating social media that students may also use outside the classroom can be a vehicle to help the educational program to be connected to their 'real life' and generate meaningful content with which more effective educational outcomes can be achieved.

Limitations

Although the current study is thought to have provided some insights, there are a number of limitations that should be taken into consideration. First, the sample size was small, with only 32 participants in both the experimental and the control groups. There were differences that could not be included among participants such as motivation. This can be taken as a serious limitation which also restrains its generalizability to a larger population. Second, the experiment lasted for seven weeks. Conducting the study with a number of participants over a longer time period might suggest different results and can erase most of the questions that might come up regarding findings. Yet, this study took place in EFL in Turkish context and can be taken as a highlighter signifying a need to more research which would include various EFL learners with different contextual variables.

Acknowledgements: I would like to highlight that I do not have any conflict of interest with anyone and thank everyone who participated in this study.

BIODATA and CONTACT ADDRESSES of AUTHOR

Dr. Sibel Ergun ELVERICI is currently teaching at Yildiz Technical University, School of Foreign Languages. She graduated from Marmara University, Faculty of Education, ELT Department with a first class degree. She received her M.A in Bogazici University ELT Department and conducted her PhD on Educational Technology in Bahcesehir University. After her PhD, she started an M.A programme on Special Education in Marmara University and is now working on her thesis. Her research interests focus on technology integration, English as a Foreign Language, mobile technologies, Web 2.0,social presence and teacher education including different aspects of Special Education.

Sibel Ergun ELVERICI
School of Foreign Languages
Address: Yildiz Technical University, 34220, Istanbul, Turkey
Phone: +90 2123834920
E-mail: elverici@yildiz.edu.tr

REFERENCES

Akbari, E., Naderi, A., Simons, R. J., & Pilot, A. (2016). Student engagement and foreign language learning through online social networks. *Asian-Pacific Journal of Second and Foreign Language Education,* 1(1), 4.

Akcaoglu, M., & Lee, E. (2018). Using Facebook groups to support social presence in online learning. *Distance Education*, 39(3), 334-352.

Albayrak, D., & Yildirim, Z. (2015). Using social networking sites for teaching and learning: Students' involvement in and acceptance of Facebook® as a course management system. *Journal of Educational Computing Research*, 52(2), 155-179.

Anankulladetch, Phasita, "The Impact of Social Media on ESL Students' Learning Performance" (2017). Capstone Projects and Master's Theses. 135.

Arbaugh, J. B., Cleveland-Innes, M., Diaz, S. R., Garrison, D. R., Ice, P., Richardson, J. C., & Swan, K. P. (2008). Developing a community of inquiry instrument: Testing a measure of the community of inquiry framework using a multi-institutional sample. *The internet and higher education*, 11(3-4), 133-136.

Aydin, S. (2014). Foreign Language Learners' Interactions with Their Teachers on Facebook. *System,* 42, 155-163. DOI:10.1016/j.system.2013.12.001.

Bahati, B. (2015). Extending student discussions beyond lecture room walls via Facebook. *Journal of Education and Practice*, 6(15), 160-171.

Balaman, U., & Sert, O. (2017). Development of L2 interactional resources for online collaborative task accomplishment. *Computer Assisted Language Learning,* 30(7), 601-630.

Chandran, Y., Plaindaren, C. J., Pavadai, S., & Yunus, M. M. (2019). Collaborative Writing: An Integration of Snack Bars and Hi-Five Fingers via Social Media. *Creative Education*, 10(02), 475.

Chen, M. M. (2018). Students' perceptions of the educational usage of a Facebook group. *Journal of Teaching in Travel & Tourism*, 18(4), 332-348.

Chu, H.-C., Wang, C.-C., & Wang, L. (2019). Impacts of Concept Map-Based Collaborative Mobile Gaming on English Grammar Learning Performance and Behaviors. *Educational Technology & Society*, 22 (2), 86–100.

Chugh, R., & Ruhi, U. (2018). Social media in higher education: A literature review of Facebook. *Education and Information Technologies*, 23(2), 605-616.

Chugh, R., & Joshi, M. (2017). Challenges of knowledge management amidst rapidly evolving tools of social media. In Chugh, R (ed), Harnessing Social Media as a Knowledge Management Tool, *IGI Global*, 299– 314, doi: 10.4018/978-1-5225-0495-5.ch014

Cox, D. & McLeod, S. (2014). Social media strategies for school principals. *NASSP Bulletin*, 98 (1) (2014), pp. 5-25

Cetinkaya, L., & Sutcu, S. S. (2018). Students' success in English vocabulary acquisition through multimedia annotations sent via Whatsapp. *Turkish Online Journal of Distance Education*, 20(4), 85-98.

Dizon, G. (2016). A comparative study of Facebook vs. paper-and-pencil writing to improve L2 writing skills. *Computer Assisted Language Learning*, 29(8), 1249-1258.

Donlan, L. (2014). Exploring the views of students on the use of Facebook in university teaching and learning. *Journal of Further and Higher Education*, 38(4), 572-588.

Dung, T. N. T., & Quynh, L. T. N. (2018). The incorporation of Facebook in language pedagogy: Merits, defects, and implications. 15th Asia TEFL and 64th TEFLIN International Conference on English Language Teaching, July 13-15, 2018, Yogyakarta, Indonesia (pp. 529-536). Routledge.

Facebook (2019). Company info: Facebook newsroom. http://newsroom.fb.com/company-info/.

Godwin-Jones, R. (2019). In a World of SMART Technology, Why Learn Another Language? *Educational Technology &Society*, 22 (2), 4–13.

Gordon, J. (2016). How is language used to craft social presence in facebook? a case study of an undergraduate writing course. *Education and Information Technologies*, 21(5), 1033-1054.

Greenhow, C., & Askari, E. (2017). Learning and teaching with social network sites: A decade of research in K-12 related education. *Education and Information Technologies*, 22(2), 623–645.

Greenhow, C., & Robelia, B. (2009). Old communication, new literacies: Social network sites as social learning resources. *Journal of Computer-Mediated Communication*, 14(4), 1130-1161.

Greenhow, C. & Lewin, C. (2016) Social media and education: reconceptualizing the boundaries of formal and informal learning, *Learning, Media and Technology*, 41:1, 6-30, DOI: 10.1080/17439884.2015.1064954

Ha, L., Joa, C. Y., Gabay, I., & Kim, K. (2018). Does college students' social media use affect school e-mail avoidance and campus involvement?. *Internet Research*, 28(1), 213-231.

Hewitt, A., & Forte, A. (2006). Crossing boundaries: Identity management and student/faculty relationships on the Facebook. *Poster presented at CSCW, Banff, Alberta*, 1-2.

Hong, Y., & Gardner, L. (2019). Undergraduates' perception and engagement in Facebook learning groups. *British Journal of Educational Technology*.

Huang, H. Y., Wu, H. L., She, H. C., & Lin, Y. R. (2014). Enhancing Students' NOS Views and Science Knowledge Using Facebookbased Scientific News. *Journal of Educational Technology & Society*, *17*(4), 289-301.

Imlawi, J., & Gregg, D. (2014). Engagement in online social networks: The impact of self-disclosure and humor. *International Journal of Human-Computer Interaction*, *30*(2), 106-125.

Kang, S. H., & Gratch, J. (2014). Exploring users' social responses to computer counseling interviewers' behavior. *Computers in Human Behavior*, *34*, 120-130.

Kawachi, P. (2019). 9. Role of Social Media in Learning: Benefits and Drawbacks—How Social Presence Theory. *Social Media in Higher Education: Case Studies, Reflections and Analysis*, 2.

Keles, E. (2018). Use of Facebook for the Community Services Practices course: Community of inquiry as a theoretical framework. *Computers & Education*, *116*, 203-224.

Kesici, A. (2019). Do Social Students Use Social Media More Often?. *Turkish Online Journal of Distance Education,* 20(2), 121-133.

Lantz-Andersson, A. (2018). Language play in a second language: Social media as contexts for emerging Sociopragmatic competence. *Education and Information Technologies*, *23*(2), 705-724.

Lau, W. W. F, Lui, V. & Chu, S.K.W. (2016). The use of wikis in a science inquiry-based project in a primary school. *Educational Technology Research and Development* (2016), 10.1007/s11423-016-9479-9

Law, K. M., Geng, S., & Li, T. (2019). Student enrollment, motivation and learning performance in a blended learning environment: The mediating effects of social, teaching, and cognitive presence. *Computers & Education*, 136, 1-12.

Leong, L. W., Ibrahim, O., Dalvi-Esfahani, M., Shahbazi, H., & Nilashi, M. (2018). The moderating effect of experience on the intention to adopt mobile social network sites for pedagogical purposes: An extension of the technology acceptance model. *Education and Information Technologies*, 23(6), 2477-2498.

Lewis, B. K., & Nichols, C. (2016). Social Media and Strategic Communication: A Three-Year Study of Attitudes and Perceptions about Social Media among College Students. *Public Relat. J*, *10*(1), 1-23.

Lim, J., & Richardson, J. C. (2016). Exploring the effects of students' social networking experience on social presence and perceptions of using SNSs for educational purposes. *The Internet and Higher Education*, 29, 31-39.

Lin, V., Kang, Y. C., Liu, G. Z., & Lin, W. (2016). Participants' experiences and interactions on Facebook group in an EFL course in Taiwan. *The Asia-Pacific Education Researcher*, *25*(1), 99-109.

Luke, J. Y. (2019, January). Portraying the Use of Facebook for Educational Purposes Among Female Undergraduates: Causes and Activities. *In UICELL Conference Proceeding* (No. 2, pp. 38-44).

Ma, Q. (2017). A multi-case study of university students' language-learning experience mediated by mobile technologies: a socio-cultural perspective. *computer assisted language learning*, *30*(3-4), 183-203.

Madge, C., Meek, J., Wellens, J., & Hooley, T. (2009). Facebook, social integration and informal learning at university:'It is more for socialising and talking to friends about work than for actually doing work'. *Learning, media and technology*, 34(2), 141-155.

Manca, S., & Ranieri, M. (2016). Facebook and the others. Potentials and obstacles of social media for teaching in higher education. *Computers & Education*, 95, 216-230.

Menzies, R., Petrie, K., & Zarb, M. (2017). A case study of Facebook use: Outlining a multi-layer strategy for higher education. *Education and Information Technologies*, 22(1), 39-53.

Muls, J., Triquet, K., Vlieghe, J., De Backer, F., Zhu, C., & Lombaerts, K. (2019). Facebook group dynamics: an ethnographic study of the teaching and learning potential for secondary school teachers. *Learning, Media and Technology*, 44(2), 162-179.

Naghdipour, B. (2017). Close Your Book and Open Your Facebook' : A Case for Extending Classroom Collaborative Activities Online. *The Journal of AsiaTEFL* volume 14, issue 1, P130-143 DOI: 10.18823/asiatefl.2017.14.1.9.130

Nagel, T. W., Remillard, C., Aucoin, R., & Takenishi, A. (2018). Findings on Student Use of Social Media at the Collegiate, Undergraduate, and Graduate Levels: Implications for Post-Secondary Educators. *Journal of University Teaching & Learning Practice*, 15(1), 8.

Nalbone, D. P., Kovach, R. J., Fish, J. N., McCoy, K. M., Jones, K. E., & Wright, H. R. (2016). Social networking web sites as a tool for student transitions: Purposive use of social networking web sites for the first-year experience. *Journal of College Student Retention: Research, Theory & Practice,* 17(4), 489-512.

Oh, C. S., Bailenson, J. N., & Welch, G. F. (2018). A systematic review of social presence: definition, antecedents, and implications. *Front. Robot*. AI 5: 114. doi: 10.3389/frobt.

Otrar, M., & Argin, F. S. (2015). Ogrencilerin sosyal medyaya iliskin tutumlarini belirlemeye yonelik bir olcek gelistirme calismasi. *Egitim ve Ogretim Arastirmalari Dergisi*, 4(1), 391-403.

Patton, M. Q. (2002). Two decades of developments in qualitative inquiry: A personal, experiential perspective. *Qualitative social work*, 1(3), 261-283.

Pavlović D., Mihajlov Prokopović A. (2015). Attitudes of teachers to the application of computers in preschools. *In The 11th International Scientific Conference eLearning and software for Education Bucharest,* Carol I NDU Publishing House, Vol 1, (277-283), Page 278-279.

Peeters, W. (2018) Applying the networking power of Web 2.0 to the foreign language classroom: a taxonomy of the online peer interaction process, *Computer Assisted Language Learning*, 31:8, 905-931, DOI: 10.1080/09588221.2018.1465982

Prescott, J., Wilson, S., & Becket, G. (2013). Facebook use in the learning environment: do students want this? *Learning, Media and Technology*, 38(3), 345–350.

Ramirez, D. M. (2017). Attitudes of Students and Faculty Toward Using Computer Technology and Twitter for Online Learning and Student Engagement: A Cross-Sectional Analysis. PhD Dissertation. St. Thomas University.

Rap, S., & Blonder, R. (2016). Let's face (book) it: Analyzing interactions in social network groups for chemistry learning. *Journal of Science Education and Technology*, 25(1), 62-76.

Sato, M., & Ballinger, S. (Eds.). (2016). *Peer interaction and second language learning: Pedagogical potential and research agenda* (Vol. 45). John Benjamins Publishing Company.

Sheeran, N., & Cummings, D. J. (2018). An examination of the relationship between Facebook groups attached to university courses and student engagement. *Higher Education*, 76(6), 937-955.

Short, J., Williams, E., & Christie, B. (1976). *The social psychology of telecommunications*. John Wiley & Sons.

Sung, E., & Mayer, R. E. (2012). Five facets of social presence in online distance education. *Computers in Human Behavior*, 28(5), 1738-1747.

Suswati, R., & Saleh, S. (2019). The Use of Social Media in Designing The Writing Assessment for EFL Students. *Journal of ELT Research*, 26-34.

Tarchi, C., & Pinto, G. (2016). Reciprocal teaching: Analyzing interactive dynamics in the co-construction of a text's meaning. *The Journal of Educational Research*, 109(5), 518-530.

Voivonta, T., & Avraamidou, L. (2018). Facebook: a potentially valuable educational tool?. *Educational Media International*, *55*(1), 34-48.

Ware, P., Kern, R., & Warschauer, M. (2016). 14 The development of digital literacies. *Handbook of second and foreign language writing*, *11*, 307.

Wei, C., Chen, N., & Kinshuk. (2012). A model for social presence in online classrooms. *Education Technology Research and Development*, 60 (3), 529-545.

Williams, E. (1978a). Teleconferencing: Social and psychological factors. *Journal of Communication,* 84, 125-131.

Wirtz, B. W., & Gottel, V. (2016). Technology acceptance in social media: review, synthesis and directions for future empirical research. *Journal of Electronic Commerce Research,* 17(2), 97.

Wood, J. (2014). College Students In Study Spend 8 to 10 Hours Daily on Cell Phone. *Psych Central.* https://psychcentral.com/news/2014/08/31/new-study-finds-cell-phone-addiction-increasingly-realistic-possibility/74312.html

Zhang, Z., & Gupta, B. B. (2018). Social media security and trustworthiness: overview and new direction. *Future Generation Computer Systems,* 86, 914-925.

Zheng, B., Yim, S., & Warschauer, M. (2018). Social media in the writing classroom and beyond. *The TESOL Encyclopedia of English Language Teaching*, 1-5.

Zincir, O. (2017). Knowledge workers' social media usage as a personal knowledge management tool. In *Harnessing Social Media as a Knowledge Management Tool* (pp. 108-124). IGI Global.

WEB 3.0 IN LEARNING ENVIRONMENTS: A SYSTEMATIC REVIEW

Dr. Esra ACIKGUL FIRAT
ORCID: 0000-0002-6401-1476
Faculty of Education
Adiyaman University
Adiyaman, TURKEY

Dr. Selcuk FIRAT
ORCID: 0000-0002-2935-2929
Faculty of Education
Adiyaman University
Adiyaman, TURKEY

Received: 22/01/2020 **Accepted:** 11/05/2020

ABSTRACT

Web 3.0 technologies have inevitably affected educational research. Many studies have been conducted on the use of Web 3.0 tools in learning environments. The synthesis and summarization of the results of these studies with a systematic review is considered important in terms of being the source of future research and helping to spread the use of these technologies in education. Hence the purpose of this systematic review is to obtain a better understanding of how Web 3.0 technologies can be used to enhance quality of educational settings. The systematic analysis was conducted by 81 papers from 2005 to 2020. The PRISMA Statement was used in the research and report generation process. Papers related to semantic, augmented reality, intelligent tutoring system, 3d visual environments, 3d games and ontologies is included in the study. The results show that in 2008 and 2013 there was an increase in the number of studies. In addition, most experimental studies have been conducted in this literature and the studies in the discipline of science education are more than other disciplines. When the data collection tools used in the studies were examined, it was found that the majority of the studies were quantitative and most benefited from surveys, questionnaires and observational information in the data collection process. In addition, the majority of studies focus on the learning usefulness and learning outcomes of the software used in the research. Furthermore, suggestions for future researches were made in line with the limitations and results of the study.

Keywords: Systematic review, Semantic Web, augmented and virtual reality, intelligent tutoring systems.

INTRODUCTION

The concept of e-learning has emerged as a result of shifting of traditional teaching environments from to digital environments with the development of web technologies (Miranda, Isaias and Costa, 2014). With the continuous development of web technologies, e-learning environments have also changed. E-learning has recently become applicable and popular thanks to the rapid development of internet technology, especially in relation to web page interaction (Lee, Tsai & Wang, 2006). When web technology entered our lives for the first time, there were websites where the flow of information was one-way, and users could not interfere with the information and only access information allowed by the administrators (Park, 2003; Thomas ve Li, 2008). This form of the Web, called Web 1.0, is only considered a "read-only" web with minimal interaction on websites (Dominic, Francis & Pilomenraj, 2014). Then, there was a transition from a read-only form (Web 1.0) to a read-write form (Web 2.0) and with Web 2.0 technologies, users also play the role of authors. In this form of the Web, the social use of the web has come to the forefront and collaboration, allowing

users to actively participate in content creation and to share information online (Grosseck, 2009). Web 2.0 tools have the potential to affect e-learning environments (Buffington, 2008). Web 2.0 technologies have greatly increased interaction with social inclusion, but with the progress of the Web, it has gone beyond interaction with knowledge. After this process, the meaning and personalization of the information has gained importance. This has led to the emergence of Web 3.0 technologies called semantic web. Semantic Web inherits the concepts of the World Wide Web and adds "meaning" to the Web that enables machines to understand the meaning of information (Berners-Lee, Hendler ve Lassila, 2001). Therefore, with the emergence of Web 3.0 technologies, the interactive world provided by Web 2.0 is made unique to people. Web 3.0 helps us to reach meaningful information by filtering out a lot of erroneous data for the needs of users in searches over the internet (Chisega-Negrilă, 2013). Therefore, the purpose of Web 3.0 tools is to provide a semantic web environment that enables users to access the information they need quickly and at any time (Miranda et al., 2014).

The advent of Web 3.0 applications and the reciprocal cyclic progress of science and technology have inevitably affected educational research. Many studies have been conducted on the use of Web 3.0 tools in education. The synthesis and summarization of the results of these studies with a systematic review is considered important in terms of being the source of future research and helping to spread the use of these technologies in education. Hence the purpose of this systematic review is to obtain a better understanding of how Web 3.0 technologies can be used to enhance quality of educational settings. Thus, information can be provided on how the evolution of web technologies will be reflected in educational environments. Because it is expected to move to Web 4.0 after 2020. Web 4.0 is called a symbiotic network in which the human mind can interact with the machine (Dominic, Francis & Pilomenraj, 2014). Although the definition and characteristics of Web 4.0 are determined, it is not known how it will affect our daily lives and especially educational environments. It is thought that this study will shed light on future learning environments by examining the studies using Web 3.0 technologies in teaching. In addition, it was determined that these studies were generally focused on one of the Web 3.0 technologies (Ibanez, Delgado-Kloos, 2018; Reisoglu, Topu, Yilmaz, Yilmaz & Goktas, 2017). In this study, more than one Web 3.0 tools are discussed and the researches in the literature are included in review. The purpose of this study is to review articles involving the use of Web 3.0 technologies in learning environments in a systematic way. For this purpose, the following sub-problems were sought:

1. What was the distribution of reviewed studies by years which determine the usage of Web 3.0 in learning environments?
2. In which disciplines were the reviewed studies carried out?
3. What were the trends in the use of research design of reviewed studies which determine the usage of Web 3.0 in learning environments?
4. What were the trends of data collecting tools, participants and examined variables of reviewed studies which determine the usage of Web 3.0 in learning environments?

BACKGROUND OF THE STUDY

Web 3.0 is also called "semantic web". Web 3.0 is a term created to describe the interaction that involves the development of Web use and the conversion of the Web into a database (Naik ve Shivalingaiah, 2008). With Web 3.0, computers can define what the query means when searching and what user intentions and needs are in this query (Miranda et al., 2014). Web 3.0 is called semantic web because it creates meaningful information. Because in these environments, the data is found by the software tools, evaluated and converted into meaningful information for transmission. With these tools, we can access the meaningful information we want in a personalized way for us in one step. The prominent features of these technologies are; smart web with intelligence analysis, personalization, interoperability web, virtualization (virtual 3D environments) and multimedia (Wadhwa, 2015). The widespread use of Web 3.0 technologies has been reflected in educational environments and has led to the development of e-learning 3.0. Dominic et al. (2014) and Rajiv and Lal (2011) summarized the E-learning 3.0 applications that provide individuals with personal settings and different options related to the use of Web 3.0 in education as Figure 1.

Figure 1. Web 3.0 Tools in E-learning (Dominic et al. 2014; Rajiv & Lal, 2011)

When the tools in Figure 1 are examined, it is seen that most tools include three-dimensional (3D) visualization. Such software allows visualization of three-dimensional (3D) data and provides an interactive environment that enhances the feeling of immersion in the computer-generated virtual world (Huang, Rauch & Liawc, 2010). In these environments, for example, a photo-realistic image of a 3D molecule can create a perception of looking at a real molecule, or a molecule can be rotated at a 360-degree angle to display different bond angles (Merchant, Goetz, Cifuentes, Keeney-Kennicutt & Davis, 2014). Another frequently used tool is Augmented reality (AR) applications. Augmented reality (AR) refers to technologies that dynamically combine real-world environments and context-based digital information (Sommerauer & Muller, 2014). Augmented Reality (AR) is the technology to add virtual objects to real scenes by allowing missing information to be added in real life (El Sayed, Zayed & Sharawy, 2011). ARs can be used for educational purposes by combining with Web 2.0 technologies or Web 3.0 technologies. For example; Schmalstieg, Langlotz and Billinghurst (2011) used Web 2.0 technologies for AR software and allowed collaboration, communication and information sharing with the system they developed. Matuszka (2013) ise combine Semantic Web and Augmented Reality utilizing the benefits of combination of Augmented Reality applications. However, many studies have identified AR as an application of Web 3.0 technologies (Chisega-Negrilă, 2016; Delgado, Fonseca & David, 2012; Dominic, Francis & Pilomenraj, 2014; Kuhn, 2014; Norman, Din & Nordin, 2011). The striking point in these studies is that the augmented reality applications go beyond the Web 2.0 tools that support communication and information sharing because they contain features for user intentions. Dominic et al. (2014), stated that Web 2.0 is about social networking and collaboration between creator and user; Web 3.0 is called smart web or semantic web with technologies such as big data, connected data, 3D visualization, augmented reality, and thus they incorporated augmented reality applications into Web 3.0 technologies. Chisega-Negrilă (2016) has similarly stated that the difference between Web 3.0 and Web 2.0 will be in the use of smart assistants who will provide augmented reality, text translation custom content (old, disabled) for specific categories of people. Accordingly, these tools, such as mobile learning, augmented reality (AR) are new ways to access information and provide potential for the Web 3.0 teaching concept (Delgado et al., 2012). Dominic et al. (2014) also stated that E-learning 3.0 technologies include augmented reality applications.

In this research, augmented reality applications are considered as a Web 3.0 technology based on these studies and are included in the systematic review. Another Web 3.0 tool is the Intelligent tutoring system (ITS). Intelligent Special Education Systems (ITSs) are computer-based education systems that shape teaching according to the individual learning needs of students and aim to reproduce the behavior of a teacher

(Moundridou & Virvou, 2003). ITS are teaching systems with an expert system that helps students solve a problem, and these systems mimic the interaction between the teacher who is an expert in a particular area and a student who wants to learn the concepts of that area (Nussbaum, Rosas, Peirano & Cardenas, 2001). Therefore, ITSs have the ability to flexibly present teaching materials and provide feedback to students (Moundridou & Virvou, 2003).

Web 3.0 tools use ontologies to make information structured and meaningful. Computer science borrows the term ontology from a branch of philosophy (metaphysics) that examines the nature of "existence" and enables the target world (or interpretation) to be represented in a comprehensible way by the computer (Isotani et al., 2013). In short, to realize the semantic Web, the use of ontology and conceptualization in organizing concepts and metadata are required. In semantic Web, ontology is a document or file containing a taxonomy and inference rules describing the concepts and their relationships that may exist for a particular field to enable information sharing and reuse (Huang & Yang, 2009; Lee, Tsai & Wang, 2008). An ontology explains concepts (classes) in a field, as well as relationships between these concepts (properties) (Huang & Yang, 2009). From an information-based system perspective, ontology is considered a hierarchical network in which the concepts of nodes, arches or arrows represent the existing relationships between relevant concepts (Wang, Mendori & Xiong, 2014). Ontologies have reusability, reasoning ability and support inference mechanisms that help provide advanced recommendations (George & Lal, 2019).

Web 3.0 and Education

In these tools, an assistant is assisted by users who are interested in learning, choosing the necessary information and tailoring it to their individual learning needs (Chisega-Negrilă, 2013). With all these features, Web 3.0 technologies provide online support to trainers in situations such as improving their courses, providing student support, evaluating and keeping records (Morris, 2011). Thus, in Web 3.0 environments, the focus is shifted to the student with fully self-directed and self-regulating with semantic web Technologies (Wadhwa, 2015). Thus, in these environments, students play an active role in the formation of knowledge through learner-centered instruction. Therefore, with the help of smart environments and personal assistants provided in Web 3.0, individuals can organize their own learning, set goals and make decisions about their own learning (Chisega-Negrilă, 2013). For example; Students' interaction in 3D visual environments enables users to influence the occurrence of events in the virtual environment through their actions (Merchant et al., 2012). The teaching environments presented in these environments also support the paradigm of constructivism, which argues that individuals construct information individually and socially. Hussain (2012) reported how Web 3.0 technologies support the basic principles of constructivism as shown in Table 1.

Table 1. Web 3.0 technologies supported by basic principles of connectivism.

Web 3.0 technologies used in e-Learning 3.0	Basic principles of connectivism
Social semantic networks, openness and interoperability	Learning and knowledge rests in diversity of opinions.
Big data or global data repository, linked data, cloud computing, extended smart mobile technology	Learning is a process of connecting specialized nodes or information sources. Currency of knowledge is important.
Machine learning, artificial intelligence, personal avatars, 3D visualization and interaction	Learning may reside in non-human appliances.
Semantic web, control of information	Capacity to know more is more critical than what is currently known.
Semantic web, collaborative intelligent filtering	Ability to see connections between fields, ideas, and concepts is a core skill.
Semantic web, collaborative intelligent filtering	Nurturing and maintaining connections is needed to facilitate continual learning.

As can be seen in Table 1, the features that semantic Web brings to teaching environments contribute to the implementation of constructivist teaching. Despite all of these contributions, there are challenges regarding the use of Web 3.0 technologies in education. Chisega-Negrilă (2013) explains the reasons for this situations; Security problems, Disliking changes, Not being innovative, No need for technology, Not familiar with technology, Disliking the idea of virtual assistants, Thinking that they will not have control over the process, Not trusting the information given, Choosing interaction with people, not making virtual decisions, Choosing to make your own decisions and so on. Hussain (2012) stated that, as a result of his literature study, some of the challenges are: *"Increased privacy and security risks, Web accessibility, Readiness of the users, be it the learner or the tutor, Requirement for further standardization of e-Learning Technologies, and social issues in term of increase of the digital divide"*. In order to eliminate these challenges and to make effective use of Web 3.0 tools in educational processes, it is important to examine the studies in this literature.

METHOD

This study aimed to review the studies related to the use of Web 3.0 technologies in education by a systematic way. A systematic review is a review of a clearly formulated problem that uses systematic and open methods to identify, select and critically evaluate the research involved, and to collect and analyze data from the studies included in the review (Moher, Liberati, Tetzlaff & Altman, 2009). Systematic analysis process was carried out using PRISMA Statement.

Eligibility Criteria and Information Sources

For the purpose of the study, firstly, articles published in English in peer-reviewed journals on the use of Web 3.0 in education as inclusion criteria were included. In order to determine the scope of the research, based on the Web 3.0 technologies specified by Dominic et al. (2014), and Rajiv and Lal (2011), semantic, augmented reality, intelligent tutoring system, 3d visual environments, 3d games and ontologies forming the infrastructure of these tools were included in the study. In the second stage, the criterion of the studies to be published in *Computers and Education* was determined. *Computers and Education* were chosen because it is one of the most cited journals in the field of educational technologies with 7.72 citeScore and 5. 627 impact factors. In addition, when the top list of journals is analyzed according to Google Scholar Metrics, this journal is first in the Social Sciences category ranks, Educational Technology subcategories with 94 h5-index and 135 h5-median scores. For this reason, the systematic analysis was conducted by including only the studies published in this journal. Since the use of Web 3.0 technologies in education does not go back to very old years, all publications were handled without limitation for a certain year. In addition, since the PRISMA Statemant was proposed for the systematic review in the *Computers and Education*, the PRISMA Checklist was used in the research and report generation process and presented in this direction.

Search

Scopus and Science direct databases were used in the search in accordance with the criteria determined in the research. The search was made on 14-15 October 2019. Firstly Scopus search by using the following search criteria in accordance with the criteria mentioned above. During the search, only the title, summary or keywords were searched.

TITLE-ABS-KEY ("web 3.0" OR "semantic" OR "intelligent tutoring system" OR "3d visual" OR ontology OR "augmented reality") AND education AND (LIMIT-TO (SRCTYPE , "j")) AND (LIMIT-TO (SUBJAREA , "SOCI") OR LIMIT-TO (SUBJAREA , "COMP")) AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (EXACTSRCTITLE , "Computers And Education")) AND (LIMIT-TO (LANGUAGE , "English")) AND (LIMIT-TO (EXACTKEYWORD , "Ontology") OR LIMIT-TO (EXACTKEYWORD , "Semantics") OR LIMIT-TO (EXACTKEYWORD , "Semantic Web") OR LIMIT-TO (EXACTKEYWORD , "Article"))

As a result of this search, 19 articles were reached. However, it was decided that the journal should be

searched from the journal page of *Computers and Education* due to the low number of the studies. Following the steps of Computers and Education / View Articles / All Issues, a search was made through the Science Direct database. (https://www.sciencedirect.com/journal/computers-and-education/issues). While searching through Science Direct database, and / or tips did not work like Scopus, separate searches were performed for each Web 3.0 technology (web 3.0, semantic, ontology, intelligent tutoring system, 3d virtual, augmented reality) and full text file of articles were downloaded.

Study Selection and Data Collection Process

The inclusion and exclusion criteria used for the study selection in the study are as in Table 2.

Table 2. Inclusion criteria and exclusion criteria

Inclusion Criteria	Exclusion criteria
• Related to Web 3.0 in education. • Related to semantic, augmented reality, intelligent tutoring system, 3d visual environments, 3d games and ontologies. • Peer-reviewed journal article. • Available with full-text. • Published with English Language • All research methods used in educational research were included in the study.	• Except articles published in journals other than Computers and education. • Studies whose research method is not clearly stated. • Review and meta-analysis studies were excluded. • Ontologies were excluded.

A pilot form was created to determine the studies to be included in the study and each study was examined by two researchers, and decided according to the criterias. In addition, in order to avoid bias risk in individual studies, all data analyzes were conducted separately by two researchers and discussed in non-common coding.

RESULTS

Study selection

The research process carried out in accordance with the determined criteria is summarized in Figure 2.

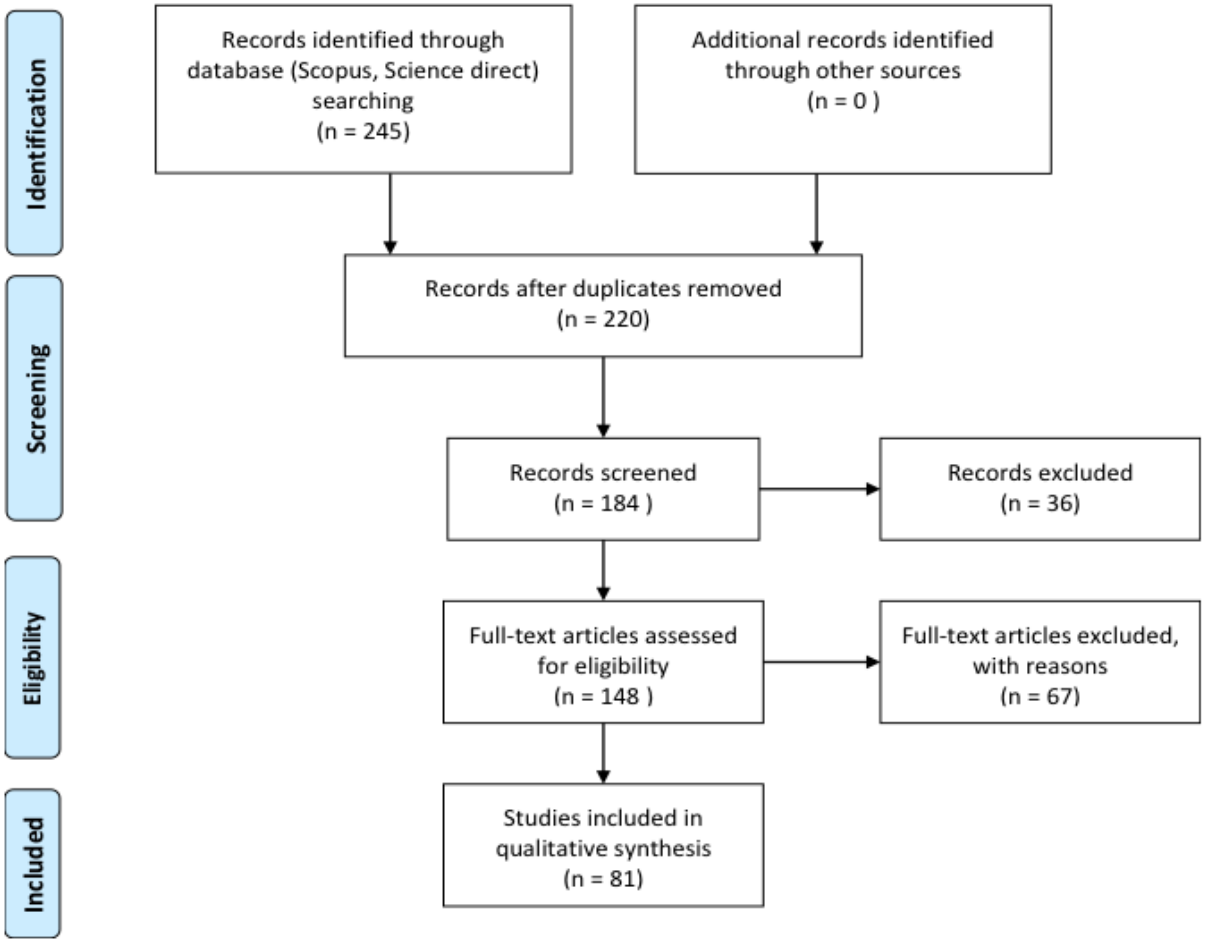


Figure 2. PRISMA Flow Diagram

Figure 2 shows the number of studies that were screened, assessed for eligilibility, included in or excluded from the systematic review.

Study Characteristics

Table 3 presents the studies included in the systematic review and which Web 3.0 browser these studies are related to.

Table 3. Studies in review and relevant Web 3.0 technologies

Web 3.0 technologies	Studies
Semantic web	Bujak et al., 2013; Isotani et al., 2013; Huang & Yang, 2009; Lee, Tsai & Wang, 2008; Lei, Sun, Lin & Huang, 2015; Vega-Gorgojo et al., 2010
3D virtual	Chen, 2016; Hamalainen & Oksanen, 2012; Harker-Schuch, Mills, Lade & Colvin, 2020; Korakakis, Pavlatou, Palyvos, & Spyrellis, 2009; Merchant et al., 2012; Mzoughi, Herring, Foley, Morris & Gilbert, 2007; Passig, 2015; Richards & Taylor, 2015; Sun & Cheng, 2009; Tuzun & Ozdinc, 2016; Zydney, deNoyelles, & Seo, 2012; Wu & Chiang, 2013

Augmented Reality/ Virtual reality	Arici, Yildirim, Caliklar & Yilmaz, 2019; Bouta, Retalis & Paraskeva, 2012; Bujak at al., 2013; Chang et al., 2014; Chang & Hwang, 2018; Chang, Lee, Wang & Chen, 2010; Chen & Tsai, 2012; Connolly, Stansfield & Hainey, 2011; Cheng & Tsai, 2014; Chiang, Yang & Hwang, 2014; Cuendet, Bonnard, Do-Lenh & Dillenbourg, 2013; Degli Innocenti et al., 2019; Di Serio, Ibanez & Kloos, 2013; Huang, Chen & Chou, 2016; Ferguson, van den Broek & van Oostendorp, 2020; Fidan & Tuncel, 2019; Frank & Kapila, 2017; Hsu, 2017; Huang, Rauch & Liaw, 2010; Ibanez, Di Serio, Villaran & Kloos, 2014; Ibanez & Delgado-Kloos, 2018; Joo-Nagata, Abad, Giner & Garcia-Penalvo, 2017; Kamarainen et al., 2013; Lin, Duh, Li, Wang & Tsai, 2013; Lee & Wong, 2014; Lindgren, Tscholl, Wang & Johnson, 2016; Merchant et al.; Passig, Tzuriel & Eshel-Kedmi, 2016; Rau, Zheng, Guo & Li, 2018; Ruiz-Ariza, Casuso, Suarez-Manzano & Martinez-Lopez, 2018; Sayed, Zayed & Sharawy, 2011; Sahin & Yilmaz, 2020; Sommerauer & Muller, 2014; Zhang, Sung, Hou & Chang, 2014; Wojciechowski & Cellary, 2013; Wang, 2017; Wei, Weng, Liu & Wang, 2015; Wu, Lee, Chang & Liang, 2013; Yip, Wong, Yick, Chan & Wong, 2019
Intelligent tutoring system	Arnau, Arevalillo-Herraez, Puig & Gonzalez-Calero, 2013; Chen, 2008; Chrysafiadi & Virvou, 2013; Curilem, Barbosa & de Azevedo, 2007; Dangsaart, Naruedomkul, Cercone & Sirinaovakul, 2008; Dolenc & Abersek, 2015; He, Hui & Quan, 2009; Hooshyar et al., 2016; Huang, Chu & Guan, 2007; Huang, Liu, Chu & Cheng, 2007; Hwang, 2003; Jaques & Vicari, 2007; Latham, A., Crockett & McLean, 2014; Latham, Crockett, McLean & Edmonds, 2012; Mitrovic, Ohlsson & Barrow, 2013; Mohamed & Lamia, 2018; Moundridou & Virvou, 2003; Nussbaum et al., 2001; Pavlekovic, Zekic-Susac & Djurdjevic, 2009; Rau, Michaelis & Fay, 2015; Sanchez, Bartel, Brown & DeRosier, 2014; Vaessen, Prins & Jeuring, 2014; Virvou & Alepis, 2005; Waalkens, Aleven & Taatgen, 2013; Wijekumar, Meyer & Lei, 2013

Table 3 shows all the studies in the systematic review. The distribution of these studies in terms of the relevant Web 3.0 technologies is shown in Figure 3.

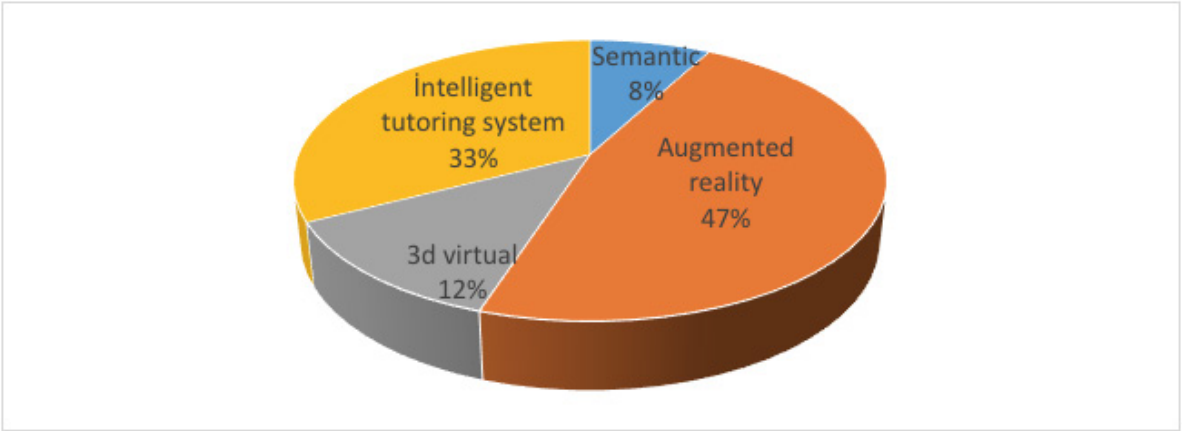


Figure 3. The distributions of studies

When Figure 3 was examined, it was found that the majority of the studies (47%) discussed in the review were conducted in Augmented reality applications. In the second place, while 33% of the studies in intelligent tutoring systems, 12% of the studies in 3d virtual technologies and semantic web technologies constitute 8%.

Results of the First sub Problem

The first problem of the research is "What is the distribution of reviewed studies by years which determine the usage of Web 3.0 in learning environments?". The distribution of the reviewed studies by years is examined in the graph in Figure 4.

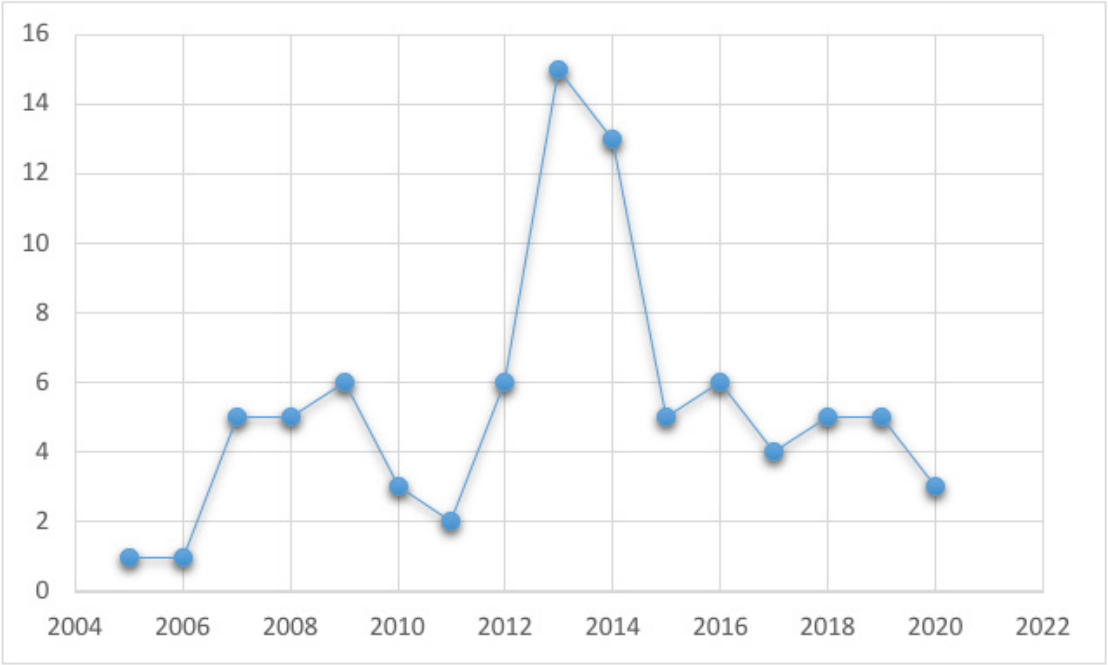


Figure 4. Distribution of the reviewed studies by years

When the distribution of the researches by years is examined, it has been observed that there has been an increase in 2008-2009 and a decrease in the number of studies in 2011. Furthermore, it was observed an increase again in 2013, but after 2015, the number of studies decreased again.

