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Dear TOJDE Readers,

Welcome to Volume 22 Issue 2 of TOJDE.

There are 16 articles in the April 2021 issue of TOJDE. 43 authors from 7 different countries contributed to the issue. These countries are Indonesia, Iran, Jordan, Malaysia, Sweden, Turkey and the USA.

ADDRESSING LEARNER CULTURAL DIVERSITY IN MOOC DESIGN AND DELIVERY: STRATEGIES AND PRACTICES OF EXPERTS authored by Meina ZHU, Najia SABIR, Curtis J. BONK, Annisa SARI, Shuya XU and Minkyoung KIM is the first article. This mixed-methods study that utilizes e-mail interviews with 19 MOOC leaders and an online questionnaire completed by 152 MOOC instructors investigates the design and instructional practices of MOOC instructors within the learning environment to address the cultural diversity and learner personalization needs. In addition to revealing how these instructors address cultural diversity, the authors provide future directions for different stakeholders.

The title of the 2nd article is TEACHERS' TECHNOLOGY INTEGRATION AND DISTANCE LEARNING ADOPTION AMIDST THE COVID-19 CRISIS: A REFLECTION FOR THE OPTIMISTIC FUTURE. The author is Imam Fitri RAHMADI. The study examines distance learning adoption levels of and the technologies used by teachers in Indonesia during the Covid 19 pandemic. The results reveal an optimistic outlook of teacher adoption of learning technologies and distance learning practices.

The 3rd article, INVESTIGATION OF PARENTS' OPINIONS ABOUT DISTANCE EDUCATION DURING THE COVID-19 PANDEMIC, is written by Mustafa Engin DEMIR and Cennet GOLOGLU DEMIR. The purpose of this survey study is to investigate parent opinions on the distance education given via the Education Information Network platform, TRT EBA-TV and EBA live lesson during the Covid-19 pandemic. The results of the study point at the positive opinions of the parents regarding these platforms, the pedagogical and technical problems they experienced and their overall opinion of the distance education practices during Covid 19 pandemic.

IDENTIFYING FACTORS AFFECTING INTENTION TO USE IN DISTANCE LEARNING SYSTEMS is the title of the 4th article, and the authors are Rahmi BAKI, Burak BIRGOREN and Adnan AKTEPE. This study that utilizes Structural Equation Modelling aims to analyze the effect of various independent variables on the learner satisfaction and intention to use Distance Learning Systems in 9 state universities in Turkey. Results show that while Interaction, Compatibility and Time Effectiveness have a positive effect on user satisfaction and intention to use via Perceived Usefulness; Self Efficacy, Subjective Norm and Enjoyment have no influence. While Self Efficacy, Interaction, Anxiety and Time Effectiveness have a significant impact on Perceived Ease of Use, Subjective Norm and Enjoyment don't.

Sumardi SUMARDI and Dyah NUGRAHANI are the authors of the 5th article titled ADAPTATION TO EMERGENCY REMOTE TEACHING: PEDAGOGICAL STRATEGY FOR PRE-SERVICE LANGUAGE TEACHERS AMID COVID-19 PANDEMIC. In this case study, the authors explore an existing pedagogical strategy to adapt to Emergency Remote Teaching and the challenges encountered in the implementation in the Indonesian context. While the results denote a successful substitution of face to face instruction, the challenges experienced both by teachers and students are also highlighted.

The title of the 6th article is SATISFACTION OF OPEN EDUCATION STUDENTS ABOUT

THE LEARNING MATERIALS OF MATHEMATICS. Nevin MAHIR, Fikret ER, Bunyamin DEMIR, Namik Kemal ERDOGAN, Harun SONMEZ and Rusen YILMAZ are the authors. This study aims to find about the student satisfaction level regarding the education services and materials provided for Mathematics I class in the Open Education system at Anadolu University, Türkiye. Based on the data gathered, the highest satisfaction level of the students is face-to-face learning whereas the lowest one is the television programmes.

THE RELATIONSHIP BETWEEN CLASSROOM MANAGEMENT AND SENSE OF CLASSROOM COMMUNITY IN GRADUATE VIRTUAL CLASSROOMS is the 7th article. Ceyhun KAVRAYICI is

the author. In their correlational study, the authors examine the relationship between classroom management and sense of classroom community. The findings of the study reveal that leadership and instructional planning and implementation dimensions of classroom management predicted connectedness dimension of classroom community positively while leadership and instructional planning and implementation, organization and communication of classroom management predicted learning dimension of classroom community.

The authors of the 8th article are Ahmet Berk USTUN and Monica Walch TRACEY. The title is AN INNOVATIVE WAY OF DESIGNING BLENDED LEARNING THROUGH DESIGN-BASED RESEARCH IN HIGHER EDUCATION. The aim of this design-based research study is to assist an inexperienced educator in teaching and designing a Blended Learning course in higher education to convert a face-to-face course into a BL course over three iterative design cycles. The results demonstrate that BL enabled the educator to adopt active learning approaches, engage students in critical thinking and promote the quality of interactive and collaborative learning assignments. The challenges experienced by the instructor are also addressed.

Denizer YILDIRIM and Suleyman Sadi SEFEROGLU are the authors of the 9th article. The title of this article is EVALUATION OF THE EFFECTIVENESS OF ONLINE COURSES BASED ON THE COMMUNITY OF INQUIRY MODEL. The purpose of this study is to investigate relations among the constructs of Community of Inquiry, characteristics of learners, e-readiness and expectations, and satisfaction by using the structural equation model. The findings revealed that the presence of the students was at a moderate level, teaching and social presence had a significant positive effect of on cognitive presence, the level of presence did not vary based on the variables of demographic and discipline, the e-presence and expectation levels had a low impact on presence levels, and the level of presence had a significantly high impact on satisfaction.

The 10th article which is authored by Nour Awni ALBELBISI, Ahmad Samed AL-ADWAN and Akhmad HABIBI is titled IMPACT OF QUALITY ANTECEDENTS ON SATISFACTION TOWARD MOOC. In their quantitative study that employs Partial Least Squares Structural Equation Modeling, the authors assess the impact of quality antecedents on satisfaction toward MOOC in five universities in Malaysia. The results partially support the effect of the quality antecedents on learner satisfaction toward MOOC. The relationship between system quality and learner satisfaction toward MOOC is also highlighted.

MEDICATION OR BAND-AID? REVISITING UNIVERSITY STUDENTS' READINESS FOR ONLINE EDUCATION is the 11th article authored by Murat CINAR, Murat EKICI and

Omer DEMIR. This study explores students' e-readiness for the changeover phase to online education, and how this differs in terms of a range of variables across 33 universities in Turkey. The results yield higher than medium level of readiness for online education, a high level of internet self-efficacy, yet low levels of motivation towards online education In addition, the results reveal that some variables significantly affect e-readiness.