Results of the Second sub Problem

The second problem of the research is "In which disciplines were the reviewed studies carried out?". Distribution of the disciplines of reviewed studies is presented in Figure 5.

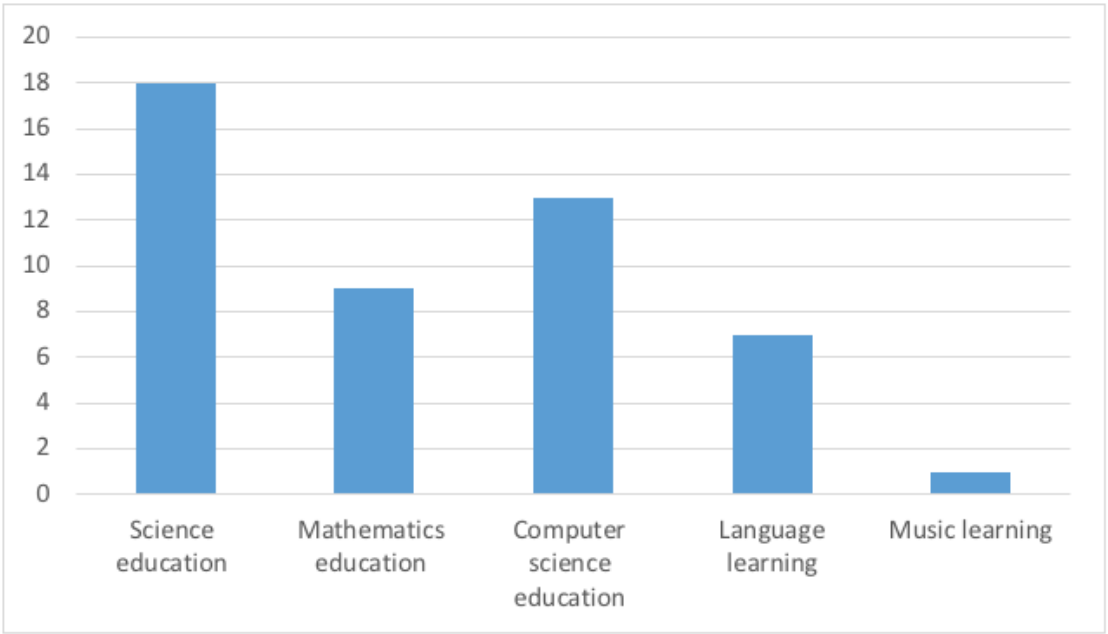


Figure 5. Distribution of the reviewed studies by disciplines

When the studies were reviewed, it was determined that 22% of the studies were conducted in order to contribute to the field of science education. While 16% of the studies were conducted in the computer science education discipline, it was found that there were 9 studies in mathematics education and 7 studies in language learning. Furthermore, it was determined that 40% of the studies were not specific to any discipline but were made to contribute to learning/teaching environments.

Results of the Third sub Problem

The third problem of the research is "What were the trends in the use of research design of reviewed studies which determine the usage of Web 3.0 in learning environments?". Distribution of the research designs of reviewed studies is presented in Figure 6.

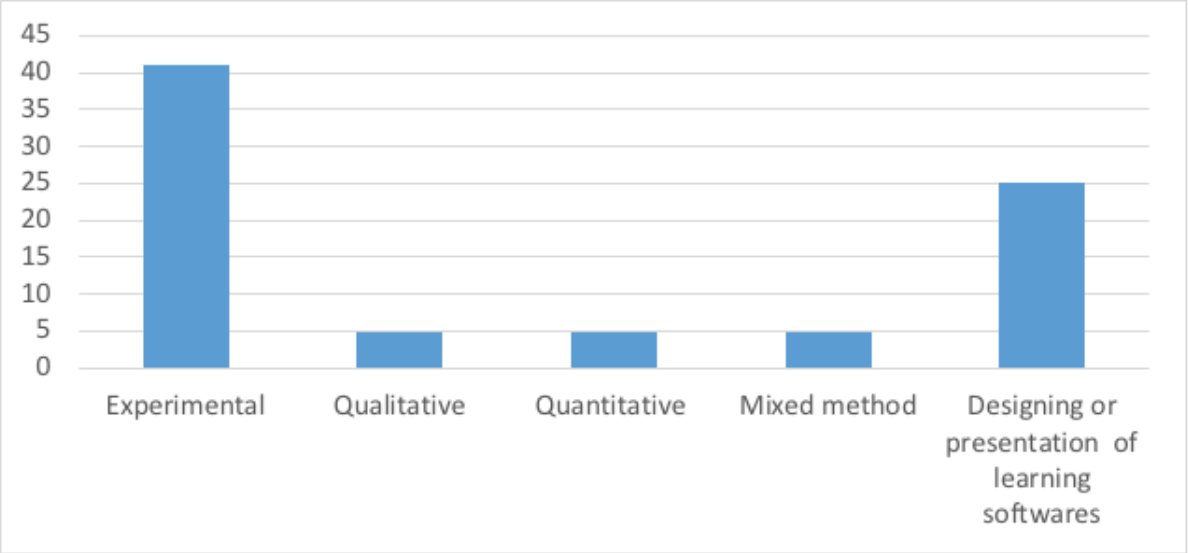


Figure 6. Distribution of the research designs of reviewed studies

Figure 6 shows that the majority of the studies (n = 41, %51) were conducted experimentally. The number of quantitative studies performed outside the experimental method is 5 and few studies (n = 5) were conducted qualitatively. In addition, the number of studies for designing or presentation of learning software was 25.

Results of the Fourth sub Problem

The third problem of the research is "What were the trends of data collecting tools, participants and examined variables of reviewed studies which determine the usage of Web 3.0 in learning environments?". Table 4 shows participants, data collecting tools, and examined variables of reviewed studies.

Table 4. Participants, data collecting tools, and examined variables of reviewed studies

Studies	Participants	Data collection	Examined variables
Mzoughi et al., 2007	386 university students	Getting feedback from instructors and student surveys	Attitude
Korakakis et al., 2009	212 8th grade students students in Greece	With computer program results exported to excel.	The contribution to the learning process of interactive 3D animations, 3D animations and 3D illustrations

Sun & Cheng, 2009	Thirty undergraduate students participated in the study	Survey	Perceived ease uf use, perceived usefulness, attitude toward using program, system usage, perceived playfulness, interface style
Zydney et al., 2012	Participants were 21 undergraduate communications majors, ranging in age from 18 to 24 years,	Two surveys including both closed and open-ended questions.	Group cognition, student ownership of the discussion
Hamalainen, R., & Oksanen, K.	18 (16–18-year-old) vocational students and two teachers	Video record Observation notes	Differences between the learning settings in terms of time used and knowledge construction processes
Merchant et al., 2012	238 undergraduates students	Chemistry learning test, the Purdue Visualization of Rotations Test (PVRT), and a self-report measure consisting of items on six variables	Representational fidelity, learners' interaction, perceived ease of use and meaningfulness, self-efficacy, and presence
Wu & Chiang, 2013	120 freshmen (72 male, 48 female, age M 20) from two universities in Taiwan	Survey	Comprehensive ability, the degree of difficulty, and gender.
Richards & Taylor, 2015	129 biology students	Pre and post test surveys	Gender, age, level of computing skills and computer game usage. how often they played computer games
Tuzun & Ozdinc, 2016	55 freshmen students in a Computer Education and Instructional Technology	27-item Presence Questionnaire in Virtual Environments, the 18-item Conceptual Knowledge Test, the 15-item Orientation Evaluation Questionnaire, the Spatial Knowledge Inventory, and a demographic questionnaire.	Knowledge of the department's objectives, locations, personnel and such relevant information, factors of influence on general learning, perceived usefulness, enjoyment and complexity users' perceptions of presence in virtual environments Gender, university entrance examination scores, and high school grades.
Chen, 2016	15 English learners	Questionnaire Learner journals Focus group interview Participant observation	Demographic backgrounds, digital competency, engagement, motivation expectations of learning English, learners' beliefs and perceptions
Zhang et al., 2014	200 fifth-grade students	The learning achievement test Stargazing targets test The flow experience test	Knowledge of astronomical observations, performance of astronomical observation skills, Flow experience questionnaire and retention effect
Lindgren et al., 2016	113 seventh grade students (age 12 to 13; 47 male, 66 female) from three local middle schools	Pre-post test	Learning and attitude about science
Passig et al., 2016	117 children (61 boys and 56 girls) from two elementary schools	Pre-post and transfer test	Improvement of analogies
Huang et al., 2010	190 university students	Questionnaire	Motivation, problem solving capacity, imagination, interaction, immersion, collaborative learning, intention to use the system
Chang et al., 2010	36 eight-grade students in a rural public junior high school in Taiwan	Questionnaire	Learning performance, difference in the subjective experience (authenticity, engagement, learning motivation)
Connolly et al., 2011	328 students from 28 schools across 17 European countries	Questionnaire	Demographic and learner type data, details of foreign languages learnt, skills that students believe can be obtained from computer games, important reasons and motivations for playing computer games

Bouta et al., 2012	24 children (15 boys and 9 girls), 5th grade Primary School students	Chat messages (obtained from the logfiles of ActiveWorlds), systematic observation of the video-recorded sessions two-stage assessment (pre-test and post-test)	Behavioral engagement, affective engagement, cognitive engagement.
Chen & Tsai, 2012	116 Grade 3 student from five classes at Taipei Municipal Wanxing Elementary School	Group Embedded Figures Test (GEFT), pretest-post test, gaming skill quesionare, learning satisfaction questionnaire	Learner performance, cognitive style, gaming skill, and learner satisfaction
Di Serio et al., 2013	69 middle-school students (age 13–16)	Instructional Materials Motivation Survey (IMMS) observing students interacting with the augmented reality learning environment and conducting post-experience interviews.	Motivation (Attention, Relevance, Confidence and Satisfaction)
Wojciechowski & Cellary, 2013	42 participants of the second grade of lower secondary school at the age of 14–16 years	Questionnaire	Perceived usefulness and enjoyment, perceived ease of use, attitude toward using, interface style
Kamarainen et al., 2013	Sixth grade students (n = 71)	Questionnaire	Students' learning and motivation, and teachers' experiences
Lin et al., 2013	20 dyads (N =40) of undergraduate students from a university located in Singapore	Pre-post test	Learning achievements, knowledge construction process
Ibanez et al., 2014	64 high school students	Pre-post test, Flow State Scale and open-ended questionnaires, survey	Students' challenge-skill perception, overall state of flow, students' learning outcomes, students' perceived benefits and difficulties of using an AR application
Chang et al., 2014	135 college students	Pen-and-paper pretests and posttests	Learning effectiveness, flow experience, the amount of time spent focusing on the paintings, behavioral patterns, and attitude of using the guide systems
Cheng & Tsai, 2014	33 child–parent pairs	Videotape, interview	Children and parents behave and interaction with each other, cognitive attainment of children, associations between child–parent behavioral patterns and children's cognitive attainment
Chiang et al., 2014	57 fourth-grade students	Learning logs	Learning behaviors, learning patterns
Lee & Wong, 2014	431 high school students	32 item test	Learners' performance achievement, learners' spatial ability with the learning environment
Wei et al., 2015	T1 is the control group and T2 is the experimental group. T1 comprises 8 boys and 8 girls, and T2 comprises 9 boys and 8 girls	Questionnare	Creative design learning motivation, teaching effects, and creativity of the output
Huang et al., 2016	21 middle school students	Questionnare, pen-ended interview survey	Impact of different learning tools on feelings, activity performance and learning effectiveness.
Hsu, 2017	A total of 38 third graders whose average age was nine	Questionnaire	Students' learning effectiveness, flow state, learning anxiety, and cognitive load

Frank & Kapila, 2017	75 undergraduate students	Pre-post assesment test, questionnaire	Educational effectiveness and user experience (sability, learnability, and engagement)
Joo-Nagata et al., 2017	143 subjects of which 72 participated in the fieldwork (m-learning) and 71 in classroom work (e-learning).	Pre-post test, interview	Level of knowledge acquired by students about heritage
Wang, 2017	30 twelfth-grade students	Pre-post questionnaries, interview	Students' Chinese writing performance, students' and instructors' perceptions of using AR-based learning materials in Chinese writing
Ruiz-Ariza et al., 2018	Control Group (n = 103), and Experimental Group (n = 87)	Trait and Emotional Intelligence Questionnaire Short Form, pokemon go game statistics, questionaire, sociodemographic sheet. Maternal educational level	Cognitive perfor- mance (memory, selective attention, concentration, mathematical calculation and lin-guistic reasoning) and emotional intelligence (well-being, self-control, emotionality and sociability
Chang & Hwang, 2018	111 fifth graders	Pre test, pre-questionnaires, online learning ability test, post test, post questionare, interview	Learning achievement, learning motivation, critical thinking tendency, group self-efficacy, cognitive load
Rau et al., 2018	63 college students	Chinese Proficiency Test	Reading performance
Yip et al., 2019	46 freshmen	Pretest, post test, questionnaire	Learning outcomes, effectiveness of AR,
Degli Innocenti et al., 2019	36, 10–11 years old children	Pre-post test, questionare	Learning achievements, students'perceived effort, engagement, motivation, and appreciation
Fidan & Tuncel, 2019	91 students (aged from 12 to 14 seventh grade	Learning achievement test, Attitude scale, Interview form	Physics learning achievement and attitude in science course, opinions of the students who used AR about the impact of physics-related AR applications on their learning experiences
Ferguson et al., 2020	A total of 42 adolescents, 38 males and 4 females, aged 13–17.	Short knowledge test, Standardized questionnaires	The spatial and factual knowledge, engagement, presence, and cognitive interest
Harker-Schuch et al., 2020	401 students 12-13 aged	Pre-post questionnaries	Individual student scores, Climate literacy
Sahin & Yilmaz, 2020	100 7th grade middle school students	Science Course Achievement Test", the "Attitude Towards Science Course Scale" and the "Attitude to- wards AR Activities Scale"	Academic achievement, attitudes
Huang & Yang, 2009	136 first-year (freshmen) undergraduate students	Pre-post test	Learning performance, adaptive learning performance collaborative activities, satisfaction with system (students' perceptions), knowledge types
Isotani et al., 2013	Fifty eight (58) pre-service teachers	Think-aloud protocol and explicitly ask teachers to explain as much as possible every decision they made.	Teacher's intentions and performance
Lei et al., 2015	100 Taiwanese fifth graders	Questionnare, search behavior indicators, Video search worksheet	Search behaviors, search performance, and learning performance

Chrysafiadi & Virvou, 2013	128 teachers and their 5th grade students, 131 teachers and their 4th grade classrooms	Pre- and post-test and two forms of a researcher designed measure	Reading comprehension
Vaessen et al., 2014	210 students of the University of Utrech	Achievement Goal Questionnaire	Help-seeking behavior, Identified help-seeking strategies, The use of strategies in relation to students and exercises, Predicted strategy use by achievement goals
Sanchez et al., 2014	36 participants via postings on local parenting listservs, social media sites, and through contacts within area school systems and child service providers.	Online product evaluation survey., The Youth Outcomes Questionnaire, the Behavioral and Emotional Rating Scale	Usability, Likeability, Psychosocial distress, Behavioral and emotional strength
Dolenc & Abersek, 2015	8th grade 117 students	Online test	Student achivement
Hooshyar et al., 2016	52 university students	Pre and post test	Learning interest, technology acceptance and learning attitude
Mohamed & Lamia, 2018	50 learners at Annaba University.	Questionnaire, Performance 7-point rating scale, Mental effort 7-point rating scale, Survey	Student knowledge level, Learning time, Learning gain, Mental effort

Some of the studies (Arnau et al., 2013; Bujak et al., 2013; Chen, 2008; Cuendet et al., 2013; Curilem et al., 2007; Dangsaart et al., 2008; He et al., 2009; Huang et al., 2007; Jaques & Vicari, 2007; Latham et al., 2014; Lee et al., 2008; Mitrovic et al., 2013; Moundridou & Virvou, 2003; Nussbaum et al., 2001; Pavlekovic et al., 2009; Sayed et al., 2011; Stankov et al., 2008; Vega-Gorgojo et al., 2010; Virvou & Alepis, 2005; Waalkens et al., 2013; Wu, Lee, Chang & Liang, 2013) included in the review and presented their findings in other sub-problems were not examined in Table 4, as they do not include any implementations and are only intended for software promotion or potential of softwares as a teaching/learning tool.

DISCUSSION AND CONCLUSION

In this study, 81 studies related to the use of Web 3.0 technologies in learning environments were reviewed by a systematic way. As a result of the reviewed studies, it was determined that the most studies related to the use of augmented/virtual reality applications in learning environments. The advantages of these tools, such as providing students with a natural experience environment and increasing the attractiveness of teaching and learning and increasing the motivation of the students (Sumadio, Dwistratanti & Rambli, 2010), may have contributed to the researches on this concept. In addition, ease of use of these tools also facilitates the transfer to teaching environments. Another result of the study is that there has been an increase in the number of the studies in 2008-2009 and a decrease in the number of studies in 2011. Furthermore, it was observed an increase again in 2013, but after 2015, the number of studies decreased again. The increase in the number of studies in 2008 may be due to the extension of Tim Berners-Lee's definition of "execution" into web technologies in 2007, and web became a "read-write-execution" network of web services and semantic markup (Demartini & Benussi, 2017). Thus, a jump in the number of studies has occurred.

When the studies were reviewed, it was determined that the highest number of studies were conducted in the field of science education. Digital resources, transformed into cognitive tools, can help science learners experiment and critically think about real-life events by working in controlled, hypothetical or virtual environments (Songer, 2007). Therefore, the fact that there are more studies in the field of science education is considered important in terms of providing scientific literacy which is the aim of science education and contributing to this discipline. Furthermore, it was found that there were 9 studies in mathematics education and 7 studies in language learning.

Results shows that the majority of the studies (n = 41, %51) were conducted experimentally. Since experimental studies are the most conclusive of scientific methods (Fraenkel, Wallen & Hyun, 2012), the fact that most of the studies are directed to experimental implementation of Web 3.0 technology may increase the validity of the researches. In addition, as a result of the analysis, it is seen that a few qualitative research is conducted. In addition, the number of studies for designing or presentation of learning softwares was 25. Participants, data collection tools and examined variables of the reviewed studies were also examined in the study. When the participants of the researches are examined, it is seen that the studies are conducted with individuals at all educational level and at certain ages. Participation of the individuals from all grade level is considered important in terms of integrating Web 3.0 into learning environments at all levels of education. When the data collection tools used in the studies were examined, it was found that the majority of the studies were quantitative and most benefited from surveys, questionnaires and observational information in the data collection process. Some studies were conducted with mixed method and qualitative data were used in addition to quantitative data. It is considered important to collect qualitative data in order to explain the effects of using Web 3.0 technologies in learning environments in detail. Finally, the examined variables of the researches were examined. According to the results, it was determined that cognitive variables were generally focused in the researches. In addition, the majority of studies focus on the learning usefulness and learning outcomes of the software used in the research.

In conclusion, this study conducted a systematic review of 81 studies on the use of Web 3.0 technologies in learning environments. The data obtained from this study is thought to be a resource for instructors and researchers during the integration of Web 3.0 technologies into education. It also provides information on how to use web technologies in future learning environments. Because the evolution of the web and its reflection on learning environments are realized by moving forward with the exponential growth of the previous web technology. Since Web 4.0, which is expected to be passed after 2020, is not completely clear in the literature and does not provide unanimity due to the fact that it is composed of several dimensions, it is not yet known how web technologies will affect educational environments in the future (Almeida, 2017). The Education 4.0 profile barely enters the real-life scene, and today's most advanced technology, Education 3.0, together with sustainable learning paradigms, shows that it is a reasonable current scenario for education (Demartini & Benussi, 2017). Therefore, this study, which includes the use of the latest web technologies in education, can shed light on future studies.

Limitations and Implications

This review doesn't include theses, conference proceedings and books. Furthermore reviewed articles related Web 3.0 technologies published in only Computers & Education. It may be suggested that further studies on this subject can be examined by widening the scope by scanning from different sources, journals and databases with other studies. By expanding the databases used in this study, more factors can be revealed or the emerging factors can be supported with more frequency. In addition, this study was conducted within the framework of four sub-problems. Participants, data collection tools and examined variables of the reviewed studies were also examined in the study. Further systematic reviews with examined other factors such as the learning outcomes of the studies or the effectiveness of the tools will contribute to the literature.

In this research, many Web 3.0 technologies were handled together and literature will guide new researches as they provide resources for the use of these technologies in learning process. When the data were analyzed methodologically, it was determined that the paradigmatic evolution in the web was reflected in the researches after 2005, but it was determined that the studies with qualitative and mixed methods in this field were insufficient. Furthermore, most of the studies use experimental research methodology. A meta-analysis of these experimental studies can provide information about the effects of Web 3.0 tools on teaching processes. Therefore, in future studies, it can be suggested to perform meta-analyzes by calculating the effect sizes of the findings obtained from these experimental studies. Thus, more generalizable information can be obtained about the use of these technologies in teaching environments by increasing the number and diversity of samples.

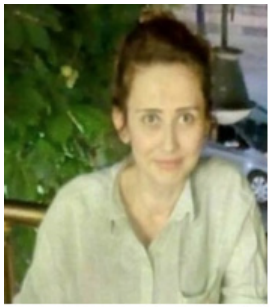
When the studies discussed in this review are examined, the number of qualitative studies is very few. Although the quantitative methods carried out using the experimental method are used in testing the web

supported learning environments, the opinions of all stakeholders about the developed teaching module are also important. Collecting data from stakeholders will help in eliminating practical problems in the teaching process. Thus, it will contribute to the quality of teaching process. Therefore, two situations gain importance for future studies. First of all, it is recommended to do more studies with qualitative and mixed methods in order to provide more detailed and in-depth information in the integration of Web 3.0 technologies into the teaching process (Patton, 1999). Secondly, when the studies in this study are examined, it is generally determined that data are collected from students. This situation may hinder multi-directional examination of the teaching process. Particularly, the opinions of teachers who play a key role in the teaching process are of great importance in the integration. Therefore, in the studies to be carried out, it is recommended to collect data from all stakeholders and perform triangulation in terms of methodology and data source.

In addition, the effectiveness of the technologies used was generally carried out within a certain time period in the studies examined. In order to use Web 3.0 technologies effectively in teaching processes, longitudinal studies should be carried out in the use of these technologies, and it should be noted that student / teacher / prospective teacher were observed in a long process and what kind of process they went through. Therefore, longitudinal studies are needed to talk about sustainability in the use of technologies used in educational context. In these studies to be conducted in the future, it is also recommended to use a large number of data collection tools such as observation and interview. Because in the studies examined in this review, it is determined that a single data collection tool was generally used and these sources are generally questionnaire or scale.

When the studies were reviewed, it was determined that the highest number of studies were conducted in the field of science education. It is remarkable that studies in Social Studies education are relatively less. In order to increase the use of Web 3.0 technologies in this field and to benefit from the contributions provides to the teaching environments, it is thought that more studies are needed in integrated Web 3.0 Social Studies education. Finally, according to the results, it was determined that cognitive variables were generally focused in the researches. In addition, the majority of studies focus on the learning usefulness and learning outcomes of the software used in the research. It can be investigated whether these web 3.0 technologies have a similar effect on different groups in terms of cognitive variables. In addition, in order to ensure the sustainability of usage of web 3.0 technologies in education, it is recommended to examine the emotional, social and behavioral variables in different sample groups as well as cognitive variables.

BIODATA and CONTACT ADDRESSES of AUTHORS



Dr. Esra ACIKGUL FIRAT is an assistant Professor of Mathematics and Science Education at Education Faculty, Adiyaman University. Dr. Acikgul Firat gained his Ph.D. in Science Education at September, 2015. Her academic interest areas are science education, Web 2.0 tools for science education, biotechnology education and computer assisted science education. She has international book chapters and various research articles published in international indexes. Also, she has other national and international articles and papers submitted to international meetings.

Esra ACIKGUL FIRAT
Mathematics and Science Education, Faculty of Education
Address: Adiyaman University, 02040, Adiyaman, Turkey
Phone: +90 4162233800 - 3415
E-mail: eacikgul@adiyaman.edu.tr

Dr. Selcuk FIRAT is an assistant Professor of Educational Sciences at Education Faculty, Adiyaman University. Dr. Firat gained his Ph.D. in Mathematics Education at April, 2018. His academic interest areas are in the area of maths education, Web 2.0 tools for education, teacher education and computer assisted maths education. He has international book chapters and various research articles published in national and international refereed journals. Also he has papers submitted to international meetings.

Selcuk FIRAT
Educational Sciences, Faculty of Education
Address: Adiyaman University, 02040, Adiyaman, Turkey
Phone: +90 4162233800 - 1069
E-mail: selcukfirat@adiyaman.edu.tr

REFERENCES

Almeida, F. L. (2017). Concept and dimensions of web 4.0. International Journal of Computers & Technology, 16(7), 7040-7046.

Arici, F., Yildirim, P., Caliklar, S., & Yilmaz, R. M. (2019). Research trends in the use of augmented reality in science education: Content and bibliometric mapping analysis. *Computers & Education*, *142*, 103647.

Arnau, D., Arevalillo-Herraez, M., Puig, L., & Gonzalez-Calero, J. A. (2013). Fundamentals of the design and the operation of an intelligent tutoring system for the learning of the arithmetical and algebraic way of solving word problems. *Computers & Education*, *63*, 119-130.

Berners-Lee, T., Hendler, J., & Lassila, O. (2001). The semantic web. *Scientific american*, *284*(5), 28-37.

Bouta, H., Retalis, S., & Paraskeva, F. (2012). Utilising a collaborative macro-script to enhance student engagement: A mixed method study in a 3D virtual environment. *Computers & Education*, *58*(1), 501-517.

Buffington, M. L. (2008). Creating and consuming Web 2.0 in art education. Computers in the Schools, 25(3-4), 303-313.

Bujak, K. R., Radu, I., Catrambone, R., Macintyre, B., Zheng, R., & Golubski, G. (2013). A psychological perspective on augmented reality in the mathematics classroom. *Computers & Education*, *68*, 536-544.

Bujak, K. R., Radu, I., Catrambone, R., Macintyre, B., Zheng, R., & Golubski, G. (2013). A psychological perspective on augmented reality in the mathematics classroom. *Computers & Education*, *68*, 536-544.

Chang, C. W., Lee, J. H., Wang, C. Y., & Chen, G. D. (2010). Improving the authentic learning experience by integrating robots into the mixed-reality environment. *Computers & Education*, *55*(4), 1572-1578.

Chang, K. E., Chang, C. T., Hou, H. T., Sung, Y. T., Chao, H. L., & Lee, C. M. (2014). Development and behavioral pattern analysis of a mobile guide system with augmented reality for painting appreciation instruction in an art museum. *Computers & Education*, *71*, 185-197.

Chang, S. C., & Hwang, G. J. (2018). Impacts of an augmented reality-based flipped learning guiding approach on students' scientific project performance and perceptions. *Computers & Education*, *125*, 226-239.

Chen, C. M. (2008). Intelligent web-based learning system with personalized learning path guidance. *Computers & Education*, *51*(2), 787-814.

Chen, C. M., & Tsai, Y. N. (2012). Interactive augmented reality system for enhancing library instruction in elementary schools. *Computers & Education*, *59*(2), 638-652.

Chen, J. C. (2016). The crossroads of English language learners, task-based instruction, and 3D multi-user virtual learning in Second Life. *Computers & Education*, *102*, 152-171.

Cheng, K. H., & Tsai, C. C. (2014). Children and parents' reading of an augmented reality picture book: Analyses of behavioral patterns and cognitive attainment. *Computers & Education*, *72*, 302-312.

Chiang, T. H., Yang, S. J., & Hwang, G. J. (2014). Students' online interactive patterns in augmented reality-based inquiry activities. *Computers & Education*, *78*, 97-108.

Chisega-Negrilă, A. M. (2013). Education in Web 3.0. JADLET Journal of Advanced Distributed Learning Technology, 50-59.

Chisega-Negrila, A. M. (2016). Impact Of Web 3.0 on The Evolution Of Learning. In Conference proceedings of» eLearning and Software for Education «(eLSE) (No. 01, pp. 58-62)." Carol I" National Defence University Publishing House.

Chrysafiadi, K., & Virvou, M. (2013). PeRSIVA: An empirical evaluation method of a student model of an intelligent e-learning environment for computer programming. *Computers & Education*, *68*, 322-333.

Connolly, T. M., Stansfield, M., & Hainey, T. (2011). An alternate reality game for language learning: ARGuing for multilingual motivation. *Computers & Education*, *57*(1), 1389-1415.

Cuendet, S., Bonnard, Q., Do-Lenh, S., & Dillenbourg, P. (2013). Designing augmented reality for the classroom. *Computers & Education*, *68*, 557-569.

Curilem, S. G., Barbosa, A. R., & de Azevedo, F. M. (2007). Intelligent tutoring systems: Formalization as automata and interface design using neural networks. *Computers & Education*, *49*(3), 545-561.

Dangsaart, S., Naruedomkul, K., Cercone, N., & Sirinaovakul, B. (2008). Intelligent Thai text–Thai sign translation for language learning. *Computers & Education*, *51*(3), 1125-1141.

Degli Innocenti, E., Geronazzo, M., Vescovi, D., Nordahl, R., Serafin, S., Ludovico, L. A., & Avanzini, F. (2019). Mobile virtual reality for musical genre learning in primary education. *Computers & Education*, *139*, 102-117.

Demartini, C., & Benussi, L. (2017). Do Web 4.0 and industry 4.0 imply education X. 0?. *IT Professional*, *19*(3), 4-7.

Di Serio, A., Ibanez, M. B., & Kloos, C. D. (2013). Impact of an augmented reality system on students' motivation for a visual art course. *Computers & Education*, *68*, 586-596.

Dolenc, K., & Aberšek, B. (2015). TECH8 intelligent and adaptive e-learning system: Integration into Technology and Science classrooms in lower secondary schools. *Computers & Education*, *82*, 354-365.

Dominic, M., Francis, S., & Pilomenraj, A. (2014). E-learning in web 3.0. *International Journal of Modern Education and Computer Science*, 6(2), 8.

El Sayed, N., A. M., Zayed, H., & Sharawy, M. I. (2011). ARSC: Augmented reality student card–an augmented reality solution for the education field. Computer & Education, 56(4), 1045–1106.

Ferguson, C., van den Broek, E. L., & van Oostendorp, H. (2020). On the role of interaction mode and story structure in virtual reality serious games. *Computers & Education*, *143*, 103671.

Fidan, M., & Tuncel, M. (2019). Integrating augmented reality into problem based learning: The effects on learning achievement and attitude in physics education. *Computers & Education*, *142*, 103635.

Frank, J. A., & Kapila, V. (2017). Mixed-reality learning environments: Integrating mobile interfaces with laboratory test-beds. *Computers & Education*, *110*, 88-104.

Fraenkel, W., & Wallen, N. Hyun, (2012). How to design and evaluate research in education. McGraw-Hill Companies.

George, G., & Lal, A. M. (2019). Review of ontology-based recommender systems in e-learning. *Computers & Education*, *142*, 103642.

Grosseck, G. (2009). To use or not to use web 2.0 in higher education?. Procedia-Social and Behavioral Sciences, 1(1), 478-482.

Hamalainen, R., & Oksanen, K. (2012). Challenge of supporting vocational learning: Empowering collaboration in a scripted 3D game–How does teachers' real-time orchestration make a difference?. *Computers & Education*, *59*(2), 281-293.

Harker-Schuch, I., Mills, F., Lade, S., & Colvin, R. (2020). CO2peration–Structuring a 3D interactive digital game to improve climate literacy in the 12-13-year-old age group. *Computers & Education*, 144, 103705.

He, Y., Hui, S. C., & Quan, T. T. (2009). Automatic summary assessment for intelligent tutoring systems. *Computers & Education*, *53*(3), 890-899.

Hooshyar, D., Ahmad, R. B., Yousefi, M., Fathi, M., Horng, S. J., & Lim, H. (2016). Applying an online game-based formative assessment in a flowchart-based intelligent tutoring system for improving problem-solving skills. *Computers & Education*, *94*, 18-36.

Hsu, T. C. (2017). Learning English with augmented reality: Do learning styles matter?. *Computers & Education*, *106*, 137-149.

Huang, C. J., Chu, S. S., & Guan, C. T. (2007). Implementation and performance evaluation of parameter improvement mechanisms for intelligent e-learning systems. *Computers & Education*, *49*(3), 597-614.

Huang, C. J., Liu, M. C., Chu, S. S., & Cheng, C. L. (2007). An intelligent learning diagnosis system for Web-based thematic learning platform. *Computers & Education*, *48*(4), 658-679.

Huang, H. M., Rauch, U., & Liaw, S. S. (2010). Investigating learners' attitudes toward virtual reality learning environments: Based on a constructivist approach. *Computers & Education*, *55*(3), 1171-1182.

Huang, S. L., & Yang, C. W. (2009). Designing a semantic bliki system to support different types of knowledge and adaptive learning. *Computers & Education*, *53*(3), 701-712.

Huang, T. C., Chen, C. C., & Chou, Y. W. (2016). Animating eco-education: To see, feel, and discover in an augmented reality-based experiential learning environment. *Computers & Education*, *96*, 72-82.

Hussain, F. (2012). E-Learning 3.0= E-Learning 2.0+ Web 3.0?. International Association for Development of the Information Society.

Hwang, G. J. (2003). A conceptual map model for developing intelligent tutoring systems. *Computers & Education*, *40*(3), 217-235.

Ibanez, M. B., & Delgado-Kloos, C. (2018). Augmented reality for STEM learning: A systematic review. *Computers & Education*, *123*, 109-123.

Ibanez, M. B., Di Serio, A., Villaran, D., & Kloos, C. D. (2014). Experimenting with electromagnetism using augmented reality: Impact on flow student experience and educational effectiveness. *Computers & Education*, *71*, 1-13.

Isotani, S., Mizoguchi, R., Isotani, S., Capeli, O. M., Isotani, N., De Albuquerque, A. R., Bittencourt, I. I., & Jaques, P. (2013). A Semantic Web-based authoring tool to facilitate the planning of collaborative learning scenarios compliant with learning theories. *Computers & Education*, *63*, 267-284.

Jaques, P. A., & Vicari, R. M. (2007). A BDI approach to infer student's emotions in an intelligent learning environment. *Computers & Education*, *49*(2), 360-384.

Joo-Nagata, J., Abad, F. M., Giner, J. G. B., & Garcia-Penalvo, F. J. (2017). Augmented reality and pedestrian navigation through its implementation in m-learning and e-learning: Evaluation of an educational program in Chile. *Computers & Education*, *111*, 1-17.

Kamarainen, A. M., Metcalf, S., Grotzer, T., Browne, A., Mazzuca, D., Tutwiler, M. S., & Dede, C. (2013). EcoMOBILE: Integrating augmented reality and probeware with environmental education field trips. *Computers & Education*, *68*, 545-556.

Korakakis, G., Pavlatou, E. A., Palyvos, J. A., & Spyrellis, N. (2009). 3D visualization types in multimedia applications for science learning: A case study for 8th grade students in Greece. *Computers & Education*, *52*(2), 390-401.

Kuhn, V. (2014). *Web three point oh: The virtual is the real. High Wired Redux: CyberText Yearbook*. Jyvaskyla, Finland: University of Jyvaskyla Press, at http://cybertext. hum. jyu. fi/articles/155. pdf, accessed, 18.

Latham, A., Crockett, K., & McLean, D. (2014). An adaptation algorithm for an intelligent natural language tutoring system. *Computers & Education*, *71*, 97-110.

Latham, A., Crockett, K., McLean, D., & Edmonds, B. (2012). A conversational intelligent tutoring system to automatically predict learning styles. *Computers & Education*, *59*(1), 95-109.

Lee, E. A. L., & Wong, K. W. (2014). Learning with desktop virtual reality: Low spatial ability learners are more positively affected. *Computers & Education*, *79*, 49-58.

Lee, M. C., Tsai, K. H., & Wang, T. I. (2008). A practical ontology query expansion algorithm for semantic-aware learning objects retrieval. *Computers & Education*, *50*(4), 1240-1257.

Lee, M. C., Tsai, K. H., & Wang, T. I. (2008). A practical ontology query expansion algorithm for semantic-aware learning objects retrieval. *Computers & Education*, *50*(4), 1240-1257.

Lei, P. L., Sun, C. T., Lin, S. S., & Huang, T. K. (2015). Effect of metacognitive strategies and verbal-imagery cognitive style on biology-based video search and learning performance. *Computers & Education*, *87*, 326-339.

Lin, T. J., Duh, H. B. L., Li, N., Wang, H. Y., & Tsai, C. C. (2013). An investigation of learners' collaborative knowledge construction performances and behavior patterns in an augmented reality simulation system. *Computers & Education*, *68*, 314-321.

Lindgren, R., Tscholl, M., Wang, S., & Johnson, E. (2016). Enhancing learning and engagement through embodied interaction within a mixed reality simulation. *Computers & Education*, *95*, 174-187.

Mansur, A. B. F., & Yusof, N. (2013). Social learning network analysis model to identify learning patterns using ontology clustering techniques and meaningful learning. *Computers & Education*, *63*, 73-86.

Merchant, Z., Goetz, E. T., Cifuentes, L., Keeney-Kennicutt, W., & Davis, T. J. (2014). Effectiveness of virtual reality-based instruction on students' learning outcomes in K-12 and higher education: A meta-analysis. *Computers & Education*, *70*, 29-40.

Merchant, Z., Goetz, E. T., Keeney-Kennicutt, W., Kwok, O. M., Cifuentes, L., & Davis, T. J. (2012). The learner characteristics, features of desktop 3D virtual reality environments, and college chemistry instruction: A structural equation modeling analysis. *Computers & Education*, *59*(2), 551-568.

Miranda, P., Isaias, P., & Costa, C. J. (2014). E-Learning and web generations: Towards Web 3.0 and E-Learning 3.0. *International Proceedings of Economics Development and Research*, *81*, 92.

Mitrovic, A., Ohlsson, S., & Barrow, D. K. (2013). The effect of positive feedback in a constraint-based intelligent tutoring system. *Computers & Education*, *60*(1), 264-272.

Mohamed, H., & Lamia, M. (2018). Implementing flipped classroom that used an intelligent tutoring system into learning process. *Computers & Education*, *124*, 62-76.

Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097

Morris, R. D. (2011). Web 3.0: Implications for online learning. *TechTrends*, *55*(1), 42-46.

Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7): e1000097. Doi:10.1371/journal.pmed1000097

Moundridou, M., & Virvou, M. (2003). Analysis and design of a web-based authoring tool generating intelligent tutoring systems. *Computers & Education*, *40*(2), 157-181.

Mzoughi, T., Herring, S. D., Foley, J. T., Morris, M. J., & Gilbert, P. J. (2007). WebTOP: A 3D interactive system for teaching and learning optics. *Computers & Education*, *49*(1), 110-129.

Naik, U., & Shivalingaiah, D. (2008). Comparative study of Web 1.0. In *Web* (Vol. 2, pp. 28-29).

Navarro Delgado, I., & Fonseca, D. (2012). Architecture Degree PRoject: USe of 3D Technology, Models and Augmented Reality Experience with Visually Impaired Users. *Systemics, Cybernetics and Informatics*, 10(2).

Norman, H., Din, R., & Nordin, N. (2011). A preliminary study of an authentic ubiquitous learning environment for higher education. *Learning*, 3(4), 89-94.

Nussbaum, M., Rosas, R., Peirano, I., & Cardenas, F. (2001). Development of intelligent tutoring systems using knowledge structures. *Computers & Education*, *36*(1), 15-32.

Passig, D. (2015). Revisiting the Flynn effect through 3D immersive virtual reality (IVR). *Computers & Education*, *88*, 327-342.

Passig, D., Tzuriel, D., & Eshel-Kedmi, G. (2016). Improving children's cognitive modifiability by dynamic assessment in 3D Immersive Virtual Reality environments. *Computers & Education*, *95*, 296-308.

Park, S. W. (2013). The potential of web 2.0 tools to promote reading engagement in a general education course. TechTrends, 57(2), 46-53.

Patton, M. Q. (2002) Qualitative Research and Evaluation Methods. Thousand Oaks, CA: Sage Publications, Inc.

Pavlekovic, M., Zekic-Susac, M., & Djurdjevic, I. (2009). Comparison of intelligent systems in detecting a child's mathematical gift. *Computers & Education*, *53*(1), 142-154.

Rajiv & Lal, M. (2011). Web 3.0 in Education & Research. BVICAM's International Journal of Information Technology, 3.

Rau, M. A., Michaelis, J. E., & Fay, N. (2015). Connection making between multiple graphical representations: A multi-methods approach for domain-specific grounding of an intelligent tutoring system for chemistry. *Computers & Education*, *82*, 460-485.

Rau, P. L. P., Zheng, J., Guo, Z., & Li, J. (2018). Speed reading on virtual reality and augmented reality. *Computers & Education*, *125*, 240-245.

Reisoglu, I., Topu, B., Yilmaz, R., Yilmaz, T. K., & Goktas, Y. (2017). 3D virtual learning environments in education: A meta-review. *Asia Pacific Education Review*, *18*(1), 81-100.

Richards, D., & Taylor, M. (2015). A Comparison of learning gains when using a 2D simulation tool versus a 3D virtual world: An experiment to find the right representation involving the Marginal Value Theorem. *Computers & Education*, *86*, 157-171.

Ruiz-Ariza, A., Casuso, R. A., Suarez-Manzano, S., & Martinez-Lopez, E. J. (2018). Effect of augmented reality game Pokemon GO on cognitive performance and emotional intelligence in adolescent young. *Computers & Education*, *116*, 49-63.

Sahin, D., & Yilmaz, R. M. (2020). The effect of Augmented Reality Technology on middle school students' achievements and attitudes towards science education. *Computers & Education*, 144, 103710.

Sanchez, R. P., Bartel, C. M., Brown, E., & DeRosier, M. (2014). The acceptability and efficacy of an intelligent social tutoring system. *Computers & Education*, *78*, 321-332.

Sayed, N. E., Zayed, H. H., & Sharawy, M. I. (2011). ARSC: Augmented reality student card an augmented reality solution for the education field. *Computers & Education*, *56*(4), 1045-1061.

Sommerauer, P., & Muller, O. (2014). Augmented reality in informal learning environments: A field experiment in a mathematics exhibition. *Computers & Education*, *79*, 59-68.

Songer, N. B. (2007). Digital resources versus cognitive tools: A discussion of learning. Handbook of research on science education, 471.

Stankov, S., Rosic, M., Zitko, B., & Grubisic, A. (2008). TEx-Sys model for building intelligent tutoring systems. *Computers & Education*, *51*(3), 1017-1036.

Sumadio, D. D., Dwistratanti, & Rambli, D. R. A. (2010). Preliminary evaluation on user acceptance of the augmented reality use for education. In The second international conference on computer engineering and applications (pp. 461–465).