The 12th article USING REFLECTIVE PRACTICES TO EXPLORE POSTGRADUATE STUDENTS SELF-DIRECTED LEARNING READINESS IN MOBILE LEARNING PLATFORM AND TASK-CENTERED ACTIVITY is authored by Malini THIAGRAJ, Abdul Malek ABDUL KARIM and Arsaythamby VELOO. The purpose of this qualitative study is to explore postgraduate students' self-directed learning (SDL) readiness using Mobile learning in Massive Open Online Courses. According to the results, most of these students were not sure of their own readiness to take on SDL in the M-learning platform during the pre-reflective stage although most of them were able to monitor their own readiness at the During-reflective process, though some progress was observed after the task-centered activity.

Omer NAYCI is the author of the 13th article titled CONTENT ANALYSIS ON THE GRADUATE THESES DONE ABOUT FLIPPED CLASSROOM MODEL IN TURKEY. In this qualitative research, the author examines 105 graduate theses on flipped classroom model in Turkey according to some variables. The findings reveal an increasing trend in flipped classroom research 2019. The author also reveals number of theses conducted in different universitirs, the purpose of these theses, the subject domains, technologies and methods of these theses.

The 14th article titled TURKISH ADAPTATION OF THE TRANSACTIONAL PRESENCE SCALE AND AN EXAMINATION OF ITS RELATIONSHIP WITH PERCEIVED LEARNING is authored by Gulten KARTAL. The main purpose of this relational survey study is to establish a valid and reliable Turkish version of the Transactional Presence Scale and to determine whether some variables are significant predictors of their perceived learning. The results showed that only institutional transactional presence was a significant predictor of perceived learning.

The 15th article, DESIGNING E-LEARNING IN MEDICAL EDUCATION: TOWARD A COMPREHENSIVE MODEL, is authored by Soleiman AHMADY, Zohrehsadat MIRMOGHTADAIE, Nahid ZARIFSANAIEY and Johan THOR. This three-stage qualitative study that employs critical review and comparative method was conducted to present a comprehensive model for designing e-learning in Medical education. This qualitative study was performed in three stages. The results of the study showed that designing e-learning in medical education requires making plans on national and international levels and continuous monitoring of all processes.

The last article EFFECTIVENESS OF VIRTUAL VS. NON-VIRTUAL TEACHING IN IMPROVING READING COMPREHENSION OF IRANIAN UNDERGRADUATE EFL STUDENTS is authored by Javad AKBARI, Hosein Heidari TABRIZI and Azizeh CHALAK. The authors investigate the significant effect of virtual teaching on improving reading comprehension of undergraduate EFL university students. The results of the study reveal that the group which was taught through web-based technologies during the term progressed substantially in comparison with the other two groups who received traditional instruction.

Hope to meet again in the next issue of TOJDE.

Cordially,

Dr. T. Volkan YUZER

Editor in Chief

ADDRESSING LEARNER CULTURAL DIVERSITY IN MOOC DESIGN AND DELIVERY: STRATEGIES AND PRACTICES OF EXPERTS

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ABSTRACT

This mixed-methods study investigates the design and instructional practices of massive open online courses (MOOCs) instructors within the learning environment to address the cultural diversity and learner personalization needs. Leveraging a grounded theory approach, the researchers analyzed two rounds of email interviews (n1= 25; n2=19) with MOOC and open education leaders about cultural sensitivity and personalization in MOOCs. Those interviews led to the formation of a 30-item online questionnaire completed by 152 MOOC instructors. While many of the MOOC instructors within the sample did not fully grasp the complex issues of cultural diversity, most made attempts to modify their instructional practices to accommodate cultural variances. To address cultural and linguistic differences, instructors added subtitles to video content and offered transcripts for video or audio content. Additionally, instructors were careful with language use and hand gestures, used simplified language, slowed their pace of speech, made the course content easy to navigate, limited text by leveraging (multi)media, and encouraged learners to translate and localize content for their peers. Furthermore, many instructors favored collaborative, small group learning; however, instructors could not agree on best practices to establish these groups. Implications and future directions for MOOC instructors and instructional designers are offered.

Keywords: MOOCs, open education, instructional practices, cultural sensitivity, cultural diversity, MOOC Instructors.

INTRODUCTION

Open online courses, specifically massive open online courses (MOOCs), have become increasingly popular, allowing for thousands of individuals within a course to engage simultaneously learning (Cormier & Siemens, 2010) while also providing millions of individuals around the globe access to thousands of MOOCs, and their associated free and open educational resources (Shah, 2015, 2016). The latest data from Class Central showed that in 2018, over 101 million learners enrolled in more than 11,400 MOOCs (Shah, 2019). This report also indicated that these MOOCs were provided by more than 900 different institutions around the world (Shah, 2019). While earlier MOOC research from Jordan (2014) found that the average MOOC enrolled approximately 43,000 learners, as MOOC offerings have increased, the average enrollment has decreased to approximately 8,000 (Chuang & Ho, 2016).

Naturally, such numbers have attracted much attention from researchers, practitioners, and the news media as well as government agencies, institutions of higher education, entrepreneurs, and venture capitalists (Riel & Lawless, 2017). MOOCs are now hosted on myriad platforms, including edX, Udacity, Udemy, FutureLearn, and Coursera (Pappano, 2012). As the number of MOOCs offered continues to grow, instructors are challenged to accommodate for the growing socio-cultural and linguistic diversity of learners. Despite mounting cross-cultural challenges due to MOOC expansion, few empirical studies examine how MOOCs and MOOC instructors address diversity issues. Many research studies focus on the learner experience in MOOCs (Zhu, Sari, & Lee, 2018), such as learner's behavior (Kahan, Soffer, & Nachmias, 2017), dropout rate (Halawa, Greene, & Mitchell, 2014; Kizilcec, Perez-Sanagustin, & Maldonado, 2017), and motivation of learners (Milligan & Littlejohn, 2017).

As MOOCs and other forms of distance education enrollments soar, understanding and adopting for learner preferences, cultural and linguistic differences, and assorted other variables become crucial (Speece, 2012). Liu et al. (2016) found that learners' performance in MOOCs was influenced by cultural diversities. Paying attention to the learners' cultural and linguistic attributes will enhance the access and success of learning through better online presence, perceptions, and performance (Wang, 2007). In turn, this study seeks to understand how MOOC instructors are personalizing MOOCs to meet the needs of culturally, linguistically, and nationally diverse learners. More specifically, this mixed-method study is driven by two primary research questions:

1. To what degree do MOOC instructors perceive the learning environments that they have designed as accommodating learner and cultural diversity?
2. What are the instructional practices that MOOC instructors rely upon to address diverse cultural backgrounds? For instance, what cultural sensitivity and personalization practices do MOOC instructors utilize to enrich the virtual classroom experience of its diverse participants?