Sun, H. M., & Cheng, W. L. (2009). The input-interface of Webcam applied in 3D virtual reality systems. *Computers & Education*, *53*(4), 1231-1240.

Thomas, D. A., and Li, Q. (2008). From Web 2.0 to teacher 2.0. Computers in the Schools, 25(3-4), 199-210.

Tuzun, H., & Ozdinc, F. (2016). The effects of 3D multi-user virtual environments on freshmen university students' conceptual and spatial learning and presence in departmental orientation. *Computers & Education*, *94*, 228-240.

Vaessen, B. E., Prins, F. J., & Jeuring, J. (2014). University students' achievement goals and help-seeking strategies in an intelligent tutoring system. *Computers & Education*, *72*, 196-208.

Vega-Gorgojo, G., Bote-Lorenzo, M. L., Asensio-Perez, J. I., Gomez-Sanchez, E., Dimitriadis, Y. A., & Jorrin-Abellan, I. M. (2010). Semantic search of tools for collaborative learning with the Ontoolsearch system. *Computers & Education*, *54*(4), 835-848.

Virvou, M., & Alepis, E. (2005). Mobile educational features in authoring tools for personalised tutoring. *Computers & Education*, *44*(1), 53-68.

Waalkens, M., Aleven, V., & Taatgen, N. (2013). Does supporting multiple student strategies lead to greater learning and motivation? Investigating a source of complexity in the architecture of intelligent tutoring systems. *Computers & Education*, *60*(1), 159-171.

Wadhwa, D. (2015). A study of web 3.0 technologies for collaborative learning. International Journal of Engineering Technology, Management and Applied Sciences, 3, 92-97.

Wang, H. C., & Hsu, C. W. (2006). Teaching-Material Design Center: An ontology-based system for customizing reusable e-materials. *Computers & Education*, *46*(4), 458-470.

Wang, J., Mendori, T., & Xiong, J. (2014). A language learning support system using course-centered ontology and its evaluation. *Computers & Education*, *78*, 278-293.

Wang, Y. H. (2017). Exploring the effectiveness of integrating augmented reality-based materials to support writing activities. *Computers & Education*, *113*, 162-176.

Wei, X., Weng, D., Liu, Y., & Wang, Y. (2015). Teaching based on augmented reality for a technical creative design course. *Computers & Education*, *81*, 221-234.

Wijekumar, K. K., Meyer, B. J., & Lei, P. (2013). High-fidelity implementation of web-based intelligent tutoring system improves fourth and fifth graders content area reading comprehension. *Computers & Education*, *68*, 366-379.

Wojciechowski, R., & Cellary, W. (2013). Evaluation of learners' attitude toward learning in ARIES augmented reality environments. *Computers & Education*, *68*, 570-585.

Wu, C. F., & Chiang, M. C. (2013). Effectiveness of applying 2D static depictions and 3D animations to orthographic views learning in graphical course. *Computers & Education*, *63*, 28-42.

Wu, H. K., Lee, S. W. Y., Chang, H. Y., & Liang, J. C. (2013). Current status, opportunities and challenges of augmented reality in education. *Computers & Education*, *62*, 41-49.

Yip, J., Wong, S. H., Yick, K. L., Chan, K., & Wong, K. H. (2019). Improving quality of teaching and learning in classes by using augmented reality video. *Computers & Education*, *128*, 88-101.

Zeng, Q., Zhao, Z., & Liang, Y. (2009). Course ontology-based user's knowledge requirement acquisition from behaviors within e-learning systems. *Computers & Education*, *53*(3), 809-818.

Zhang, J., Sung, Y. T., Hou, H. T., & Chang, K. E. (2014). The development and evaluation of an augmented reality-based armillary sphere for astronomical observation instruction. *Computers & education*, *73*, 178-188.

Zydney, J. M., deNoyelles, A., & Seo, K. K. J. (2012). Creating a community of inquiry in online environments: An exploratory study on the effect of a protocol on interactions within asynchronous discussions. *Computers & Education*, *58*(1), 77-87.

STUDENTS' BARRIERS TO ONLINE TUTORIAL

Dr. SUGILAR
ORCID: 0000-0003-3037-2158
Universitas Terbuka
Tangerang Selatan, INDONESIA

Received: 15/09/2019 **Accepted:** 10/06/2020

ABSTRACT

An online tutorial should be the core of the student learning support services in the digital era to maintain the quality of distanced higher education. However, in Universitas Terbuka with supposed to be the cyber university of Indonesia, the participation in the online tutorials was still not encouraging. For example, the average of the percentage of students' involvement in the first academic semester of 2017 to the 2nd semester 2018 for one course was 2.21%. This study aimed to identify barriers for students to participate in the online tutorial. The method consisted of two stages. First, analyzing qualitative data that were gathered through open-ended questions to identify factors of the barriers. Second, developing 20 items' questionnaire based on the factors identified in the first stage and analyzed using Partial Least Squares Structural Equation Model (PLS-SEM). The study involved 76 students in the first stage and 237 students in the second. The results of the study revealed that the students' barriers to online tutorial reflected in four factors, i.e. (1) information, (2) motivation, (3) technical, and (4) supports; each factor confirmed significantly (p-values < 0.05) with t-values equal to 14.108, 27.875, 7.502, and 25.640, respectively. The study proposed some recommendations to improve student participation in online tutorials.

Keywords: Online tutorial, barriers to participation, structural equation model.

INTRODUCTION

Tutoring is an essential part of distance education to help students through written communication, telephonic communication, or face-to-face communication to overcome learning difficulties (Puspitasari, 2002; Bukhari, 1997). An online tutorial is a tutorial service delivered via the internet. The purpose of the online tutorial is to provide learning support services that enable students to interact with tutors through the internet to resolve the difficulties of students in learning the primary teaching materials independently (self-instructional study material). The online tutorials are different from the delivery of courses via the internet or what is known as online learning, as is popularly known as MOOC in recent times. The difference between online tutorials and online learning lies in the topic discussed and the purpose of its activities. In a tutorial, the difficulty of students in learning self-instructional study material determined the issue presented, and the activities aimed to help students to overcome these difficulties. Whereas, online learning could discuss the subject matter as a whole of a course and targeted to achieve the objectives of the course. In online learning could also include examinations to evaluate learning outcomes. In other words, online tutorials are complementary as the online to learning activities that are carried out by either face-to-face, online, or blended.

Universitas Terbuka (UT) provides online tutorial services for students to overcome the difficulties in comprehending the self-instructional study material in the form of modules delivered in printed and digital format. In most courses at UT, online tutorials are offered optionally to the students; however, UT encourages the students to take online tutorials. Until now, the level of student participation in online tutorials is still deficient. For example, in the Education Statistics course (PEMA 4210), the average proportion is only 2.21% (see Table 1) and raises questions that require answers, what are the obstacles for students to participate in the online tutorials?

Table 1. Students' participation in online tutorial (PEMA4210 Course)

Semester	Number of Students	The Proportion of Students taking Online Tutorial	
		Number	%
2016/2017.1	22,557	232	1.03
2016/2017.2	14,210	248	1.75
2017/2018.1	19,215	486	2.53
2017/2018.2	17,457	616	3.53
Average			2.21

Research on online tutorials is not as much as online learning research that hardly found in the literature. Some of these online tutorial studies highlight more the effectiveness of online tutorials as a support service to students in learning in the form of online learning or e-learning, among others: (1) online tutorials are as useful as face-to-face tutorials as a learning aid for e-learning learning (Iwasaki, et al., 2019), (2) online tutorials provide fewer learning experiences compared to face-to-face tutorials on distance education (Price, Richardson, & Jelfs, 2007), (3) online tutorials help students improve learning outcomes students who learn through e-learning and online tutorials are responded well by students. Research conducted by Riveros (2009) on interactions between tutors and students in an online tutorial concluded that the communication of tutors and students was different from interactions in face-to-face class and took place in two directions dynamically (double-way dynamic). From a few studies of online tutorials, no research was found on the barriers of students to participate in the online tutorials. Therefore, this article is the result of research on the obstacles of students in the online tutorials that can hopefully enrich the body of scientific knowledge in distance education, especially in the area of learning support services.

METHOD

This study used a mixed-method approach to answer questions about what the students' obstacles were to take part in online tutorials. There are many definitions of mixed-method research. In this article, the notion of a mixed-method referred to an empirical study involving the collection and analysis of qualitative and quantitative data (Almalki, 2016). Research with a quantitative approach is deductive research, and it can be deriving some hypotheses regarding a variable with its dimensions or sub-variables, deductively from the theory already available as a result of the accumulation of previous studies. In this study, related to the variable barriers students to online tutorials are still unavailable, and lack of theories to rely upon to parse the dimensions of these variables. The qualitative approach, by contrast, could be an inductive study, which concludes the dimensions of a variable from the opinions of students who feel inhibited from participating and engaging in the online tutorials. The method implemented in this study consists of the following three steps.

Step 1: Quantitative Analysis to Students' Opinion

First, distributing a written questionnaire asking what obstacles students have in attending the online to students taking face-to-face tutorials. This questionnaire was an open question regarding obstacles that prevent students from taking online tutorials. There were 76 students responded to the questionnaire. The results of this questionnaire were then analyzed qualitatively to get an overview of the factors underlying students' barriers to take online tutorials. The academic staff of the mathematics education study program in Universitas Terbuka discussed each written answer in the survey to classify the responses by their underlying meaning.

Step 2: Developing Likert Scale Questionnaire

The next step was developing a questionnaire in the form of a Likert scale to measure the level of student barriers in taking online tutorials based on literature reviews and the results of the first step. A literature review is needed to classify the statements obtained in the first step into the dimensions or sub-variables

of the variables of barriers to online tutorials that are prevalent in discussing online tutorials. However, as mentioned earlier, the literature on online tutorials is minimal, especially for research on students' obstacles to participate in online tutorials. Because of the lack of documentation on online tutorials, some of the naming dimensions for obstacle variables in online tutorials adopted the name of aspects from the literature on e-learning or online learning. In some cases, barriers to online tutorials are similar to barriers to e-learning; for example, barriers to student access and technological obstacles were the same meaning in the online tutorial and online learning.

Step 3: Using PLS-SEM to Analyzed the Data

The questionnaire resulted from the second step, then distributed to the students. A sample of 237 students filled out the questionnaire measuring the level of barriers to online tutorial participation. The results then analyzed with partial least squares structural equation model (PLS-SEM) using the Smart-PLS software. Using PLS-SEM was to overcome the constraints of the less theoretical basis in building structural models, and the data might not fulfill standard assumptions (Hair, Hult, Ringle, & Sarstedt, 2017).

FINDINGS

Students' Opinion on Barriers to Participation in the Online Tutorial

A qualitative descriptive analysis was carried out on students' written answers to open questions related to student barriers to following the tutorial. The 76 written answers resulted in four student answer groups, namely: (1) the boundaries conveyed by 34 (44%) students related to the lack of online tutorial information, (2) boundaries provided by 20 (26%) students related to technical restrictions at the time of starting the tutorial, and (3) barriers delivered by 7 (10%) students related to obstacles during the tutorial take place.

Some students revealed the obstacles before students followed the online tutorial from students' responses to an open question in the questionnaire. The hindrance includes information about online tutorials that do not reach students. The students expected that information should consist of the notion of online tutorials, benefits, and ratings in online tutorials, schedule of implementation of online tutorials, how to register online tutorials, and who are the contact persons. A student wrote that information about online tutorials was not available. He wrote that since the first semester as a UT student until the sixth semester studied at UT, he did not know yet how to follow the tutorial. He recommended that UT's team should go to the study group in some remote areas to explain the online tutorials. In fact, every regional office center of UT has informed new students about the online tutorial during a face-to-face meeting in the orientation program of the new students. However, not all new students can take part in these activities. Many students live in remote areas, making it difficult to go to the location of the activities.

Although some students may already have adequate information about online tutorials, the students have internal barriers due to a lack of motivation to follow the tutorial. Based on the theory of expectancy-instrumentality-valence (Simone, 2015), motivation is a function of the perception of the benefits of pursuing an online tutorial and the perceived ease of doing so. In this case, some students know the benefits of online tutorials, but consider it as difficult to follow. Alternatively, students judge online tutorials as not useful even though they can use them. A student wrote that he felt face-to-face tutorials to be more effective than online tutorials for achieving learning goals. Another student wrote that he had problems with his, so he could not read through a computer screen.

Obstacles felt by students when carrying out online tutorials are related to procedures for registering participation in online tutorials as well as barriers in slowly internet speeds in certain areas. Students complain about the complexity of the stages to follow the online tutorial. A student wrote that he was interested in taking online tutorials, but before the implementation of the online tutorial, he could not activate his account. Other students complained about the difficulty of registering to participate in online tutorials.

Student barriers to starting the online tutorial above suggest the need for technical assistance provided by UT. Technical support is needed by students, whether they are going to take part in online tutorials or when students have taken part in the online tutorial. In this case, many students feel they do not know how to

obtain technical assistance or do not even know that there is practical assistance provided by UT. A student wrote that he needed a written-guidance to use the online tutorial. Other students expressed the different things during the online tutorial; he could not find feedback from tutors regarding the tasks he was doing.

As mentioned earlier, the study of barriers to online tutorials was scarce. Therefore, to complete the above findings in identifying student barriers to online tutorials, the researcher adopted some research results that report several obstacles in participating in online learning or e-learning. Muilienburg & Berge (2005) reported eight factors in describing students' barriers to online learning, i.e. (1) administrative issues, (2) social interaction, (3) academic skills, (4) technical skills, (5) learner motivation, (6) time and support for studies, and (7) cost and access to the internet, and technical problems. Palmer, Bowman, & Haroff (2013) identified technical, structural, and cultural as the barriers to part-time in online learning. Technical barriers include having no access to the internet or computer and a lack of computer skills. Structural barriers comprise some factors that are related to poverty and social marginal. Cultural barriers contain factors related to learned behavior from a community culture, such as learning style. Srichanyachon (2014) identified students' challenges to participate in online learning, namely problems with online systems and personal issues. Issues with online systems included connection errors, system complexity, communication convenience, and attractiveness. The particular difficulties of students consisted of a lack of computer skills, internet skills, understanding the platform used for online tutorials, and lack of money to support the cost of internet connection. O'Doherty et al. (2018) mentioned the main barriers to online learning were time constraints, poor technical skills, inadequate infrastructure, absence of institutional strategies and support, and negative attitudes.

Based on a descriptive qualitative study of student answers to open questions and some previous research reports about participation in online learning, four factors identified as students' barriers to participating in the online tutorials, namely: (1) lack of information about online tutorials, (2) the low motivation of students to follow the tutorial online, (3) technical barriers to starting and using online tutorials, (4) lack of support services felt by students. The four factors were then developed as a questionnaire with a Likert scale to measure the size of the students' barriers to taking online tutorials. For this reason, each factor was developed by a five-point statement of obstacles to follow the online tutorial so that students would assess all 20 items as "Strongly Disagree" to "Strongly Agree.".

Measurement Model of Students' Barriers to Online Tutorial

A questionnaire to measure student barriers to taking online tutorials was given to 327 students to fill in. Student responses were analyzed using a structural least square structural equation model (PLS-SEM) using Smart-PLS software (Ringle, Wende, & Becker, 2015). Figure 1 presented the analysis results in the form of diagrams to describe the students' barriers to participate in online tutorials (Barriers). There were four factors reflected the barriers, i.e., information about online tutorials (Information), students' motivation to participate in online tutorials (Motivation), technical skills to get through the online tutorial (Technical), and availability of supports in the online tutorial (Support). Each factor in Figure 1 was associated with several indicators or observed variables that counted up from items in the questionnaire.

The discriminant validity measures the validity of the measurement, namely the value of the average variance extracted (AVE) of each item in the questionnaire. The AVE value of each item questionnaire that is more than 0.50 indicates significant convergent validity, and a higher AVE value towards the latent variable intended than to other latent variables shows the discriminant validity (Fornell & Larcker, 1981). Table 2 showed that all items in the questionnaire or observed variable have an AVE value > 0.50 for the intended latent variable. Also, the AVE value for each observed variable has the highest value on the expected latent variable. Thus, measurements on the model studied show convergent validity and discriminant validity.

Table 2. Discriminant validity

Item	Examples of the statements	Average Variance Extracted				T-Stat
		Information	Motivation	Support	Technical	
I. Information						
I1	…	0.732	0.159	0.419	0.003	18.448
I2	…	0.786	0.145	0.429	0.121	25.050
I3	I don't know the schedule of the online tutorial	0.861	0.237	0.418	0.104	41.658
I4	…	0.818	0.331	0.391	0.128	26.443
I5	I don't know what devices needed for an online tutorial	0.827	0.365	0.402	0.069	35.556
M. Motivation						
M6	…	0.425	0.700	0.309	0.112	13.238
M7	…	0.217	0.824	0.316	0.197	21.435
M8	I think there is no benefit for joining the online tutorial	0.183	0.876	0.406	0.264	45.122
M9	Probably, join an online tutorial will just waste my limited time	0.279	0.904	0.424	0.299	61.099
M10	…	0.241	0.851	0.478	0.237	39.155
T. Technical						
T11	…	0.014	0.122	0.025	0.664	7.608
T12	…	0.014	0.122	0.025	0.664	11.680
T13	I have difficulties in reading through a computer screen	0.026	0.298	0.202	0.794	20.184
T14	…	-0.011	0.182	0.168	0.803	18.144
T15	I don't have devices for a tutorial online	0.202	0.171	0.387	0.739	19.283
T16	…	0.441	0.188	0.143	0.550	13.686
S. Support						
S17	...	0.381	0.419	0.797	0.355	24.750
S18	I need a written guidance	0.523	0.378	0.854	0.180	39.689
S19	I need an opportunity to guided practice	0.396	0.425	0.884	0.277	45.627
S20	...	0.405	0.348	0.825	0.228	28.097

Table 3 listed the reliability of the measurement for each variable. From Table 4, it appeared that for each measurement variable, the Cronbach alpha value was slightly higher than 0.80. Thus, analyses for each latent variable indicated adequate reliability (Sarstedt & Ringle, 2017).

Table 3. Reliability

Variable	Alpha Cronbach	T-Value	P-Value
Information	0.865	51.868	0.000
Motivation	0.888	54.463	0.000
Supports	0.861	48.241	0.000
Technical	0.840	44.319	0.000

Overall, the reliability measurement of students' variables barriers to online tutorials shown by Alpha Cronbach is equal to 0.887. Therefore, the instrument to measure the barriers variable has demonstrated adequate reliability.

Structural Model of Barriers to Online Tutorial

The following Figure 1 was the structural model of barriers to online tutorials (Barriers) that reflected in four factors of inhibiting the students from taking the online tutorials. These factors are (1) lack of information received by students regarding online tutorials (Information), (2) the motivation of students to take online tutorials (Motivation), (3) technical barriers faced by students when they will start and during online tutorials (Technical), and (4) less of the supports felt by students (Support).

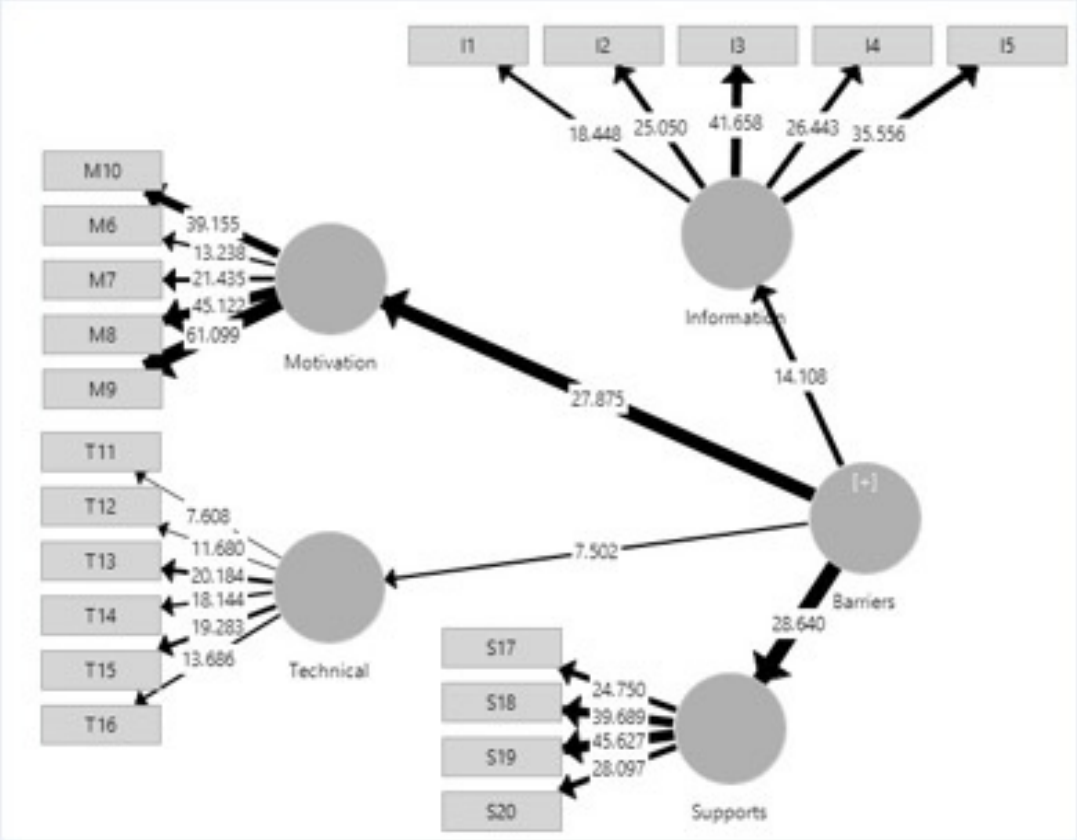


Figure 1. Structural model of students' barriers to online tutorial

The number on the arrow line indicates the significance of the correlation coefficient (t-values) to represent the strength of the relationship between two variables, in this case, the power of an observed variable reflected latent variable or the strength of the latent variable reflects other intangible variables. Another critical parameter in a structural model of SEM was R^2 or coefficient of determination to indicate the proportion of the dependent variable explained by the predictors (Zhang, 2016). Table 4 showed the coefficient of determination for each dimension variable of barriers to the online tutorial. Based on these two parameters, t-values, and R^2, some interpretations of the model in Figure 1 as follows.

Figure 1 showed that the latent variable of the Support (availability support service for using online tutorial) indicated by 28.640 of t-value, which was the most strength variable to reflect the latent variable of the barriers to an online tutorial, and the proportion of information explained by the variable was 45.6%. The observed variable of s19 was the most strength item in the questionnaire in reflecting the Support variable with t-value = 45,627. As could be seen in Table 2, the s19 is a statement that expressed the students need an opportunity to a guiding practice of the online tutorial. The next item, which was the second most strength to reflect the barrier to participation in the online tutorial, was s18 with t-value = 39.689. The s18 is a statement that expressed the students need written guidance to join and carry out the online tutorial (see Table 2). UT provided such a written manual; however, to disseminate information to a large number of students spread out in remote areas was not an easy task. Administrative issues could classify both the barriers of supporting students to online tutorials and information regarding the online tutorial. Therefore,

the finding agreed with the results of Mulienburg & Berge (2005) that placed the administrative issues in the first rank to explain student barriers to online learning.

The second best in reflecting barriers to participation in an online tutorial, as could be seen in Figure 1, was the motivation variable, with T-value = 27.875. In Table 4, the motivation variable reflected the proportion of variances in barriers to online tutorials equal to 43,4%. Motivational variables are internal barriers for students to take online tutorials. Students' perception of the value and the ease of the online tutorial influenced motivation to join the tutorial online. (National Academies of Sciences, Engineering, and Medicine, 2018). So, the barriers that come from motivation can be tangible in the form of perceptions of fewer benefits of participation in the online tutorial or perceptions of natural difficulties following online tutorials. The questionnaire items that most strongly show motivational barriers are points M8 and M9, which state that students do not see the benefits of online tutorials. The findings regarding motivation to take part in this online tutorial are slightly different from the conclusions of a study by Mulienburg & Berge (2005), which place motivation at a lower rank, after technical obstacles, as the variable that most explains barriers to online learning. These differences can occur because, in online learning or e-learning, the choice to participate does not as freely as in the online tutorial. In online learning, the activities could include all the subject matter in a course. They could be the only activities in the course so that joining online learning is to take or leave the course, while in the online tutorial, the subject material might be in other learning activities.

Table 4. Coefficient of determination

Variable	Coefficient of Determination
Information	0.304
Motivation	0.434
Supports	0.456
Technical	0.242

The third variable that reflected the barriers in following online tutorials is the variable lack of information about the online tutorial with the t-value = 14.108, with the coefficient of determination equal to 30.4%. This obstacle applies to students wanting to join the online tutorials, but they do not find an explanation for how to join it. The questionnaire item that most reflects this variable is the point I3 (t-value = 41.658) and I5 (t-value = 35.556), which states that students do not know the schedule and equipment needed to take online tutorials. UT undoubtedly provided the timing of the online tutorials. The problem was how the students could have and grasp the schedule. Indonesia is an archipelago nation in which 13000 islands inhabited of 17000 islands in Indonesia. Therefore, to spread out the information was not an easy task. Information variables fall into administrative categories, as do support variables. Thus, in conclusion, the regulatory issues are the biggest obstacle in organizing online tutorials. Organizational constraints can also affect the lack of student motivation in online tutorials.

Fourth, the technical constraint variable is the variable that least explains the variable of the barriers to an online tutorial, with t-value = 7.502 and the coefficient of determination, R^2, at 24.2%. This barrier is related to the technical difficulties experienced by students when participating in the online tutorials. This difficulty is often related to the use of computers, for example, lack of access to computers or internet networks. Some students have trouble reading text on the gadget screen, perhaps related to the age factor. Due to openness in recruiting students, UT still has many elderly students, and most students used smartphones to join online tutorials. However, since the technical constraints were the least of the determination coefficient in this research finding, then it could be interpreted that the technological barriers were not the most crucial to inhibit the students to take part in the online tutorial. This finding was consistent with Ismaila, Tukur, & Gambari (2019), which concluded that smartphones were easy to use for learning in higher education.

CONCLUSION AND RECOMMENDATIONS

Barriers to students in online tutorials are related to (1) lack of support services for students, (2) lack of student motivation, (3) lack of information about online tutorials, and (4) technical obstacles related to online tutorials. Administrative barriers, related to support services and information about online tutorials, dominate student barriers in online tutorials. It is this organizational constraint that can also affect the lack of student motivation in online tutorials. The conclusion was in line with the results of

Barriers to students in online tutorials are related to (1) lack of support services for students, (2) lack of student motivation, (3) lack of information about online tutorials, and (4) technical obstacles related to online tutorials. Administrative barriers, related to support services and information about online tutorials, dominate student barriers in online tutorials. It is this organizational constraint that can also affect the lack of student motivation in online tutorials. The conclusion was in line with the results of Mulienburg & Berge (2005) that the main factor in explaining student barriers to online learning is the administrative issues. However, the findings regarding motivation to take part in this online tutorial are slightly different from the conclusions of a study by Mulienburg & Berge (2005) that place the technical obstacles as the variable that most explains barriers to online learning comparing to students' motivation. The different conclusions might come from the year of the study, which related to the popularity of the gadget and this finding was consistent with research conducted by Ismaila, Tukur, & Gambari (2019) that smartphones were easy to use for learning in Pre-Service Teachers Colleges of Education in North-West, Nigeria.

Recommendations

To increase the number of students using the online tutorial in the future, UT and similar open and distance university with a large number of heterogeneous students spread out in remote areas, should:

- Provide student support services specialized for a tutorial online in every regional office center.
- Inform the students of the benefits and easiness of tutorials online to their learning.
- Provide and distribute written guidance of online tutorials.
- Offer online practice for students whenever they need it.

Author's Note: This paper is an extended version of a paper presented at IODL 2019 Conference.

BIODATA and CONTACT ADDRESSES of AUTHOR

Dr. SUGILAR is an Associate Professor at the Faculty of Teacher Training and Educational Sciences, Universitas Terbuka. He gained his Bachelor's degree in mathematics at Bandung Institute of Technology in 1985 and a doctoral degree in education from the State University of Jakarta in 1999. His academic interest areas are mathematics education and distance education. He has several journal articles published in international indexes and international book chapters, as well as some national and international articles submitted to international meetings.

SUGILAR
Department of Mathematics and Sciences Education
Address: Faculty of Teacher Training and Educational Sciences.
Universitas Terbuka, Tangerang Selatan, Indonesia
Phone: +62 (021) 749-0941,
E-mail: gilar@ecampus.ut.ac.id

REFERENCES

Almalki, S. (2016). Integrating Quantitative and Qualitative Data in Mixed Methods Research—Challenges and Benefits. *Journal of Education and Learning; 5*(3), 288-296.

Bukhari, M., A. (1997). *Tutorial support in distance education*. Islamabad: Allama Iqbal Open University.

Fornell, Claes & Larcker, David F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research 18* (February): 39-50.

Hair, J., Hult, G.T.M., Ringle, C.M., & Sarstedt, M. (2017). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM) Second Edition*. Thousand Oaks, California: SAGE Publication.

Iwasaki, I., Tada, Y., Furukawa, T., Sasaki, K., Yamada, Y., Nakazawa, T., & Ikezawa, T. (2019). Design of e-learning and online tutoring as learning support for academic writing. *Asian Association of Open Universities Journal, 14*(2), 85-96, DOI 10.1108/AAOUJ-06-2019-0024.

Ismaila, A., A., Tukur, A., K., & Gambari, I., A. (2019). Ease and Level of use of Smartphone for Learning Amongst Pre-Service Teachers Colleges of Education in North-West, Nigeria. *International Journal on Research in STEM Education*, 1(1), 40-49; DOI: 10.31098/ijrse.v1i1.60.

Muilienburg, L., Y. & Berge, Z., L. (2005). Student Barriers to Online Learning: A factor analytic study. *Distance Education*, *26*(1), 29–48.

O'Doherty, D., Dromey, M., Lougheed, J., Hannigan, A., Last, J., & McGrath, D. (2018). Barriers and solutions to online learning in medical education – an integrative review. *BMC Medical Education*, *18*(130), 1-11.

Palmer, G.,A., Bowman, L., & Harroff, P. (2013). "Literature Review: Barriers to Participation in the Online Learning Environment: The Role of Race and Gender," Adult Education Research Conference. http://newprairiepress.org/aerc/2013/papers/36.

Price, L., Richardson, John, T.E., & Jelfs, A. (2007). Face-to-face versus online tutoring support in distance education. *Studies in Higher Education*, *32*(1), 1–20.

Puspitasari, K.A. (2002). Layanan bantuan bagi mahasiswa Universitas Terbuka. Dalam T. Belawati, dkk (eds). Pendidikan Terbuka dan Jarak Jauh, hal. 315-333. Jakarta: Universitas Terbuka.

Ringle, C.M., Wende, S., & Becker, J.-M. (2015). *SmartPLS* 3. Boenningstedt: SmartPLS GmbH, http://www.smartpls.com.

Riveros, R., A., M. (2009). Interaction in Online Tutoring Sessions: An Opportunity to Knit English Language Learning in a Blended Program. *PROFILE, 11*(2), 117-134.

Sarstedt, M. & Ringle, C. M. (2017). "Partial Least Squares Structural Equation Modeling". In Christian Homburg, Martin Klarman, & Arnd Vomberg, *Handbook of Market Research,* Chapter 15. Project: New Course on PLS Path Modeling. DOI: 10.1007/978-3-319-05542-8_15-1.

Simone, S.D. (2015). Expectancy Value Theory: Motivating Healthcare Workers. *American International Journal of Contemporary Research*, *5*(2), pp. 19-23.

Srichanyachon, N. (2014). The barriers and needs of online learners. *Turkish Online Journal of Distance Education-TOJDE, 15*(3), 50-59.

National Academies of Sciences, Engineering, and Medicine. (2018). *How People Learn II: Learners, Contexts, and Cultures*. Washington, DC: The National Academies Press. doi: https://doi.org/10.17226/24783.

ASSESSMENT AND EVALUATION IN OPEN EDUCATION SYSTEM: STUDENTS' OPINIONS ABOUT OPEN-ENDED QUESTION (OEQ) PRACTICE

Dr. Nejdet KARADAG
ORCID: 0000-0002-9826-1297
Open Education Faculty
Anadolu University
Eskisehir, TURKEY

Dr. Belgin BOZ YUKSEKDAG
ORCID: 000-0003-2862-3544
Open Education Faculty
Anadolu University
Eskisehir, TURKEY

Dr. Murat AKYILDIZ
ORCID: 000-0001-5069-0132
Open Education Facult
Anadolu University
Eskisehir, TURKEY

Ali Ihsan IBILEME
ORCID: 0000-0002-4705-3973
Computer Research Center
Anadolu University
Eskisehir, TURKEY

Received: 27/08/2020 **Accepted:** 27/09/2020

ABSTRACT

The aim of this study is to determine students' opinions about open-ended question exam practice during 2018-2019 academic year for the following programs of Anadolu University Open Education System: Economy, Hospitality Management, Philosophy, History, Sociology, and Turkish Language and Literature. The study was designed as a quantitative study that describes an existing situation. The measurement tool developed to achieve that purpose includes 5 Likert type questions, 8 closed-ended question – 3 of which are yes-no questions-, and 2 open-ended questions. The data were collected between February 14th 2020 and February 16th 2020 and 3236 students responded to the tool in total. Percentage-frequency tables and graphs were used for the analysis of the data collected. Since each question in the tool measured a different and independent dimension of the research, the tool was not taken as a scale, so each question was analyzed separately. The data were recoded for certain questions and chi-square analysis was done by using "age", "gender" and "the program they attend" variables.

The results of the study showed that majority of the participants find open-ended questions more difficult than multiple-choice questions and have negative opinions about open-ended questions in terms of measuring subject matter competency and fair assessment.

Keywords: Open Education, open ended questions, measurement, evaluation.

INTRODUCTION

A teaching program consists of the following main components: objectives, scope, learning activities, and measurement and evaluation. Objectives refer to the skills to be developed during the program; scope is the content to be covered to achieve the predetermined objectives; and learning activities are the activities prepared in parallel with the objectives and content. Assesment and evaluation is about testing whether students have achieved predetermined objectives and target behaviors or not (Yasar, 2014).

"Assesment and evaluation" is the basic element of any educational practice and search for quality in education. Simonson, Smaldino, Albright, Zwacek (2012) stated that the data obtained through the evaluation of learning performance can be used to facilitate learning, to evaluate and improve the program, to place students in the program, to make funding priority decisions and to report long term tendencies to governments and institutions.

Assessment of students in open and distance education systems is a problematic process because students are often from different age groups and occupations, have different learning materials, different purposes to be enrolled in programs and different criteria for success (Thorpe, 1988). In addition, there are certain limitations when compared to traditional education environments because teachers and students are in different physical environments (Puspitasari, 2010). Therefore, teachers have limited options for measuring students' performances in open and distance education systems (McIsaac and Gunawardena, 1996).

Due to above mentioned reasons, some measurement and evaluation activities are based on study materials designed according to self-learning principles, and timed and invigilated exams are used while determining success level of students (Karadag, 2005). Although today's technological advancements provide new alternatives for teachers, it is still not possible to achieve complete exam security and secure identity check in new learning environments.

As the main measurement tools, Anadolu University Open Education system uses multiple choice tests, which are also known as objective tests, in addition to homework and portfolios. The research showed that students also prefer alternative assessment tools such as true/false tests, matching tests, homework/project, and graduation dissertation (Karadag, 2014). Using some of these measurement tools will be possible when online exam system is implemented, which is also another preference stated by students. In open-ended questions, students can structure their own answers, explain the reasons for their answers and express their opinions freely and uniquely (Gronlund, 1998).

Various measurement tools used in formal education should also be used in open and distance learning applications, and Open-ended questions should be used as an alternative to multiple choice questions (Karadeniz, 2016).

Open-ended questions are more advantageous than multiple choice questions in that they minimize measurement errors by eliminating chance success , and they are suitable for partial grading and easier to prepare (Tan and Erdogan, 2004; Bahar, Nartgun, Durmus and Bicak, 2010; Ilhan, 2016)

However, open-ended questions have some disadvantages such as time-consuming administration and scoring, difficulty of ensuring content validity, fewer number of questions due to time constraints and, most importantly, lack of objective scoring (Ozcelik, 2011; Dogan, 2013; Ilhan, 2016).

Open-ended questions refer to classical and written question types that cannot simply be answered as "yes/no". The emotions and opinions of those who answer these questions are determined through certain analysis. Open-ended questions are often asked as the last question of classical exams. Open-ended question practice in Anadolu University Open Education system started in 2017-2018 academic year. The tests consist of 16 multiple-choice questions (5 points each), two short answer questions (5 points each) and one long answer question (10 points). These questions are graded through online Open-ended Question Evaluation System in Anadolu University Open Education System. In this study, it is aimed to detect students' opinions about open-ended question exam practice during 2018-2019 academic year for the following programs of Anadolu University Open Education System: Economy, Hospitality Management, Philosophy, History, Sociology, and Turkish Language and Literature. The study was designed as a quantitative study that describes an existing situation. The results of this study will contribute to the development of open-ended question applications.

ANADOLU UNIVERSITY OPEN EDUCATION SYSTEM OPEN-ENDED QUESTION EVALUATION SYSTEM

Six programs in Anadolu University Open Education System use open-ended questions in the midterms at undergraduate level. Computer Research and Application Center (CRAC) Web Group has established a unit to evaluate open-ended questions. Open-ended question system in Anadolu University Open Education Ssytem consists of two phases: administration and evaluation. In the first phase, long and short answer questions to be asked in the exams are collected from the course coordinators by Test Research Unit, These questions and other questions in the question bank are used as exam questions. Selected questions are placed in the exam booklet for each course after the multiple-choice questions. Three open-ended questions – two short answer questions and one long answer question - are asked in each exam. (CRAC) Test Software Team prepare an extra form for these open-ended questions in addition to the regular optic form for multiple questions. There are empty spaces on this special form for fill-in-the-blanks or short answer questions as well as the long answer question. Students mark their answers in the optic form for multiple-choice questions while they use the other form for open-ended questions. After the administration of the exam, the optic forms are scanned and digitalized by CRAC. Later, the scanned forms are sent to the Open-ended Question Evaluation System. The following procedure is followed prior to the evaluation process:

- Preparation of open-ended questions
- Printing optic forms
- Administration of the exam
- Scanning the optic forms

Scanned forms are assigned to graders, and each form is graded by two different graders according to the rubric and grades are announced when multiple choice questions are scored and combined with those taken from open-ended ones."

METHODOLOGY

The study examines students' opinions regarding open-ended question practice in the exams of Anadolu University Open Education System. It was designed as a quantitative study aiming to determine students' opinions regarding open-ended question practice in the exams.

Participants

The participants of the study are 3.236 students out of 14.565 students who took open-ended questions in the midterm exams in 2018-2019 at Anadolu University Open Education System. Table 1 displays demoGraph information about the participant students such as the program they attend, age and gender.

Tablo 1. The Distribution of Participants according to the Programs They Attend, Age and Gender

Program	N	%	Age	N	%	Gender	N	%
Sociology	1320	40.8	17-22	71	2.2	Female	1671	51.6
Economy	894	27.6	23-28	813	25.1	Male	1565	48.4
Hospitality Management	322	9.9	29-34	880	27.2			
Turkish Language and Literature	272	8.4	35-40	645	19.9			
History	261	8.1	41-46	449	13.9			
Philosophy	167	5.2	47 +	378	11.7			

Table 1 shows that the percentage of the participants attending the Sociology program is the highest (%40.8) and the Philosophy program the lowest (%5.2). This result is consistent with the number of students taking the open-ended question exam in terms of the programs they attend. As for the age ranges of the participants, 29-34 age range has the highest number of participants (%27.2) and 17-22 age range the lowest (%2.2).

This finding also reflects the student profile in Anadolu University Open Education System. Finally, the data regarding the gender distribution of the participants shows that %52.6 of the participants are female and %48.4 male. This distribution ratio is quite similar to that of 14565 students who took open-ended question exam although the study did not use any sampling method while determining the participants.

Data Collection Tool

The data were collected through a measurement tool prepared via the Google Form. The tool includes 5 Likert type questions, 8 closed-ended questions - three of which are yes-no questions- and 2 open-ended questions. One of these open-ended questions allows the participants to write about why they did not reply open-ended questions, and the second open-ended question aims to collect data regarding their opinions about open-ended question practice. Although each item used separately and scale scores haven't used as sum scores, scale's Cronbach Alfa internal consistency reliability was found as 0.89. This means that the scale is highly reliable. The measurement tool was examined by three experts forcontent validity.

Data Collection Procedures

14565 students who took open-ended question exam were sent the link of and the information text about the measurement tool via e-mail and SMS. The information text involved the potential advantages of the study to improve the system and stated that the participation in the study is voluntary. The replies were collected between February 14th and February 16th 2020.

Data Analysis

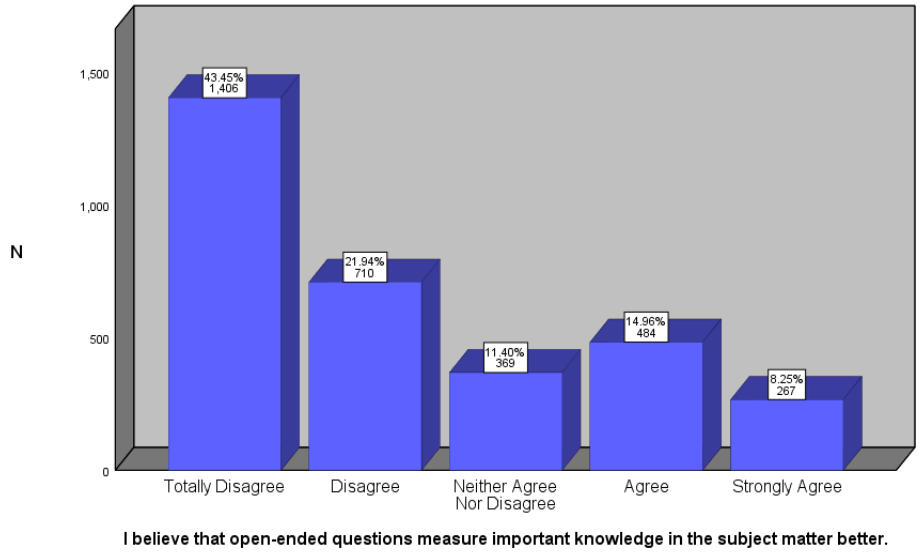
Percentage-frequency and graphs of the data collected were used for analysis purposes. Percentage-frequency graphs were prepared and interpreted for each item in the measurement tool. Since each question in the tool measured a different and independent dimension of the research, the tool was not taken as a scale, so each question was analyzed separately. The data were recoded for certain questions and chi-square analysis was done by using "age", "gender" and "the program they attend" variables.

FINDINGS

This section presents and discusses the findings obtained from 3.236 participants who answered the questions in the measurement tool.