Research Question #1 relates to the design of MOOCs for cultural sensitivity and diversity practices. Research Question #2 concerns the actual delivery of MOOCs in the form of adaptive instructional practices.

THE EVOLUTION OF MOOCS

Since their introduction in 2008 (Cormier & Siemens, 2010), MOOCs have become mainstream, drawing throngs of self-directed, highly motivated adult learners. A key part of this expansion was salient in the news in 2011, when Stanford Professors Sebastin Thrun and Peter Novig opened their online artificial intelligence class to anyone in the world with Internet access, resulting in over 160,000 adult learners from 190 different countries (Dekena, 2012; Markoff, 2011; Rodriguez, 2012). Researchers have revealed some essential factors in drawing such large enrollments, including opportunities to achieve personal learning goals, develop new skills, and expand one's professional networks (McAuley, Stewart, Siemens, & Cormier, 2010; Siemens, 2012a).

Often MOOCs are held asynchronously, with some optional, scheduled meetings, allowing learners the flexibility to manage not only what they learn, but also how they learn (Kim & Chung, 2015; Severance, 2015). This element of flexibility is vital for MOOC learners since it reduces the perceived learning barriers; if they have a somewhat stable Internet connection, they can enroll in nearly any open online course that fancies them (Bonk et al., 2018; Jordan, 2014). The openness and flexibility of a MOOC has resulted in such open courses not only becoming common in academia but also being utilized by international organizations such as the Commonwealth of Learning (Venkataraman & Kanwar, 2015), the World Bank (Jagannathan, 2015), the United Nations, and OECD. They can also directly address various regional and national government initiatives (Alony, Kaye, & Lambert, 2015; Boga & McGreal, 2014; Czerniewicz, Deacon, Small, & Walji, 2014; Miller & Jay, 2015; Warugaba, Naughton, Gauthier, Muhirwa, & Amoroso, 2016). As MOOCs become more accepted and embraced as reputable, and perhaps even essential, ways to learn new skills, the backgrounds, experiences, and needs of MOOC learners multiply.

What has been apparent since inception is that MOOCs and other forms of open education tend to draw self-directed learners. Such intrinsically motivated adults seek to achieve personal learning goals, develop new skills and competencies, and enjoy opportunities to network and interact with others (McAuley et al., 2010; Siemens, 2012a). Unfortunately, the gap between the high expectations of meeting individual learning goals and the open-ended or less guided nature of MOOCs often results in MOOC participants struggling to complete them (Belanger & Thornton, 2013; Christensen, Steinmetz, Alcorn, Bennett, & Woods, 2013; MOOC @ Edinburgh 2013 – Report #1, 2013). In fact, Mackness, Mak, and Williams (2010) claimed that MOOCs are a paradox; while designed for independent learning, they noted that learners frequently rely on peer support to complete the MOOC. McAuley et al. (2010) called for instructors to reevaluate what skills learners need prior to enrolling in the MOOC as well as what specific types of skills necessitate more scaffolding. Other researchers have called for instructors to evaluate if linguistic and technical skills pose difficulties for MOOC participants (e.g., Fini, 2009; Schulze, 2014). Suffice to say, more research on the design of MOOCs is warranted (McAuley et al., 2010; Ostashewski & Reid, 2012); particularly, design that addresses the diverse cultural backgrounds (Nkuyubwatsi, 2014; Wang, 2007).

As the use of MOOCs has expanded, MOOC leaders and researchers like Siemens (2012b) have increasingly called for instructors to consider their target learners. Meanwhile, Preece, Rogers, and Helen (2007) stated that designing courses that are culturally sensitive can foster positive and effective learner experiences. As distance education enrollment rises, it is pivotal to understand and take into account learner preferences, culture, and style (Speece, 2012). Therefore, the consideration of cultural differences and accommodation of learners with different backgrounds is becoming essential to the design of high-quality MOOCs. Additionally, Gunawardena's (2020) review of online learning white papers and reports found that, by 2030, university instruction in Europe is projected to be "more flexible and provide different learning pathways recognizing the diversity of the student population" (p. 5). Despite such needs, research on the instructional design practices related to cultural diversity in online learning is too limited (Jung & Gunawardena, 2014; Rogers, Graham, & Reeves, 2007; Swierczek & Bechter, 2010; Wang & Reeves, 2007).

THEORETICAL FRAMEWORK

Subramony (2004) argues that a lack of attention to cultural diversity in distance education design results in the alienation of adult learners. Culture impacts distance education from two fronts: design and use (Seufert, 2002). MOOCs are often designed and developed in a specific cultural context; however, like most distance education models, what is successful in one cultural context may not carry over to another (Watson, Ho, & Raman, 1994). In response, Edmundson (2005), Henderson (1996), and Reeves and Reeves (1997) propose a multidimensional approach to address cultural issues in distance education courses.

The notion of 'culture' has been used in common language since the 18th Century (Tylor, 1871); however, there does not seem to be a universally accepted definition. For the purposes of this study, "culture" is a collection of fundamental values and patterns of acting, feeling, and thinking (Ford & Kotze, 2005), which influence how people communicate, with or without technology. This research study leverages Hofstede and Hofstede's (2005) definition of culture as the "collective programming of the mind that distinguishes the members of one group or category of people from others" (p.4). This complex notion of culture examines

patterns of beliefs, systems of knowledge, and behaviors. The authors use the analogy of an onion to explain the complexities of culture that include attitude, goals, symbols, practices, and values. While Hofstede's (2001) model is based on national archetypes, it is considered seminal in its relation to many multicultural distance learning environment studies (e.g., Bentley, Vawn-Tinney, & Chia, 2005; Kondratova, Goldfarb, Gervais, & Fournier, 2005; Morse, 2003; Renner, Laumer, & Weitzel, 2015; Rogers et al., 2007; Shishah & FitzGerald, 2016; Sieffert, 2006; Swierczek & Bechter, 2010). Given that individual learner's learning preferences may vary across different cultures and/or nations (Fail, 2011; Hofstede, 1983, 1986), it is important to consider cultural diversity in online course design because courses are often developed based on instructors' personal values, preferences, expectations, and experiences (Ahn, Yoon, & Cha, 2015; Speece, 2012).

Hall's (1976) schema classifies culture into high or low contexts, based on the amount of information a learner expresses or communicates. Individual learners in face-to-face (f2f) learning environments rely mostly on verbal cues to communicate. Communication in high-context cultures becomes challenging due to the lack of f2f contact in distance education environments where participants rely mostly on the written word (Gobbo, Nieckoski, Rodman, & Sheppard, 2004; Speece, 2012). As an example of such cultural differences, in one study of learner interactions in solving online case problems via asynchronous conferencing across several cultures, Finnish learners were more reflective and theoretical, Korean learners were more social and contextually driven, and American learners were more action oriented and pragmatic in seeking results (Kim & Bonk, 2002). Other researchers also explored strategies to create a culturally inclusive online learning environment through developing a learning community, negotiating identity, power, and authority, engaging in authentic inquiry-based learning, supporting collaboration and navigating interactions in an additional language (Gunawardena, 2020).

While MOOCs often incorporate video lectures from instructors, the lack of intimacy in online environments nevertheless presents serious problems (Hannon & D'Netto, 2007; Morse, 2003). With participants from nearly 200 countries in many MOOCs (Breslow et al., 2013; Ebben & Murphy, 2014), such intimacy is made even more difficult. In fact, Sandeen (2013) stated that on average, 60% of the learners in MOOCs are not from the U.S. This raises a growing concern; namely, if instructors and learners lack shared understandings, there is a greater probability of misunderstandings occurring due to language barriers and communication method differences (Callaway, Matthew, & Felvegi, 2014). Past research has shown that different cultures have different communication patterns (Hofstede, 1986; McLoughlin, 2006).

Gunawardena, Frechette, and Layne (2019) define culture as a "collection of shared perceptions of the world and our place in it" (p. 3). Gunawardena et al. (2019) describe four levels of cultural inclusivity when designing education for global learners. At Level 1, MOOCs cannot directly address cultural variances, but indirectly take on the values, norms, and biases of the instructor/curriculum designer. At Level 2, they allow for the explicit design and inclusion for a specific culture. Next, at Level 3, MOOCs can accommodate different, specific cultural contexts. Finally, at Level 4, they allow for instruction to be created with multicultural learning experiences.

When cultural issues and circumstances are not addressed while designing education, it might lead to misunderstanding (Callaway et al., 2014). There are various ways to address cultural issues. For instance, the course might use a common language like English, but encourage subtitling and transcripts. In addition, in actively building cultural awareness and sensitivity among the learners, the course might be designed to be considerate when using symbols, provide use easy-to-digest examples, take into account time differences among participants, and engage in role modeling (Wendler & Struthers, 2002; Yousef, Chatti, Schroeder, & Wosnitza, 2014).

While there is growing literature on online cultural sensitivity, there remains limited discussion related to MOOC design for culturally diverse participants (Teras, 2013; Wang & Reeves, 2007). Further complicating efforts to design and deliver MOOCs that are culturally sensitive and more personalized, there are few empirical studies representing MOOC instructors' voice in discussing how the learning environment is adapted for learner needs. Much of the MOOC research fixates on learner perspectives (e.g., Paquette, Mariño, Rogozan, & Leonard, 2015) or present metaliterature reviews which suggest "implementing personalization and adaption in MOOCs in order to improve users' engagements, hence reduc[ing] MOOC's drop-out rate problem" (Sunar, Abdullah, White, & Davis, 2016, p. 8).

Kop (2011) argues that instructors are one of the five core success elements (i.e., instructors, learners, topic, materials, and context) in MOOCs. However, as Veletsianos and Shepherdson (2016) and Zhu et al. (2018) reveal, few studies leverage instructor perspectives to better understand such personalization and cultural sensitivity (Veletsianos & Shepherdson, 2016). In response, this study examined the various ways MOOC instructors design and implement their courses to meet the needs of learners with different cultural and linguistic backgrounds.

METHODS

This mixed-methods (Creswell & Plano-Clark, 2017) study analyzes data drawn from: (1) email interviews (n=25) with MOOCs and open online education experts related to cultural sensitivity and diversity in MOOCs; (2) additional follow-up email interviews (n =19) with the same sample, but varying protocols, related to the personalization of MOOCs; and (3) online questionnaire responses from MOOC instructors (n=152) targeting cultural sensitivity and personalization in MOOCs. Whereas most of the findings related to MOOC personalization practices were reported elsewhere (Bonk et al., 2018), this study was primarily concerned with issues of cultural sensitivity and diversity in the design and delivery of MOOCs.

Expert Interviews

To understand more about how cultural diversity is addressed, an email was sent in October 2015 to roughly 30 international experts in the field of MOOCs and open education. Each of these experts had contributed a chapter to a book on MOOCs and open education which had been published earlier that year.

In the email, it was prefaced that a factor often overlooked in the field of open education and MOOCs is cultural sensitivity. The goal was to better understand what they deemed best practices for designing and delivering MOOCs in ways that are culturally inclusive and sensitive. The experts were given examples such as being cognizant that images of certain hand gestures or body movements may offend people or not be part of societal norms.

The email then asked these experts to use their expertise and extensive experience related to MOOCs and other forms of open education to make suggestions for the types of cultural accommodations that might be made in MOOCs that are intended for a global audience. As part of this response, they were asked about the guidelines that existed, if any, related to adjusting multimedia and other MOOC components to make them more culturally sensitive; especially as it pertained to their particular culture or region of the world. Practical advice was especially encouraged.

Replies with insights, experiences, and suggestions related to cultural diversity were received from 25 of these experts. Following that, email interviews with 19 experts about the personalization of MOOCs were conducted. A thematic analysis was used to catalogue, summarize, and analyze the interview scripts into "emerging themes [that] become categories for analysis" (Fereday & Muir-Cochrane, 2006, p. 4). These expert participants were MOOC instructors, course designers, and administrators from universities, institutions, and organizations around the world such as the World Bank Institute, University of Cape Town, Open University of Japan, University of Edinburgh, Future Learn, African Virtual University, University of Michigan, Georgia Tech University, University of the Philippines Open University, Stanford University, ALISON, MERLOT, University of Tasmania, Commonwealth of Learning (COL), and Open University of the Netherlands.

Web-based Survey

Analysis of the email interviews crystallized points of inquiry (Bogner, Littig, & Menz, 2009) regarding cultural diversity and personalization in MOOCs and helped to reduce uncertainty when building the online questionnaire (Rappert, 1999). The questionnaire consisted of 30 items and incorporated 25 closed questions and five open-ended items related primarily to MOOC personalization and cultural diversity issues and adaptations. The questionnaire was designed and created via SurveyMonkey, an online survey tool.

A large database of over 1,000 MOOC instructors and designers was mined from online course platforms (e.g., Class Central, MOOC list, Coursera, edX, and FutureLearn) and cross referenced against proprietary platforms (e.g., Blackboard and Canvas). Instructors were located in more than two dozen countries around the world, including Australia, Belgium, Canada, China, Germany, Ireland, Japan, Korea, Mexico, the Netherlands, Norway, Russia, Singapore, Switzerland, the U.K., and the United States. These instructors taught different subjects such as business and management, medicine, education, and computer science.

In vivo coding and thematic analysis were applied to the open-ended questionnaire responses, identifying MOOC instructional design practices used to personalize the MOOC learning environment via course resources and technological tools. Constant comparison was used to analyze all qualitative data and responses (Glaser & Strauss, 2009); in effect, iterations of data analysis occurred as new data sources were collected across the various stages of research. Grounded theory informed the methodology, enabling complex, multi-faceted dialogs without the constraint of a predefined framework. Data collection and later analysis stages were built off the prior stages, grounding them in the real-world experiences of practitioners (Glaser & Strauss, 2009; Goulding, 2002).