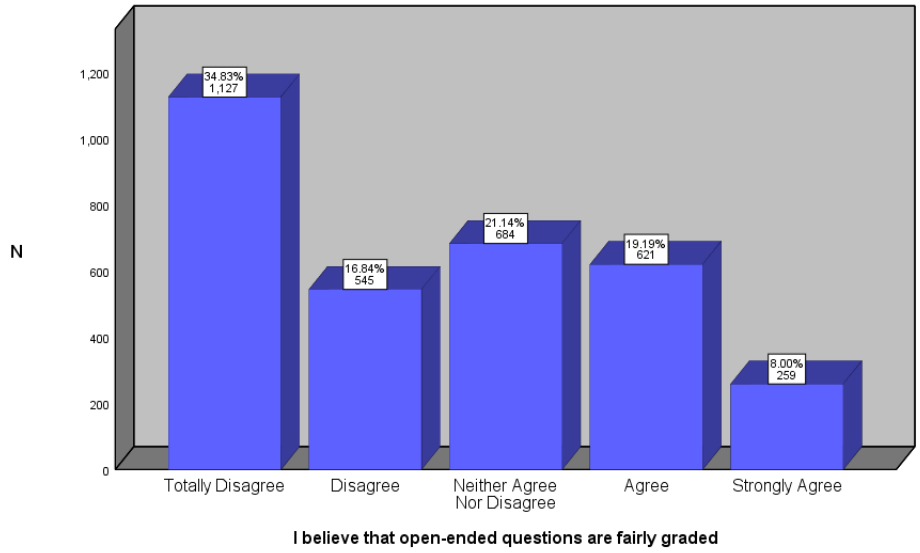
The Opinions regarding Whether "Open-ended Questions Measure Important Knowledge in the Subject Matter Better or Not"

% 43.45 of the participants provided "Totally disagree" answer for the question aiming to determine students' opinions about to what extent open-ended questions measure their subject matter knowledge. %21.9 reported that they do not agree with this statement. The percentage of those who marked "Strongly Agree" is %8.25, and "Agree" option was chosen by %14.96 of the participants. Graph 1 shows that majority of the participants do not believe that open-ended questions measure important knowledge in subject matter better.



Graph 1. The level of agreement about whether open-ended questions measure important knowledge in the subject matter better or not

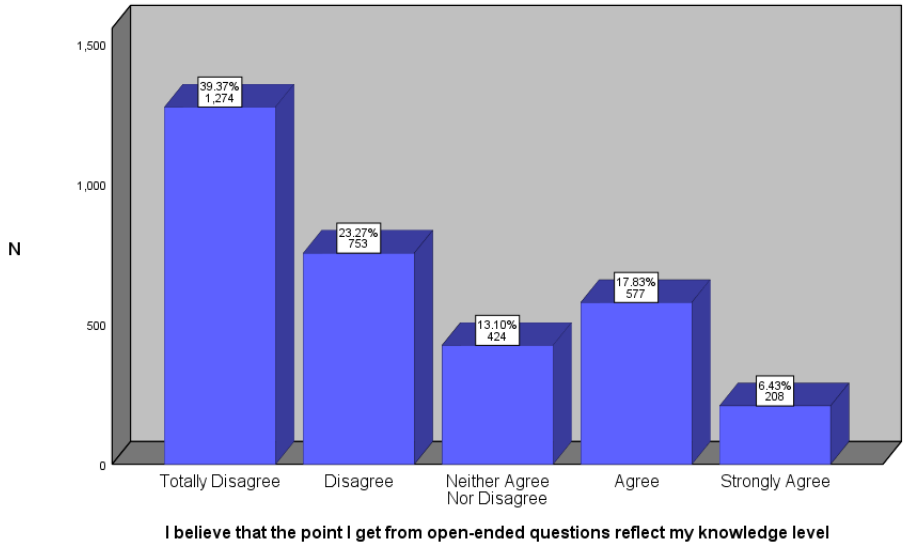
The Opinions regarding Whether "Open-ended Questions are Fairly Graded or Not"



Graph 2. The opinions regarding whether "open-ended questions' are fairly graded or not

%34.83 of the participants do not agree at all with the statement "I believe that open-ended questions are fairly graded" and %16.84 do not agree with it. "Strongly Agree" option was marked by %8 of the participants and "Agree" option by %19.9. It is clear that more than half of the participants think that evaluation of open ended questions is not fairly done while %21.14 are undecided about this statement.

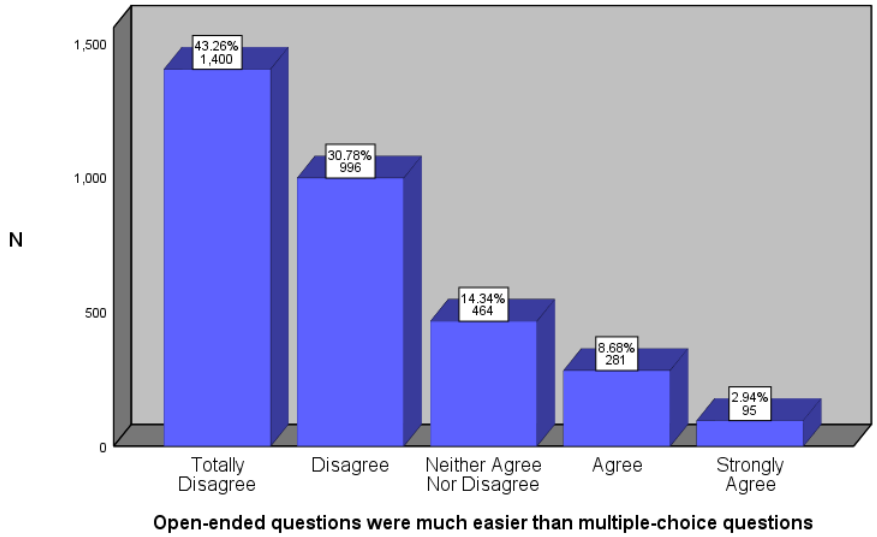
The Opinions regarding Whether "The Points Obtained from Open-ended Questions Reflect Students' Knowledge Level or Not"



Graph 3. The Opinions regarding Whether the Points Obtained from Open-ended Questions Reflect Students' Knowledge Level or not

As for the statement "I believe that the point I get from open-ended questions reflects my knowledge level", %39.37 of the participants marked "Totally disagree" option and %23.27 "Disagree" option. The total percentage of those who chose "Agree" and "I Strongly agree" option is %24.26. Graph 3 shows that a great majority of the participants do not believe that the points they get from open-ended questions reflect their knowledge level.

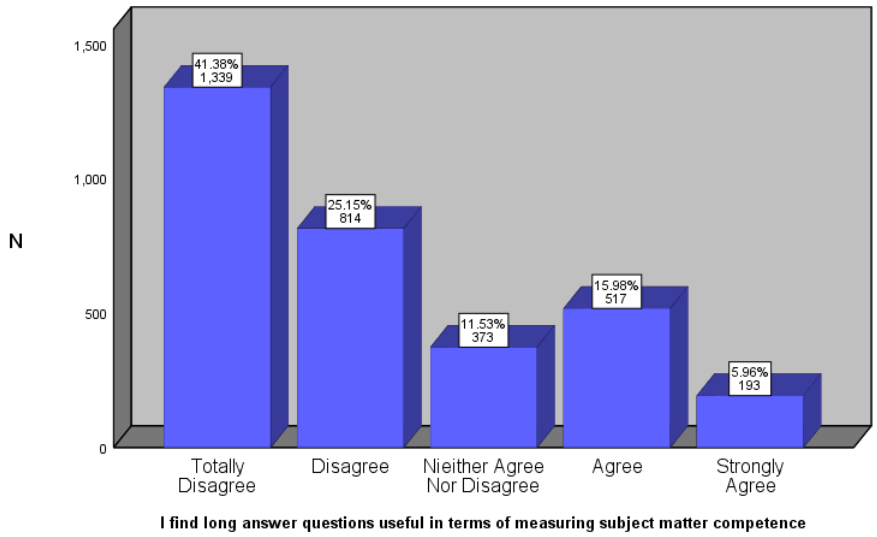
The Opinions regarding Whether "Open-ended Questions were Easy or Not"



Graph 4. The Opinions regarding Whether Open-ended Questions were Easy or not

According to Graph 4, majority of the participants found open-ended questions more difficult than multiple-choice questions. The percentage of participants who replied the statement above as "Totally Disagree" is %43.26 and "Disagree" %30.78, which makes %74.04 in total. However, %2.94 of the participants "Strongly Agree" with the statement and %8.68 agreed, which makes %10.62 in total.

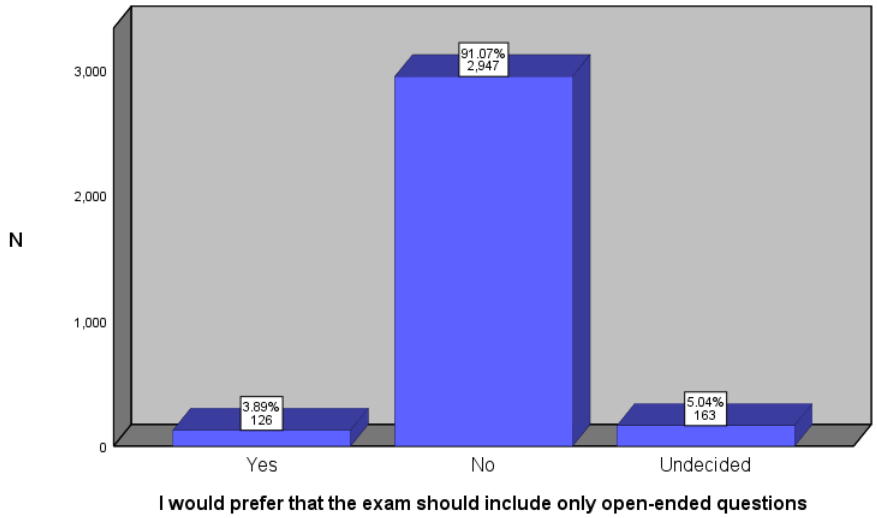
The Opinions regarding Whether "Long Answer Open-ended Questions Measure Subject Matter Competence"



Graph 5. The Opinions regarding whether Long Answer Open-ended Questions Measure Subject Matter Competence

%41.38 of the participants totally disagree with the statement "I find long answer questions useful in terms of measuring subject matter competence." and %25.15 disagree with it. In total, %66.53 of the participants express a sort of disagreement for the statement, while %21.94 of the participants agree with the statement (%15.98 – Agree- and %5.96 – Strongly Agree). These percentages suggest that majority of the participants think long answer open-ended questions do not measure subject matter competencies.

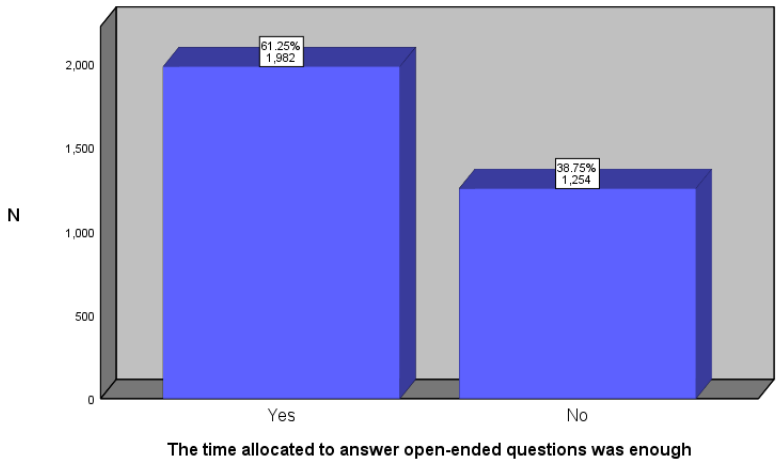
The Opinions regarding the Statement "I would Prefer that the Exam should Include Only Open-Ended Questions"



Graph 6. The Opinions regarding the Statement "I would prefer that the exam should include only open-ended questions"

%91.07 of the participants disagree with the idea that the exam should include only open-ended questions while only %3.89 replied to the statement above by marking the option "YES".

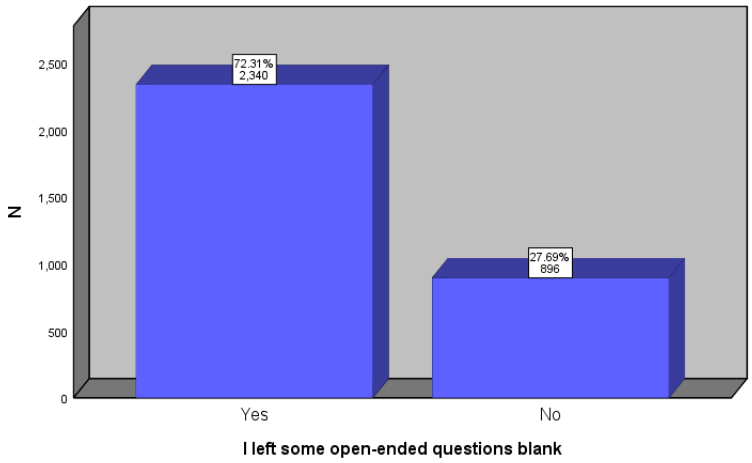
The Opinions regarding the Time Allocated to Answer Open-ended Questions



Graph 7. The Opinions regarding the Time Allocated to Answer Open-ended Questions

%61.25 of the participants think that the time allocated to answer open-ended questions is enough while %38.85 disagreed with this statement.

The Opinions regarding the Reasons for Leaving Open-ended Questions Blank



Graph 8. The Percentage of those Leaving Open-ended Questions Blank

%72.31 of the participants reported that they left some open-ended question blank while %27.69 stated that they answered these questions.

In order to examine the participants' opinions according to demoGraph variables, "Strongly agree" and "Agree" Likert type options were recoded as "Agree"; and "Disagree" and "Totally disagree" options as "Disagree". "Undecided" option was not included in the analysis. By doing so, all the data obtained from Likert type questions were analyzed as if they had only two options, which made chi-square statistics possible between demoGraph variables and recoded variables.

Table 2 below shows chi-square test results, which was done to examine the replies provided by the participants according to gender variable.

Table 2. Chi-Square Table Displaying Agreement on Statements according to Gender

		Male	Female	Total
OEQ (Open-Ended Questions) measure better	Disagree	82.7%$_a$	80.0%$_a$	81.40%
	Agree	17.3%$_a$	20.0%$_a$	18.60%

X^2=3.184; df =1; p>0.05

		Male	Female	Total
OEQ are more fair	Disagree	75.1%$_a$	80.0%$_a$	81.40%
	Agree	24.9%$_a$	20.0%$_a$	18.60%

X^2=5.99; df =1; p<0.05

		Male	Female	Total
OEQ reflect my knowledge level	Disagree	79.1%$_a$	70.6%$_b$	72.90%
	Agree	20.9%$_a$	29.4%$_b$	27.10%

X^2=2.519; df =1; p>0.05

		Male	Female	Total
OEQ were easier	Disagree	91.6%a	76.5%$_a$	77.80%
	Agree	8.4%a	23.5%$_a$	22.20%

X^2=13.693; df =1; p<0.05

		Male	Female	Total
EOQ are useful	Disagree	82.2%$_a$	87.3%b	89.50%
	Agree	17.8%$_a$	12.7%b	10.50%

X^2=13.693; df =1; p<0.05

"Subscripted letters" under the percentages show the gender group that shows significant difference at .05 level of significance.

The data in Table 2 reveal that the agreement levels of the participants with "more fair" "easier" and "more useful" statements are significantly different according to gender variable ((X2=5.99, df =1, p<0.05; X2=13.693, df =1, p<0.05; X2=13.693, df =1, p<0.05) respectively). Accordingly, males reported higher level of disagreement for "open-ended questions are fairly graded" statement although majority of both male and female participants disagreed with it. Similarly, a high percentage of both males and females did not agree with the statement "open-ended questions were easier", and males disagreed less. In addition, high percentage of the participants disagreed with the usefulness of open-ended questions in reflecting knowledge level, and males stated relatively lower level of disagreement with this idea. However, the agreement level of the participants with the statement "open-ended questions measure subject matter better" is not significantly different according to gender variable and males displayed lower level of agreement than females. In other words, the opinions of males and females regarding this statement do not differ significantly.

Table 3. Chi-Square Table showing how levels of Agreement with the Statements change according to the Age Variable

		17- 22	23 - 28	29 - 34	35 - 40	41 - 46	47 and above	Total
OEQ (Open-Ended Questions) measure better	Disagree	82.8%$_{a, b, c}$	86.8%$_{c}$	84.4%$_{b, c}$	80.0%$_{a, b}$	74.2%$_{a}$	71.5%$_{a}$	81.40%
	Agree	17.2%$_{a, b, c}$	13.2%$_{c}$	15.6%$_{b, c}$	20.0%$_{a, b}$	25.8%$_{a}$	28.5%$_{a}$	18.60%

X^2=47.857; df =5; p<0.05

		17- 22	23 - 28	29 - 34	35 - 40	41 - 46	47 and above	Total
OEQ are more fair	Disagree	75.5%$_{a, b, c}$	79.7%$_{c}$	78.7%$_{c}$	70.3%$_{b}$	63.8%$_{a, b}$	59.2%$_{a}$	72.90%
	Agree	24.5%$_{a, b, c}$	20.3%$_{c}$	21.3%$_{c}$	29.7%$_{b}$	36.2%$_{a, b}$	40.8%$_{a}$	27.10%

X^2=64.009; df =5; p<0.05

		17- 22	23 - 28	29 - 34	35 - 40	41 - 46	47 and above	Total
OEQ reflect my knowledge level	Disagree	78.2%$_{a, b, c, d}$	84.4%$_{d}$	81.5%$_{c, d}$	75.9%$_{b, c}$	71.2%$_{a, b}$	65.3%$_{a}$	77.80%
	Agree	21.8%$_{a, b, c, d}$	15.6%$_{d}$	18.5%$_{c, d}$	24.1%$_{b, c}$	28.8%$_{a, b}$	34.7%$_{a}$	22.20%

X^2=58.803; df =5; p<0.05

		17- 22	23 - 28	29 - 34	35 - 40	41 - 46	47 and above	Total
OEQ were easier	Disagree	81.7%$_{a}$	91.2%$_{a}$	90.5%$_{a}$	90.6%$_{a}$	86.4%$_{a}$	86.6%$_{a}$	89.50%
	Agree	18.3%$_{a}$	8.8%$_{a}$	9.5%$_{a}$	9.4%$_{a}$	13.6%$_{a}$	13.4%$_{a}$	10.50%

X^2=13.908; df =5; p>0.05

		17- 22	23 - 28	29 - 34	35 - 40	41 - 46	47 and above	Total
EOQ are useful	Disagree	77.8%$_{a, b, c}$	86.8%$_{c}$	82.7%$_{c}$	81.7%$_{b, c}$	74.9%$_{a, b}$	67.2%$_{a}$	80.60%
	Agree	22.2%$_{a, b, c}$	13.2%$_{c}$	17.3%$_{c}$	18.3%$_{b, c}$	25.1%$_{a, b}$	32.8%$_{a}$	19.40%

X^2=61.826; df =5; p<0.05

"Subscripted letters" under the percentages show the gender group that shows significant difference at .05 level of significance.

Table 3 shows that there is a significant difference for all the statements about the open-ended question in the measurement tool for all age ranges, and disagreement levels are quite high. Disagreement for the statements "open-ended questions measure subject matter knowledge better", "open-ended questions are fairly graded" and "open-ended questions are useful in terms of measuring subject matter competence" is higher for 17-34 age group than 35 and above age group. In addition, 23-24 age group tended to disagree more than other age groups for the statement "Open-ended questions reflect my knowledge level."

Table 4. Chi-Square Table showing how levels of Agreement with the Statements change according to "the program they attend" variable

		Philosophy	Turkish Language and Literature	Economy	History	Hospitality Management	Sociology	Total
OEQ (Open-Ended Questions) measure better	Disagree	66.7%$_{a}$	63.2%$_{a}$	88.1%$_{b}$	74.0%$_{a, c}$	84.5%$_{b, c}$	82.1%$_{c}$	81.40%
	Agree	33.3%$_{a}$	36.8%$_{a}$	11.9%$_{b}$	26.0%$_{a, c}$	15.5%$_{b, c}$	17.9%$_{c}$	18.60%

X^2=89.187; df =5; p<0.05

		Philosophy	Turkish Language and Literature	Economy	History	Hospitality Management	Sociology	Total
OEQ are more fair	Disagree	53.8%$_{a}$	51.7%$_{a}$	82.6%$_{b}$	63.6%$_{a, c}$	77.3%$_{b, d}$	72.7%$_{c, d}$	72.90%
	Agree	46.2%$_{a}$	48.3%$_{a}$	17.4%$_{b}$	36.4%$_{a, c}$	22.7%$_{b, d}$	27.3%$_{c, d}$	27.10%

X^2=102.150; df =5; p<0.05

		Philosophy	Turkish Language and Literature	Economy	History	Hospitality Management	Sociology	Total
OEQ reflect my knowledge level	Disagree	60.5%$_{a, b}$	57.6%$_{b}$	84.9%$_{c}$	70.7%$_{a, b}$	75.0%$_{a, d}$	80.8%$_{c, d}$	77.80%
	Agree	39.5%$_{a, b}$	42.4%$_{b}$	15.1%$_{c}$	29.3%$_{a, b}$	25.0%$_{a, d}$	19.2%$_{c, d}$	22.20%

X^2=103.777; df =5; p<0.05

		Philosophy	Turkish Language and Literature	Economy	History	Hospitality Management	Sociology	Total
OEQ were easier	Disagree	85.8%$_{a, b}$	67.8%$_{c}$	93.1%$_{b}$	88.5%$_{a, b}$	86.8%$_{a}$	91.8%$_{a, b}$	89.50%
	Agree	14.2%$_{a, b}$	32.2%$_{c}$	6.9%$_{b}$	11.5%$_{a, b}$	13.2%$_{a}$	8.2%$_{a, b}$	10.50%

X^2=113.014; df =5; p<0.05

		Philosophy	Turkish Language and Literature	Economy	History	Hospitality Management	Sociology	Total
EOQ are useful	Disagree	61.1%$_{a}$	61.2%$_{a}$	89.6%$_{b}$	72.9%$_{a, c}$	84.8%$_{b, d}$	80.8%$_{c, d}$	80.60%
	Agree	38.9%$_{a}$	38.8%$_{a}$	10.4%$_{b}$	27.1%$_{a, c}$	15.2%$_{b, d}$	19.2%$_{c, d}$	19.40%

X^2=129.537; df =5; p<0.05

"Subscripted letters" under the percentages show the gender group that shows significant difference at .05 level of significance.

Table 4 shows that the students disagree with the statements about open-ended questions to a great extent regardless of the programs they attend; however, there are differences between the programs in terms of level of agreement. For instance, Economy students tend to disagree more than those of other programs for the statements "open-ended questions measure important knowledge in the subject matter better, "open-ended questions are fairly graded" and "open-ended questions reflect knowledge level". As for the statement "open-ended questions were easier than multiple-choice questions", the students attending Turkish Language and Literature program displayed less tendency to disagree with the statements when compared to those attending other programs. In other words, Turkish Language and Literature program student agree with the statement "open-ended questions were easier than multiple-choice questions" more than other participants. Finally, the group that disagreed the most with the statement "I find long answer questions useful in terms of measuring subject matter competence" is the students attending the Economy program.

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

This study aims to determine students' opinions about open-ended question exam practice during 2018-2019 academic year in the following programs of Anadolu University Open Education System: Economy, Hospitality Management, Philosophy, History, Sociology, Turkish Language and Literature. The results of the study are presented below.

First, the participants think that open-ended questions do not measure their subject matter knowledge. Whereas, Javid (2014) stated that the reliability of open-ended questions is higher than multiple-choice questions. The reason lying behind this result of the study might be the prejudices they have about open-ended questions or that they are not accustomed to this type of question.

The finding related to the evaluation of open-ended questions revealed that almost half of the participants disagree with the statement "open-ended questions are fairly graded", which might be due to the fact that students do not have enough knowledge about this evaluation process. This result supports what has been stated in the literature about open-ended questions. The most obvious drawback was the lack of objectivity and rater bias in the evaluation of open-ended questions (Atilgan, Kan, and Dogan, 2009; Eckes, 2005). Thus, it is recommended that students should be informed about the evaluation process and scoring procedures. Publishing short online videos might be a good solution.

Students do not believe that the points they get from open-ended questions reflect their knowledge level. Therefore, it might be useful to conduct another study to determine the factors leading to this opinion.

Another finding of the study is that students find open-ended questions more difficult than multiple-choice questions. This result is in parallel with another research result (Oksuz&Guven Demir, 2019; Duran&Tufan, 2017). The researchers stated that this might be because open-ended items require remembering information and expressing it in written form. The factors affecting this idea might be the lack of options for answers, absence of luck-based success (Turgut&Baykul, 2012) and that the students are supposed to express their own opinions in their answers in open-ended questions. It may be presupposed that open-ended questions are difficult for learners, and this may have affected students' thoughts.

In long answer questions, students are expected to write at least one paraGraph about the topic. Majority of students think that this question type does not measure their subject matter competencies. Economy students are more negative about this issue. Therefore, further studies might be conducted to identify the reasons lying behind this finding.

Another finding of the study is that majority of students do not prefer that the exams should include only open-ended questions, which is not supported by the findings of the study conducted by Karadag (2014) on alternative measurement tools in Open Education System. Therefore, it might be useful to collect data about students' preferences for measurement tools specific to each program.

When the findings of the study are examined in terms of gender variable, it is seen that more males than females believe that open-ended questions are not fairly graded, and they are not easy and useful. In other words, males have more negative opinions than females about open-ended questions. Another study conclusion supports this finding (Oksuz&Guven Demir, 2019). It is stated that the female students were more successful in the open-ended test in the analysis step. Du Plessis &Du Plessis (2009) found that male students who were successful in the multiple-choice test failed in open-ended versions of the same questions.

As for age variable, the participants in 17-22 age group believe that open-ended questions do not measure subject matter content better, are not fairly graded and not useful in measuring competency in subject matter more than students who are 35 year old and over.

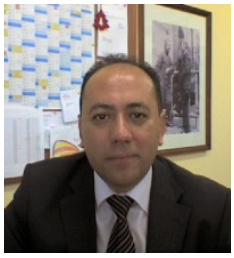
According to the findings related to the program they attend, we can see that the students attending Economy program are more negative than students of other programs for the following statements: "I believe that open-ended questions measure important knowledge in the subject matter better; "I believe that open-ended questions are fairly graded"; and "I find long answer questions useful in terms of measuring subject matter competence".

The participants generally believe that the time allocated for the exam involving open-ended questions (30 minutes) for 16 multiple-choice questions and 3 open-ended questions (two short answer and one long

answer) is sufficient to allow them to answer all the questions. The students who experience problems with the duration of the exam should be examined in a further study. For example, it should be examined whether students face difficulties in time management or difficulty of reading and whether these problems affect their scores or not.

Finally, it was found that majority of students leave open-ended questions blank. The reasons reported for this preference are as follows: they did not know the answer; they could not remember the answer; and they found the question difficult. There are studies in the literature that support this result (Oksuz&Guven Demir, 2019; Duran&Tufan, 2017; Eckes, 2005). The most important reason for students to leave open-ended questions blank might be the 10% weight of these questions in the overall exam score. An increase in this percentage might change this behavior in a positive way.

BIODATA and CONTACT ADDRESSES of AUTHORS



Dr. Nejdet KARADAG, works as the manager of the Assessment Department at the Open Education Faculty of Anadolu University. He has a BA degree from the Department of French Language Teaching and MA degree from the Department of Distance Education. He received his PhD. in Distance Education from Anadolu University in 2014. His research interests are instructional design, assessment and evaluation, mega universities, and new learning technologies in open and distance learning.

Nejdet KARADAG
Non-Formal Education, Open Education Faculty
Address: Anadolu University, 26470, Eskisehir, Turkey
Phone: +90 222 3350580
E-mail: nkaradag@anadolu.edu.tr

Dr. Belgin BOZ YUKSEKDAG has been working at Anadolu University College of Open Education Testing&Research Center as a lecturer doctor. She graduated from the School of Nursing of Hacettepe University in 1990. She earned her MS degree from the Graduate School of Istanbul University (Health Sciences Department), Internal Medicine Nursing in 1995, and the MA degree from the Graduate School of Anadolu University (Distance Education Department) in 2008. She earned her PhD degree from the Graduate School of Marmara University (Health Sciences Department), Psychiatry Nursing, in 2013.

Belgin BOZ YUKSEKDAG
Department Of Health Programs, Open Education Faculty
Address: Anadolu University, 26470, Eskisehir, Turkey
Phone: +90 222 3350580
E-mail: bboz@anadolu.edu.tr

Dr. Murat AKYILDIZ is an associate professor at Open Education Faculty, Anadolu University. Dr. Akyildiz gained his PhD. in Educational Assessment in 2009. His academic interest areas are item response theory, statistical analysis, assessment in open and distance learning. He has over than 15 journal articles published in international indexes, and other national and international articles, papers submitted to international meetings.

Murat AKYILDIZ
Non-Formal Education, Open Education Faculty
Address: Anadolu University, 26470, Eskisehir, Turkey
Phone: +90 222 3350580
E-mail: muratakyildiz@anadolu.edu.tr

Ali Ihsan IBILEME is a Lecture and Software Developer at Computer Research Center, Anadolu University. He completed his bachelor's degree in Anadolu University, Department of Computer Education and Instructional Technology in 2009. He completed his master's degree, and he is currently a PhD student at the Department of Distance Education, Anadolu University. He take part in the development of many software projects in the field of open and distance learning in Open Faculty, Anadolu University. His academic interest areas are open and distance learning, learning analytics, social network analysis, and learner support system.

Ali Ihsan IBILEME
Anadolu University, Computer Research Center
Address: Anadolu University Computer Research Center, Eskisehir, Turkey
Phone: +90 5544170415,
E-mail: aiibileme@anadolu.edu.tr

REFERENCES

Atilgan, H., Kan, A., & Dogan, N. (2009). Egitimde olcme ve degerlendirme. Ani Yayincilik.

Bahar, M., Nartgun, Z., Durmus, S., & Bicak, B. (2010). *Geleneksel-tamamlayici olcme ve degerlendirme teknikleri*. Ankara: Pegem Akademi Yayincilik.

Dogan, N. (2013). Yazili yoklamalar. H. Atilgan (Ed.), *Egitimde olcme ve degerlendirme* icinde (145-168). Ankara: Ani Yayincilik.

Du Plessis, S., & Du Plessis, S. (2009). A new and direct test of the 'gender bias' in multiple-choice questions.

Duran, E., & Tufan, B. S. (2017). The Effect Of Open-Ended Questions And Multiple Choice Questions On Comprehension, International Journal of Languages' Education and Teaching, 5(1), 242–254.

Eckes, T. (2005). Examining rater effects in TestDaF writing and speaking performance assessments: A many-facet Rasch analysis. Language Assessment Quarterly: An International Journal, 2(3), 197-221.

Gronlund, N.E. (1998). Assessment of student achievement. Boston: Allyn and Bacon.

Ilhan, M. (2016). Acik uclu sorularla yapilan olcmelerde klasik test kurami ve cok yuzeyli rasch modeline gore hesaplanan yetenek kestirimlerinin karsilastirilmasi. Hacettepe Universitesi Egitim Fakultesi Dergisi [Hacettepe University Journal of Education], 31(2), 346-368. DOI:10.16986/HUJE.2016015182

Javid, L. (2014). The Comparison between Multiple-choice (MC) and Multiple True-false (MTF) Test Formats in Iranian Intermediate EFL Learners' Vocabulary Learning. Social and Behavioral Sciences 98, 784- 788. doi: 10.1016/j.sbspro.2014.03.482.

Karadag, N. (2005). Anadolu Universitesi Acikogretim Sisteminde Soru Yazarlarinin Soru Hazirlamada Karsilastiklari Guclukler. The Turkish Online Journal of Educational Technology (TOJET), 4(3).

Karadag, N. (2014). Acik ve Uzaktan Egitimde Olcme ve Degerlendirme: Mega Universitelerdeki Uygulamalar. Yayinlanmamis Doktora Tezi. Anadolu Universitesi Sosyal Bilimler Enstitusu, Eskisehir.

Karadeniz, A. (2016). Kitlesel acik ve uzaktan ogrenmede basarinin acik uclu sorularla olculmesine yonelik bir sistemin tasarimi, uygulanmasi ve degerlendirilmesi. (Design, Evaluation And Implementation of A System Intended to Assess The Learners' Achievement Through Openended Quesions In Massive Open And Distance Learning). Anadolu University, Turkey. Graduate School of Social Sciences, (Doctoral dissertation). Available from the Council of Higher Education, National Dissertation Center, Dissertation ID: 449995.

McIsaac, M.S., & Gunawardena, C.N. (1996). Distance education. Handbook of research for educational communications and technology (Ed: D. Jonassen). New York: Simon and Schuster Macmillan, ss. 403.

Oksuz, Y., & Guven Demir, E. (2019). Acik uclu ve coktan secmeli basari testlerinin psikometrik ozellikleri ve ogrenci performansi acisindan karsilastirilmasi. (Comparison of Open Ended Questions and Multiple Choice Tests in terms of Psychometric Features and Student Performance). Hacettepe Universitesi Egitim Fakultesi Dergisi, 34(1), 259-282. doi: 10.16986/HUJE.2018040550

Ozcelik, D.A. (2011). Olcme ve degerlendirme. Ankara: Pegem Akademi Yayincilik.

Puspitasari, K.A. (2010). Student assessment. Policy and Practice in Asian Distance Education (Ed: T. Belawati ve J. Baggaley). New Delhi: SAGE, pp.60-65.

Simonson, M., Smaldino, S., Albright, M., & Zvacek, S. (2012). Teaching and learning at a distance: Foundations of distance education (3. Baski). New Jersey: Prentice Hall.

Tan, S., & Erdogan, A. (2004). Ogretimi planlama ve degerlendirme. Ankara: PegemA Yayincilik.

Thorpe, M. (1998). Assessment and third generation distance education. Distance Education, 19(2), 265-286.

Turgut, M.F., ve Baykul, Y. (2012). Egitimde olcme ve degerlendirme. Ankara: Pegem Akademi Yayincilik.

Yasar, M. (2014). Egitimde Olcme ve Degerlendirme Dersine Yonelik Tutum Olceginin Gelistirilmesi. Egitim Bilimleri Arastirma Dergisi (EBAD), 4(1).

Zhang, W., Tsui, C., Jedege, O., Ng, F., & Kowk, L. (2002). A comparison of distance education in selected Asian open universities. 14. Annual Conference of Asian Association of Open Universities Konferansi'nda sunulan bildiri. Manila, Philippines. http://www.ouhk.edu.hk/cridal/gdenet/Management/Governance/EAM11A.html.

FOSTERING LANGUAGE LEARNER AUTONOMY THROUGH INTERDEPENDENCE: THE POWER OF WIKIS

Dr. Shirin SADAGHIAN
ORCID: 0000-0003-1405-5363
Alzahra University
Tehran, IRAN

Dr. Susan MARANDI
ORCID: 0000-0001-9852-1880
Department of Languages
Alzahra University
Tehran, IRAN

Received: 06/04/2020 **Accepted:** 28/07/2020

ABSTRACT

The present study reports on a collaborative writing project initiated and completed by 18 Iranian English language learners enrolled in an online writing course. Using a wiki as the core element of the project, the aim of the course was fostering learner autonomy in online settings based on the collaborative autonomous language learning framework proposed by Kessler and Bikowski (2010). The outcome of collaborative writing project was a text created in a wiki, which was manually analyzed from the very beginning of writing to the final revisions and reflections to find autonomous alterations made by student writers. The findings of the study revealed student-writers' autonomous contributions in the form of alterations to the text which were accomplished interdependently with peers through alterations such as *commenting* as an instance of scaffolding to reach a shared goal. Other types of autonomous alterations such as *adding new information*; *deleting existing information*; *correction of information*; *clarification*; *synthesis*; *and reflection* were observed in the final product. Frequent occurrence of peer correction with regard to content and form was a discriminating finding of the current study. Also, despite the initial goal which was completion of the project exclusively by learners, teacher intervention was witnessed throughout the process. To study the role of teacher in depth, a semi-structured interview about the roles of a teacher in a collaborative autonomous learning was conducted. The data from the interview went through a manual thematic analysis to find the themes related to the learners' perceptions of teacher's roles. The findings revealed a need for a teacher as a facilitator and resource, which highlighted students' demands for motivation and content knowledge from teacher in an autonomous contribution to completing a collaborative project.

Keywords: Learner autonomy, collaborative writing, wiki, online education, interdependence.

INTRODUCTION

One of the affordances of technology for language learners is the creation of opportunities to use language in collaborative authentic contexts. Such contexts are assumed to increase learners' autonomy by developing a "capacity for reflection and analysis, which is central to the development of learner autonomy" (Little, 1996, p. 210).

However, the availability of technology alone does not lead toward independence from teacher and pedagogy. Benson (2001) points out that a number of researchers have used the term independence interchangeably with autonomy, whereas, equating the two concepts ignores the social character of learning. Such a definition loses sight of the fact that interdependence lies at the heart of the concept of autonomy. Little (1996) believes that social interaction is at the center of the concept of autonomy and the development of capacity for reflection "depends on the internalization of a capacity to participate fully and critically in social interactions" (p. 210). Kohonen (1992), cited in Benson (2001), argues that "autonomy entails the notion of

interdependence which means being responsible for one's own conduct in the social context" (p. 14). What interdependence entails here is being responsible for one's own conduct in the social context that is being able to cooperate with others and solve conflicts in constructive ways (Kohonen, 1992, p.19)

With the advent of technology, social interaction is extended to include an additional virtual dimension. Schwienhorst (2008) claims that technology is capable of assisting a learner-autonomy-based pedagogy that supports reflection, interaction, experimentation, and participation of learners. In addition, the growing role of technology has changed the essence of learner autonomy to interaction and interdependence rather than isolation and independence (Healey, 2007; Schwienhorst, 2003).

The current study focuses on a collaborative writing project completed using an educational wiki to address the following research questions:

1. How do Iranian language learners demonstrate autonomy in a collaborative wiki-based writing project?
2. How does a degree of teacher intervention affect EFL learners' autonomous collaborative behavior?

LITERATURE REVIEW

Language Learner Autonomy

Increasing levels of learner autonomy has been an important educational goal during recent decades. This entails detachment from one's own learning, development of linguistic and metalinguistic awareness, and creating an ability to reflect on one's own learning procedure. Apart from being aware of their own learning, autonomous learners also need to practice collaboration with teacher, learners, and native speakers or more experienced peers (Schwienhorst, 2012) in order to take control of their learning in various learning situations.

The role of a teacher can also vary in autonomous learning based on her/his interaction with learners. According to Voller (1997), a teacher can take on three different roles as a *facilitator, counsellor*, and *resource*. The language teacher may act as a facilitator who initiates and supports decision-making processes, a counselor who responds to the ongoing needs of individuals, and a resource who makes his or her knowledge and expertise available to the learners in times of need.

In the same vein, Littlewood (1996) asserts that in an autonomous learning setting, learners should take on different roles to practice complete control over their learning. In his framework for promoting autonomy among language learners, Littlewood (1996) assigns three roles to an autonomous individual, namely that of *communicator*, *learner, and person*.

Autonomy as a communicator depends on (a) the ability to use the language creatively, and (b) the ability to use appropriate strategies for communicating meanings in specific situation. Autonomy as a learner depends on (a) the ability to engage in independent work (e.g. self-directed learning), and (b) the ability to use appropriate strategies, both inside and outside classroom. Finally, autonomy as a person depends (in the foreign language learning context) on (a) the ability to express personal meanings, and (b) the ability to create personal learning contexts, e.g. through interacting outside the classroom. (p. 431)

At the very heart of Littlewood's (1996) autonomy framework, there are two major components, namely "ability" and "willingness," which are the prerequisites for all types of learnings. Ability includes both "knowledge" about various choices offered to the learner and the "skills" for implementing those choices, whereas "willingness" involves "motivation and the confidence to take responsibility" for one's decisions (p. 428). Figure 1 shows the elements of the framework in detail.

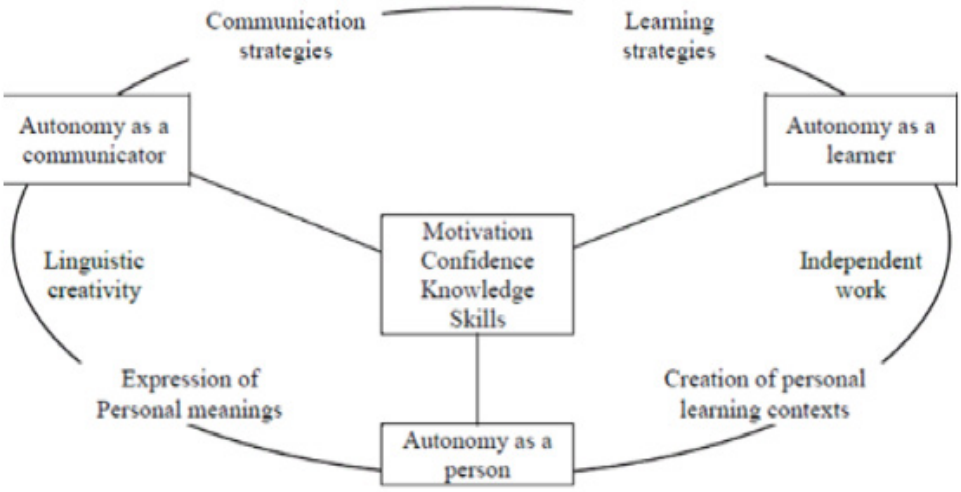


Figure 1. A Framework for developing autonomy in foreign language learning (Adopted from Littlewood, 1996, p.432).

Littlewood (1996, 1997) suggests the autonomous approach be used as a teaching methodology that focuses on linking classroom learning to learning beyond the classroom. However, despite the merits of Littlewood's framework, it does not recognize the importance of interdependence, which is vital to the interaction in which learning lies (Little, 1995(. To compensate for this shortcoming, Kessler and Bikowski (2010) add a new dimension to acknowledge the importance of students' developing collaborative autonomous language learning abilities from what Levy and Hubbard (2005) call a "CALL-centered viewpoint." From a CALL-centered point of view, the computer is not a neutral delivery system and the interaction among computer, learner, peer, teacher, and the learning material altogether, leads toward learning goals. The notion of interdependence is clearly indicated in Kessler and Bikowski's (2010) framework through the mediating role of the computer. According to Kessler and Bikowski (2010), the framework encompasses the responsibility of collaborative autonomous language learners in CALL-focused settings by adding interdependence to autonomy as a learner.

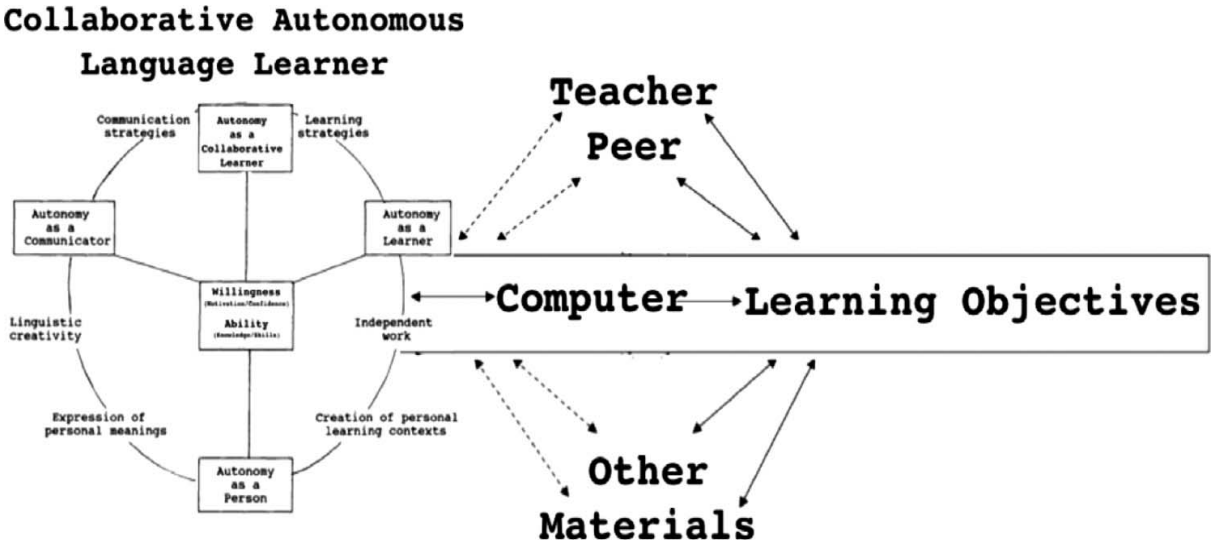


Figure 2. An expanded framework for developing collaborative autonomous language learning abilities in computer mediated contexts (Adopted from Kessler & Bikowski, 2010, p. 55).