QUANTITATIVE DATA ANALYSIS RESULTS

Instructor Experience and Approach

The survey yielded 152 responses or about a 15% response rate which was more than adequate (Cho & LaRose, 1999). The largest percent came from the medical field, followed in order by education, social science, business, computer science, natural science, climate science, data science, art, engineering, mathematics, history, astronomy, and philosophy. While most instructors had only taught one MOOC at the time of the survey, one in four of these instructors had already taught three or more MOOCs. Slightly more than half had never completed a MOOC as a learner in the past.

We also asked about prior experience teaching online or blended. As shown in Figure 1, the online and blended teaching backgrounds of the MOOC instructors were not that extensive. In fact, the previous experience of half of them was on the low side. At the same time, about 28% indicated that they had much experience teaching online prior to teaching a MOOC. The overall average experience teaching online or blended for the survey respondents was 4.55 on a scale of 1 (low) to 10 (high); however, there was much variability (SD=3.5). Given the modest experience teaching online, it would be expected that most of these instructors would rely on vendor provided tools and structures, rather than personally designed tools. They would also be expected to use less risky teaching methods compared to those with more extensive online teaching backgrounds.

Figure 1. Instructor Experience Teaching Online/Blended Courses prior to Teaching their Recent MOOC

Note: on a scale of 1 (low) to 10 (high)] (n= 148)

Despite the lower than expected online learning backgrounds of these instructors, most of them indicated that they were heavily involved in the design of the course content of their MOOC; with an average rating of nearly 9 on a scale of 1 (low) to 10 (high). Therefore, they did have opportunities to specifically address the diverse needs and backgrounds of the learners in their MOOC(s). Furthermore, as reported elsewhere (Bonk et al., 2018), these instructors were hopeful to learn additional ways to better personalize the design of the instruction in their next MOOC.

Naturally, the size of MOOC enrollments might influence the degree to which instructors can personalize their courses and address diverse learner backgrounds, needs, specific situations, and experiences, including cultural, educational, technological, linguistic, and other factors. The data showed that most of these instructors (71.3%) were teaching courses with under 25,000 participants and nearly half (47.3%) were MOOCs of under 10,000 participants. Only 6% MOOCs taught by respondents had more than 100,000 participants. While MOOC size was markedly smaller than previously reported by Jordan (2013, 2014), these still could be considered enormous courses in size and scope (Chuang & Ho, 2014), making instructional attempts to address diverse learner needs an extremely daunting task.

As we document elsewhere in a parallel study of instructor personalization of MOOCs (Bonk et al., 2018), more than 85% of these instructors reported a high degree of involvement in the design of the course content for their most recent MOOC. Unfortunately, that earlier report also noted that just over one-third of these instructors felt that they placed extensive effort on meeting individual learner needs when designing their courses and even less (i.e., 28.5%) when delivering their MOOCs (Bonk et al., 2018). Importantly, however, the findings of that study indicated that MOOC instructors wanted additional professional development on how to attempt to make their MOOCs more personally engaging.

Instructional Strategies and Tools

Another common problem encountered by MOOC instructors is the range of learner prior content knowledge and self-confidence. As identified by Fini (2009), Mackness et al. (2010), McAuley et al. (2010), and Schulze (2014), MOOC instructors need to account for learner diversity in linguistic, technical, and content competency throughout the course. Table 1 represents the various ways that the respondents addressed varying participant competencies and needs. Again, discussion forums are the primary mechanism utilized (n=115; 81.0% of respondents), followed by embedding supplemental course materials (e.g., readings, animations and simulations, job aids, news, videos, maps, etc.) (n=111; 78.2%), and the posting of timely course announcements and emails (n=90; 63.4%). Items employed less often yet still of importance included the recording of videos and tutorials (n=58; 40.8%), emphasizing project-based forms of learning over exams (n=49; 34.5%), utilizing preexisting online videos like TED Talks and Lynda.com (n=46; 32.4%), and holding synchronous lectures, meetings, and events (n=34; 23.9%). Somewhat less popular were establishing study groups (n=27; 19.0%), incorporating learner reflection journals or blogs (n=23; 16.2%), scheduling virtual office hours or meetings (n=20; 14.1%), and offering opportunities for face-to-face meetups (n=10; 7.0%). Of course, the tools to address the knowledge gaps and deficiencies of MOOC participants will continue to evolve and change in the coming years.

Table 1. Instructional Practices of MOOC Instructors to Address the Variety of Learner Competencies and Needs (n=142)

Items	Response percent	Response count
Establish learner-based discussion forums	81.0%	115
Embed supplementary course materials	78.2%	111
Post timely course announcements and emails	63.4%	90
Record video tutorials or walkthroughs	40.8%	58
Emphasize project-based learning over exams	34.5%	49
Using preexisting online videos (e.g., Lynda.com, TED talks, YouTube, etc.)	32.4%	46
Other	26.1%	37
Hold synchronous lectures, meetings, and events (e.g., Skype, Google Hangouts, Zoom, etc.)	23.9%	34
Establish study groups	19.0%	27
Establish learner reflection journals or blogs	16.2%	23
Schedule virtual office hours and meetings	14.1%	20
Offer face-to-face meet-up opportunities	7.0%	10

As shown in Table 1, in this fast-changing age of digitally enhanced learning, there are numerous instructional practices and technology tools and resources from which to attempt to address the various competencies and needs of MOOC participants. Accordingly, we asked the respondents how they or their teaching assistants and moderators provided just-in-time support, feedback, and individualized learner attention. Several of the survey respondents noted that they constantly monitor learner performance in the discussion forums and address pressing needs and any perceived learner struggles with discussion forums and Twitter posts. Some others relied on weekly updates, course announcements, or virtual office hours to respond to the most frequently asked questions. As one of them noted, "Constant, constant, constant attention to discussion forums." MOOC instructors also focused on fostering collaboration and a sense of learning community.

One MOOC instructor mentioned how they apportioned the workload among many instructors and teaching assistants and moderated different sections or forums. Others noted that a team of instructors delivered content from their respective areas of expertise and monitor forums and activities related to it. They also apportioned their time so that different people would be online at different times to respond to learner needs. And they let the learners know the specific dates and times that they would be online to discuss issues and answer questions in a synchronous or live fashion. And that was not all. In addition to all this support from the academics, one MOOC instructor stated that, "we also had resident entrepreneurs and business experts (6) who were asked to be online over certain dates/times to provide the 'practical' view. Finally, we also have a central 'digital learning team' who supports all University MOOCs. Their team members were also assigned various dates to moderate and try to add comments, monitor any issues, etc."