In the above framework, Kessler and Bikowski (2010) introduce the features of collaborative autonomous learners, which include:

(1) the ability to use language to independently contribute personal meanings as a collaborative member of a group,

(2) the ability to use appropriate strategies for communicating as a collaborative member of a group,

(3) the willingness to demonstrate these abilities within the group. (p. 49)

Kessler and Bikowski's (2010) study is not the first to look at the concept of learner autonomy from a CALL-centered point of view. The importance of autonomy in online courses has led many researchers (e.g. Warschauer, Turbee & Roberts, 1996; Schwienhorst, 2003) to explore the relationship among CALL, educational technologies, and learner autonomy and to investigate how the new technologies require and at the same time assist learner autonomy.

Schwienhorst (2003), for example, devotes a chapter of his book to explain how through the tandem learning technique, he attempts to foster learner autonomy in a MUD Object Oriented (MOO) environment. "Tandem learning involves learners of complementary L1-L2 combinations learning a new language through playing the roles of L2 learner and L1 expert" (p. 431). Schwienhorst believes that the combination of pedagogy and technology supports learner autonomy through helping learners to reflect on their own learning planning, monitoring and evaluating the learning process. Moreover, the affordances of technology engage learners in different types of communications, similar to real life situations. Finally, the combined pedagogy/technology frameworks provide learners with the opportunity to experiment with and participate in the process of language learning and accept the responsibility to co-design and customize their learning environments.

Obviously, the mere addition of technology without the intervention of pedagogy would not serve the purposes of autonomy (Levy, 1997) yet, there are many ways through which CALL can enable the application of autonomy training. For instance, Reinder and Hubbard (2012) propose the free and ubiquitous access to resources as an advantage of CALL through which one can overcome the practical and political limitations on autonomy. Moreover, the authenticity of online materials (Reinder and Hubbard, 2012) is seen as an important plus for the development of learner autonomy (Benson, 2007).

Collaborative Writing

Collaborative writing, which involves multiple authors in producing a written work, is considered as a useful method for practicing process writing (Chao & Lo, 2011). In essence, collaborative writing is a collaborative learning process. According to Vygotsky (1978), collaborative writing can help students advance within their zone of proximal development (ZPD). ZPD is defined as the gap between what a learner can accomplish alone and in cooperation with others who are more skilled or experienced.

In response to the collaborative potential of Web 2.0 tools, practices that encourage collaboration among learners are being increasingly advocated in second language classrooms. The research on collaborative writing suggests that collaboration leads to an increase in the complexity of written texts (Sotillo, 2000). Consequently, the complexity of the final product and the higher quality of the joint work in collaborative writing projects have been known as sources of student motivation (Swain & Lapkin, 1998). The final products of collaborative writings have a better sense of audience (Leki, 1993) and are enriched with knowledge (Donato, 1994). Furthermore, the writing process itself, which includes planning, co-creating written work, peer-reviewing and co-editing, can engage learners in becoming more active and responsible (Scardamalia, 2002).

Swain and Lapkin (1998) find that attention to discourse structures as well as grammar and vocabulary usage were the discriminating features of collaboratively written texts. Focusing on the importance of social interaction, Hirvela (1999) notes the opportunities that collaborative writing brings about for students to write as part of a community and to rely on each other for support and guidance. In order to increase collaboration, Ware (2004) suggests flexibility in grading collaborative written works to avoid establishing a sense of competition and to encourage support and guidance.

Using Wikis for Collaborative Writing

Computer Mediated Communication (CMC) provides a social interactive environment appropriate for collaborative learning that encourages students' responsibility toward learning and allows students to exercise control over tasks (Chao & Lo, 2009). The affordances of CMC allow learners to discuss their ideas collaboratively via tools such as forums, email, wikis and conferencing applications. These tools are claimed to "stretch the input and output limits of FL classrooms" (Ortega, 2007, p. 198).

One of the well-known CMC open sources, the wiki (Cunningham, 1998), provides a web space for social interaction and collaboration (Godwin-Jones, 2003). It provides learners with a tool to collaboratively create, transform, and erase their work through the built-in affordances. The wiki tracking system, which discriminates wiki from other CMC tools, allows teachers to follow student-writers' collaborative processes by examining the changes. Flexibility of the wiki promotes the shaping and sharing of knowledge when working collaboratively. Also, the potential of the wiki for increasing collaboration has made it a useful tool for educational purposes. Though wiki technology has a relatively short history, it has already found its place within the language teaching profession.

Many researchers have studied the potentials of wikis in foreign language education (e.g. Kessler, 2009; Kessler & Bikowski, 2010; Oskoz & Elola, 2010). In order to increase the collaborative value of a wiki, Oskoz and Elola (2010) suggest adding synchronous web-based text and audio applications to further increase the level of interaction and accountability of the participants. Kessler (2009) studied student-initiated attention to form in a wiki-based collaborative writing and found that students are successful in using wikis autonomously. In his study however, the final product represented less student-initiated attention to form, indicating that even with many-to-many collaborative writing, grammatical accuracy does not necessarily increase. Nevertheless, when used as a tool for collaborative writing, wikis are useful in the redefinition of authorship from an author-centric perspective to a more collaborative stand (Hunter, 2011).

METHOD

Design

The current study adheres to the mixed-method paradigm, benefitting from both qualitative and quantitative approaches. The quantitative part of the study included a thorough directed content analysis over the final collaborative writing to find the alterations made by student-writers. The reason for using directed content analysis was that the codes extracted from the final product were formed based on Kessler and Bikowski's (2010) study. Although there were slight differences in the coding system, the core elements were nearly alike. Also, for the qualitative part, interviews were carried out which were aimed at studying the role of teacher in autonomous collaborative writing. A semi-structured interview conducted at the end of the semester sought to uncover learners' perception about the role of teacher in an autonomous writing project.

Participants

The current study analyzes the data collected from 18 upper-intermediate Iranian EFL learners enrolled in online synchronous general English courses with a specific focus on writing skill. The participants were female and male adults, with an age range of 18 to 30, who were participating in online English courses offered by E-Zaban virtual language institution from different cities of Iran. All the participants had prior experience of learning English language online for almost two years. The current course was delivered through a Moodle-based course management system with additional features of Adobe Acrobat Connect and synchronous video and voice interaction. Students were required to participate twice a week in live video sessions to receive new lessons and interact with the instructor and classmates. They were also expected to log into the system regularly to access the materials uploaded by the instructor. The participants were experienced in using the course management system for general English language course. However, due to the focus of the course which was writing skill, the wiki was introduced as an educational technology to assist collaborative learning. Finally, the learners were required to participate in a wiki-based collaborative writing to complete a written project. The wiki allowed students to collaboratively build, revise and complete their writing projects within an eight-week long course.

Instrumentation

Wiki

Wikis are websites created by individuals and edited collaboratively by communities of users. What makes wikis an appropriate educational tool is the relative ease with which a group of people can collaborate together to edit the content of the website. Also, the possibility of tracking back modifications through the "history" feature and the availability of the "commenting" feature on all pages makes the wiki an appropriate educational tool to practice collaboration. According to the literature (Chao & Lo, 2011; Peled, Bar-Shalom & Sharon, 2012; Wichmann & Rummel, 2013) there are three potential advantages within Wikis which make them proper tools for educational purposes. Firstly, wikis support multiple users to create and modify articles, texts, or documents. Secondly, the History of a wiki keeps track of all edits, by means of color coding, allowing users to trace all revisions being made. And thirdly, the discussion page enables asynchronous written communication between users by providing explanations and posting comments on various issues related to the wiki. Among the plethora of wiki tools, the current study chose Wikispaces (www.wikispaces.com), which is a free educational wiki service provider. The current wiki was initially created by the instructor, but the writing process, including all stages of writing, were initiated and completed by the learners.

Wiki-based Collaborative Writing

Underpinned by Vygotsky's sociocultural learning theory, collaborative writing highlights the importance of collaboration among participants for optimum benefits from learning. The theory involves the essentials of a collaborative writing project known as language, social interaction, and Zone of Proximal Development (ZPD). ZPD is defined as the "distance between the actual developmental level 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). Hence, the affordances of a wiki allow these three elements to coexist enabling wiki users to reach their potential developmental levels by social interaction during the projects. Thus, interactions between students and teacher are mutually supported to reach the potential of ZPD (Mindel & Verma, 2006).

Apart from the above-mentioned possibilities, the Wiki paves the way for collaborative writing projects by allowing users to edit and revise their contributions to the wiki (Chao & Lo, 2011). Alterations and changes are also made directly to the text being written. Moreover, argumentations and critical reflections accompanying the revisions may arise in the discussion page.

Interview

Interview was the method of data collection for the second research question. A semi-structured interview of the teacher-researcher with the participants in the writing course was conducted in the virtual classroom at the end of the writing course, as well as through Skype for some complementary questions. The questions that revolved around the teacher's role in a collaborative autonomous writing were as follow:

1. Was the teacher's presence helpful in completion of collaborative writing task? (If yes how)
2. Could you complete the task without teacher's intervention?

The second complimentary interview included one question posed as: "In your opinion, which roles of the teacher [facilitator, counsellor, and resource] can help you the most in the completion of an autonomous collaborative writing project?". The interview was done separately for each individual through Skype. The complimentary interview was done through Skype and English was the language of the interview. Throughout the interview, each student had time to think and answer the interview questions, which lasted around 20 minutes. Students' responses were recorded for later transcription and analysis.

The data from semi-structured interview which allowed learners to reflect on the interview questions went through a manual thematic analysis, and the extracted themes and the related excerpts were categorized for the second research question.

Procedure

The wiki, as the core element of writing for the course, was created, developed, and revised during 14 sessions of the writing course. The teacher-researcher (i.e. the first researcher) introduced the concept of the wiki by showing screenshots taken from different sections of a wiki and elaborating on the ways wikis function. Later we created a wiki and introduced it to the learners who were given time to explore and send posts to practice writing in the new medium. The participants in the writing course had 14 sessions to build, edit, and reflect on the collaboratively produced texts. The subject of writing was introduced by the teacher based on prior consultation with the learners and one student voluntarily initiated writing the introductory paragraph. Each student was responsible for developing collaborative writing by adding at least one paragraph to the existing paragraphs and making two revisions. The revisions were done on a weekly basis, though some students contributed to the writing project more than once a week.

Mainly, student-writers were responsible for adding a paragraph each week and editing the text for form- and meaning-related errors. Students were regularly reminded by the teacher to consider coherence and cohesion in the changes they made to the text. The teacher-researcher also cooperated in the writing process by reflecting on errors as well as giving feedback regarding cohesion and coherence of the text in a section entitled *Discuss*. Ultimately, the final text which was around 2700 words was analyzed to find the number and types of alterations made by student-writers. The alterations were then evaluated based on the principles extracted from the collaborative autonomous learning framework presented by Kessler and Bikowski (2010). Those alterations which were not easily categorizes as an autonomous alterations were identified during the analysis stage and after discussing with the student-writer in charge were sent to the right category of autonomous alterations.

The track-back (i.e. page history) affordance of the wiki also provided a detailed map of the alterations that students had made to the wiki. Thus, to keep up with the changes, the teacher-researcher created a weekly report of the number and types of alterations (based on the principles introduced by Kessler & Bikowski (2010) for each learner. These reports went through a detailed manual analysis to find out the types of alterations made by each learner. In case of vague alterations, clarifications were requested from the student-writers which yielded the data for the first research question.

Also, during the coding process, two other researchers were asked to code the alterations for the purpose of cross-checking (Guest et al., 2012). Based on the intercoder agreement results, there was 80% agreement among three coders which indicated an acceptable estimate of reliability.

Moreover, for securing the study from validity threats, multiple validity strategies (Cresswell, 2014) were applied to the process of data collection and final analysis. As the first step, sources of possible bias were determined during the interview stage. Consequently, the teacher researcher elaborated on them prior to the interview and informed the learners of the value of responses for the purpose of research.

Moreover, after the collection of research data through content analysis and interview, an external auditor was required to provide an objective assessment of the project. Based on the judgment of the external auditor, the process of data collection and transcription was in line with the purpose of research which confirmed the validity of the study.

RESULTS

The first research question of the study sought to investigate the patterns of Iranian EFL learners' autonomy in a collaborative attempt to accomplish a wiki-based writing project. In estimating the amount of autonomous behavior based on Kessler and Bikowski's (2010) principles, student-made changes to the wiki were tracked and the alterations that were considered autonomous were counted. Kessler and Bikowski maintain that autonomous learners manifest an ability to use language to independently contribute personal meanings as a collaborative member of a group, and show tendency to use appropriate strategies for communicating interdependently in the social structure of their groups. Therefore, autonomous alterations were considered to be those that were done independently by the student-writers and were meaningful (i.e. made sense when applied to the previous text); showed interaction with teacher, peer, computer or material; and led toward the learning objectives. Overall, student-writers manifested a considerable amount of autonomy

based on this criterion. Table 1 shows the total number of alterations made by student-writers, and Table 2 demonstrates the number and type of autonomous alterations.

Table 1. The number of alterations made by students

Number of alterations	Number of students
4 or more	7
2 or 3	9
1	1

As Table 1 shows, seven students contributed to the development of the text more than four times, among which, one student had the highest number of alterations to the wiki (i.e. seven alterations) and another did not participate in the writing project at all.

An analysis of the final product represented various kinds of changes. These changes included adding new information (from a single sentence to a paragraph); deleting existing information; correction of information (correction due to wrong structure or meaning); clarification; synthesis; reflection; and cosmetic change. Adding new information and deleting the unrelated parts helped the group to create the foundations of the text whereas, clarification and synthesis were aimed at enhancing the quality of the text and adding artistic effects to the writing. Student comments on some parts of the text were also used for the purpose of elaboration. Alterations known as cosmetic change occurred when a student made a change to the appearance of the wiki. Changes in the style, background, and font color were considered cosmetic and as they did not contribute to the meaning or structure of the text, they were omitted from the list of autonomous alterations. Finally, in the case of alterations which could not be easily understood or classified, elaborations were requested from the student-writer responsible for the change. Table 2 presents the types and numbers of autonomous alterations.

Table 2. The number of autonomous alterations

Type of autonomous alterations	Number of alterations
Adding new information	22
Deleting existing information	10
Correction of information	9
Clarification	6
Synthesis	2
Reflection	9

As clarified earlier, based on Kessler and Bikowski's study (2010), only the alterations which manifested interaction with text, peer, technology, and teacher within the social structure of a group were considered autonomous. Furthermore, autonomous alterations resulted in the improvement of the text in general rather than merely fulfilling the course requirement. Thus, for instance, two of the deletion instances did not meet autonomous alteration criteria and were not considered as manifesting autonomous behavior. An example of a collaborative autonomous deletion can be found in the following excerpt from the wiki:

> *Technology brings with itself to us freedom to choose among many ways to present our research findings to the interested audience. (P. Maleki, February, 2016)*

The underlined words were deleted by one of the learners. It is apparent that the deleted part was a redundant part of the sentence, omitted for the sake of clarity. On the other hand, there were some instances of deletion that did not seem to be collaborative as they did not show interaction with peers and the final goal. These alterations appeared to violate the interdependence maxim of autonomous alterations as they did not contribute to the improvement of the text in constructive ways. The following excerpt from the wiki shows how a deletion was considered a non-autonomous act.

Before bringing technology to elementary schools, teachers should be trained about using those technologies for educational purposes. One problem that arises when this principle is violated is budget problem. Budget problem refers to spending the money which is for the school to the facilities that are not going to be useful at that school. (M. Assari, January 2016)

Though the underlined part of the collaborative essay was deleted, there was no attempt at revising the text after deletion or clarifying the reason for the deletion. When the student-writer was asked for the reason, reducing the length of the paragraph was the reason for deleting the underlined part. The analysis of the essay, however, proved that the length of the paragraph was acceptable and the deletion had resulted in the violation of the maxim of interaction. Moreover, the writer of the paragraph was annoyed by the deletion and commented: "Why did you wrongly delete my paragraph?" (N. Aazadeh, February, 2016)

The second research question sought to uncover the students' perceptions about the effectiveness of teacher intervention in a collaborative autonomous online environment. At the initial stages of collaborative writing, the teacher's intervention in the form of comments was more frequent to help learners with technical and content knowledge. As the project processed, the teachers' comments were less frequent and mainly addressed the students' questions and problems. Eighteen students responded to the interview questions about the role of the teacher in an autonomous collaborative writing project. A considerable number of the students (i.e. fourteen out of eighteen learners) found teacher intervention necessary for increasing learners' motivation and the correction of language-related errors.

Feeling that the teacher was reading our text very quickly, made me write better paragraphs every day. She always encouraged us with kind words. (B. Javidmajd, February, 2016)

If the teacher was not there we couldn't continue, as she forced us and also helped us with motivating words. She mentioned the right points, that none of us thought could be mistakes. (M. Taher, January, 2016)

If the teacher didn't log in, we couldn't complete it like our weblogs. We students always need a power. And also our teacher is very careful with mistakes, she controls them very well. (M. Assari, February, 2016)

The results of the interview revealed that the learners needed the teacher as a source of motivation (and even force!) for completing the project. Teacher intervention was also generally considered helpful and motivating. Yet, there were some students who appeared to rely on their peers rather than the teacher.

My classmates were very helpful in teaching me to correct my mistakes, we could progress without teacher even; we were dependent on each other more than teacher. (N. Aazadeh, March, 2016)

Teacher is very good in the class but neutral in wiki writing. Sometimes her comments were good but not very important. (G. Fatemi, March, 2016)

During the second interview that aimed at studying the teacher's role in more depth, the question posed was: In your opinion, which roles of the teacher [facilitator, counsellor, and resource] can help you the most in the completion of an autonomous collaborative writing project such as a wiki writing? Elaborate. (It is worth noting that the above roles were first explained to the participants.)

Eight out of eleven learners who took part in the interview found the role of the teacher as a resource to be the most prominent. As it is clear in the quotations below, learners stated that it is possible to move forward without a counsellor to some extent, but there is always a need for a knowledge provider for accurate and reliable learning material. Moreover, three students highlighted the role of teacher as a facilitator or provider of motivation throughout their learning paths. The teacher as facilitator also had a strong presence at the beginning of the project to make students acquainted to the new writing environment.

It is possible to learn more about wiki from my classmates, but the comments that the teacher provides for the mistakes are all new. (M. Assari, May, 2016)

The most important comments are writing comments…the teacher was a knowledge provider. (A. Aali, May, 2016)

She motivated us, but giving knowledge is more important than motivation. It is about three years that we are learning English online, me and some of my classmates…, sometimes some tools are new, but finally we discover how to work with them. But we always need our teacher to help us with the right points. (N. Aazadeh, May, 2016)

Overall, the interviews revealed that learners preferred the teacher to be a source of knowledge and motivation and believed that teachers' monitoring motivated them to move forward. Furthermore, teacher knowledge was considered a reliable source and the learners wanted their teacher for accurate error feedback.

DISCUSSION AND CONCLUSION

The first research question studied the patterns of Iranian EFL learners' autonomy in a collaborative attempt to accomplish a wiki-based writing project. Based on the number of autonomous alterations, the results suggest that students manifested autonomy in the writing process. Autonomous alterations in the current study included adding new information; deleting existing information; correction of information; clarification; synthesis; and reflection. However, meaning related changes (MRCs) manifested a slight difference compared to Kessler and Bikowski's (2010) study that included MRCs such as: adding new information; deleting information; clarification/elaboration of information; synthesis of information and addition of URL links. An outstanding feature of the current study was the frequent occurrence of peer correction with regard to content and form as a dominant form of collaboration. Furthermore, learners in the current study did not rely on hyperlinks as a link to the source of information. Instead they provided related information to their peers through comments. In the same vein, researchers (e.g., Donato, 1988; Storch, 2002; Swain & Lapkin, 1998) have shown that throughout the process of co-authoring a text, lexical aspects as well as discourse is improved along with grammatical accuracy.

A detailed analysis of the alterations to the text, which started from writing the first paragraph and ended with a complete essay with 2700 words, revealed that all the alterations were aimed at a shared final goal which was creating a coherent and united essay. Learners' collaboration and the interaction between the learners; teacher; peers; computer; material; and the learning goal resulted in a final product which as a process encouraged learners' autonomous collaborative contribution.

The findings were also supported by the principles of constructivism. Schwienhorst (2012) believes that for a second language learning to be productive, it should follow a Vygotskyan approach encouraging interaction and collaboration (Parker & Chao, 2007). Although, wikis are not known to be inherently collaborative (Judd, Kennedy& Cropper, 2010) the features they possess can facilitate knowledge building among peers within a community rather than individually. Wikis facilitate interaction and collaboration with peers and teachers which leads to shaping meaning and constructing knowledge constructed (Higgs & McCarthy, 2005). In the current study, the number of autonomous alterations to the wiki demonstrates that wikis promote autonomous collaboration in a writing task through providing the student-writers with the opportunity to complete a shared writing project. The number of interactions between peers and teacher in the form of reflections and commenting could be considered as an instance of scaffolding to reach a shared goal. Although there were some coherence and cohesion-related problems with the final text, writing in a wiki was a successful experience due to the collaboration of many writers and the length of text and experiencing interdependence in reaching a shared goal collaboratively. In fact, preparation to reach a common goal help student to coordinate their efforts systematically (Wichmann & Rummel, 2013).

In addition, wikis were found helpful in encouraging learners to write for a global audience and communicate with peers through the collaborative writing process. Learners' communications with peers in the form of comments and reflections added to the precision of the final product. Moreover, student-writers showed solidarity with peers through commenting and subsequent revising, which suggest a positive role of wikis in fostering collaborative learner autonomy in writing. In fact, the premise that wikis are built for collaboration and that they encourage interdependence, makes them appropriate for collaborative autonomous projects.

However, the mere presence of wikis does not guarantee the success of a collaborative project aiming at encouraging learner autonomy. Indeed, as Grant (2009) indicates, to consider technology a solution for collaboration is in fact underestimating the nature of collaboration. Collaboration and autonomy are more of a cultural issue rather than mere technological, however, technologies such as wikis have the potential to assist the process of collaboration. For a collaborative project to be successful in encouraging learner autonomy, there should exist interaction between one's independent work; the computer; material; peers; teacher, and the learning objectives (Kessler & Bikowski, 2010). Thus, extending wiki for a collaborative writing project necessitates a constant supervision to stimulate peers' contribution and observe content and technical issues. Therefore, for a deeper study of the nature of interaction between learner or teacher or what was called teacher intervention in this study, we investigated the most beneficial teacher role from the students' point of view.

The second research question sought to uncover the students' perceptions about the effectiveness of teacher intervention on learners' autonomous behaviors in a collaborative online environment. A considerable number of learners (i.e. fourteen out of eighteen) found teacher intervention as helpful and a source of motivation in an online collaborative writing project. Learners preferred the teacher to monitor their progress, even in a student-initiated task. This preference may be in part due to the fact that Iranian learners are more accustomed to a teacher-centered educational system. In any case, however, the results of the current study indicated a need for teacher intervention among student-writers in an online autonomous collaborative writing project. The findings are contrary to the common beliefs about the limited need of autonomous learners for teacher. The need may have been strengthened by the fact that the learners were experiencing learning in a technology-rich environment, replete with new challenges. Additionally, the experience of writing for many readers was a challenge, which possibly made them rely more on teacher corrections and comments.

According to the results taken from the interviews, learners preferred the teacher to take on the roles of motivator and knowledge provider simultaneously; yet they were not fully dependent on their teacher through the course of writing. Autonomous learners need psycho-social support from the teacher, which includes support for motivating learners and raising their awareness of the learning process (Voller, 1997). This means that they need to practice interdependence rather than full independence in learning. Teachers should also balance control and freedom in terms of responsibility and autonomy in their teaching. In other words, interdependence exists not only among peers in autonomous collaborative writing, but also the students and the teacher are committed to the completion of the project interdependently. In the same vein, Kessler (2009) believes that a "limited amount of teacher intervention, or some external incentive, would encourage more attention to issues of accuracy" (p. 90) or more generally a successful collaborative writing.

It is worth mentioning that the concept of interdependence which involves "cooperating with others and solving conflicts in a constructive way" (Kohonen, 1992, p.19) relies to a great extent on technology in modern educational settings. Including technology in teaching brings about motivation to autonomous learners. Although, some learners find the experience frustrating due to the complexities of using technology. Moreover, current technologies provide a wide access to tools and applications for the writing skill. As an instance, wikis are known to increase computer-supported collaborative learning (Augar, Raitman & Zhou, 2004) through peer interaction and group work. Such a power in wikis facilitates sharing among a community of learners (Parker & Chao, 2007) in comparison to a face-to-face learning environment which often confines collaborative writing to pair work (Kessler, Bikoeski & Boggs, 2012).

Limitations

The most obvious limitation to the current study is the issue of external validity. As the results were collected from a small convenience sample, they may only represent small groups. Future studies can work with larger population and various age ranges to confirm the issue and until then, the results should be taken with caution.

Online collaborative tools make it possible for students to practice autonomy in flexible learning environments, through interdependence which entails cooperating with others toward solving conflicts in a constructive way (Kohonen, 1992). Autonomy and interdependence seem to have a reciprocal relationship

and interaction lies at the heart of this relationship. In technology-rich learning environments, optimal interaction between the tool, teacher, peers and materials should take place and lead toward final objectives. The vastness and novelty of educational technologies impose some limitations to the studies done in this field. As an instance, the current study did not investigate the invisible or lurking students and the reason they did not show up regularly in collaborative completion of the text. These students were not motivated to take part in building the text and were passive listeners with a few interactions. More studies should focus on studying levels of autonomy among lurking students and whether they could gain the principles of autonomy by being a passive participant in the online course. Another set of limitations stemmed out of the internet and the nature of online courses. Learners' regular disconnections and other technical problems recurrently resulted in students' missing the discussions parts of instruction. It is suggested that future researchers take the internet problems into consideration and find alternative ways to deal with the problem.

BIODATA and CONTACT ADDRESSES of AUTHORS

Dr. Shirin SADAGHIAN completed her Ph.D. at Alzahra University, Tehran, Iran, focusing on the issue of language learner autonomy in online education. Her field of interest includes Computer-assisted Language Learning, Self-Directed learning, and Language Learner Autonomy. She is currently teaching at Azerbaijan Shahid-Madani University, Tabriz, Iran.

Shirin SADAGHIAN
Address: Alzahra University, Tehran, Iran.
Phone: 00989144006851
Email: Shirin_Sadaghian@yahoo.com

Dr. Susan MARANDI is an associate professor of Teaching English as a Foreign Language (TEFL) and the head of English Language department at Alzahra University, Tehran, Iran. Her current interests are Computer Assisted Language Learning (CALL), Language Assessment, and Localized Practices in Language Teaching. She has published in many scholarly journals and is well-known for pioneering research and projects on online language education in Iran.

Susan MARANDI
Faculty of Literature
Address: Department of Languages, Alzahra University, Tehran, Iran.
Phone: (+98-21) 88041461
Email: susanmarandi@alzahra.ac.ir

REFERENCES

Augar, N., Raitman, R., & Zhou, W. (2004, January). Teaching and learning online with wikis. In Beyond the comfort zone: proceedings of the 21st ASCILITE Conference, Perth, 5-8 December (pp. 95-104). ASCILITE.

Benson, P. (2001). Teaching and researching autonomy in language learning. Harlow, England: Longman.

Benson, P. (2007). Autonomy in language teaching and learning. Language Teaching, 40(01), 21-40. Doi:10.1017/s0261444806003958

Chan, V. (2001). Readiness for learner autonomy: What do our learners tell us? Teaching in Higher Education, 6(4), 505-518. Doi:10.1080/13562510120078045

Chao, Y. C. J., & Lo, H. C. (2011). Students' perceptions of Wiki-based collaborative writing for learners of English as a foreign language. Interactive Learning Environments, 19(4), 395-411. Doi:10.1080/10494820903298662

Chesher, C. (2005). Blogs and the crisis of authorship. Blog Talk Downunder. Available at: http://www.incsub.org/blogtalk.

Creswell, J. W. (2014). A concise introduction to mixed methods research. SAGE publications.

Cunningham, W. (1998). What gets protected in a (S)Wiki [On-line]. Available at: http://pbl.cc.gatech.edu/myswiki/7.

Donato, R. (1994). Collective scaffolding in second language learning. In J. Lantolf & G. Appel (Eds.), Vygotskian approaches to second language research. Cambridge: Cambridge University Press.

Guest, G., MacQueen, K. M., & Namey, E. E. (2012). Introduction to applied thematic analysis. Applied thematic analysis, 3, 20.

Grant, L. (2009). 'I don't' care do our own page!' A case study of using wikis for collaborative work in a UK secondary school. Learning, Media, and Technology, 34(2), 105–117.

Godwin-Jones, R. (2003). Emerging technologies. Language Learning & Technology, 7(2), 12-16.

Healey, D. (2007). Theory and research: Autonomy and language learning. In J. Egbert & E. Hanson-Smith (Eds.), CALL environments: Research, practice and critical issues (pp. 377–389). Alexandria, VA: TESOL.

Higgs, B., & McCarthy, M. (2005). Active learning—from lecture theatre to field-work. Emerging issues in the practice of university learning and teaching, 37-44

Hirvela, A. (1999). Collaborative writing instruction and communities of readers and writers. TESOL Journal, 8(2), 7-12.

Holec, H. (1985) On autonomy: some elementary concepts. In R. Philip (Ed.), Discourse and Learning (pp. 173–190). Longman.

Hunter, R. (2011). Erasing "property lines": A collaborative notion of authorship and textual ownership on a fan wiki. Computers and Composition: An International Journal for Teachers of Writing, 28(1), 40–56. Doi: 10.1016/j.compcom.2010.12.004

Judd, T., Kennedy, G., & Cropper, S. (2010). Using wikis for collaborative learning: Assessing collaboration through contribution. Australasian Journal of Educational Technology, 26(3), 341–354.

Kessler, G. (2009). Student-initiated attention to form in wiki-based collaborative writing. Language Learning & Technology, 13(1), 79-95.

Kessler, G., & Bikowski, D. (2010). Developing collaborative autonomous learning abilities in computer mediated language learning: Attention to meaning among students in wiki space. Computer Assisted Language Learning, 23(1), 41-58. Doi:10.1080/09588220903467335

Kessler, G., Bikowski, D., & Boggs, J. (2012). Collaborative writing among second language learners in academic web-based projects. Language Learning & Technology, 16(1), 91-109.

Kohonen, V. (1992). Experiential language learning: Second language learning as cooperative learner education. In D. Nunan (Ed.), Collaborative language learning and teaching (pp. 14–39). Cambridge: Cambridge University Press.

Leki, I. (1993). Reciprocal themes in reading and writing. In J. Carson, & I. Leki (Eds.), Reading in the composition classroom: second language perspectives (pp. 9–33). Boston: Heinle & Heinle.

Levy, M., & Hubbard, P. (2005). Why call call "CALL"? Computer Assisted Language Learning, 18(3), 143-149. Doi:10.1080/09588220500208884

Levy, M. (1997). Computer-Assisted Language Learning. Oxford University Press, New York.

Little, D. (1995). Learning as dialogue: The dependence of learner autonomy on teacher autonomy. System, 23(2), 175-181. Doi:10.1016/0346-251x(95)00006-6

Little, D. (1996). Freedom to learn and compulsion to interact: Promoting learner autonomy through the use of information systems and information technologies. In R. Pemberton, E. S. L. Li, W. W. F. Or, & H. D. Pierson (Eds.), Taking control: Autonomy in language learning (pp. 203-218). Hong Kong: Hong Kong University Press.

Littlewood, W. (1996). "Autonomy": An anatomy and a framework. System, 24(4), 427-435. Doi:10.1016/s0346-251x(96)00039-5

Luke, C. L. (2006). Fostering learner autonomy in a technology-enhanced, inquiry-based foreign language classroom. Foreign Language Annals, 39 (1), 71-86. Doi:10.1111/j.1944-9720.2006.tb02250.x

Mindel, J. L., & Verma, S. (2006). Wikis for teaching and learning. Communications of the Association for Information Systems, 18(1), 2–38.

Ortega, L. (2007). Meaningful L2 practice in foreign language classrooms: A cognitive-interactionist SLA perspective. In R. M. DeKeyser (Ed.), Practice in second language: Perspectives from Applied Linguistics and Cognitive Psychology (pp. 180-207). NewYork, NY: Cambridge University Press.

Oskoz, A., & Elola, I. (2010). Meeting at the wiki: The new arena for collaborative writing in foreign language courses. In M. Lee & C. McLaughlin (Eds.), Web 2.0-based E-learning: Applying social informatics for tertiary teaching (pp. 209-227). Hershey, PA: IGI Global.

Parker, K. R., & Chao, J. T. (2007). Wiki as a teaching tool. Interdisciplinary Journal of Knowledge and Learning Objects, 3, 57–72.

Peled, Y., Bar-Shalom, O., & Sharon, R. (2012). Characterisation of pre-service teachers' attitude to feedback in a wiki-environment framework. Interactive Learning Environments. http://dx.doi.org/10.1080/10494820.2012.731002.

Reinders, H. & Hubbard, P. (2012). 'CALL and autonomy. Affordances and constraints'. In: Thomas, M., Reinders, H., & Warschauer, M. (Eds.), Contemporary CALL. New York: Continuum.

Scardamalia, M. (2002). Collective cognitive responsibility for the advancement of knowledge. In B. Jones (Ed.), Liberal education in a knowledge society (pp. 67–98). Chicago: Open Court.

Schwienhorst, K. (2003). Learner autonomy and tandem learning: Putting principles into practice in synchronous and asynchronous telecommunications environments. Computer Assisted Language Learning, 16(5), 427-443. Doi:10.1076/call.16.5.427.29484

Schwienhorst, K. (2008). Learner autonomy and virtual environments in CALL. Routledge studies in computer assisted language learning. London: Routledge.

Schwienhorst, K. (2012). Learner autonomy and CALL environments. Routledge.

Sotillo, S. M. (2000). Discourse functions and syntactic complexity in synchronous and asynchronous communication. Language Learning & Technology, 4(1), 82-119.

Storch, N. (2002). Patterns of interaction in ESL pair work. Language Learning, 52(1), 119–158. Doi: https:10.1111/1467-9922.00179

Swain, M., & Lapkin, S. (1998). Interaction and second language learning: Two adolescent French immersion students working together. The Modern Language Journal, 82(3), 320-337. Doi:10.1111/j.1540-4781.1998.tb01209.x

Voller, P. (1997). Does the teacher have a role in autonomous learning? In P. Benson & P. Voller (Eds.), Autonomy and Independence in Language Learning (pp. 98-113). Longman.

Vygotsky, L. (1978). Interaction between learning and development. Readings on the Development of Children, 23(3), 34-41.

Vygotsky, L. S. (1978). Mind and society: The development of higher mental processes. Cambridge: MA, Harvard University Press.

Ware, P.D. (2004). Confidence and competition online: ESL student perspectives on web-based discussions in the classroom. Computers and Composition, 21(4), 451–468. Doi: 10.1016/j.compcom.2004.08.004

Warschauer, M., Turbee, L., & Roberts, B. (1996). Computer learning networks and student empowerment. System, 24(1), 1-14. Doi:10.1016/0346-251x(95)00049-p

Wichmann, A., & Rummel, N. (2013). Improving revision in wiki-based writing: Coordination pays off. Computers & Education, 62, 262–270.

EXAMINATION OF SAMPLE COURSE DESIGN STUDIES PERFORMED BY PRE-SERVICE SOCIAL STUDIES TEACHERS BY USING DIGITAL TECHNOLOGIES

Dr. Turkan CELIK
ORCID: 0000-0001-8380-9419
Faculty of Education
Kilis 7 Aralik University
Kilis, TURKEY

Received: 30/12/2019 **Accepted:** 30/06/2020

ABSTRACT

The aim of this study is to examine the sample course design studies performed by pre-service social studies teachers by using digital technologies and to describe the opinions of pre-service teachers about this process. Design-based Research Model was used in the study. The study was conducted with 30 pre-service social studies teachers with criterion sampling technique. Data collection tools consisted of design documents, video recordings and interview forms. Descriptive analysis method was used for data analysis. Technological Pedagogical and Content Knowledge model was applied in the instructional process of the research. At the end of the 8-week instructional process, designs of pre-service teachers and their opinions about the process were obtained. In the research findings, course designs where pre-service teachers integrated their content knowledge and pedagogical knowledge with digital technologies, were acquired. Addition, all of the views of pre-service teachers on the process were found to be positive. In the context of these findings, it is concluded that technological pedagogical and content knowledge studies can be given with pre-service trainings. In this context, it is recommended to focus on pre-service training activities in future studies to be conducted and for any new researches, it is suggested to make longitudinal studies in order to monitor the effectiveness of this design model in real classroom environments.

Keywords: Design-based research, technology integration, social studies, pre-service teachers, digital education.

INTRODUCTION

The competency of teachers is important in the permanence of teaching and in designing an enriched learning environment. Because in addition to a teacher's content knowledge, the competencies explained by Shulman (1986) within the framework of pedagogical content knowledge are also important. According to the theory, teachers should have a deep content knowledge as well as pedagogical knowledge so that they can effectively teach their students. Because the ability to integrate the new technologies with content knowledge within the framework of pedagogical knowledge has become one of the most sought-after characteristics of teachers in this century. Because the 21st century teacher is expected to blend the content, pedagogical and technological knowledge correctly and share it with the students in the education process. "*Pedagogical content knowledge*", one of the three types of knowledge to be used in the integration process, is emphasized by the British pedagogue Shulman (1986). In the process of sharing knowledge with students, metaphors, reenactments, examples, explanations, concept explanations, presentations, and teaching methods used to formulate information and optimize it for the target audience to understand and pedagogical content knowledge with its techniques are effective in determining the expertise of teachers in their profession (Usak, 2005; Park & Oliver, 2008). In one aspect, the quality of teaching activities is closely related to teachers' level of teaching competencies within the context of pedagogical content knowledge (Moore, 2000). Another factor that determines the quality of learning environments is teachers' mastery of "*content knowledge*". It is important how much the teachers can achieve the specific objectives of the course they are responsible for. This situation increases the importance of the teacher's content knowledge. It is important that pre-service social studies teachers, who are the focus of this study, have at least undergraduate level expertise about the social science disciplines that constitute the subjects under the umbrella of the learning fields such as "Individual and Society," "Culture and Heritage," "People,

Places and Environments," "Science, Technology and Society," "Production, Distribution and Consumption," "Effective Citizenship" and "Global Connections" in the social studies curriculum (MoNE, 2018). Within the framework of their pedagogical skills, during an efficient education process, social studies teachers must teach about the important advantages of the 21st century such as "*life and career skills," "learning and innovation skills" and "knowledge, media and technology skills"*. Among these skills, in the context of digital literacy, which is under the category of "information, media and technology skills," there are the fields of information, media, information and communication technologies. Information literacy skills make it possible to gain effective and accurate access to information, to evaluate the information accessed and to use this information correctly. Media literacy is closely related to individuals' ability to correctly analyze Web 2. 0 and social media tools and to use them effectively in learning processes. On the other hand, "information and communication technologies literacy skills" express the ability to integrate technological tools such as computers, tablets, mobile phones into learning processes (Goksun & Kurt, 2018). In this context, a person who is digitally literate is expected to have the knowledge and skills related to ethical and legal processes in the process of using information in a creative way, selecting useful information from different sources, accessing and using information in the solution of problems (Partnership for 21st Century Learning, 2015; Trilling & Fadel, 2009). Therefore, digital technologies have an important function in this process, and teachers can use these tools in light of their "*technological knowledge"*. Projectors and smart boards in classrooms and the internet available to be used in the educational context provide teachers with a digital door as they conduct the teaching process. Therefore, universities should improve their technological infrastructures in terms of mechanical and qualified academic staff and higher education institutions that train teachers should provide education to students in this direction (Kurt, 2013). Because technology has the role of creating more tools for the use of teachers and students, while the role of those responsible for teacher training is to train teachers who use technological tools correctly and appropriately (Koehler & Mishra, 2005). Because the fact that educational environments are enriched with the use of technology cannot be denied (Melia, et al., 2012; Mishra & Koehler, 2006). It is commonly known that technological tools have been around educational environments for a long time. Whereas, in the past, tools such as chalkboards, chalk, books, magazines, etc. existed in educational environments, with recent developments, internet and Web 2.0 technologies have been added to projectors, PowerPoint presentations, smart boards of today's classrooms. As a result of these developments, teachers can use applications such as Facebook, Blog, Wiki (Chou, 2011) as well as some digital applications built on Web 2.0 technologies. Some digital applications that today's teachers can easily adapt to many lessons (Benzer, 2017; Gununc, 2017; Esgi & Kocadag Unver, 2018; Kazanci & Donmez, 2013; Goksun & Kurt, 2018; Onal, 2018; Sahin, 2013; Tatli, 2017) are presented in categories in Table 1 with the help of related literature.

Table 1. *Digital applications that can be integrated with the courses in teacher education and MoNE*

CATEGORIES	WEB 2. 0 APPLICATIONS
Mind Map Applications	Wisemapping, Pooppet, SpiderScribe, Mindmeister, MindMaple Lite, Inspiration 9, Gocongr,Coggle,Mindomo
Dashboard Applications	Padlet, Blendspase, Lino it, Wordle, Bubble, RealtimeBord
Poster and Cartoon Creation Applications	Word Art, Canva, Make Beliefs Comix, Toondoo, Sketch toy, Face Your Manga
Story and Book Writing Applications	Pixton, Storyjumper, Storybord That, Storybird, Wattpad, Joomag.
Note Taking and Blogging Applications	Evernote, Trello, Blogger, Tlumblr, Glogster
Test and Puzzle Building Applications	Flippquiz, Puzzlemaker, Kahoot, Plickers, Quiziz, Socrative, mentimeter, LearningApss CrossWordLabs, Triventy.
Presentation and Animation Applications	Prezi, Powtoon, Buncee, Emaze, Vyond,Voki, Mine-Imator, Scracth.
Information Poster and Infographic Preparation Applications	Easelly, Visme, Piktochart, Venngage, Creately
Distance Education and Virtual Classroom Applications	Edmodo, Moodle, Classdojo, Remind, Beyaz Pano, Google Clasroom, Adobe Connect, Bigblubutton,EBA.
Virtual and Augmented Reality Applications	Aurasma, Quiver, Morfo, Augmented Reality (AR), Nearpod, Uzay 4 D, Animal 4D
Photography, Film and Video Editing and Design Applications	Thinglink, GIMPS, Mowi maker, Photostory, Safeshare, OpenShot, Filmora, Nimbb, Jing, SmartDraw, Vocaro, Davinci 15 Beta, AppInventor
Social Media Applications	Blog, Wiki, Youtube, Skype, Houngout, Whatsapp, Facebook, Instagram, WebQuest.

In new learning perspectives, educational environments have now shifted from a teacher-centered approach to a student-centered one. Web 2.0 applications, which are important tools of information and communication technologies in new instructional environments designed in line with constructivist approach, support the active and participatory role of the student in learning processes as well as the constructivist approach. Therefore, the use of Web 2.0 tools in educational processes is consistent with educators such as Vygotsky, Jean Piaget and Jerome Bruner, as well as educational theories such as problem-based learning, correlative learning, distributed cognition, cognitive flexibility theory, cognitive apprenticeship, situated learning, self-regulated learning (Gunduz, 2007).