Cultural Diversity

Addressing cultural diversity involves providing participants with options. As revealed in a parallel study (Bonk et al., 2018), these MOOC instructors typically offered optional readings and their course structures allowed the learners to decide about incentives for completion of the MOOC (e.g., certificates, badges, or course credit). Options on assignments or using multimedia to explain difficult concepts were less frequently offered (see Table 2). Only about one-third of these MOOCs allowed learners to generate or contribute content or discuss and negotiate ideas about the course content. Even fewer permitted learners to select their own learning pathways.

Table 2. Items Instructors Provided in their Most Recent MOOC (n = 126)

Items the current MOOC covered	Percent	Count
Optional readings, videos, or other materials	74.6%	94
Learner selected incentives (e.g., certificates, badges, course credit, etc., options)	64.29%	81
Options with course tasks and assignments	38.10%	48
Learner discussion and negotiation of content	36.51%	46
Two or more media elements to learn the same content	31.75%	40
Learner determined or contributed content	30.16%	38
Learner selected learning pathways (i.e., different routes to learn the same content)	19.05%	24
Learner portfolios of course accomplishments	16.67%	21
Choice in team or collaborative partners (i.e., self-formed teams)	12.70%	16

One means to address the diversity in a MOOC is to allow participants to display their learning in individually preferred or different ways. Again, choice in task or learning activity can be interpreted as being sensitive to people from different cultures and educational backgrounds. However, as illuminated in Figure 2 below, the MOOCs of half of the instructors surveyed did not allow any way for learners to present or share their work with others in the MOOC. In those that did, MOOC participants more often shared their work through social media (n=33; 25.4%), online sharing exchanges or portals (n=28; 21.5%), and online galleries (n=19; 14.6%). Not as prevalent were learner blogs (n=15; 11.5%), e-portfolio systems (n=13; 10.0%), posting one's work to the learning management system (n=11; 8.5%), or class presentations (n=6; 4.6%). Clearly, a typical MOOC is not set up to share or showcase one's learning with other participants and stakeholders.

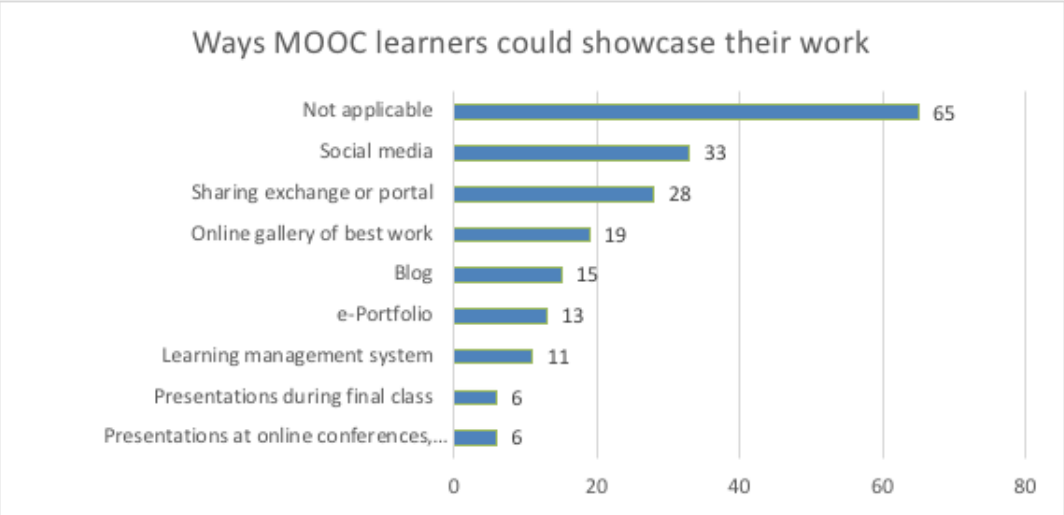

Figure 2. Methods by Which MOOC Learners Could Showcase their Work [Note: on a scale of 1 (low) to 10 (high)] (n= 130)

The above tables and figures provide some insight into the size, content, and resources of MOOCs that all might be related to the ability of instructors to address cultural and linguistic diversity. Importantly, two questions specifically were focused on cultural and linguistic adaptations. When asked, on a scale of 1 (low) to 10 (high), how much effort was placed on addressing the needs of individuals from different cultural backgrounds and languages in their most recent MOOC, these instructors put forth modest effort, but, once again, there was much variability (M=5.37; SD=2.87). Whereas 43 (30.5%) of them put forth high effort, another 45 (31.9%) respondents put forth low effort; the remaining 53 (37.6%) MOOC instructors felt that they gave medium effort. In effect, as shown in Figure 3, MOOC instructors were quite varied in their commitment to addressing diverse learner needs.

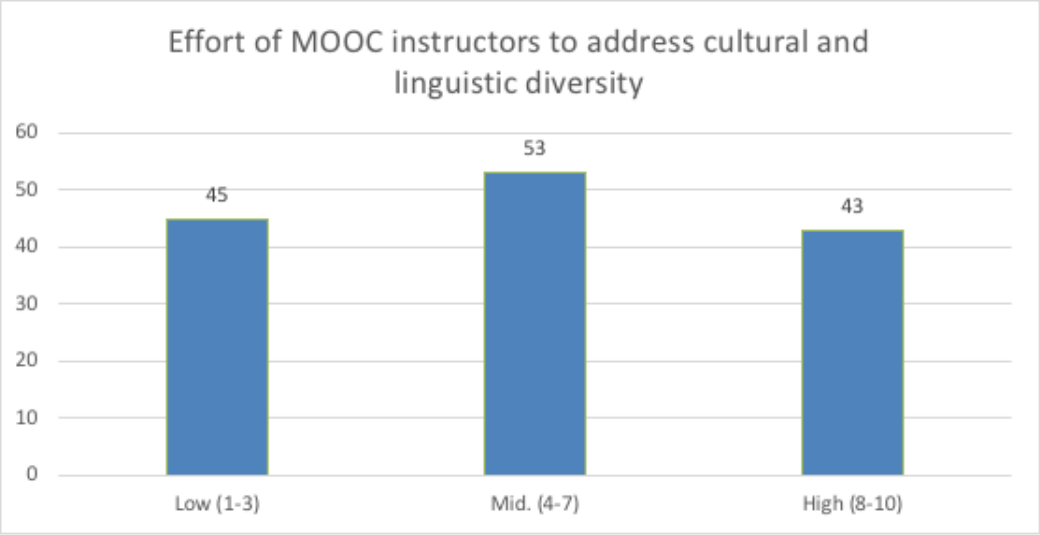

Figure 3. The Perceived Effort of MOOC Instructors in Addressing Cultural and Linguistic Diversity
Note: on a scale of 1 (low) to 10 (high)] (n= 141)

Given the modest effort that MOOC instructors placed addressing those participants from different cultural and linguistic backgrounds, it was vital to probe further into the strategies that they implemented. Figure 4 breaks down the order in which MOOC instructors designed their MOOCs to be suitable for learners from different cultures and/or linguistic backgrounds. At the top of the strategies to address cultural diversity was offering transcripts of video and audio contents (n=88; 66.2%) and adding subtitles to video content that was provided in the course (n=85; 63.9%). The third most common strategy was for MOOC instructors to be careful with the language that they used and any hand gestures (n=69; 51.9%). Among the other somewhat common techniques included that instructors simplify the language used (n=56; 42.1%), slow down their rate of speech (n=49; 36.8%), and simplify the course design and make it easier for learners to navigate it (n=36; 27.1%). Nearly one in five indicated that they would limit text and rely more on pictures. Slightly less selected that they would encourage participants to translate and localize the content for others (n=24; 18.1%). However, only 15 (11.3%) of the respondents designed their courses with parallel translations to other languages.