Social Studies Curriculum and Digital Technologies

One of the most remarkable of the subjects that make up the eight titles of the Turkish Qualifications Framework (TQF) in the curricula is "*digital competence*". The competencies in the digital field, which should be emphasized in particular, are related to media, internet and social networks which have become integral parts of the individual in social life. Through the training given in the context of the program, it is observed that the basic skills such as access to information, the use of computers for the evaluation, storage, production, presentation and exchange of information, participation in common networks via the internet and communication are expected to be integrated with digital competence skills. This is supported by the specific objectives of the social studies curricula (MoNE, 2018). 27 skills that are aimed to be taught within the scope of Social Studies Course "*perception of change and continuity,*" "*digital literacy*" and "*media literacy*" again emphasize the importance of this issue. The description of one of the learning areas that constitute the backbone of the program, "*science, technology and society,*" emphasizes the importance of helping students gain an innovative and critical thinking perspective in social studies courses for the development of science and technology. In addition, students are expected to gain the ability to use technology consciously by seeing examples of the effects of science and technology on social life in this learning area. Therefore, it is important that teachers enrich their courses with activities that will feed digital competence in social studies teaching process. Additionally, organizing technology-assisted learning environments in indicates that the 21st century teacher has become technologically competent and productive (Goksun & Kurt, 2018). However, the literature shows that there are some problems that prevent the use of technology in the education process. It is indicated that there are external factors such as equipment, time and technical support, as well as internal factors such as belief, attitude, self-confidence, which prevent technology from inducing change in educational environments by being integrated into traditional learning as a single discipline (Ertmer, 2005, Mazman & Kocak-Usluel, 2011). This requires a profound reform of the initial teacher training process, and according to the United States Office of Technology Assessment (1995), the most immediate and effective solution to this problem is through pre-service teacher training (Hur et al., 2010). However, the quality of education provided in faculties of education may not always be the same. Because studies (Russell et al., 2003; Doering et al., 2003; Hew & Brush, 2007; Karuki & Duran, 2004; Pope et al., 2002) show that due to technology being taught as a single discipline rather than being integrated to courses, the Technological Pedagogical Content Knowledge (TPACK) skills of pre-service teachers do not fully develop. Moreover, in the study findings of Karuki and Duran (2004), it was stated that many faculties of education in the U.S. mostly focused on developing technological knowledge of pre-service teachers rather than integrating technology use into courses. Similarly, another study conducted abroad, (Russell et al., 2003) showed that a large number of new teachers used technology only in preparing syllabi instead of integrating technology into their fields and felt uncomfortable using classroom technology. Therefore, it is seen that pre-service teachers have difficulty in using technological knowledge in the teaching process due to the fact that technology is taught to them as a separate discipline without being integrated with field knowledge and pedagogical knowledge during pre-service teacher training (Doering et al., 2003; Hew & Brush, 2007; Pope et al., 2002). In some studies, pre-service teachers were observed to have problems not only in terms of integrating technology into their fields but also in using it. It is noted that these problems have various sources. For example, in some studies, it was concluded that pre-service teachers did not feel competent enough to use technology (Pamuk et al., 2012), and in others (Graham et al., 2009; Meric, 2014) it was concluded that pre-service teachers it was due to a lack of self-confidence and also related to their self-efficacy perceptions (Abbitt & Klett, 2007; Gomleksiz & Fidan, 2011). There are also studies

emphasizing that increasing the self-confidence of pre-service teachers in this context, depends on their getting technologically supported trainings (Brown & Warschauer, 2006; Lee et al., 2008). In addition to the studies conducted with pre-service teachers, in another study (Collis & Moonen 2008) where people working as teachers were the subject, it was stated that teachers were reluctant to use technology because they did not have sufficient equipment to integrate technology with their fields. Therefore, no movements of innovation in the field of education will be successful unless they are well understood and internalized by teachers (Baki, 2002). Therefore, in order to solve the problem in question, it becomes clear that it is necessary to teach how technology should be integrated with the courses in education faculties first.

Significance of the Research

Digital learning materials have an important role not only to enrich educational environments but also enable students from all around the world to reach the information from their home. Especially, along with the spread of recent COVID-19 pandemic across the world, the importance of distance education is heavily recognized. Because of the pandemic, many countries had to switch distance education which requires the use of digital learning materials and skills to use these materials. However, as seen in the literature of this research, it was found that teachers and pre-service teachers had problems in the process of integrating technology and their pedagogical knowledge. Researches have shown that the reason for these problems arise from the fact that technology is taught to pre-service teachers as a separate discipline. In this context, the healthy integration of digital technologies in the teaching process depends on informing and empowering today's teachers. However, this cannot be a solution on its own. One of the parts of a permanent solution requires delving into the source of the problem, meaning the process of teacher training. In this respect, it is necessary to increase the quality of teaching in terms of the practical use of digital technologies in the faculties of education. In this regard, the "*Digital Transformation in Higher Education*" project created by Anadolu University and Council of Higher Education of Turkey (YOK) is currently being implemented in certain universities and these ongoing projects need to be supported by other universities as well. In this respect, it is important that pre-service teachers become more competent by having their related courses integrated with digital technologies during their education processes. The significance of integrating technology to the educational environment is also reflected by Ministry of National Education's (MEB) Vision 2023 plan and 21st century learning skills (Bozkurt, 2019).

Therefore, this study, which aims to design and implement a course integrated with digital technologies with pre-service teachers, will contribute both to the 21st century's educational needs and the field.

Purpose

The purpose of this study is to examine the sample course design studies conducted by pre-service social studies teachers using digital technologies and to describe their opinions about this process. The research questions created in this context are as follows:

1. How did pre-service social studies teachers design a course in the process of designing a sample course with digital technologies?
2. What is the distribution of the content prepared by pre-service teachers in the process of designing a sample course with digital technologies in terms of grade, learning area, digital application and activities/techniques used?
3. Which digital applications have pre-service social studies teachers used in the process of designing a sample course with digital technologies?
4. What are the opinions of pre-service social studies teachers about the process of designing a sample course with digital technologies?

METHOD

Research Model

Design-based Research Model was used in this study. Design-based research is a method that emerged from the need of formative research regarding theoretical education designs (Cobb et al., 2003; Collins et al., 2004) and the need to take the interaction of design, theory, and application trio to the next level. Design-based research was first put forward by Brown (1992) and Collins (1992) with the name of design experiments. Design experiments are known as a research method which includes scientific processes such as discovery, disclosure, verification and dissemination and active participation of the researcher in instruction-learning activities (Kelly, 2003). In design-based research, the researcher conducts the research with the participants and is an important part of the research process (Cobb et al., 2003). The researcher systematically designs and implements interventions, reviews and develops the initial design according to the results of the application and reapplies it. The researcher continues this process cyclically until he/she thinks that the application made from a pragmatist perspective is sufficiently developed. In this respect, it is possible to design and develop products in three different types with the design-based research method (Design-Based Research Collective, 2003). These types are; developing innovative learning environments, developing new classroom practices and developing new learning theories. In addition, it is possible to develop an innovation, product or theory at the end of the design-based research process. Levin and O'Donnell (1999) state that the fact that most of the research methods commonly used in educational research fall short of producing convincing experimental evidence causes loss of trust in educational research. In this context, design-based research method is seen as a positive effort in eliminating this loss of trust in educational research (Levin & O'Donnell, 1999). However, the application steps of design-based research are not as clear as quantitative research. Depending on the context, the research processes can vary greatly. However, the general path to follow is; first, the designer develops and implements the initial version of his/her design. Then, he/she looks at how the design works in practice. As a result of the experience gained from the implementation, the designer regularly reviews the design and makes corrections. The design becomes solid, error-free and productive over time. Finally, the research report is written. A design-based research is made up of holistic systems and change in one part can affect the whole and other parts of the whole (Brown & Campione, 1996). Therefore, the evaluation of designs is a continuous process and as the design changes, the evaluation process changes along with it. Design-based research, which requires a dynamic process to achieve a positive goal, is similar to action research in this respect. However, while the aim of action research is to solve a problem, in design-based research, this aim turns into designing and implementing a product.

Study Group

Participants of the study were selected by using criterion sampling technique from among the purposive sampling methods. 30 pre-service social studies teachers, who were taking the "Special Teaching Methods I" course in the spring term of the 2018-2019 academic year, were selected for the study based on purposive sampling methods. Criteria for selection of participants were; to be in a group where a course is designed with digital technologies in the context of pedagogical and content knowledge, to have taken courses such as Teaching Principles and Methods, Computer or Information Technologies, Instructional Technology and Material Design in addition to courses such as History, Geography, Philosophy, Sociology. In addition, volunteering of all participating pre-service teachers constitutes another criterion of the study.

Design Process

The objective of this study is to design and implement a social studies course integrated with digital technologies. In line with this objective, the researcher provided 4 weeks of theoretical training to the participants. The researcher has an important role in the process of giving trainings. Being an expert in the field of media/social media literacy and having work experience and publications related to the use of digital technologies and Web 2.0 tools in educational processes, helped the researcher identify and manage the tools to be used in the educational process. An 8-week implementation time was set for the presentation of the design studies. The groups of at least 2 and 4 people, which the researcher formed during the theoretical

training, started to work on a sample social studies course project that they would integrate with digital technologies towards the end of the theoretical training. The drafts were implemented in a classroom environment and evaluated in terms of their usefulness. Angeli and Valanides (2009) emphasize the fact that teaching models and applications aiming at gaining the necessary knowledge and skills for technology assisted instruction include real learning environments and in-class applications. However, due to the fact that the participants of this study were 3rd Grade university students, they did not have the opportunity to use the courses they designed in a real classroom environment. Alternatively, they created in their own classrooms an environment similar to a real classroom and applied their courses there. The researcher gave the groups feedback for the resulting course designs each week and motivated them. Since the designs would be evaluated in their entirety, different variables in addition to the products of the groups were considered in the evaluation of group success. Collins et al. (2004) assert that there are points of consideration for evaluating a design, which are cognitive, interpersonal, group/grade, resource, institution or school levels. In the method used in this study, the aforementioned levels were considered as follows:

Cognitive Level

At this level, the course design activities, the processes of teaching the designed course and reflective thoughts about the process of pre-service social studies teachers were determined. At the same time, the groups were videotaped while presenting and then the students tried to reflect on their work by watching the videos.

Interpersonal Level

Pre-service social studies teachers carried out a course design study using digital materials as part of a group. A total of 8 groups carried out studies. Each group shared their work step by step with the instructor and received correctional feedback. During the process, pre-service teachers were encouraged to collaborate both within and between groups. Jigsaw technique was used in the process. As a matter of fact, in the majority of technology based instructional design models, collaborative learning approach is applied in which pre-service teachers work in groups (Lu et all., 2011; So & Kim, 2009). The feedback-corrections given to the groups who made their presentations in the classroom environment were instructive in terms of other groups not repeating the same mistakes.

Group or Grade Level

Pre-service social studies teachers tried to create an environment similar to a real middle school classroom in their courses designed with digital materials. In this process, other pre-service teachers in the classroom supported the groups that presented their studies by playing the role of secondary school students. Each group made sacrifices for its success and there were certain roles assigned within the groups. In addition, the groups who were more successful in designing their products collaborated with the members of other groups and then returned to their own groups.

Resource Level

In this process, digital applications (Kahoot, Triventy, Canva, Powton, etc.) where teacher candidates would prepare digital materials were introduced and the steps to use them were shared with the pre-service teachers. The pre-service teachers were notified that these resources could be used for free or by paying, with or without a set period of use. They were then asked to design their courses while keeping that information in mind.

Institution or School Level

In the faculties of education where the implementations took place, the managers of the institutions supported the process. Especially, the maintenance, repair and internet connection problems of smart boards were tried to be solved. In addition, the instructor was given the responsibility of "Instructional Technologies and Material Design Exhibition" at the end of the year due to the use of an innovative educational model in

the faculty, thus providing both motivation and moral support. In short, the characteristics of the teaching model applied in this research can be summarized in four main steps. These steps, which form a cyclic whole, are presented in Figure 1.

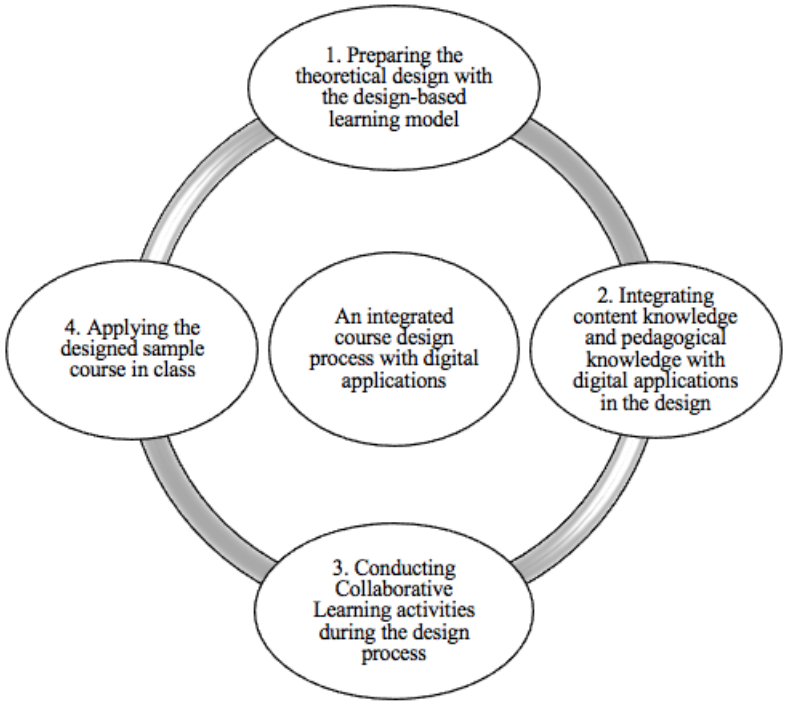


Figure 1. A representative module of the steps performed within the scope of the teaching model used in the research

Data Collection Process

The data collection process of the research was carried out according to the design-based learning method. The researcher shared information with the pre-service teachers during the 4-week period of a semester. In this period, teaching methods and techniques that pre-service teachers would use in social studies education were discussed. Additionally, it was stated that pre-service teachers would design a social studies course with digital technologies within the framework of pedagogical and content knowledge. In this process, the pre-service teachers were allowed to choose the level of social studies course, learning area, teaching technique and digital applications to be used. In addition, the form containing the digital applications discussed in the theoretical part of the course (presented in Table 1) was given to them by the researcher, and they were given the opportunity to choose the application appropriate for their designs. The researcher gave a few examples of how to use the digital applications from the form for social studies courses, used them on a smart board step by step and helped the pre-service teachers to use them. The part of the study based on group practices lasted 8 weeks. Each group presented their lessons in a classroom environment and were videotaped and watched themselves again. Also, while the groups introduced their applications, other pre-service teachers in the class acquired more information regarding different digital applications each week. In order to enable each group member to work actively in the process, 4 course designs were requested from each group. The processes to be carried out by the groups in the design process consisted of 4 stages and they were:

- *Preparing the theoretical design with Design-based Learning model:* Pre-service teachers are asked to review the learning areas, subjects and digital applications that they already knew about and which were included in the social studies curriculum.
- *Integrating content knowledge and pedagogical knowledge into digital applications in design:* By synthesizing their knowledge and skills in social studies learning areas, teaching techniques and digital applications. They form the infrastructure of the sample course.

- *Conducting Collaborative Learning activities in the design process:* In this step, pre-service social studies teachers work in group and inter-group collaboration with their friends. Each group member plays an active role in the process to partake in the learning and teaching of the design process.
- *Application of the designed sample course in the classroom:* Pre-service teachers conduct the social studies course designed with digital technologies in an environment similar to a real secondary school classroom. Their classmates take on the role of middle school students and they act as teachers themselves. Then, they redevelop their designs according to the feedback-corrections from the researcher. In addition, the activities in this step are videotaped.

Data Collection Tools

Documents for Developing a Social Studies Course with Digital Applications

A form for designing a Social Studies Course with digital materials was prepared by the researcher beforehand. In this form, the parts regarding classroom level, learning area, teaching techniques to be used and digital materials to be used were left blank for the pre-service teachers to fill in. The pre-service teachers filled in the relevant parts of this form and submitted it to the researcher before creating their designs. Two experts were consulted for the suitability of the form.

Participant (Pre-service Teacher) Opinions

One of the data collection tools of this study is the interview technique. Interview technique can be used as the main data source of the research as well as with other data collection techniques such as participant observation and document collection. Such use of interviews also enables the verification of the data obtained through observation and document analysis and the creation of alternative explanations for the data (Buyukozturk et al., 2008; Glesne, 2013). In this study, data were collected from pre-service teachers through a semi-structured interview form to describe their opinions on the process. Collecting data from the participants through interview method allows the control of the data obtained through observation and document analysis from the participants' perspectives and can contribute positively to the reliability and validity of the research (Merriam, 2013).

Observation (Video Recordings)

Observation is considered to be one of the most important ways to obtain this data (Merriam, 2013). Keeping field notes to obtain useful data from observations made during the research process (Mayring, 2011), is also common practice in addition to recording audio and video in the environment where the observation takes place (Merriam, 2013; Yildirim & Simsek, 2013). During this research, sample social studies courses designed by a different group each week were recorded with a video recorder including audio recording. It is known that video recording of the observations contributes to the credibility of the research as well.

Analysis of the Data

The documents, interview data and video recordings collected during this research were examined by descriptive analysis method. Descriptive analysis is the interpretation and summarization of previously collected data under certain themes or titles (Altunisik et al., 2007; Yildirim & Simsek, 2013). In this study, the researcher firstly formed a framework by bringing together the written, visual and audio products collected from each pre-service teacher under a code (P1, P2...) assigned to each respective teacher. Then, these data were examined, and themes were created. In addition to the excerpts from the documents of the pre-service teachers related to each theme, statistical values of how many pre-service teachers used each theme are presented. In brief, there are four steps of descriptive analysis; creating the framework, processing data according to the thematic framework, identifying and interpreting the findings. In this study, the findings presented with different themes by each group were supported with video recordings in order to increase the credibility of the research.

Reliability and Validity

For the validity and reliability studies of this research, the preparation of data collection tools, data collection process, data analysis and recording processes were carried out very carefully. In the process of preparing the data collection tools, in addition to two field experts, a Turkish teacher was also consulted in order to determine the language suitability of the data collection tools. Participants were selected on a voluntary basis. The participants were also informed that they could leave the study process (participation in the research, data collection, video recording, broadcasting on YouTube) at any time. In order to increase the credibility of the research, the application of the designed courses was recorded on video and these data were also shared on social media (Turkan Hoca Dijital Materyal Egitimi, 2019). No financial gain was sought from this social media channel and only the work done for the integration of digital technologies was shared with other stakeholders and colleagues throughout the education process. Signed permission was obtained from the pre-service teachers to share their videos and they were informed that their videos could be removed if they wanted at any time. Necessary information regarding the work and the procedures was given to the authorities of the institutions and permissions were obtained.

FINDINGS

How did Pre-service Social Studies Teachers Design Sample Social Studies Courses with Digital Technologies?

Table 1. How are the samples designs made by pre-service social studies teachers with digital technologies?

P	DIGITAL APPLICATIONS (TK)	ACTIVITIES AND TECHNIQUES USED (PK)	SOCIAL STUDIES LEARNING AREA (CK)
		1st. Group	
P1 (URL-2)	Buncee, Thinglink, Popplet, Goconr	More Tomorrow, Get the Flag Answer the Question	5th Grade People, Places and Environments
P2	Neaorpod, Popplet, Quiziz Wondershare filmora	Market Place Technique, Draw and Find Technique, Assemble Parts	5th Grade Global Connections
P3	Goconqr, Powtoon, Storyjumper, Triventy	Quick Round, Knock Over and Win	5th Grade Culture and Heritage
P4	Neorpad Aurasma Learning apps	Station, Build and Solve	5th Grade Production, Distribution and Consumption
		2nd. Group	
P5 (URL-3)	Emaze Go animate, Learningsapps	Question Round, Take a Hint	5th Grade People, Places and Environments
P6	Goanimate Thinglink, Mentimeter	Remember and Win, Quick Round	5th Grade Science, Technology and Society
P7	Movie maker, Easelly Crooswordlabs	Collect Points, Aquarium	6th Grade Culture and Heritage
P8 (URL-4)	Thinglink Aurasma Socrative	True or False? What Does It Have?	6th Grade People, Places and Environments
		3rd. Group	
P9 (URL-5)	Mindomo, Triventy	Everybody Is a Teacher Here, Cast a Line Get the Question	5th Grade People, Places and Environments
P10 (URL-6)	Padlet,Storyjumper,Aurasma, Goanimate, Safeshare, Learningapps	Come Out Come Out Wherever You Are, Hit the Dart Answer the Question	6th Grade Culture and Heritage
P11 (URL-7)	Thinglink, Flipguiz, Prezi	Court, Gossip	5th Grade Active Citizenship
P12	Canva, Word Art, Kahoot	Card Matching, Be Quick and Win	5th Grade Science, Technology and Society

		4th. Group	
P13	Canva, Thinglink, Go animate, Mentimeter	Idea Scan, Wheel of Fortune, Get Your Bearings	5th Grade Global Connections
P14	Classdojo, Powtoon, Storyjumper, Learningapps, Lino-it, Quizizz	Role Playing, Playing Tag	7th Grade Culture and Heritage
P15	Powtoon, Storyjumper Flipguiz	Information Pouch, Listing	5th Grade Active Citizenship
P16	Lino it, Plickers	Station, Basket of Apples	7th Grade Production, Distribution and Consumption
		5th. Group	
P17 (URL-8)	Emaze, Thinglink, Toondoo, Mentimeter	More Tomorrow, Guess and Find Me	5th Grade Global Connections
P18	Prezi, Mentimeter, Thinglink	Analogy (Metaphor), Ring a Ring o' Roses	5th Grade People, Places and Environments
P19	Wisemapping, Emaze, Learning Apps, Padlet-Socrative	True or False, Alternating Learning	7th Grade Science, Technology and Society
P20	Kahoot, Wordle	Flashcards, Listing	5th Grade Active Citizenship
		6th. Group	
P21	Amaze, Quzizz, Wisemapping, Crossword Laps	Flashcards, Come Out Come Out Wherever You Are	6th Grade Global Connections
P22	Learning Apps, Goanimate, Easelly	Quick Round, Hourglass	7th Grade Production, Distribution and Consumption
P23	Mindmeister, Canva, Blendspace, Quizizz	Court, Race Against Time	6th Grade Active Citizenship
P24	Quiziz, Emaze, Mindmeister	Hourglass, True or False?	5th Grade Culture and Heritage
		7th. Group	
P25	Blendspace, Powtoon, Quizizz	Roller, Role Playing	6th Grade People, Places and Environments
P26	Emaze, Socrative, Bubbl	Speaking Circle, Who Does It?	7th Grade Culture and Heritage
P27	Voki, Flipguiz, Thinglink	Card Matching, Burst the Bubble See the Answer	5th Grade Culture and Heritage
P28	Voki, Canva, Kahoot	Treasure Hunt, Questions and Answers	5th Grade Individual and Society
		8th. Group	
P29	Emaze, Voki, Quizizz	Drama, The Stranger Next to Me	6th Grade Active Citizenship
P30	Neopad, Mentimeter, Pooplet	Six Shoes, Argumentation	7th Grade Global Connections

When Table 1 is examined, it is observed that each group designed and presented 4 sample social studies courses. It is seen that both individual products and common group products have emerged during the group work. It is evident in this finding that, particularly in collaborative studies, balanced work takes place within the groups, which is important for preventing unfairness within groups. Because there are four people in each group, it is noteworthy that the four courses designed together are each presented by a single group member. The fact that pre-service teachers apply teaching techniques in social studies courses where they use digital applications in the context of class level and learning areas in the social studies curriculum, also draws attention. In addition to the teaching techniques (e.g. come out come out wherever you are, quick round, hourglass) in the literature, it was observed that pre-service teachers also used instructional activities they created themselves (the stranger next to me, hit the dart answer the question, cast a line get the question). When the videos of pre-service teachers about the social studies course designed with digital technologies are examined, it is observed that the designs created are also suitable for constructivist understanding and student participation.

What Is the Distribution of the Content Prepared by Pre-service Teachers in the Process of Designing a Sample Course with Digital Technologies in Terms of Grade, Learning Area, Digital Application and Activities/Techniques Used?

Table 2. Distribution of the designed courses in terms of grade level, learning area, digital applications and techniques used

Grade	Learning Area	f	Which Digital Applications Are Used in This Field	What Are the Learning Techniques Used?
5,6,7	Culture and Heritage	7	**Storyjumper (3)**, Powtoon (2), Quizizz (2), Emaze (2), Triventy (1), Movie Maker (1), Easelly (1), Crooswordlabs (1) Goconqr (1), Padlet (1), Aurasma (1), Goanimate (1), Safeshare (1), Learningapps (2), Classdojo (1), Lino It (1), Mindmeister (1), Socrative (1), Bubble (1), Voki (1), Flipquiz (1), Thinglink (1)	Quick Round (1), Knock Over and Win (1), Collect Points (1), Aquarium (1), Role Playing (1), Playing Tag (1), Hourglass (1), True or False? (1), Speaking Circle (1), Who Does It (1), Card Matching (1), Burst the Bubble See the Answer (1)
5,6	People, Places and Environments	6	**Thinglink (2)** Buncee (1), Popplet (1), Goconr (1), Emaze (1), Go Animate (1) Learningsapps (1), Mindomo (1), Triventy (1), Prezi (1), Mentimeter (1), Blendspace (1), Powtoon (1), Quizizz (1)	More Tomorrow (1), Get the Flag Answer the Question (1), Question Round (1), Take a Hint (1), True or False? (1) What Does It Have? (1) Everybody Is a Teacher Here (1), Cast a Line Get the Question (1), Analogy (Metaphor) (1), Ring a Ring o' Roses (1), Roller (1), Role Playing (1)
5,6,7	Global Connections	5	**Mentimeter (3)**, Neaorpod (2), Popplet (2), Quizizz (2), Thinglink (2), Emaze (2), Wondershare Filmora (1), Canva (1), Go Animate (1), Toondoo (1), Wisemapping (1), Crossword Laps (1)	Idea Scan (1), Wheel of Fortune (1), Get Your Bearings (1), More Tomorrow (1), Guess and Find Me (1), Flashcards (1), Come Out Come Out Wherever You Are (1)
5,6	Active Citizenship	5	**Quizizz (3)**, Flipquiz (2), Prezi (1), Powtoon (1), Storyjumper (1), Kahoot (1) Wordle (1), Mindmeister (1), Canva (1), Blendspace (1), Emaze (1), Voki (1) Thinglink (1)	Court (2), Gossip (1), Information Pouch (1), Listing (1), Flashcards (1), Race Against Time (1), Drama (1), The Stranger Next to Me (1)
5,7	Science, Technology and Society	3	Goanimate (1), Thinglink (1), Mentimeter (1), Canva (1), Word Art (1), Kahoot (1), Wisemapping (1), Emaze (1), Learning Apps (1), Padlet (1), Socrative (1)	Remember and Win (1), Quick Round (1), Card Matching (1), Be Quick and Win (1), True or False (1), Alternating Learning (1)
5,7	Production, Distribution and Consumption	3	**Learning Apps (2)**, Neorpad (1), Aurasma (1), Lino It (1), Plickers (1), Goanimate (1), Easelly (1)	Station (2), Build and Solve (1) Basket of Apples (1), Quick Round (1), Hourglass (1)
5	Individual and Society	1	Voki (1), Canva (1), Kahoot (1)	Treasure Hunt (1), Questions and Answers (1)

When Table 2 is examined, it is seen that the learning area the participants prepared the most content for during the process of integrating their technological pedagogical content knowledge in the social studies course was the "*Culture and Heritage*" (7) learning area. In this area of learning, content was prepared for 5th, 6th, and 7th Grade levels. Similarly, in the "global connections" learning area, technological, pedagogical and content knowledge studies have been carried out extensively for the 5th, 6th and 7th Grades. The most frequently preferred digital applications for course integration in terms of specific learning areas were as follows; a digital storytelling app called *"Storyjumper"* (3) for the Culture and Heritage learning area, *Thinglink "(2),* for the People, Places and Environments learning area, *"Mentimeter" (3*), for the Global Connections learning area, *"Quiziz" (3),* for the Active Citizenship learning area and finally, *"Learning Apps "(2),* for the Production Distribution and Consumption learning area. However, it was observed that for the Individual and Society and Science, Technology and Society learning areas, different applications were used only once. In the pre-service teachers' preferences of using instructional techniques, there were no repeated techniques other than "Court" (2) and "Station" (2) techniques. This finding shows that social studies teachers produce different contents within the scope of their creativity. In addition, pre-service teachers also created some activities such as "*Knock Over and Win, Collect Points, Playing Tag, Burst the Bubble See the Answer, Take a Hint, Cast a Line Get the Question"* themselves.

Which Digital Applications Did Pre-service Social Studies Teachers Used in the Process of Designing A Sample Course with Digital Technologies?

Table 3. Digital applications mainly used in the process of designing a sample course with digital technologies

Digital applications used	f	Digital applications used	f
Thinglink	8	Blendspace	2
Quiziz	7	Easelly	2
Emaze	7	Crooswordlabs	2
Learning Apps	6	Prezzi	2
Go animate (Vyond)	5	Wisemapping	2
Mentimeter	5	Lino-it,	2
Powtoon,	4	Triventy	2
Storyjumper	4	Padlet	2
Canva	4	Movie maker	1
Popplet,	3	Mindomo	1
Neaorpod	3	Buncee	1
Aurasma	3	Safeshare	1
Socrative	3	Word art	1
Voki	3	Classdojo	1
Kahoot	3	Plickers	1
Flipguiz	3	Toondoo	1
Goconqr	2	Wordle	1
Mindmeister	2	Bubbl	1
		Wondershare filmora	1

Pre-service social studies teachers have integrated a total of 37 digital applications into the social studies course content process. Among the applications used, "*Thinglink*" was the app used the most used in the social studies learning areas. With Thinglink, you can place icons on the images in your presentation and add content such as audio, video, music, pictures, etc. on them. Presentations are usually more interesting and student-engaging activities. For example, by embedding videos on the pictures of touristic areas in certain regions on a tourism map of Turkey, you can satisfy the curiosity of the students by appealing more to the senses. In this respect, it can be said that pre-service teachers focused on practices that facilitate student participation in the process. Other digital applications that pre-service teachers preferred most during the preparation of social studies course content were; *Quiziz, Emaze, Learning Apps, Go animate and Mentimeter*. Digital applications integrated with social studies courses by only one pre-service teacher were as follows; virtual classroom application: Classdojo, presentation and animation applications: Buncee and Toondoo, Word building applications: Wordle, Bubbl, Word art, Test and puzzle building applications: Plickers, Mind map applications: Mindomo and film-video editing applications: *Movie maker, Safeshare* and *Wondershare filmora* respectively.

What Are the Opinions of Pre-service Social Studies Teachers about the Integration of Pedagogical and Content Knowledge with Digital Technologies?

Table 4. Opinions of pre-service social studies teachers about their contribution to professional competence

	Opinions of pre-service teachers	Participants	f
Professional Competence Theme	Being able to integrate digital technologies with content knowledge within the framework of pedagogical knowledge	P1, P2, P3, P4, P5, P6, P7, P8, P9, P10, P13, P14, P15, P18, P20, P21, P23, P24, P25, P26, P28, P29, P30	23
	Increased knowledge and skills about digital applications over time	P1, P3, P5, P8, P11, P12, P15, P16, P17, P19, P22, P23, P28	13
	Regarding the use of technology, gaining a positive attitude	P1, P7, P23, P25, P26	5
	Increasing curiosity about technology	P17, P29, P30	3
	Feeling oneself at a level that can help others	P18, P27, P28	3
	Improving self-confidence about using digital applications in social studies	P4, P17	2
	Considering oneself to be different from the classical teacher model	P4, P6,	2
	Being able to use applications that most people don't know about in class is very pleasing	P12, P17	2
	Destruction of prejudice against technology	P15, P29	2
	Considering oneself to be one of the best in the class to integrate digital applications with social studies	P10	1
	Thinking that the process of integration into social studies increases creativity as well	P6	1
	Gaining the ability to use technological tools in a more controlled and purposeful manner	P15	1
	Finding the opportunity to discover new features and aspects of oneself in the process	P25	1

Even though I had no knowledge and interest in using the applications in social studies at the beginning of this course, I am now one of the most effective people in using applications in social studies (P10).

There was an improvement in my ability to visualize and integrate knowledge into the course. I used virtual classes such as Edmodo and Classdojo in social studies and gained competence in observing students and class management (P14).

Before I started to use these applications in social studies, I had difficulty even using computers. Now I can easily use these applications in social studies. In the process of integrating these practices, I began to realize my abilities and interests that I had not noticed before (P25).

Table 5. Opinions of pre-service social studies teachers about their contributions to social studies course

Theme of Contributions to Social Studies Course	Opinions of pre-service teachers	Participants	f
	The opinion that digital applications make social studies a more fun course	P1, P3, P8, P25, P26, P20	6
	Students in social studies course become more active with digital applications	P3, P11,	2
	Opportunity to interact with students in virtual classes at any time	P1, P14,	2
	The opinion that learnings of social studies become more permanent with the use of applications	P2, P12,	2
	The opinion that social studies are prevented from becoming monotonous with digital applications	P1,	1
	Contribution to the effective teaching of social studies course	P8	1
	In the social studies course, digital applications are thought to be useful	P13	1
	The opinion that courses designed in this model support collaborative learning studies as well	P14	1
	Saving time with digital applications	P15	1

If we want to teach the subjects effectively in the social studies course and have the students participate more, we need to use digital applications. The course becomes even more fun with these applications (P8).

Teaching the course with digital applications will make the learnings of students more permanent. Integrating courses with digital applications instead of just plain talking is important for ensuring that the courses are not boring and that they facilitate student participation (P12).

I have seen that using digital applications in social studies courses saves time. In this way, I can share my presentations and animations with the class in a more practical and fun way (P15).

I realized that there are digital applications that enable my students to work effectively as a team in social studies course. (P14).

Table 6. Opinions on the implementation of the applications in the future during their professional lives

The Theme Regarding the Process in the Future	Opinions of pre-service teachers	Participants	f
	Regarding the future, the idea of wanting to use the applications more effectively and productively while teaching	P5, P7, P11, P13, P21, P24, P26	7
	Regarding the teaching practice, thinking about which digital applications to integrate with social studies.	P4, P12,	2
	Regarding the future, belief that social studies course will be more fun to teach with digital applications	P11, P19	2
	The opinion that it will be professionally beneficial for oneself	P26, P28	2
	Regarding the future, the idea of becoming a social studies teacher who makes children enjoy technology	P10	1
	The opinion that digital applications will motivate students	P1	1
	The opinion that with this model, it will be easier to stimulate more senses in the students	P14	1
	The opinion that this way students will participate more in class	P19	1
	The idea of closely following technological developments in the future and using them in class	P25	1
	The belief that the fear of taking tests that students experience will be eased with digital games	P1	1

In the future, I will try to use digital applications more and strive to produce richer content (P19).

When we use these applications in class, our lessons become more fun. When we become teachers, I believe that when we use these applications while teaching with our students, they will have more fun while learning (P5).

I think I'll benefit from using digital applications that fit my course subjects when I'm a teacher in the future (P26).

I can easily draw the attention of my students in the future by blending social studies with digital applications. This will allow my students to see the positive aspects of technology. I also think I'll keep track of the work my students do outside the classroom with virtual classroom applications. I'm planning to help my students get rid of their test anxiety with digital evaluation applications such as digital Kahoot, Quizziz and Triventy and make learning more fun for them (P1).

DISCUSSION AND CONCLUSION

Teacher competencies are important for improving the quality of teaching in educational environments. Because teachers who are competent and qualified are the ones responsible for teaching the 21st century knowledge and skills to students in a healthy way. Since one of the competencies that must to be taught to the students as part of curricula is "*digital competence",* teachers are required to have this skill themselves in the first place and a competent teacher must have the ability to integrate the content knowledge and pedagogical knowledge with digital technologies. The aim of this study is to examine the sample course design studies conducted by pre-service social studies teachers using digital technologies and to describe their opinions about this process. In this context, according to the first question of the research, "How did pre-service social studies teachers design a course in the process of creating a sample course with digital technologies?" it was concluded that each group of pre-service social studies teachers designed a sample social studies course by integrating their content and pedagogical knowledge with digital applications. In relation to this finding of the research, the resulting collaborative work done by pre-service teachers in the process of designing a technology-supported course is consistent with certain other studies (Lu et al., 2011; So & Kim, 2009) as well. Both individual products and common group products were created during the group work. This development prevents the unfair gain which is one of the limitations of the collaborative works. It is also worth pointing out that pre-service teachers applied teaching techniques in social studies courses in the process. In addition to the teaching techniques (e.g. come out come out wherever you are, quick round, hourglass) in the literature, it was observed that pre-service teachers also used instructional activities they created themselves (the stranger next to me, hit the dart answer the question, cast a line get the question) and used their creativity. When the videos of pre-service teachers about the sample social studies course designed with digital technologies were examined, it was concluded that the designs created coincided with the constructivist understanding and student participation as well. The ability of pre-service teachers to design content knowledge and digital applications in such a way to be able to teach them in a classroom environment depends on the soundness of their pedagogical knowledge. Because the use of appropriate teaching methods and techniques for optimizing the knowledge, skills and approach to be gained by the target audience in the process of teaching is related to the pedagogical knowledge that increases the quality of teaching activities (Usak, 2005; Park & Oliver, 2008; Moore, 2000). In the research *"What is the distribution of the content prepared by the pre-service social studies teachers in the process of designing a sample course with digital technologies in terms of grade level, learning area, digital applications and techniques?"* was another point of question.

In the findings related to the second question of the research the learning area the participants prepared the most content for during the process of integrating their technological pedagogical content knowledge in the social studies course was seen to be the "*Culture and Heritage"* (7) learning area. In this area of learning, content was prepared for 5th, 6th, and 7th Grade levels. When the content of culture and heritage learning area is examined, it is seen that it mostly includes historical and cultural issues related to past experiences. Pre-service teachers may have preferred to use this learning field more because they thought about how they could make the lessons more concrete when dealing with historical and cultural issues when they became teachers. Similarly, in the "Global Connections" learning area, technological, pedagogical and content knowledge studies have been carried out extensively for the 5th, 6th, 7th Grades. Again, as the learning area of global connections can be a bit more difficult to teach by simplifying the subjects of international political, economic and cultural relations for the students, teachers may have chosen this field by thinking that this problem can be overcome with digital technologies.

Another interesting finding was the variability in the preferences of pre-service teachers regarding instructional techniques. This finding shows that social studies teachers produce different contents within the scope of

their creativity. In addition, the creativity of the pre-service teachers also developed during this process as evidenced by the activities such as *knock over and win, collect points, playing tag, burst the bubble see the answer, take a hint, cast a line get the question,* that they created themselves. Findings related to *"Digital technologies extensively used by pre-service social studies teachers in designing sample courses with digital technologies"* show that pre-service social studies teachers tried to integrate 37 digital applications into social studies course content process. Among the applications, "*Thinglink*" (f-8) was the most widely used application in social studies learning areas. Via Thinglink, you can place icons on the images in your presentation and add content such as audio, video, music, pictures, etc. on them. Presentations are usually more interesting and student-engaging activities. In this respect, it can be said that pre-service teachers focused on practices that facilitate student participation in the process. The result is in parallel with the idea that technology enriches the educational environment (Melia et al., 2012; Mishra and Koehler, 2006).

Other digital applications that pre-service teachers preferred most during the preparation of social studies course content were; *Quiziz, Emaze, Learning Apps, Go animate and Mentimeter*. Digital applications integrated with social studies courses by only one pre-service teacher were as follows; virtual classroom application: Classdojo, presentation and animation applications: Buncee and Toondoo, Word building applications: Wordle, Bubbl, Word art, Test and puzzle building applications: Plickers, Mind map applications: Mindomo and film-video editing applications: *Movie maker, Safeshare and Wondershare Filmora* respectively. The finding related to the question of *"What are the opinions of pre-service social studies teachers about the process of designing a sample course with digital technologies?"* was also acquired in the research**.** As a result of the data obtained from the opinions of pre-service teachers on this subject three themes of *"contribution to their professional competence," "contribution to social studies course," "implementation in the future professional life"* and opinions within the context of these themes were acquired. From among the opinions acquired; *being able to integrate digital technologies with content knowledge within the framework of pedagogical knowledge over time, considering oneself to be different from the classical teacher model, thinking that the process of integration into social studies increases creativity as well, the opinion that digital applications make social studies a more fun course, the opinion that students in social studies course become more active with digital applications, the benefits of the opportunity to interact with students in virtual classes at any time, the opinion that courses designed in this model support collaborative learning studies as well, the idea of wanting to use the applications more effectively and productively while teaching* were the most striking ones.

When all these findings are taken into consideration, it can be said that they coincide with the opinion that technological infrastructure of the universities should be developed and improved in terms of qualified and competent academic staff and that the training of pre-service teachers to be organized accordingly (Kurt, 2013). Considering the triad of technological pedagogical and content knowledge usage achieved in this study, it is also concluded that the advice of Koehler and Mishra (2005) regarding those responsible for training teachers to train them to be able to use technological tools correctly and properly, is also followed. Therefore, the study's finding that technology integration can be compensated by pre-service training, strengthens Hur et al. (2010)'s views.

Recommendations

Based on the literature and the finding of this study, it is recommended that pre-service training activities should be focused on deep-rooted solutions in the use of technology in integration with courses. In this regard, projects involving face to face training for all academics could be implemented and vocational courses in the Department of Education can be taught more practically. This study was conducted only with social studies teachers. However, similar course designs can be carried out in different branches. In order to observe the effects of the education given to pre-service teachers in real classroom environments, longitudinal researches including the process of teaching practice can be conducted.

BIODATA and CONTACT ADDRESSES of AUTHOR

Dr. Turkan CELIK is an assistant Professor Doctor, at Kilis 7 Aralik University, Faculty of Education, Depertmant of Turkish and Social Sciences Education, Division of Social Studies Education. Dr. CELIK gained her PhD from Pamukkale University Primary Education Phd in 2016. Her Phd thesis about An Investigation on The Benefits and Risks of Social Media from Stakeholders 'Perspective. She has been working at Kilis 7 Aralik University since 2018. Her research interests include social studies education, teacher education, social media literacy, digital literacy, technology integration social studies, Web 2.0 training. She has journal articles published in national and international indexes, book chapters, and papers submitted to international meetings

Turkan CELIK
Kilis 7 Aralik University, Faculty of Education Department of Social Studies Education
Address: Kilis 7 Aralik University, Faculty of Education, 79000, Kilis, Turkey
Phone: + 90 348 814 26 66-1722
E-mail: turkancelik@kilis.edu.tr

REFERENCES

Abbitt, J., & Klett, M. (2007). Hizmet oncesi egitimciler arasinda teknoloji entegrasyonuna yonelik tutum ve oz yeterlik inanclari uzerindeki etkilerin belirlenmesi. *Egitimde Teknoloji Entegrasyonu Elektronik Dergisi,* 6, 28-42

Altunisik, Remzi, Coskun, Bayraktaroglu & Yildirim. (2007). *Sosyal Bilimlerde Arastirma Yontemleri: Spss Uygulamali.* 4. Baski. Istanbul: Avci Ofset.

Angeli C. & Valanides, N., (2009). Epistemological and methodological issues for the conceptualization, development, and assessment of ICT–TPCK: Advances in technological pedagogical content knowledge (TPCK*). Computers & Education,* 52, 154–168.

Kurt, A. A. (2013). Teknopedagojik egitim modeli. I. Kabakci Yurdakul (Editor). *Egitimde teknoloji Entegrasyonuna Kavramsal ve Kuramsal Bakis* icinde (s. 3-37). Ankara: Ani Yayincilik.

Baki, A. (2002). *Bilgisayar destekli matematik*. Istanbul: Ceren Yayin Dagitim.

Benzer, A. (2017). *Dijital Cagda Ogretim Teknolojileri ile Turkce Egitimi,* Ankara: Yeni Anadolu Yayincilik.

Bozkurt, A. (2019). Vizyon 2023: Turkiye'de acik ve uzaktan ogrenme alaninda somut ve soyut teknolojiler baglaminda egilimler. *Acikogretim Uygulamalari ve Arastirmalari Dergisi, 5*(4), 43-64.

Brown, A., & Campione, J. (1996). Psychological theory and the design of innovative learning environments: On procedures, principles, and systems. L. Schauble ve R. Glaser (Eds.), *Innovations in learning: New environments for education* icinde (289–325). Mahwah, NJ: Lawrence Erlbaum Associates.

Brown, A. L. (1992). Design experiments: Theoretical and methodological challenges in creating complex interventions in classroom settings. *Journal of the Learning Sciences,* 2(2), 141–178.

Brown, D., & Warschauer, M. (2006). From the university to the elementary classrooms: Students' experiences in learning to integrate technology in instruction. *Journal of Technology and Teacher Education*, *14*(3), 599-621.

Buyukozturk, S., Kilic Cakmak E., Akgun, O. E., Karadeniz, S., & Demirel, F. (2008*). Bilimsel arastirma yontemleri*. Ankara: PegemA Yayincilik.

Chou, C. M. (2011). Student teachers socialization development by teaching blog: Reflections and socialization strategies. *TOJET: The Turkish Online Journal of Educational Technology,* 10(2), 190-201.

Cobb, P., Confrey, J., diSessa, A., Lehrer, R. & Schauble, L. (2003). Design experiments in educational research. *Educational Researcher,* 32(1), 9–13.

Collins, A. (1992). Towards a design science of education. E. Scanlon ve T. O'Shea (Eds.), *New directions in educational technology* icinde (15–22). Berlin: Springer.

Collins, A., Joseph, D., & Bielaczyc, K. (2004). Design research: Theoretical and methodological issues. *Journal of the Learning Sciences*, 13(1), 15–42.

Collis, B., & Moonen, J. (2008). Web 2.0 Tools and Processes in Higher Education: Quality Perspectives. Educational Media International, 45 (2), 93-106.

Design-Based Research Collective (2003). Design based research: An emerging paradigm for educational inquiry. *Educational Researcher,* 32(1), 5–8.

Doering, A., Hughes, J., & Huffman, D. (2003). Preservice teachers: Are we thinking with technology? *Journal of Computing in Teacher Education*, 35(3), 342-361.

Ertmer, P. A. (2005). Teacher pedagogical beliefs: The final frontier in our quest for technology integration? *Educational technology research and development*, 53(4), 25-39.

Esgi, N., & Kocadag Unver, T. (2018). *Bilisim Teknolojileri, Ogretim Teknolojileri, Materyal Gelistirme Icin Web 2. 0 Araclari,* Ankara: Nobel Akademi Yayincilik.

Glesne, C. (2013). *Nitel arastirmaya giris*. Ani Yayincilik.

Gomleksiz, M. N., & Fidan, E. K. (2011). Pedagojik Formasyon Programi Ogrencilerinin Web Pedagojik Icerik Bilgisine Iliskin Oz-Yeterlik Algi Duzeyleri. *Turkish Studies International Periodical For The Languages, Literature and History of Turkish or Turkic,* 6(4), 593-620.

Graham, R. C., Burgoyne, N., Cantrell, P., Smith, L., St Clair, L., & Harris, R. (2009). Measuring the TPACK confidence of inservice science teachers. *TechTrends*, 53(5), 70-79.

Gunduz, S. (2007). Ogretmen Egitiminde Bilgi ve Iletisim Teknolojileri Planlama Rehberi, H. Ferhan Odabasi (Ceviri Ed.), *Bilgive Iletisim Teknolojileri ve Ogretmen Egitimi: Kuresel Baglam ve Yapi* (s. 5-22), Ankara: Nobel Akademi Yayincilik.

Gununc, S. (2017). *Egitimde Teknoloji Entegrasyonunun Kuramsal Temelleri,* Ankara: Ani Yayincilik.

Hew, K. F., & Brush, T. (2007). Integrating technology into K–12 teaching and learning: Current knowledge gaps and recommendations for future research. *Educational Technology Research and Development*, 55(3), 223–252.

Hur, J. W., Cullen, T., & Brush, T. (2010). Teaching for application: A model for assisting preservice teachers with technology integration. *Journal of Technology and Teacher Education*, 18(1), 161-182.

ISTE (Uluslararasi Egitim Teknolojileri Toplulugu -International Society for Technology in Education), 2019. Standart for educators, https://www.iste.org/standards/for-educators, Erisim tarihi: 12.02.2019.

ISTE (Uluslararasi Egitim Teknolojileri Toplulugu -International Society for Technology in Education), (2019). Standart for Students, http://www.iste.org/standards/for-students Erisim tarihi: 12.02.2019.

Kariuki, M., & Duran, M. (2004). Using anchored instruction to teacher preservice teachers to integrate technology in the curriculum. *Journal of Technology and Teacher Education,* 12(3), 431-445.

Kazanci, A., & Donmez, F. I. (2013). *OKUL 2.0 Egitimde Sosyal Medya ve Mobil Uygulamalar,* Ankara: Ani Yayincilik.

Kelly, A.E. (2003). The role of design in educational research. *Educational Researcher*, 32(1).

Koehler, M.J., & Mishra, P. (2005). What happens when teachers design educational technology? The development of technological pedagogical content knowledge. *Journal of Educational Computing Research*, 32(2), 131-152.

Lee, C. B., Chai, C. S., Teo, T., & Chen, D. (2008). Preparing Pre-Service Teachers' for the Integration of ICT Based Student-Centered Learning (SCL) Curriculum. *Journal of Education,* 13, 15-28.

Levin, J.R., & O'Donnell, A.M. (1999). What to do about educational research's credibility gaps? *Issues in Education,* 5(2), 177-229.

Lu, L., Johnson, L., Tolley, L.M., Gilliard-Cook, T., & Lei, J., (2011). Learning by design: TPACK in action. Technology integration preparation for preservice teachers. In C. D. Maddux et al. (Eds.), *Research highlights in technology and teacher education* , (pp. 47-54). Chesapeake: The Society for Information Technology & Teacher Education.

Mayring, P. (2011). *Nitel sosyal arastirmaya giris.* Bilgesu Yayincilik

Mazman, S. G., & Kocak U. Y. (2011). Bilgi ve iletisim teknolojilerinin ogrenme-ogretme sureclerine entegrasyonu: Modeller ve gostergeler. *Egitim Teknolojisi Kuram ve Uygulama*, *1*(1), 62-79.

Melia, J. M. J., Gonzalez-Such, J., & Garcia-Bellido, M. R. (2012). Evaluative research and information and communication technology (ICT). *Revista Espanola De Pedagogia*, 70 (251), 93-110.

Meric, G. (2014). Fen ve teknoloji ogretmen adaylarinin teknolojik pedagojik alan bilgisi konusunda oz guven seviyelerinin belirlenmesi. *Egitimde Kuram ve Uygulama,10*(2), 352-367.

Merriam, S. B. (2013). *Nitel arastirma desen ve uygulama icin bir rehber.* Ankara: Nobel Yayin Dagitim.

Mishra, P. & Koehler, M.J. (2006). Technological pedagogical content knowledge: A new framework for teacher knowledge. *Teachers College Record,* 108 (6), 1017-1054.

Moore, K. D. (2000). *Ogretim becerileri.* (Ed. E. Altintas), (Cev. N. Kaya). Ankara: Nobel Yayinevi.

Goksun, D. O., & Kurt, A. A. (2018). Ogretim teknolojilerinin temelleri, Kurt, A. A., (Ed.), *21. Yuzyil* Ogrenci *ve* Ogretmen *Becerileri* (s. 95-114). Ankara: Nobel Akademi Yayincilik.

Onal, N. (2018). Etkinlik Ornekleriyle Zenginlestirilmis Egitimde Teknoloji Uygulamalari, Onal, N. (Ed.), Ogretimde *Kullanilabilecek Teknoloji Destekli Uygulamalar,* (s.2-13). Ankara: Pegem Akademi.

Pamuk, S., Ulken, A. & Dilek, N. S. (2012). Ogretmen adaylarinin ogretimde teknoloji kullanim yeterliliklerinin teknolojik pedagojik icerik bilgisi kuramsal perspektifinden incelenmesi. *Mustafa Kemal Universitesi Sosyal Bilimler Enstitusu Dergisi,* 9(17), 415-438.

Park, S. & Oliver, J. S. (2008). Revisiting the Conceptualisation of Pedagogical Content Knowledge (PCK): PCK as a Conceptual Tool to Understand Teachers as Professionals. *Research in Science Education,* 38(3), 261-284.

Partnership for 21st Century Learning (2015). P21 Framework Definitions. Erisim adresi: https://files.eric.ed.gov/fulltext/ED519462.pdf.

Pope, M., Hare, P., & Howard, E. (2002). Technology integration: Closing the gap between what preservice teachers are taught to do and what they can do. *Journal of Technology and Teacher Education*, 10(2), 191–203.

Russell, M., Bebell, D., O'Dwyer, L., & O'Connor, K. (2003). Examining teacher technology use: Implications for preservice and inservice teacher preparation. *Journal of Teacher Education*, 54(4), 297-310.

Shulman, L. S. (1986). Those who understand: Knowledge Growth in teaching. *Educational Researcher*, 15(2), 4-14

So, H.J., & Kim, B., (2009) Learning about problem based learning: Student teachers integrating technology, pedagogy and content knowledge. *Australasian Journal of Educational Technology,* 25(1), 101-116.

Sahin, Y. L. (2013). Teknopedagojik Egitime Dayali Ogretim Teknolojileri ve Materyal Tasarimi, Kabakci Yurdakul, I. (Ed.), *Teknopedagojik Egitimde Web 2. 0 araclari* (s. 163-192), Ankara: Ani Yayincilik.

Tatli, Z. (2017). Kavram Ogretiminde Web 2. 0, Tatli, Z. (Ed.), *Pixton*, (s. 262-273). Ankara: Pegem Akademi.

Trilling, B., & Fadel, C. (2009). 21st century skills: Learning for life in our times Francisco: Jossey-Bass.

Turkan Hoca Dijital Materyal Egitimi. (2019, Haziran 7). Turkan Celik sosyal bilgiler 3. sinif ozel ogretim yontemleri [Video]. YouTube. https://www.youtube.com/playlist?list=PLHl-bVQN-ArEcf9_3wzBa6_MytokteLdA

URL-1: MEB (Milli Egitim Bakanligi) *Sosyal bilgiler* ogretim *programi*, (2018) 23. 01. 2017 tarihinde http://mufredat.meb.gov.tr/Dosyalar/201812103847686SOSYAL%20B%C4%B0LG%C4%B0LER%20%C3%96%C4%9ERET%C4%B0M%20PROGRAMI%20.pdf. adresinden erisilmistir.

Usak, M. (2005). *Fen bilgisi ogretmen adaylarinin cicekli bitkiler konusundaki pedagojik alan bilgileri*. Yayimlanmamis doktora tezi. Gazi Universitesi, Ankara.

Yildirim, A. ve Simsek, H. (2013). *Sosyal bilimlerde nitel arastirma yontemleri*, Ankara: Seckin Yayincilik.

URL-2: K1 TPAB Videosu, Erisim adresi (2019, Aralik 7): https://www.youtube.com/watch?v=1iSMxiPdgVA&list=PLHl-bVQN-ArEcf9_3wzBa6_MytokteLdA&index=14,https://www.youtube.com/watch?v=_k-AIU3SoIQ&list=PLHl-bVQN-ArEcf9_3wzBa6_MytokteLdA&index=3&t=112s

URL-3: K5 TPAB Videosu, Erisim adresi (2019, Aralik 7): https://www.youtube.com/watch?v=c-RWgOWQn60&list=PLHl-bVQN-ArEcf9_3wzBa6_MytokteLdA&index=3, https://www.youtube.com/watch?v=8MLINK5wyR0&list=PLHl-bVQN-ArEcf9_3wzBa6_MytokteLdA&index=4

URL-4: K8 TPAB Videosu, Erisim adresi (2019, Aralik 7): https://www.youtube.com/watch?v=B7_E28ZC0fU&list=PLHl-bVQN-ArEcf9_3wzBa6_MytokteLdA&index=8&t=0s, https://www.youtube.com/watch?v=fUYxqPPGttY&list=PLHl-bVQN-ArEcf9_3wzBa6_MytokteLdA&index=8

URL-5: K9 TPAB Videosu, Erisim adresi (2019, Aralik 7): https://www.youtube.com/watch?v=PlCwmiuPmaU&list=PLHl-bVQN-ArEcf9_3wzBa6_MytokteLdA&index=5,https://www.youtube.com/watch?v=Xmm5LZCyqEo&list=PLHl-bVQN-ArEcf9_3wzBa6_MytokteLdA&index=6

URL-6: K10 TPAB Videosu, Erisim adresi (2019, Aralik 7): https://www.youtube.com/watch?v=BTOUAesszb0&list=PLHl-bVQN-ArEcf9_3wzBa6_MytokteLdA&index=1,2) https://www.youtube.com/watch?v=_k-AIU3SoIQ&list=PLHl-bVQN-ArEcf9_3wzBa6_MytokteLdA&index=2

URL-7: K11 TPAB Videosu, Erisim adresi (2019, Aralik 7): https://www.youtube.com/watch?v=9CK1L8xWUlY&list=PLHl-bVQN-ArEcf9_3wzBa6_MytokteLdA&index=31, https://www.youtube.com/watch?v=eekwlWxQmX8&list=PLHl-bVQN-ArEcf9_3wzBa6_MytokteLdA&index=32

URL-8: K17 TPAB Videosu, Erisim adresi (2019, Aralik 7): https://www.youtube.com/watch?v=TrBcbKQypE0&list=PLHl-bVQN-ArEcf9_3wzBa6_MytokteLdA&index=35,https://www.youtube.com/watch?v=4ZwMYLcjvtA&list=PLHl-bVQN-ArEcf9_3wzBa6_MytokteLdA&index=36

CORRELATION BETWEEN FACEBOOK USE, MENTAL HEALTH AND LEARNING ENGAGEMENT: A CASE OF UNIVERSITIES IN SURABAYA CITY, INDONESIA

Dr. Baraka Manjale NGUSSA
ORCID: 0000-0001-5527-9924
School of Education
University of Arusha
Arusha, TANZANIA

Fifi Khoirul FITRIYAH
ORCID: 0000-0002-4087-0022
Faculty of Teacher Training and Education
Universitas Nahdlatul Ulama Surabaya
Surabaya, INDONESIA

Syaiputra Wahyuda Meisa DININGRAT
ORCID: 0000-0003-4529-9168
Department of Islamic Early Childhood Education
STIT Al-Ibrohimy Bangkalan
Bangkalan, INDONESIA

Received: 05/04/2020 **Accepted:** 28/05/2020

ABSTRACT

This study was propelled by the Covid 19 Global Pandemic which necessitates online platforms to replace traditional classrooms than ever before. The study investigated on the perception on and interrelationships between Facebook use, mental health and engagement in learning. Using Descriptive Correlational Design, the study used online questionnaire to collect data from a convenient sample of 253University students with varied demographic characteristics in Surabaya City. The mean age of respondents was 21.5. Cronbach's Alpha of above 0.7 was established for each variable prior to data analysis. The study established that students did not consider Facebook as a valuable platform for learning. Difference in Facebook use by gender and area of study was not significant. Students' preferred platforms included Google classroom, WhatsApp and Zoom. Students experienced anxiety and it was not easy for them to cope up with stressful moments. However, they concentrated in learning without any interference from Facebook and took active role in extra-curricular activities, sports and games. Mental health positively influenced students' engagement while Facebook use enhanced mental health. Therefore, it is recommended that educators should make use of Google Classroom, WhatsApp and Zoom to support students' engagement. Students need to actively engage in sports and games to overcome potential stressful moments. Educators should take advantage of students' engagement by introducing alternative social media platforms for further enhancement of learning engagement. Finally, Education stakeholders need to enhance mental health education in order to increase rates of students' engagement in learning.

Keywords: Facebook, Social media, mental health, engagement, learning, Covid 19, Indonesia.

INTRODUCTION

Covid 19 Global Pandemic has highly necessitated online learning means to replace traditional learning approaches whereby the teacher must meet the learners face to face at a certain locality in the classroom. While most governments around the world have temporarily closed educational institutions in an attempt to contain the spread of the COVID-19 pandemic, these nationwide closures are impacting over 89% of the

world's student population (UNESCO Covid 19 Educational Disruption and Response, 2020). Burgess and Sievertsen (2020) consider the COVID-19 pandemic as first and foremost health crisis. As many countries have decided to close schools, colleges and universities, the crisis crystallises the dilemma policymakers are facing between closing schools to reduce contact and saving lives and keeping them open by allowing workers to work and maintaining the economy. While numerous countries in the world have suspended traditional face to face meetings including face to face classrooms in fear of massive spread of the Covid 19 pandemic, there is a serious need for educators and researchers to find out most appropriate alternative means to meet the learners at the points of their needs. In response to this need, this study sought to investigate on the correlation between Facebook use, mental health and students' engagement in learning in order to come up with appropriate recommendations to students, parents, educators, education administrators, policy makers and other higher education stakeholders.

In the 21st century, the use of social media is the closest life to society in all of development ages. Social network has influenced the lives of young people and penetrated into many fields including the field of education. In particular, Facebook is used by millions of people for various activities including teaching and learning. In recent times, Facebook has become one of the most important communication platforms through which young people can easily interact in both personal and academic issues. In particular, some students and educators around the world utilize Facebook into the instructional process as a communication tool (Al-rahmi, 2013). Its roles include sharing ideas, collaboration between faculty and students as well as facilitating and acquiring knowledge (Al-Khalifa & Garcia, 2013). Studies have shown the effect of social media platforms on academic performance, interaction and participation of students in the teaching and learning transaction. The study of (Al-Khalifa & Garcia, 2013), for instance, revealed a significant positive relationship between Telegram usage and students' learning engagement. The study of (Sharma, Joshi, & Sharma, 2016)thus supporting Vygotsky's socio constructivist approach. The aim of this paper is to predict key determinants that affect students' intention towards academic use of Facebook. The usable data were gathered from 215 Omani students, and multi-analytical methods were employed to test the proposed research model. The results obtained from structural equation modeling (SEM further outlined possible key factors that may affect students' intention to use social media for academic matters. The study revealed that resource sharing was the most influencing factor in the decision to use Facebook in higher education, followed by personal usefulness, enjoyment, collaboration and social influence.

Usefulness of Facebook in academic arena can be seen in the fact that about 91.1% of students in African countries, for example, use social media, Facebook included, for learning purpose (Mirembe, Lubega, & Kibukamusoke, 2020). Several previous research found that Facebook is highly recommended in learning in various countries, including for distance learning by involving interactions in Facebook groups (Baggaley, 2012; Lenandlar, 2013; Lim, 2010). Likewise, Indonesia has witnessed a tremendous growth in social media usage in various aspects of life. According to Internet World State (2018), Indonesia, is the 4th country in the world with the highest Facebook user having 130 million users. In particular, records show that Facebook is the most used social media among English teachers in Indonesia (Rafidiyah& Bayeck, 2016). Form the Indonesian teachers' perspective, the study of Patahuddin, Rokhmah and Lowrie, (2020) highlights the affordance of Facebook in providing opportunity for members to connect not only with friends but also with professionals across the country, in sharing expertise, practices, and ways of thinking. In addition, a recent study in private Indonesian universities showed that Facebook groups have potential to be used as online tutorial complement in which there are pedagogical, social and technological affordances for sharing ideas and resources as well as implementing online discussions. However, although most faculty members were aware of the benefit Facebook in teaching and learning and they used a range of social media platforms for various personal and professional courses, they were reluctant to use it in the classroom (Inayati, 2015) Malang, Indonesia. She obtained her Master of Education from the University of Adelaide, Australia. She has published several textbooks and research papers, and presented in several conferences. Her research interest is in technology and independent learning in ELT. Social media technology (SMT. This could be due to availability of multiple social media platforms like Twitter, Instagram and others which can be used for the same purpose.

While studies have revealed usefulness of Facebook in both personal and academic arena, other studies have indicated possible negative effects of Facebook especially when it is overused (Brailovskaia, Margraf,

Schillack, & Kollner, 2019). The study of Rahman and Ahmed (2018) at Chitagong University, for instance, revealed that while female students spent more time on Facebook than males, significant correlations existed among Facebook use, Facebook addiction, and mental health. Particularly, Facebook use and addiction both negatively predicted the mental health. According to Nazzal, Rebee, Baara and Berte (2018), dependence on social media is suggested to diminish motivation to participate in naturally occurring activities and life interests, leading to physical and mental health risks. The study of Pantic (2014) further revealed that while prolonged use of social networking sites such as Facebook may be related to signs and symptoms of depression, the relationship between Social Network use and mental problems remains controversial. Therefore, the apparent diminishing motivation to participate in naturally occurring activities due to Facebook usage has triggered the present researchers to find out whether Facebook use affects students' mental health and learning engagement in traditional classrooms in the context of Indonesian universities. This study therefore, sought to establish the interrelationship between Facebook use, mental health and student engagement in the teaching and learning transaction. The researchers consulted various sources including journal articles and books to throw more light on the variables under investigation.

THE CONCEPT OF ENGAGEMENT IN LEARNING

One important learning outcome variables related to attributes of social networking services is engagement. Due to this, educational research has increasingly highlighted the importance of student engagement and its impact on student's retention and learning. Even though engagement is pivotal in learning effectiveness, it is difficult to provide a clear definition of it. Generally, engagement can be seen as the quality of a student connection or involvement with the endeavor of schooling and hence with the people (Skinner, Kindermann, and Furrer, (2009). Specifically, different authors have attempted to define the term in various ways. According to Nasional Survey of Student Engagement (2002), for instance, engagement can be referred to as the intersection of time and energy students devote to involve in productive learning activity. Newmann, Wehlage, and Lamborn (1992) in Martin and Boliger (2018) consider it as "the student's psychological investment in and effort directed toward learning, understanding or mastering the knowledge, skills, or crafts that academic work is intended to promote." The term is further regarded by Csikszentmihalyi (1990) in Taylor and Pearson (2011, p. 67) as "a growth-producing activity through which an individual allocates attention in active response to the environment." The current study considers it as the time and effort invested by students in participating in the moment, task, or learning activity.

Engagement is a key ingredient for learning effectiveness. This fact is built on a constructivism theory which states that the learner is a key person in the teaching and learning transactions (Ngussa and Ndiku, 2014). According to Taylor and Pearson (2011, p. 27), "student engagement has primarily and historically focused upon increasing achievement, positive behaviors and a sense of belonging in students so they might remain in school. Therefore, it is essential for teachers and administrators in higher learning institutions to ensure that students are highly engaged in the teaching and learning process to guarantee presence and maximized performance. Hart, Stewart and Jimerson (2011, p. 67) have it that "student engagement in school is an important construct that has been associated with student success." Furthermore, Martin and Boliger (2018, p. 205), add that "student engagement increases student satisfaction, enhances student motivation to learn, reduces the sense of isolation, and improves student performance in online courses."

Even though engagement is relatively diverse, the dimension of behavioural, emotional, and cognitive engagement is employed to measure the student's engagement in learning (Fredricks & McColskey, 2012). Behavioural engagement draws on the idea of participating and includes involvement in academic, social, or extracurricular activities. It is considered crucial for achieving positive academic outcomes. While emotional engagement focuses on the extent of positive and negative reactions to teachers, classmates, academic or school, cognitive engagement is the student's level of investment in learning. Indicators for behavioural engagement include directly observable attendance and participation in curricular and extracurricular tasks. Indicator for cognitive engagement includes asking questions for clarification of ideas, persistence in difficult activities, flexibility in problem-solving, use of learning strategies and use of self-regulation to support learning. The emotional engagement, on the other hand, includes indicators such as presence of interest and happiness and the absence of boredom, anxiety, and sadness, a sense of identification and belonging to

school, value school outcome and feelings as though the learners are supported by their peers and teachers (Alrashidi, Phan, & Ngu, 2016; Fredricks & McColskey, 2012).

Studies have indicated various factors that may be associated with students' engagement in learning. One of the most identified factors is mental health. According to Jonynien and Kern (2012) in Alhabees, Alsaida and Alhabees (2018), mental health is a state of psychological contentment, or the condition when there is no mental illness. It is the psychological state of someone who is functioning at a satisfactory level of emotional level and behavioural adjustment." This definition alone tells how mental health can be a determining factor in learning effectiveness whose prerequisite is engagement. When students are characterized with effective mental health, their rates of engagement in the teaching and learning process is likely to be maximized. According to Substance Abuse and Mental Health Services Administration (2005 and World Health Organization (2005) in Swaner (2007, p. 1), "like the concept of engaged learning, "mental health" and "well-being" … are broadly described in the literature as encompassing individuals' abilities to realize their potential, cope with stress, relate positively with others, make healthy decisions, and contribute to community." According to Suldo, Gormley, DuPaul and Anderson-Butcher (2013), while students' mental health and academic outcomes are different domains of functioning, they are closely interrelated. They particularly argue that despite most educators' primary focus on academic learning and indicators of achievement, attention to student mental health is highly needed because mental health affects academic outcomes, academic achievement affects mental health and therefore since the mission of schools involves developing competent citizens, a dual focus on mental health and academic outcomes is highly needed.

Apart from Mental health, availability, use and usefulness of modern technology can be another factor which may determine the rate of students' engagement in learning. This fact is based on the constructivism theory which holds that the more the learners are exposed to practical employment of teaching and learning resources, the more they get engaged in the teaching and learning process (Ngussa and Abel, 2017). Particularly, the use of social media platforms such as Facebook can be a specific factor that can enhance or hinder learners' engagement in the teaching and learning process. Particularly, while effective use of Facebook can support learning engagement, when Facebook is overused or misused, it may lead into students' disengagement in the learning process. The overuse of Facebook by learners brings about a likelihood of students getting exhausted as well as experiencing a situation of burning eyes, disturbed sleep and headache (Jha, Shah, Basnet, et al, 2016). While these conditions may cause absence from the classroom while the teaching and learning process takes place, the rate of engagement in learning can be negatively affected.

FACEBOOK USE AND LEARNING ENGAGEMENT

Social media networks have created conducive atmosphere for learning to take place beyond traditional classroom. According to Bahati (2015, p. 160), "when face-to-face lecture sessions and classroom seminars are conducted during hours and days that are not convenient to students, the level of student active engagement and participation is considerably reduced." In the contemporary time when online learning competes with traditional modalities of teaching and learning, which are basically characterized with physically attendance at the teaching-learning site, technology has played great deal in expanding avenues for studying without physical contact between the teacher and the learner. In this attempt, Facebook is one of most widely used social media platforms in day to day activities. It is the most popular social networking tool among university-aged youths and its popularity has suited it for educational purposes (Dheleai and Tasir, 2017). According to Eroglu (2016), while social networking sites are becoming one of the most frequently used online communication types in the world, Facebook is one of the commonly used social networking for teaching, learning and other activities.

Studies have indicated the power of Facebook on the life of modern young people. According to Debatin and Lovejoy (2009, p. 83), "student life without Facebook is almost unthinkable. Since its inception in 2004, this popular social network service has quickly become both a basic tool for and a mirror of social interaction, personal identity and network building among students." By July 2016, Facebook had more than 1.71 billion active users per month, with 1.1 billion log-ins every day. It has been estimated that the average American spends approximately 40 minutes per day on Facebook and approximately 50% of 18–24 year-olds visit Facebook as soon as they wake up (Chakraborty, 2016).

Studies have thrown light on the rate of Facebook usage for academic purposes. Jha, Shah, Basnet, et al (2016), for instance, investigated on Facebook use and its effects on the life of health science students in a private medical college of Nepal and came up with the findings that the main reason for using Facebook was to remain in contact with family and friend (32 %) while its use for the academic purpose was only 5 %. This suggests that the use Facebook use trend by university students is majorly on social networking rather than on learning. Further, while 80.8 % of students under investigation acknowledged ease in acquiring academic materials from others through Facebook, one-fourth of respondents indicated that they use Facebook late at night on a regular basis. Surprisingly, 4.2 % of respondents admitted accessing Facebook for personal issues during the classroom lectures when the teaching learning activities are taking place. This is one of potential negative effects of Facebook usage toward learning engagement.

According to Saleh, Abdul and Ameen (2017, p. 7597), while some students suffer from using Facebook because of being addicted to it, Facebook still occupies an important part of people's time and life due to the recent developments in the field of communication technologies." This implies that like any other social media platform, Facebook must have positive and negative effect on the users. According to Wanjohi, Mwebi and Nyang'ara (2015), the use of social media platforms, Facebook included, has a potential effect on the productivity of the users in their places of work, at schools and in the society. Most recent study findings by Murad, Gul, Changezi, Naz and Khan (2019) from undergraduate students of Quetta City indicate that Facebook has infiltrated the 21st-century generations of Internet users, making it a very active means of communications among students of higher education. Particularly, Facebook plays an important role in a student's daily life, thus having great impact on academic performance. Specific established positive effect of Facebook technology includes gaining a lot of information through it, easy communication with teachers and fellow learners as well as maximized interaction with learning peers.

Studies have further revealed the power of Facebook toward maximized engagement in learning. Findings of Dheleai and Tasir (2017), for instance, revealed that university students had positive views towards the use of Facebook for online interaction with peers. Specifically, the findings revealed a positive relationship between students' perceived online interaction via Facebook and academic performance. According to Moghavvemi, Sulaiman, Aziz and Way (2017), University students admitted to have used Facebook technology for entertainment, relaxing and passing time. They also affirmed that spending time on Facebook had a positive effect on their academic performance, thus, concluding that time spent on Facebook did not affect quality of their education.

On the contrary, other studies have revealed negative effect of Facebook usage on the learners. According to Jha, Shah, Basnet, et al (2016), negative effects of excessive Facebook usage includes burning eyes, disturbed sleep and headache. Apart from physical and mental effect, Facebook usage has other negative effect on academic performance. This is seen in findings of Rouis, Limayem and Salehi-Sangari (2011), who investigated on impact of Facebook usage on students 'academic achievement in the context of self-regulation and trust and came up with the findings that extensive use of Facebook by university students with extraverted personalities leads to poor academic performance. However, the study also revealed that students who are more self-regulated control their presence on Facebook more effectively, thus getting rid of possible detrimental effects from the platform. This suggests that the negative effect from Facebook usage depends on approaches employed on its use.

MENTAL HEALTH AND LEARNING ENGAGEMENT

Mental health is defined as a person's ability to endure stressful conditions by increasing productivity (Fusar-poli et al., 2019). Mental health management in a country is inseparable from government policies in supporting mental health services (Petrea et al., 2019). This has led nations to spend significant amount is their budgets to ensure mental health of citizens. In European countries, for instance, handling mental health is given a portion of the budget of 2.3% outside the research budget on mental health. Yet, study findings claim that funds for overcoming chronic mental health conditions in the countries for managing mental health disorders are still lacking (Castelpietra et al., 2020). This leads parents to get worried about status of mental health of their children in schools. Parents in Latin, for example, experience worries for their children aged 6-13 years with regard to their mental health. This is due to the difficulty they face in

identifying mental health problems in their children. On the other hand, those parents who are aware of the mental health problem, play an active role in seeking mental health services (Dixon De Silva, Ponting, Ramos, Cornejo Guevara, & Chavira, 2020).

Therefore, mental health study findings are essential for parents, who are key school stakeholders, for them to play their roles effectively in guiding and counseling their children in order to improve their mental health. Some examples of suggested techniques for improving mental health include mental health literacy, attitudes toward mental disorders, perception and self-values, cognitive skills, academic and work performance, emotion management, appropriate behavior, self-management strategies, social skills, appropriate family relationships, physical health, sexual health and meaningful of life (Fusar-poli et al., 2019). Other strategies in improving mental health in students include engage in physical activities and sports (deJonge, Omran, Faulkner, & Sabiston, 2020). It is also important to note that implementation of elective mental health courses positively improves the mental health of students especially in the aspect of self-confidence (Robinson, Maslo, McKeirnan, Kim, & Brand-Eubanks, 2020). Implications of Sexual Assault Referral Centers (SARCs) in the UK was also observed to have an impact on improving the mental health of victims of sexual violence (Brooker, Hughes, Lloyd-Evans, & Stefanidou (2019); (deJonge et al., 2020). Therefore, guidance and counseling regarding sex and sexuality have great deal in supporting mental health of the youths.

Further, the essence of studying mental health in relation to academic issue is in that conducting activities with a compulsion worsens a person's productivity, yielding to limited learning engagement (Lowe, 2020). Specifically, when appropriate mental health is lacking to learners in higher learning institutions, negative outcomes are likely to take place. A study of Lindow et al., (2020) indicates that unstable mental health may result into high number in suicides. This is further evidenced by study findings of Choo, Chew and Ho (2018) that when three years of medical records related to suicide attempters (N = 462) admitted to the emergency department of a large teaching hospital in Singapore were subjected to analysis, 25% were diagnosed with mental illness. Of these, 70.6% were females while 29.4% were males; National wise, 62.6% were from China, 15.4% were Malays and 16.0% were Indians. This suggests that mental health is a serious issue that cuts across demographic differences among students in higher learning institutions. It is also evidenced that mental health disorders can influence violence and crime cases in the society (Halle, Tzani-Pepelasi, Pylarinou, & Fumagalli, 2020). Therefore, it is essential to ensure that higher learning institutions become aware of factors that positively influence mental health and act accordingly to boost the students' mental health condition.

Study findings have mentioned several factors that affect mental health condition negatively. These include financial distress (Frankham, Richardson, & Maguire, 2020), failure to finish studies and graduate on time (Avendano, de Coulon, & Nafilyan, 2020), stress (Lowe, 2020), peer pressure from neighborhood (Wallace & Wang, 2020) and career adaptation (Xu et al., 2020). Likewise, other studies have indicated a close connection between mental health and the usage of social media platforms like Facebook. For instance, when students overspend their time into Facebook usage, they are likely to face mental illness something which may interfere with their engagement in learning. The study of Nisar, Prabhakar, Ilavarasan and Baabdullah (2019), for instance, was conducted using data collected through an online survey of 399 Facebook users in the UK, whereby a Facebook frequency rating scale was developed and validated as a part of the study. The findings indicate a negative relationship between active Facebook usage and mental health. Particularly, increased depressive symptoms were identified among active Facebook users. Similarly, the study of Hanprathet, Manwong, Khumsri, Yingyeun and Phanasathit (2015) found that Facebook addiction among high school students is associated with abnormal general mental health status, somatic symptoms, anxiety and insomnia, social dysfunction, and severe depression. With these findings, they recommended that relevant authorities must educate young people about the mental health impacts linked with Facebook addictive usage.

METHODOLOGY AND DESIGN OF THE RESEARCH

This section dealt with a research methodology that guided the study. It outlines the research design employed, population and sampling procedures, data collection method and procedures as well as validity and reliability of research instruments.

Research Design

The study employed descriptive correlational research design in the sense that the first three research questions simply described perception of respondents while the last research question sought to establish the interrelationships among variables under investigation. According to Mugenda and Mugenda (2003) descriptive design entails a systematic and empirical inquiry in which the researcher describes certain aspects and establishes how the independent variable affects the dependent variable.

Population, Sampling and Data Collection Method

One of the key limitations of the study was the fact that students under investigation would not be reached physically to fill the questionnaire due to the Corona Virus Pandemic which made it not possible to contact respondents physically.

Table 1. Demographic Characteristics of Respondents

SN	Category	Frequency	Percent
1.	**Gender of Respondents**		
	Males	50	19.8
	Females	203	80.2
	TOTAL	**253**	**100**
2.	**Study Level**		
	S1	241	95.3
	S2and 3	12	4.7
	TOTAL	**253**	**100**
3	Age of respondents		
	22 and below	221	87.4
	23 and above	32	12.6
	TOTAL	**253**	**100**
4	**Type of university**		
	State university	62	24.5
	Private university	191	75.5
	TOTAL	**253**	**100**
5	**Marital**		
	Single	233	92.1
	Married	20	7.9
	TOTAL	**253**	**100**
6	**Race**		
	Javanese	217	85.8
	Madurese	18	7.1
	Other	18	7.1
	TOTAL	**253**	**100**
7.	**Area of Study**		
	Exact Science	107	42.3
	Social Science	115	45.5
	Linguistics	31	12.3
	TOTAL	**253**	**100**

To overcome this threat, the questionnaire was sent online to potential respondents in selected universities to read and fill it. Out of 300 expected respondents, 253 managed to fill and return the questionnaire, thus the

response rate was 84.3%. Questionnaire was the only tool used to gather data from respondents. It was self-constructed by the researchers based on reviewed literature and studies. The questionnaire had two major sections namely demographic characteristics of respondents and descriptive section whereby respondents were to tick the most predetermined most correct perception. Description of questionnaire respondents by demographic characteristics appears in table 1.

In terms of gender, males were 50 (19.8%) while females were 203 (80.2%). Therefore, majority of respondents were females. By study level, S1 students were 241 (95.3%) while S2 and S3 were 12 (4.7%). Therefore, majority of respondents were S1 students. Respondents were also categorized according to their age groups. Those in the group of 22 years and below were 221 (87.4%) while those 23 and above were 32 (12.6%) meaning that majority of respondents were in the age of 22 years and below. As far as type of university is concerned, 62 (24.5%) came from State Universities while 191 (75.5%) came from Public Universities. Therefore, majority of respondents came from private universities. A total 0f 233 (92.1%) were single while 20 (7.9%) were married. Therefore, majority of respondents were single as compared to married counterparts. As far as race is concerned, 217 (85.8%) respondents were from the Javanese race while 18 (7.1%) came from the Madurese race and 18 (7.1%) came from other races. Therefore, majority of respondents came from the Javanese race. Finally, respondents were characterized according to area of study. In this demographic factor, 107 (42.3%) took exact science, 115 (45.2%) took social sciences while 31 (12.3%) took linguistics. Therefore, majority took social sciences.

Validity and Reliability

Prior to data analysis, the questionnaire was subjected to pilot testing to determine internal consistency of items. SPSS was used to calculate Cronbach's Alpha for each variable in the questionnaire and minimal acceptable reliability was 0.7.

Table 2. Reliability Test

SN	Variable in Question	Items	Cronbach's Alpha
1.	Facebook Use	9	.842
2.	Mental Health	11	.752
3.	Engagement in Learning	11	.759

As seen in Table 2, Cronbach's Alpha for Facebook use was .842, for mental health was .752 and for engagement in learning was .759 meaning internal consistency of items in the questionnaire was good enough.

DATA ANALYSIS AND RESULTS

Analysis of data included descriptive statistics and correlational analysis among the variables of interest. The descriptive analysis involved mean scores and standard deviations in various aspects while the correlational analysis, on the other hand, involved hypothesis testing to determine the interrelationships among variables under investigation.

Descriptive Analysis of Data

This section sought to establish perception of students on Facebook use for learning, mental health and engagement in learning. Students were required to respond by ticking most appropriate option in the questionnaire ranging from 4- strongly agree, 3- agree, 2- disagree and 1- strongly disagree. Scale of mean score interpretation was as follows: 3.50-4.00 = strongly agree, 2.50-3.49= agree, 1.50-2.49 = disagree and 1.00-1.49 = strongly disagree.

Research Question One: What is the perception of University students in Subaraya City on Facebook use for learning?

This research question sought to establish perception of students on the use of Facebook platform for learning. There were nine items in the questionnaire whereby students were to indicate their level of agreement or disagreement with particular statements. As observed in Table 3, mean score for the first three items in the questionnaire ranged between 2.50 and 3.49 which means agreement with the statement. Particularly, students generally agreed that they have Facebook accounts, they have many friends with whom they are connected through Facebook platform and that they possess devices that support the use of Facebook. This suggests that students in selected universities are well equipped with Facebook devices. This finding is in harmony with the Internet World State (2018) which describes Indonesia as the 4th country in the world with the highest Facebook user having 130 million users.

Table 3. Perception of Students on Facebook Use

SN	Item	Mean	Std. Dev	Interpretation
1.	I have a Facebook account	2.97	.63248	Agree
2.	I have many friends from Facebook	2.65	.75433	Agree
3.	I possess a devise that supports the use of Facebook	2.51	.57594	Agree
4.	Facebook is a valuable platform for effective learning	2.27	.58633	Disagree
5.	Facebook is one of major social media platforms to depend	2.17	.70246	Disagree
6.	I frequently log in Facebook whenever I am on my phone/ computer	2.08	.74869	Disagree
7.	I usually provide information via Facebook to support peer learning	1.88	.62502	Disagree
8.	I participate in the course-related peer discussion via Facebook.	1.86	.58902	Disagree
9.	I cannot finish a day without visiting Facebook	1.73	.70930	Disagree

However, mean score for the last six items in Table 3 was between 1.50 and 2.49 which denotes disagreement. Particularly, students disagreed that Facebook is a valuable platform for effective learning, that Facebook is one of major social media platforms to depend on and that they frequently log in Facebook whenever they are on their phones or related devices. Furthermore, they disagreed that they usually provide information via Facebook to support peer learning, that they participate in the course-related peer discussion via Facebook and that they cannot finish a day without visiting Facebook. Much as students were well equipped with gadgets for Facebook usage, they actually did not use the platform for the learning process. When asked to list type of social media platforms used in day to day life, the most frequently mentioned platform was Instagram (57.3%) followed by WhatsApp (28.5%), Twitter (7.1%), Facebook (5.1%) and others (2%). This finding is in harmony with that of Inayati (2015)Malang, Indonesia. She obtained her Master of Education from the University of Adelaide, Australia. She has published several textbooks and research papers, and presented in several conferences. Her research interest is in technology and independent learning in ELT. Social media technology (SMT that although most faculty members in Indonesia were aware of the benefit Facebook in teaching and learning, they are reluctant to use it in the classroom. Specifically, when they were asked to list the social media platforms used for learning, Google Classroom was the most frequently listed (50.6%) followed by WhatsApp (30.8%) and Zoom (18.6). Therefore, Facebook is not preferred platform for learning. Therefore, Facebook was not preferred by students for learning.

Research Question Two: What is the perception of University students in Subaraya City on their Mental Health?

The second research question sought to establish mental health of students under investigation as appears in Table 4. Information from the table indicates that mean score for the first two items ranged between 1.50

and 2.49 which denotes disagreement with the statements. Particularly, students disagreed that their minds are free from anxiety and that it is easy for them to cope up with stressful moments. Therefore, students under investigations were faced with anxiety and it was difficult for them to cope up with the anxiety they went through. This situation might be due to the Covid 19 outbreak which was seriously facing Indonesia during the time of data collection to the extent that educational institutions were closed, and students filled the questionnaire online.