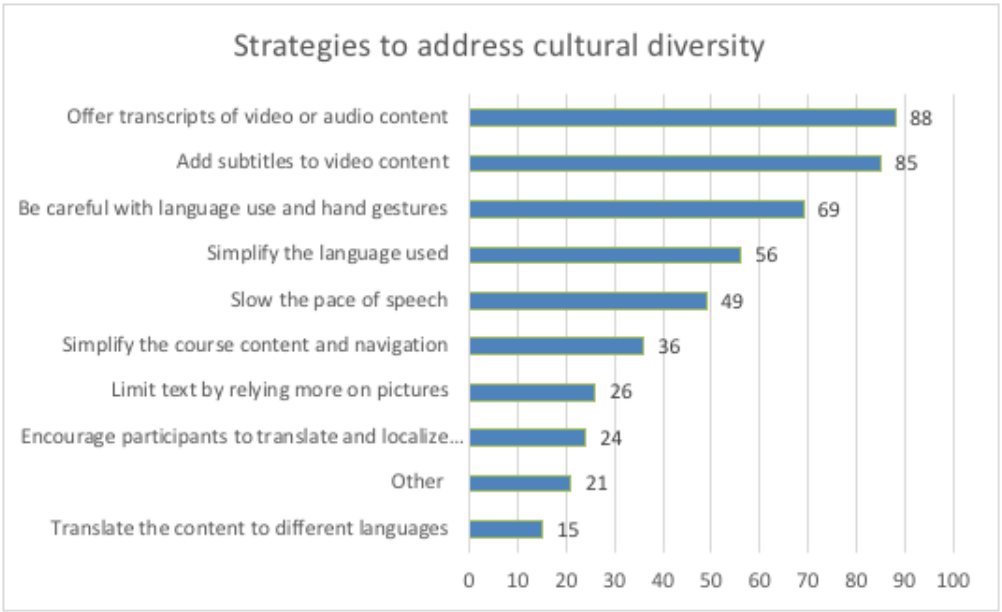

Figure 4. MOOC Instructors' Instructional Practices to Address Cultural Diversity (n=133)

QUALITATIVE DATA ANALYSIS RESULTS

MOOC and Open Education Experts

As indicated in the method section, we conducted two rounds of interviews with the MOOC and open education experts regarding cultural sensitivity and personalization of MOOCs. These experts were given examples such as being cognizant that images of certain hand gestures or body movements may offend people or not be part of societal norms. Also mentioned to the experts was the problem of case situations or scenarios involving alcohol, the incorporation of pictures of dogs in the Middle East, political humor and satire, the use of quotes from religious leaders, and incorporating YouTube videos (which are not accessible in cultures like China). In addition, it was mentioned that clothing, hairstyle, music, jokes, and reliance on the English language can all be problematic.

That long prompt fostered many ideas, personal anecdotes, and suggestions. As noted in Table 3, these MOOC and open education experts had a wide range of recommendations related to cultural sensitivity. Some related to content design, whereas others related to the delivery of MOOC instruction. A few of these experts offered ideas related to the overall learning environment or ecology of the MOOC such as encouraging participants to support each other with lower bandwidth versions of MOOC videos as well as to find ways to translate the MOOC content to local language and cultural needs.

Table 3. Best Practice Recommendations by MOOC and Open Education Experts for Addressing Cultural Sensitivity (n=25)

MOOC Stage	Category	Approach
Design	Communication	Provide possible alternative back channels for traditional discussion boards (e.g., WhatsApp, WeChat, KakaoTalk, etc.).
		Consider the different ways learners read information – Some languages are not presented in a linear format.
	Course design	Leverage straightforward course designs as intricate or nested course designs can be difficult to convert across languages and platforms.
		Ensure visual examples (i.e., icons and caricatures) repeated throughout the course appeal to as many stakeholders as possible.
	Media use	Consider different audiences through perspective taking when incorporating multimedia.
		Overreliance on visual rhetoric (e.g., visual images) alone to communicate can be problematic.
		Use caution when including videos on an external website, such as YouTube, as content could be restricted for certain users.
		Remember that converting text into various languages is easier than videos, and it takes much longer to create a video.
		Slideshows should not overwhelm learners with text; try to use symbols, icons, and other visual elements.
	Reuse and remix	Ensure inclusivity by openly licensing all educational materials developed for MOOCs, to guarantee the permissions and freedoms required for translation, adaptation, re-use, redistribution, and repackaging.
		Understand the legal differences and barriers between copyright, copyleft, and public.
		Consider the technology used in development. Ask yourself, "Does it assist reuse and remixing?"
		Weigh the potential of other instructors' capabilities in remixing/reusing the content and provide support where appropriate.
	Technology accessibility	Appreciate the power of mobile learning! In many regions of the world, learning occurs through mobile devices. Courses should be pedagogically and technologically developed with this mindset.
		Identify the range of learner digital literacy skills.
		Encourage learners to create low bandwidth versions of multimedia for those in low bandwidth areas.
		Foster a learner community where learners help learners in downloading, translating, and hosting multimedia.
	Working with a design team	Encourage courses/content to be developed by teams consisting of members for various institutions, countries, and/or cultures.
		Actively prepare MOOC instructors and online course designers for cultural sensitivity.