Table 4. Perception of Students on their Mental Health

SN	Item	Mean	Std. Dev	Interpretation
1.	My mind if free from anxiety	2.42	.67229	Disagree
2.	It is easy for me to cope up with stressful moments	2.37	.65261	Disagree
3.	I normally feel calm and peaceful	2.62	.66391	Agree
4.	I rarely feel down, depressed, or hopeless.	2.67	.71206	Agree
5.	Under pressure, I stay focused and think clearly.	2.75	.64946	Agree
6.	I normally see the humorous side whenever faced with difficulties	2.85	.62230	Agree
7.	I am able to adapt when changes occur in my life	2.91	.54948	Agree
8.	Even when things look hopeless, I don't give up easily	3.07	.56596	Agree
9.	I am strong when dealing with life's challenges and difficulties	3.10	.53943	Agree
10.	I am not easily discouraged by failure	3.10	.54233	Agree
11.	I normally have interest and pleasure in doing things	3.18	.44381	Agree

While mental health disorders can influence violence and crime cases in the society (Halle et al., 2020), this situation calls for effective strategies to combat the anxious moments students went through. As suggested by deJonge, Omran, Faulkner and Sabiston (2020), experienced anxiety can be combated through various ways including active involvement in physical exercises as well as effective guidance and counseling. Therefore, the guidance and counseling experts from universities in Subaraya City should counsel students to engage into physical exercises while taking preventive measures against the Covid 19 which is a global pandemic.

However, it is worth noting that amid stressful moments students were going through, the mean score for the rest of items in Table four ranged between 2.50 and 3.49, suggesting agreement with the statements. Particularly, students agreed that they normally feel calm and peaceful. This suggests that their studying environments are supportive enough to create peaceful atmosphere for learning in spite of stressful moments. Furthermore, they agreed that they rarely feel down, depressed or hopeless and that when under pressure, they stay focused and think clearly. They also agreed that they normally see humorous side whenever faced with difficulties, they are able to adopt when changes occur in their lives and they don't give up easily even when things look helpless. Finally, they agreed that they are strong when dealing with life challenges and difficulties, they are not easily discouraged by failure and they normally have interest and pleasure in doing things.

Research Question Three: What is the perception of University students in Surabaya City on their engagement in learning?

While active engagement is a key factor for learning effective, the third research question sought to determine the extent to which learners got engaged in the learning process. There were eleven items in the questionnaire to which they had to show their level of agreement or disagreement. As observed in table 5, the mean score for all items ranged between 2.50 and 3.49 suggesting agreement with all the items. Particularly, students agreed that their minds concentrate in learning without any interference from Facebook.

Table 5. Students' Engagement in Learning

SN	Item	Mean	Std. Dev	Interpretation
1.	My mind concentrates in learning without interference from Facebook	2.69	.65938	Agree
2.	I take active role in extra-curricular activities at the university	2.72	.66123	Agree
3.	I actively participate in school activities like sports and game	2.73	.61632	Agree
4.	It is easy to concentrate during the teaching-learning session	2.77	.54974	Agree
5.	I am comfortable to stay in class while teaching - learning takes place	2.98	.45845	Agree
6.	When I'm in class, I participate in learning activities	2.99	.51561	Agree
7.	I actively engage in the teaching-learning process	3.01	.49986	Agree
8.	What I learn in class is interesting	3.03	.49443	Agree
9.	I pay undivided attention to what should take place in class	3.16	.49744	Agree
10.	I am able to control FB use not to interfere with studies in class	3.22	.81066	Agree
11.	I never check on Facebook while in class	3.35	.70223	Agree

They also agreed that they take role in extra-curricular activities at their respective universities and particularly in sports and games. Also it was easy for them to concentrate during the learning sessions. Furthermore, they agreed that they were comfortable to stay in class while teaching-learning takes place and actually they actively participated in the teaching and learning process. Finally, they agreed that what they learnt in class was interesting, they paid undivided attention to what should take place in classrooms, they were able to control FB use not to interfere with their studies and they never check on FB while in class. This means that while learning in classrooms, they are not tempted to open their devices to read Facebook notifications. The fact that students do not access Facebook during the teaching-learning session would also mean that Facebook is not used for teaching and learning. This finding is similar to that of Jha, Shah, Basnet, et al (2016), who investigated on Facebook use and its effects on the life of health science students in Nepal and found out that the main reason for using Facebook was to remain in contact with family and friend (32 %) while its use for the academic purpose was only 5 %.

Hypothesis Testing

This section dealt with hypothesis testing to determine the interrelationship among variables under investigation, it was deemed necessary to test null hypotheses which resulted from the next three research questions.

Research Question Four: Is there significant difference in Facebook use by students characterized according to gender and area of study?

Table 6. Facebook Use by Gender

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of FACEBOOKfactor is the same across categories of Gender.	Independent-Samples Mann-Whitney U Test	.054	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05

As observed in results of the first research question that Facebook was not a preferred platform for learning by students, it was necessary to test a hypothesis to determine Facebook use by students' gender and area of study. The question called for testing for a hypothesis which states: *There is no significant difference in Facebook use by students characterized according to gender and area of study.* Table 6 indicates the Independent Sample Mann-Whitney U Test with a Sig. of .54 which is greater than the critical value (.05) suggesting that the difference in the use of Facebook by Gender does not exist.

Table 7. Facebook Use by Area of Study

Area of Study	Mean Score	Sig.	Results
Linguistics and Social Sciences	2.26	.142	No significant difference
Exact Sciences	2.18		

Furthermore, Table 7 indicates the Independent Sample T- test with mean score of 2.26 for linguistics and Social Sciences and 2.81 for exact sciences and the Sig. of .142 which is greater than the critical value (.05), suggesting the difference in the use of Facebook by area of study happens by chance and therefore, not significant. Therefore, the null hypothesis is accepted that there is no significant difference in Facebook use by students characterized according to gender and area of study.

Research Question Five: Is there significant relationship between Facebook use, mental health and engagement in learning by university students in Surabaya City?

This research question called to testing a null hypothesis which states: *there is no significant relationship between Facebook use, mental health and engagement in learning by university students in Surabaya City.* The null hypothesis was tested through Pearson Product Moment Correlation Coefficient within the Statistical Package for Social Sciences. The strength of possible correlations was interpreted as follows: Greater or Equal to 0.7 = Strong Relationship; Greater or Equal to 0.5 = Moderate Relationship and lesser or Equal to 0.5 = Weak Relationship.

Table 8. Correlation among Variables

		Mental Health	Engagement	Facebook Use
Mental Health	Pearson Correlation	1	.394**	.212**
	Sig. (2-tailed)		.000	.001
	N	253	253	253
Engagement	Pearson Correlation	.394**	1	-.041
	Sig. (2-tailed)	.000		.514
	N	253	253	253
Facebook Use	Pearson Correlation	.212**	-.041	1
	Sig. (2-tailed)	.001	.514	
	N	253	253	253

**. Correlation is significant at the 0.01 level (2-tailed).

As seen in Table 8, there is a significant weak yet positive correlation between mental health and engagement in learning (r=.394, *p= .000).* The positive correlation means mental health positively influences the rate of students' engagement in learning. This finding is supported by existing literature and study findings. According to Jonynien and Kern (2012) in Alhabees, Alsaida and Alhabees (2018), mental health is a state of psychological contentment or the condition when there is no mental illness. It is a psychological state for learners to function at a satisfactory level of emotional and behavioral adjustment. This means mental health propels learners to function properly in various aspects including learning engagement. Therefore, the more the mental health, the more the engagement in the learning process.

Secondly, there is a significant weak yet positive correlation between Facebook usage and mental health (r=.212, *p= .001).* The positive correlation means Facebook usage positively influences mental health. This finding is contrary to findings of Nisar, Prabhakar, Ilavarasan and Baabdullah (2019) who conducted a similar study using data collected through an online survey of 399 Facebook users in the UK, where a negative relationship existed between active Facebook usage and mental health and increased depressive symptoms were identified among active Facebook users. While other studies like that of Hanprathet,

Manwong, Khumsri, Yingyeun and Phanasathit (2015) found that Facebook addiction is associated with abnormal general mental health, somatic symptoms, anxiety and insomnia, there is need for students to make use of Facebook moderately to avoid negative effects of the overuse of Facebook.

CONCLUSIONS AND RECOMMENDATIONS

This section comes up with conclusions and then gives corresponding recommendations to students, parents, educators and other education stakeholders with regard to Facebook use, mental health and engagement in learning.

Conclusions of the Study

The researchers came up with the following conclusions of the study: First, whereas students were well equipped with devices for Facebook, they had Facebook accounts and many friends with whom they are connected through platform, they did not consider Facebook as a valuable platform for effective learning. They neither provided information through Facebook to support peer learning nor did they participate in the course-related peer discussions through Facebook. There is no significant difference in use of Facebook by gender and areas of study. Students' most preferred social media platforms for learning include Google classroom (50.6%), WhatsApp Group (30.8%) and Zoom (18.6%) in order of preference.

Secondly, students experienced anxiety and it was not easy not for them to cope up with stressful moments they went through. This might be due to the Covid 19 outbreak which was seriously facing Indonesia during the time of data collection. Yet they felt calm and peaceful, they stayed focused, thought clearly and saw humorous side whenever faced with difficulties.

Thirdly, students concentrated in learning without any interference from Facebook. They took active role in extra-curricular activities and engaged in sports and games. They were comfortable to stay in class while teaching-learning took place and therefore were highly engaged in the learning process. They considered what they learnt in class interesting and paid undivided attention to what took place in classrooms.

Lastly, there is a significant weak yet positive correlation between mental health and engagement in learning and between Facebook use and mental health. Therefore, mental health influences the rate of students' engagement in learning positively while Facebook use enhances mental health.

Recommendations of the Study

Based on conclusions above, the researchers came up with the following recommendations to students, parents and other education stakeholders:

First, educators in higher learning institutions, especially in Surabaya City, should make good use of Google Classroom, WhatsApp and Zoom to support students' engagement in learning especially during this critical time for Global Covid 19 pandemic when online learning is needed than ever before. Facebook can be used as an alternative instructional media for those students who may prefer using it for learning. There is need to encourage students to frequently and actively participate in sports and games for them to overcome stressful moments they go through. Furthermore, face to face or online guidance and counseling are highly needed to help those students who go through critical stressful moments for them to come back to their normal health conditions and proceed with active engagement in learning.

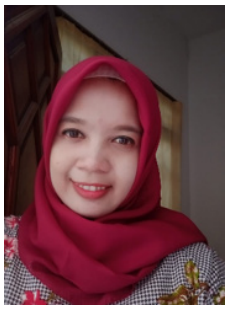
In addition, educators should take advantage of students' readiness to actively engage in the teaching-learning processes by introducing alternative social media platforms for enhancement of learning engagement as revealed by de Paulo, Sinatra, Monacis, Di Bitonto, Roselli (2012) who advocated for the efficacy of the adaptation of learning contents to students' cognitive style in an e-learning setting, centrally to what happens routinely, and Bitonto, Roselli, Rossano, Sinatra (2009) who believed in customizing learning paths according to user preferences based on the fact that individuals learn best when information is presented in ways that are congruent with learners' preference.

Finally, University administration teams, educators and parents should work together to enhance mental health education and support to increase rates of students' engagement in learning. Furthermore, there is need to encourage students to get connected with friends and peer learners through Facebook and other social media platforms as engagement in such improves mental health.

BIODATA and CONTACT ADDRESSES of AUTHORS

Dr. Baraka Manjale NGUSSA, PhD, is an Associate Professor of Curriculum and Teaching at the University of Arusha in Tanzania. He completed his PhD in Education (Curriculum and Teaching) from the University of Eastern Africa Baraton in Kenya in 2016. He has a wide experience in teaching, publication and research supervision. He has authored over 50 publications including books, journal articles encyclopedia articles and book chapters. His research areas includes curriculum and teaching, educational management and leadership as well as research in higher education. He is an external examiner of University of South Africa and University of Eastern Africa Baraton, Kenya.

Baraka Manjale NGUSSA
Department of Curriculum and Teaching, School of Education, University of Arusha.
Address: P. O. Box 7 Usa River, Arusha, Tanzania
Phone: +255753889912
E-mail: ngussathe5th@gmail.com



Fifi Khoirul FITRIYAH, is a lecturer at the Faculty of Teacher Training and Education, Universitas Nahdlatul Ulama Surabaya. She gained her Master Degree in Department of Guidance and Counseling, Universitas Pendidikan Indonesia in 2014. She is currently working on Ph.D program at the Department of Guidance and Counseling, Universitas Negeri Malang, Indonesia. Her academic interest areas are cultural counseling, mental health, learning and education. She has more than 19 articles published in national and international journals with reputable indexing.

Fifi Khoirul FITRIYAH
Department of Early Childhood Education, Faculty of Teacher Training and Education
Address: UNUSA Kampus B, Jl. Raya Jemursari No.57, Jemur Wonosari, Kec. Wonocolo, 60237, Surabaya, Indonesia
Phone: +62 81312294102
E-mail: fifi@unusa.ac.id

Syaiputra Wahyuda Meisa DININGRAT, is a lecturer in the Department of Islamic Early Childhood Education, STIT Al-Ibrohimy Bangkalan, Indonesia. He received his Master in Educational Technology from Universitas Negeri Surabaya at September, 2016. His main research areas of interest are Issues in Technology-Enhanced Learning, Online Learning, Flipped Classroom and Instructional Design. Syaiputra Wahyuda Meisa Diningrat Has been teaching instructional technology for early childhood learners for the last5 years. He has more than 3 articles published in international journals. He is currently pursuing his PhD in Instructional Technology which has strong focus in computational thinking, flipped classroom, and instructional videos.

Syaiputra Wahyuda Meisa DININGRAT
Department of Islamic Early Childhood Education
Address: STIT Al-Ibrohimy Bangkalan,
Jl. Raya Galis No.03 Galis, Bangkalan, East Java 69173, Indonesia
Phone: 0823-3147-4019
E-mail: syaiputradiningrat@stital.ac.id

REFERENCES

Alhabees, F. A., Alsaida, K. A. and Alhabees, K. A. M. (2018). Levels of Mental Health among University Students: A Comparative Study Between Public and Private University. Journal of Education and Practice 9(10), 39-44.

Al-Khalifa, H. S., & Garcia, R. A. (2013). The State of Social Media in Saudi Arabia's Higher Education. *International Journal of Technology and Educational Marketing*, *3*(1), 65–76. https://doi.org/10.4018/ijtem.2013010105

Al-rahmi, W. M. (2013). The Impact of Social Media use on Academic Performance among university students : A Pilot Study. *Journal Of Information Systems Research and Innovation*, (July 2017), 1–10. https://doi.org/http://seminar.utmspace.edu.my/jisri/

Alrashidi, O., Phan, H. P., & Ngu, B. H. (2016). Academic Engagement: An Overview of Its Definitions, Dimensions, and Major Conceptualisations. *International Education Studies*, *9*(12), 41. https://doi.org/10.5539/ies.v9n12p41

Avendano, M., de Coulon, A., & Nafilyan, V. (2020). Does longer compulsory schooling affect mental health? Evidence from a British reform. *Journal of Public Economics*, *183*, 104137. https://doi.org/10.1016/j.jpubeco.2020.104137

Baggaley, J. (2012). Harmonizing global education: From Genghis Khan to Facebook. *Harmonizing Global Education: From Genghis Khan to Facebook*, (October), 1–197. https://doi.org/10.4324/9780203817636

Brailovskaia, J., Margraf, J., Schillack, H., & Kollner, V. (2019). Comparing mental health of Facebook users and Facebook non-users in an inpatient sample in Germany. *Journal of Affective Disorders*, *259*(April), 376–381. https://doi.org/10.1016/j.jad.2019.08.078

Bitonto, D., Roselli, T., Rossano, V., Sinatra, M. (2009). Adaptive learning using SCORM compliant resources. International Conference on Distributed Multimedia Systems. From https://www.researchgate.net/search.Search.html?type=publication&query=Adaptive%20 learning%20using%20SCORM%20compliant%20resources.

Brooker, C., Hughes, E., Lloyd-Evans, B., & Stefanidou, T. (2019). Mental health pathways from a sexual assault centre: A review of the literature. *Journal of Forensic and Legal Medicine*, *68*(August), 101862. https://doi.org/10.1016/j.jflm.2019.101862

Burges, S. and Sievertses, H. H. (2020). Schools, skills, and learning: The impact of COVID-19 on education. Retrieved on April 5. 2020 from https://voxeu.org/article/impact-covid-19-education

Castelpietra, G., Nicotra, A., Pischiutta, L., Gutierrez-Colosía, M. R., Haro, J. M., & Salvador-Carulla, L. (2020). The new Horizon Europe programme 2021–2028: Should the gap between the burden of mental disorders and the funding of mental health research be filled? *European Journal of Psychiatry*, *34*(1), 44–46. https://doi.org/10.1016/j.ejpsy.2019.12.001

deJonge, M. L., Omran, J., Faulkner, G. E., & Sabiston, C. M. (2020). University students' and clinicians' beliefs and attitudes towards physical activity for mental health. *Mental Health and Physical Activity*, *18*(December 2019), 100316. https://doi.org/10.1016/j.mhpa.2019.100316

de Paulo, V., Sinatra, M., Monacis, G., Di Bitonto, P., Roselli, T, (2012). How cognitive styles affect the e-learning process. 12th IEEE International Conference on Advanced Learning Technologies. From https://ieeexplore.ieee.org/document/6268119

Dixon De Silva, L. E., Ponting, C., Ramos, G., Cornejo Guevara, M. V., & Chavira, D. A. (2020). Urban Latinx parents' attitudes towards mental health: Mental health literacy and service use. *Children and Youth Services Review*, *109*, 104719. https://doi.org/10.1016/j.childyouth.2019.104719

Frankham, C., Richardson, T., & Maguire, N. (2020). Psychological factors associated with financial hardship and mental health: A systematic review. *Clinical Psychology Review*, *77*, 101832. https://doi.org/10.1016/j.cpr.2020.101832

Fredricks, J., & McColskey, W. (2012). The Measurement of Student Engagement: A Comparative Analysis of Various Methods and Student Self-report Instruments. In *Handbook of Research on Student Engagement*. https://doi.org/10.1007/978-1-4614-2018-7

Fusar-poli, P., Salazar, G., Pablo, D., Micheli, A. De, Nieman, D. H., Correll, C. U., … Amelsvoort, T. Van. (2019). What is good mental health ? A scoping review. *European Neuropsychopharmacology*, 1–14. https://doi.org/10.1016/j.euroneuro.2019.12.105

Halle, C., Tzani-Pepelasi, C., Pylarinou, N. R., & Fumagalli, A. (2020). The link between mental health, crime and violence. *New Ideas in Psychology*, *58*(December 2019), 100779. https://doi.org/10.1016/j.newideapsych.2020.100779

Hart, S., Stewart, K., Jimson, S. R. (2011). The Student Engagement in Schools Questionnaire (SESQ) and the Teacher Engagement Report Form-New (TERF-N): Examining the Preliminary Evidence. *Contemporary School Psychology 2011(15), 67-79.*

Inayati, N. (2015). English language teachers' use of social media technology in Indonesian higher education context. *Asian EFL Journal*, *17*(4), 6–36.

Lenandlar, S. (2013). Guided assessment or open discourse: A comparative analysis of students interaction on facebook groups. *Turkish Online Journal of Distance Education*, *14*(1), 35–43.

Lim, T. (2010). The use of facebook for online discussions among distance learners. *Turkish Online Journal of Distance Education*, *11*(4), 72–81. https://doi.org/10.17718/tojde.17195

Lindow, J. C., Hughes, J. L., South, C., Minhajuddin, A., Gutierrez, L., Bannister, E., … Byerly, M. J. (2020). The Youth Aware of Mental Health Intervention: Impact on Help Seeking, Mental Health Knowledge, and Stigma in U.S. Adolescents. *Journal of Adolescent Health*. https://doi.org/10.1016/j.jadohealth.2020.01.006

Lowe, J. (2020). Social Science & Medicine Power , powerlessness and the politics of mobility : Reconsidering mental health geographies. *Social Science & Medicine*, *252*(October 2019). https://doi.org/10.1016/j.socscimed.2020.112918

Martin, F. and Boliger, D. U. (2018). Engagement Matters: Perceptions on the importance of engagement strategies in the Online learning Environment. Online Learning Journal 22(1), 205-222.

Mirembe, D. P., Lubega, J. T., & Kibukamusoke, M. (2020). Leveraging Social Media in Higher Education: A Case of Universities in Uganda. *European Journal of Open, Distance and E-Learning*, *22*(1), 70–84. https://doi.org/10.2478/eurodl-2019-0005

Ngussa, B. M., and Abel, C. (2017). Significance and adequacy of instructional media as perceived by primary school pupils and teachers in Kinondoni District, Tanzania. International Journal of Educational Policy Research and Review, *4* (6), 151-157.

Ngussa, B. M., and Ndiku, L.M (2014). Constructivism Experiences in Teaching-Learning Transaction among Adventist Secondary Schools in South Nyanza, Tanzania. American Journal of Educational Research 2(11A), 1-7.

Nasional Survey of Student Engagement. (2002). *From promise to progress: How colleges and universities are using student engagement results to improve collegiate quality*. Blomington: Indiana University, Center for Postsecodndary research and planning.

Patahuddin, S. M., Rokhmah, S., & Lowrie, T. (2020). Indonesian Mathematics Teachers' and Educators' Perspectives on Social Media Platforms: The Case of Educational Facebook Groups. *The Asia-Pacific Education Researcher*. https://doi.org/10.1007/s40299-020-00503-3

Petrea, I., Shields-zeeman, L., Keet, R., Nica, R., Kraan, K., Chihai, J., … Consortium, M. (2019). Mental health system reform in Moldova: description of the program and reflections on its implementation between 2014 and 2019. *Health Policy*. https://doi.org/10.1016/j.healthpol.2019.11.007

Rafidiyah, D; Bayeck, R. Y. (2016). *Social Media in English Teaching for Higher Education: The Case of Indonesia*. (March 2016).

Rahman, A., and Ahmed, O. (2018). Facebook Use, Facebook Addiction and Mental Health of Chittagong University Students**.** *Bulgarian Journal of Science and Education Policy (BJSEP) 12(2), 345-358.*

Robinson, J. D., Maslo, T. E., McKeirnan, K. C., Kim, A. P., & Brand-Eubanks, D. C. (2020). The impact of a mental health course elective on student pharmacist attitudes. *Currents in Pharmacy Teaching and Learning*. https://doi.org/https://doi.org/10.1016/j.cptl.2020.02.011

Sharma, S. K., Joshi, A., & Sharma, H. (2016). A multi-analytical approach to predict the Facebook usage in higher education. *Computers in Human Behavior*, *55*, 340–353. https://doi.org/10.1016/j.chb.2015.09.020

Skinner, E. A., Kindermann, T. A., & Furrer, C. J. (2009). A Motivational Perspective on Engagement and Disaffection. *Educational and Psychological Measurement*, *69*(3), 493–525. https://doi.org/10.1177/0013164408323233

Taylor, L. and Pearson, J. (2011). Improving Student Engagement. *Current Issues in Education*, 14(1)1-34.

Wallace, D., & Wang, X. (2020). SSM - Population Health Does in-prison physical and mental health impact recidivism ? *SSM - Population Health*, *11*, 100569. https://doi.org/10.1016/j.ssmph.2020.100569

Xu, C., Gong, X., Fu, W., Xu, Y., Xu, H., Chen, W., & Li, M. (2020). The role of career adaptability and resilience in mental health problems in Chinese adolescents. *Children and Youth Services Review*, *112*, 104893. https://doi.org/10.1016/j.childyouth.2020.104893

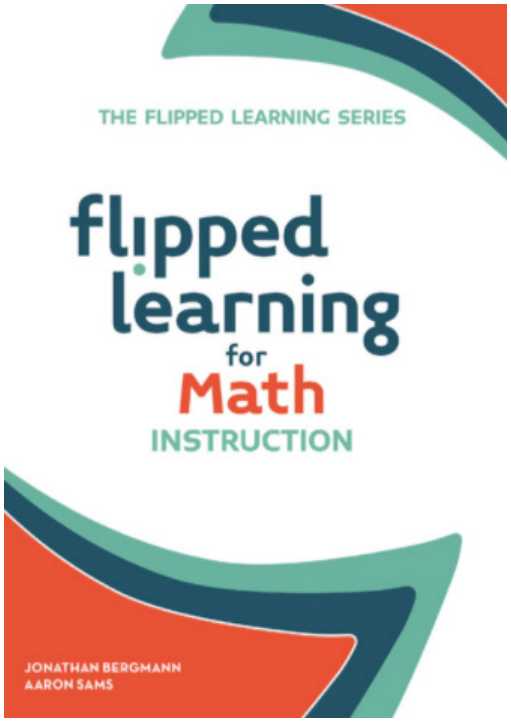
BOOK REVIEW

THE FLIPPED LEARNING SERIES: FLIPPED LEARNING FOR MATH INSTRUCTION

Written By Jonathan Bergmann and Aaron Sams

Monalisa DASH
ORCID: 0000-0003-2537-3404
Brajrajnagar College
Sambalpur University
Odisha, INDIA

ISBN	9781564843609 (paperback) 9781564845016 (e-book)
Publication Date	2015
Publication Formats	Print Book, e-book
Publisher	International Society for Technology in Education, USA



INTRODUCTION

Active learning as a meta-strategy of meaningful learning is an essential ingredient for the effective learning of students as it actively engages the students, enhances interactivity and encourages them to acquire the knowledge with reason. It can impact the way the students receive, process and assimilate the information disseminated to them by utilizing their cognitive skills of understanding, analyzing, evaluating and creating, thereby constructing their own knowledge. Thus in such a situation the role of teachers happens to experience a profound transformation from being merely the "disseminators of content" to "facilitators of learning" which is rather easily said than done. In most of the cases it is found that the teachers are unable to culminate into the so called "facilitators of learning" as they need to finish the bulky syllabus in a stipulated time. In order to achieve the predetermined syllabus and the students being the novices, 58% of the classroom time is spent in interacting with the new content, 36% is used for practicing the content and just 6% is utilized for cognitively complex work (Marzano & Toth, 2014). These figures need to be changed especially in a mathematics classroom where students need to learn the varied ways to apply math in the real world rather than just knowing the computation. But how do math teachers transform themselves into "facilitators of learning" thereby creating a deeper learning environment in their classrooms?

REVIEW OF THE BOOK

The book, Flipped Learning for Math Instruction addresses this crucial issue of creation of a deeper learning environment in classrooms by advocating "Flipped learning" as a meta- strategy that can assist in reinventing the classroom time and practically accommodating active learning into the math classroom thereby producing more meaningful learning. Flipped learning can be defined as a subset of blended learning where

the students watch video lessons at home and come prepared for the higher order cognitive activities to be carried out in the classroom. Authored by Jon Bergmann and Aaron Sams, this book is a part of the Flipped Learning series that was essentially designed for the teachers of different subjects and grade level. It describes the flipped learning approach to be used for math instruction by proceeding from whole to parts approach with a plethora of experiences provided by the real math teachers using flipped learning in the real math classrooms. The authors being the pioneers of flipped learning believe that the flipped learning is not just a time shift but its focal point is active learning thereby placing teachers as facilitators of learning. The book deals with the varied ways to flip a math class, overcome the barriers of the flipped classroom, develop lesson plans, utilize the face-to-face class time, integrate projects, inquiry and mastery model and familiarize the teachers with the different math resources used in flipping.

The primary objective of the book is to capture the process of flipped learning that can be specifically utilized for various topics in a math classroom. The second objective is to vehemently recommend flipped learning in conjunction with numerous constructivist approaches to promote a culture of inquiry among the math students in the school. The authors believe that the flipped learning not only has a positive effect in the lives of the students by transforming their learning environment but also has a deep impact on the professional lives of the teachers by altering their teaching practices to suit their unique contexts.

The book is comprised of ten chapters. The first chapter defines the term flipped learning, provides an array of benefits driven out of flipped learning that ultimately guides us to the reasons behind flipping, the best way to utilize face-to face classroom time and brings out the differences between a flipped class and flipped learning. The second chapter highlights the four major hurdles to flipping namely flipping ones thinking, technological barriers, finding time and training parents, students and at the most oneself and it even suggests some ways to overcome them. The third chapter illustrates the approaches to plan a unit for the flipped classroom, maximize student engagement and manage chaos. The fourth chapter deals with incorporation of interactive math resources in flipped learning like use of math manipulatives, interactive simulations and tools and student- created content. The fifth chapter thoughtfully explores traditional resources that can help teacher to complement their instructional videos. All the more it presents the idea of giving a choice to students to consume information in multiple modalities that in turn helps to increase their engagement. The sixth chapter focuses on the various strategies to maximize the face- to- face class time so that students develop a deeper understanding of the concept and truly learn math. These may include activities where solving worksheets and practice lie on one side of the continuum and the other side of the continuum involves higher-order cognitive activities. The seventh chapter explains how to successfully move from a flipped class 101 to a flipped mastery learning environment in math by providing two exemplary examples wherein successful implementations of the flipped- mastery model have been initiated by the math teachers. The eighth chapter suggests various ways to adapt the flipped learning model in order to merge it with an inquiry- based approach to learning. The ninth chapter showcases the initiatives of two math teachers to substantiate the idea that the flipped videos support projects and project based learning in the math classroom. Finally in the tenth chapter the authors arrive at a conclusion that this book should be regarded as a guide for the math teachers and also warn that instead of replicating everything in this book, the teachers should adopt practices most appropriate to their teaching contexts. The authors suggest some action steps to start flipping their math class and encourage the teachers to use constructive approaches to learning in conjunction with flipped learning.

The most significant contribution of the book is the innovative way it suggests for reaching out each and every student by optimally utilizing the class time and that too without compromising with the predetermined syllabus thereby empowering the teachers. This atypical method of teaching, promises to practically accommodate all the active learning strategies that makes the adoption of constructivism pedagogy in a classroom a reality. Moreover this flipped learning approach seems to be the best fit for the students of the information rich world where the content pertinent to their syllabus is readily available in the form of text, video or audio and helps to recuperate the class time for other higher order learning tasks. Thus it serves dual purpose of having a deep impact upon the professional development of the teachers and enabling the students attain indepth knowledge at one go.

Through the narrative accounts of real math teachers, the authors shed light on how flipped learning is possible in every math classroom in multiple ways. By presenting the valuable insights into the process of flipped learning and impact on their teaching practice it empowers the math teachers to transform their

classrooms by improving their teaching practice. Right from developing the lesson plans to the assessment of the students the book has successfully captured the process of flipping the classroom. Authors have also attempted to elaborate the process of flipping through several instances like Julie Schell's steps for peer instruction, Graham Johnson's flipped mastery class insights and Adam Johnson's guided enquiry process.

The anecdotal benefits of the flipped learning cited in the book by the math flippers presented by the authors make it quite compelling for the math teachers to start flipping their classes. For example the authors said about a 5-6th grade math teacher, Enoch Ng -

He was frustrated as he was unable to help his struggling and advanced students. The only students he felt he was reaching were a few in the middle…….As he began to implement flipped learning, he realized that there was a way to help the vast majority of his students……Enoch is now able to meet the needs of all his students. (p.4)

Another math teacher, Adam Johnson admits that after flipping his classes with efficacy he discovered an array of benefits like the model enhanced his students' engagement, increased individualization, inculcated a culture of learning, provided him more time to help his struggling students, fostered a positive cognitive dissonance and made the school transparent. One of the teachers Graham Johnson who indulges in flipped mastery points out that he earlier feared that flipped learning would reduce the time to let him know his students yet he was amazed to find out that instead flipped learning build better teacher-student connections as he could not only recognize and diagnose the learning challenges of his students but also helped them to overcome them. The Algebros of Defense School in Germany commented that before implementing flipped learning they found it difficult to meet the needs of individual student as their school received new students at any time round the year thereby making the classes heterogeneous but flipped mastery class rescued them by creating rich and individualized environment. Again, a K-12 teacher Ben Rimes used video story problems in his flipped classroom and was able to make connection of mathematics with the real world that was truly beneficial for students.

This book is indispensible for neo- flippers in math instruction as it explores the practical ways to integrate flipped learning in their real classrooms by incorporating the resources for aid. The resources enlisted in the book for example Math Manipulatives like National Library of Virtual Manipulatives; Interactive Simulations like Geogebra, Desmos, PHET Interactive Simulations, Explore Learning Gizmos and Student-Created Content like videos created by the students on their own, all encourage the teachers to get started with the flipped learning by utilizing the ready to use resources.

Apart from process and product, the book also discusses the four major hurdles to flipping namely mentally getting prepared for flipping, technological barriers, finding the time, training oneself, students and parents and even suggests some definite practical ways to overcome these hurdles. Indeed it has all the essential ingredients that a neo- flipper needs to get started.

While the book has several strengths yet at times it is disappointing for the readers. The authors often suggest referring to their previous books for instances

There are many other benefits, which we have chronicled in our aforementioned previous books. (pg.6)…..We chronicle this transformation well in our book Flipped Learning: Gateway to Student Engagement.(pg.8)….. We encourage you to read the second half of our first book, Flip Your Classroom, and read Flipped Learning… (pg.73)….Pick up a copy of Flip Your Classroom and the accompanying workbook.(pg.91)

These statements reflect as if the authors are self advertising their books. This also suggests that this book is incomplete and not a stand alone.

The audience of the book as stated in the back covers namely the Grade 5- 12 math teachers and curriculum specialists may not be comfortable implementing the flipped learning for two reasons. First it would have been wise to provide the list of successful flippers in the appendix which would have eased the process of finding them at the back rather than searching for them in the book. Moreover websites, blogs or contacts of the persons indulged in flipped learning is vital for the neo-flippers because in case they get stuck during flipping they could approach those experienced flippers who have already implemented Flipped Learning and are more familiar with the process and pros and cons of this approach. Secondly, flipped learning guidelines and templates helpful for better implementation of flipped learning in the real classrooms are missing in the appendix.

This flipped learning method may not seem appealing to the math teachers who are not tech savvy as the entire book discusses about flipped learning as a pedagogical concept having a technological input. Whether it is about developing lesson plans or teaching aids, out-class activities, in-class activities or assessments the book gives a multitude of references of links, software or technological tools which can put the math teachers following traditional methods of teaching in dilemma to whether or not initiate flipped learning in their context. Though the book mentions about the use of traditional resources like the use of textbook but fails to demonstrate the proper strategies to incorporate it into the classroom teaching. Moreover it stresses the teachers on creating video lessons of their own which many may not find comfortable as there is no proper guidelines as how to initiate the process.

The book lacks a strong theoretic stance and very scarce empirical evidences are cited which can altogether create a skeptical attitude among the math teachers towards the flipped learning approach. Moreover some questions still remain unanswered like what should one do in case the students don't watch the video? or If the students don't have access to technology at home? These are indeed the most pertinent and essential doubts that the neophytes need to come prepared with before they start flipping their classes.

CONCLUSION

In the information rich world of twenty- first century where a teacher needs to be transformed into a facilitator of learning, flipped learning can truly serve the purpose. The book is a pioneering work in flipped learning and a first of its kind in flipped learning for mathematics. The information provided in this book about flipped learning motivates and guides the math teachers, both in-service and pre-service, NGOs in education and curriculum experts by familiarizing them with the fundamentals of a flipped math classroom with several real life experiences of the math teachers. It redefines the position of teachers from being mere "disseminators of information" to "facilitators of learning" in real sense.

BIODATA and CONTACT ADDRESSES of AUTHOR

Monalisa DASH is a Lecturer in Education at Brajrajnagar College, Sambalpur University, India. Ms. Dash received her Master's in Education from Regional Institute of Education, Bhubaneswar, NCERT, Utkal University. Her research focuses on integrating Information and Communication Technologies in K12 settings to enhance Highet Order Thinking Skills in students. Additional areas of research include online learning, distance learning and instructional technology.

Monalisa DASH
Brajrajnagar College
Address: Sambalpur University, Brajrajnagar, Jharsuguda- 768216, Odisha, India
Phone: +919776290131
Email: monalisa.pihu@gmail.com

REFERENCES

Begmann, J., & Sams, A. (2015). *The Flipped Learning Series: Flipped Learning for Math Instruction*. Eugene, OR: International Society for Technology in Education.

Marzano, R., & Toth, M. (2014, March). *Teaching for rigor: A call for a critical instructional shift*. Retrieved from https://eohighschool.com/wp-content/uploads/MC05-01-Teaching-for-Rigor-Paper-05-20-14-Digital-1-1.pdf

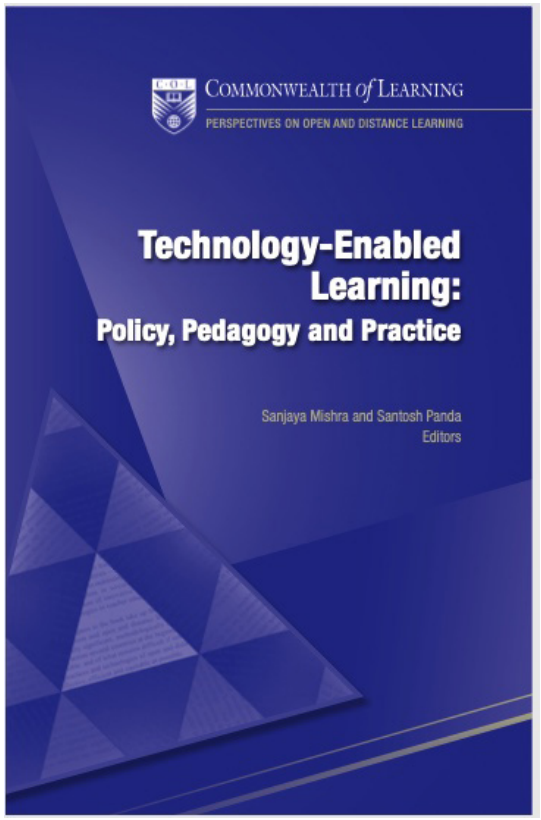
BOOK REVIEW

TECHNOLOGY-ENABLED LEARNING: POLICY, PEDAGOGY AND PRACTICE

Edited By Sanjaya MISHRA and Santosh PANDA

Aysun GUNES
ORCID: 0000-0002-4152-6768
School of Foreign Languages
Anadolu University
Eskisehir, TURKEY

ISBN	978-1-894975-98-8
Publication Date	2020
Publication Formats	Print Book, PDF
Publisher	Commonwealth of Learning



"Today, it is no longer valid to ask whether we need the assistance of technology for teaching, learning, and development. What is more important is to apply Technology Enabled Learning (TEL) in the context of specific needs and ask questions about how to improve its effect/impact."

Sanjaya Mishra & Santosh Panda
(From the Prologue of the book)

INTRODUCTION

As Asha Kanwar, the president and the chief executive officer of the Commonwealth of Learning (COL), stated in the acknowledgments part of the book "This book comes at an unprecedented moment in history when the COVID-19 pandemic has disrupted every sphere of activity". As is known, the COVID-19 pandemic forced governments to make a quick transition to distance and online learning. Immediately after the transition, many problems arose, and also there were many solutions proposed and adapted. Responding to the COVID-19 context, this book strongly argues for the importance of policies and the reimagination of education to take full advantage of open and distance learning (OER) and Information and Communication Technologies (ICT).

REVIEW OF THE BOOK

This book is written to document the positive outcomes of the interventions supported by the Commonwealth of Learning and the main objective of this book is to share the lessons learned with the best practices that can be used in ICT integration in teaching and learning. To help improve youth employability and entrepreneurship, Commonwealth of Learning started to develop advanced ICT skills courses. To achieve this aim, Commonwealth of Learning collaborated with several educational institutions and this collaboration

resulted in 26 advanced ICT skills courses and over 70,000 downloads of these courses were observed. The lessons learnt from such initiatives and also the best practices on ICT integration in teaching and learning are highlighted in this book.

The focus point of the book is "Technology Enabled Learning". In the book the term was defined as the "application of some form of digital technology to teaching and/or learning in an educational context" (Kirkwood & Price, 2016, p.1). The enabling nature of technology is underlined in the term rather than using the term's well-known equivalent, technology-enhanced learning. The book was divided into 15 chapters and 3 main sections. These sections are:

1. ICT in Education: Policy and National Development

In this section, there are two chapters and the section itself focuses on the ICT policies. In this section, while Chapter 2 is giving a road map for ICT in education, and also. In this chapter three main approaches to technology are given. These are:

1. learning from technology,
2. learning in technology, and
3. learning with technology.

The chapter also focuses on some emerging technologies such as blockchain and wearable technologies. In Chapter 3 readers can find a critical analysis of OER policies of selected nations and institutions. Especially after the COVID-19 pandemic the importance of ICT and OER are underlined in this chapter and the reimagination of education is strongly argued.

2. Technology-Enabled Learning Strategies and Implementation: Case Studies

In this section, there are five case studies and these chapters focus on the Technology Enabled Learning (TEL) strategies and implementations. All of the given case studies give the readers the chance to analyze the different implementations of blended learning and technology-changed environments. Also, the last two chapters in this section focus on learner engagement and also capacity building to help teachers continue their professional development in different parts of the Commonwealth Countries. Mentoring and effective workshops and their positive results in the learning and teaching processes are underlined.

3. Technology-Enabled Learning: Research and Evaluation

The last section is on the scrutinized research and their evaluation on Technology-Enabled Learning (TEL). In the prologue of the book, they stated that they used the word Technology Enabled Learning deliberately rather than using technology-enhanced learning. They explain their reason by saying: "*The phrase* "technology-enhanced *learning" was deliberately avoided (cf. Chapter 16), as we wanted to emphasize the enabling nature of* the *technology that supports student learning in different ways, including the provision of access to those who previously had no access to learning opportunities and also those who are studying on campus."*

In the last section, Chapters 9, 10, and 11 focus on the design and implementation, methodological challenges, and the evaluation of Technology Enabled Learning. For example, in Chapter 10, the implementation of TELMOOC (Introduction to Technology Enabled Leaning MOOC) was observed and the progress of the MOOC itself (the 4th offering of the MOOC reached more than 2400 participant from 34 countries) and the end results of the participants showed the effectiveness of their efforts. High level of participation, interaction and course completion are observed after the course finished. Chapters 12 and 13 focus on the C-DELTA program (Commonwealth Digital Education Leadership Training in Action (C-DELTA). This program aims to enhance the competencies of teachers and learners in the Commonwealth. To create a common understanding in terms of using ICT in education and integrating it effectively, the program provides a well-designed curriculum and resources to educators in the Commonwealth. Chapters 14 and 15 presents findings and analysis on Open Education Resources (OER) and Chapter 16 presents a framework on benchmarking for Technology Enabled Learning. Quality assurance practices concerning TEL are also presented in the chapter.

In a nutshell, this book presents effective technology integration by putting the know-how into action. This is quite an important move for today's learning environments as bad implementations resulted in misconceptions about technology such as "One Laptop Per Child Program". To move from decisions taken without the necessary know-how and implementations to putting the experience of the subject area into the center of all implementations will bring the desirable results. In this book the technology integration in well-planned contexts brought these desirable results but the challenges faced, and the lessons learnt from these integrations are also underlined. To sum up, this book shares expertise and meaningful resources like benchmarking frameworks and roadmaps on Technology-Enabled Learning environments, it has an important role in enlightening the path of educators and policymakers from all around the world to create Technology Enabled Learning environments.

BIODATA and CONTACT ADDRESSES of AUTHOR

Aysun GUNES is a lecturer of English at Anadolu University, a teacher trainer, also a Master Trainer on Educational Technology for Pearson, and a TESOL trainer. Before working at Anadolu University, she had worked as an English teacher for the Ministry of National Education. She has been teaching English for over 15 years. She is a Ph.D. student in Open and Distance Education at Anadolu University. For the last 5 years, she has been researching educational technology and technology integration and also giving in-house pieces of training on technology for the School of Foreign Languages. She also worked as the course coordinator, the learning unit head, and LMS system coordinator at the same school. Her interest areas are 21st-century skills, teacher training, technology integration, learning management systems, MOOCs, and instructional design.

Aysun GUNES
Anadolu University
Address: School of Foreign Languages, Eskisehir, Turkey
Phone: +90 506 2480388
E-mail: aysung@anadolu.edu.tr

REFERENCES

Mishra, S. and Panda, S. (2020). Technology-Enabled Learning: Policy, Pedagogy and Practice: Commonwealth of Learning.