Delivery	Attire and mannerisms	Remain presentable and well-dressed when appearing in multimedia.
		Be thoughtful about body movement and overall gestures, as well as images of hand gestures, as different cultures decipher meaning in diverse ways.
	Culture specific	Asian audiences may not be the quickest to voice their opinions and prefer to be spoken to with deference, politely, and softly.
		Not all learners read left to right. For example, some Middle Eastern learners read content right to left, and some Asian learners read content top to bottom.
		Content including case situations or scenarios involving alcohol, the incorporation of pictures of dogs (from some nations), political humor/satire, and the use of quotes from religious figures can prove to be controversial and potentially offensive.
	Developing a sense of community	Avoid references to current events that may only be shared by a small subgroup.
		Urge learners to meet locally or amongst themselves to share materials and address any sensitive concerns.
		Avoid issues related to religion and politics.
		Minimize distractions and possible negative responses by staying away from controversial topics.
	Emphasis on expertise	Respect the deep-seated cultural differences related to the following: the value of expert vs. learner-originated knowledge; deference to experts; and willingness to engage in discussion and critique - with the most noticeable contrasts between those educated in Anglo-Saxon education systems and in Confucianist ones.
		Have instructions/directions at the ready, just as a backup, for those who tend to respect authority and prefer following directions.
	Language and translations	Make subtitles and transcriptions, when possible, available in multiple languages based on intended audiences. This also empowers hard of hearing learners.
		Even when English is the primary or secondary language of the target audience, consider making MOOC content available in the major dialect(s) of the country.
		Identify any cultural aspects of resources disseminated as understandings and meanings may not be exact when translated; each linguistic group has its own scientific history and culture.
		Jokes and humor, in general, can be easily misinterpreted.

The second round of interviews with most of these experts (n = 19) identified instructional design elements that assisted MOOC instructors in personalizing their course for cultural diversity and technology accessibility. Principle among these elements was changing course assignments to be "collaborative projects" and allowing learners to engage in "small group learning." Four of the 19 experts interviewed in round two noted instances of increased learner motivation from these elements and attributed it to learner empowerment. Instructors also mentioned increased formations of learning networks and personal connections as learners engaged in the MOOC via group work and by self-selecting tasks and/or groups.

Qualitative analysis revealed disagreement about best practices to account for cultural multiplicity when grouping learners. Some instructors practiced grouping learners with similar backgrounds and interests to become a "cohort that has similar learning goals, or that is interested in supporting their own learning goals." Others believed in creating "mixed group[s] to see if there are any differences of opinions" to promote dialogues of difference. Even though the methods of group creation vary, the online questionnaire data support small-group learning as a personalization tool for enhanced cultural understanding and awareness. Correspondingly, some MOOC instructors reported that they either personally assigned learner groups or used the learning management system to do so, whereas other instructors reported using pair-based assignments to encourage learner interactions.

Survey Respondents

In one of the open-ended questions, the researchers probed further about how these instructors designed their MOOCs to make them easier to access for learners with different backgrounds and technology access. Many of the MOOC instructors provided quite pertinent and thoughtful responses to this question. Among them, one person who likely taught a MOOC in the area of political science stated that: "Our content covered examples from different political and religious contexts, across Europe, the Americas, the Middle East and Asia, designed in turn to encourage learners from diverse backgrounds to share their own political experience." Another respondent noted that his or her course followed the "UK accessibility compliance

guidelines" and the key course materials were made available at an elementary level while more complex materials were embedded in the form of supplemental readings and case studies for those who wished to delve more deeply into the content. Additional examples of providing greater access to course content included working with university experts, consulting with language departments, and piloting content with international learners and friends from countries like "Jordan, China, Greece and Turkey" and then debriefing and discussing it with them. Another example is, "All videos and screencasts had transcriptions available to read. Our MOOC platform was designed to allow users to view the MOOC material on a computer, tablet, or smartphone."

One survey respondent had a vast repertoire of strategies to address the various participant cultures and backgrounds that are typical in MOOCs. This individual stated:

> "I use a platform that I know is reasonably good across browsers and operating systems. I do not use anything which is flash-based. I test material on different devices. I make navigation as easy as possible. I offer multiple communication channels. I do not comment on language or grammar when commenting on forum posts. I caption videos and supply transcripts, though I do make it clear the course is developed in English. I have a long history of teaching learners from other countries so I am conscious about creating material that is accessible from cultures other than the UK."

The survey respondents also commented on specific instructional practices adopted to address the cultural and linguistic differences amongst learners. While most of the responses were centered on adopting the MOOC for linguistic diversity, some instructors elaborated on other aspects of accommodating for cultural diversity in MOOC design. A professor of engineering stated that he "adapt[s] assignment[s] to fit…different cultures." The questions asked instructors to describe not only their cultural diversity adaptations, but also their methods for improving technology access. As MOOC instructors varied in subject area expertise, and national origin, their involvement in addressing culture and language differences was quite varied as well.

One open-ended question asked about the instructional practices that were used to address different cultural backgrounds as well as technology access among learners (n=35). The responses of these instructors are reported in Table 4. Multimedia presentations, optional resources, course instruction and language, feedback, collaboration, technology access, and varied communication channels were some of the approaches that instructors used to address diversity during the MOOC design stage. The top four ways related to how MOOC instructors design their courses in consideration of learners' background and technology access included: (1) providing captions and transcriptions to all videos and screencasted materials. Importantly, this strategy was intended to accommodate learners with disabilities or different learning styles; (2) offering supplemental or optional materials; (3) making sure that all materials can be viewed on an assortment of devices, including computers, tablets, or smartphones. Moreover, some instructors experimented with the look of their materials on smartphones of different sizes; and (4) keeping the course materials at the level of a non-expert. Such an approach was intended to limit the tension and stress of MOOC learners who come from different fields, while, at the same time, not neglecting learners who wanted to study more deeply by offering additional learning materials.

Further information on what various MOOC instructors in this survey attempted is detailed in Table 4. While approaches of MOOC instructors may slightly vary from MOOC experts, categories overlap. A noted difference between Table 3 and 4's compilation of approaches is the level of specificity and breadth of the discourse in Table 3, whereas Table 4 presents central themes. Both collections of approaches provide valuable insight for addressing cultural sensitivity with MOOC environments.

Table 4. Approaches Employed by MOOC Instructors to Enhance Access for Learners with Different Backgrounds and Technology (n=35)

Category	Approach
Collaboration	Work alongside various university divisions (e.g., international office, student support, university expert, and language department).
	Pilot the course with international learners.
Communication, feedback, and language	Offer multiple communication channels.
	Use simple, slow, and clear language.
	Do not focus on language or grammar when commenting on forum posts.
Content	
	Create material that is acceptable for various cultures.
	Keep cultural differences in mind when designing and producing the material.
	Emphasize materials which accommodate for various learning preferences.
	Share personal stories, to some degree, by recording lessons in and around personal spaces.
	Follow target country's compliance rules and regulations.
Course instruction	Ensure material is kept at a non-expert level.
	Provide detailed outlines of the lesson.
	Arrange open course work where everyone can choose to work individually.
	Provide background information and course expectations.
Multimedia use	Strive to include captioned or transcribed videos and screencasts.
	Ensure videos are kept simple and short and include animations in presentations.
	Leverage free textbooks and open resources.
	Attempt to provide PDF documents and Word version of materials.
	Provide text reader or read aloud options, when possible.
Optional resources	Offer supplemental or optional materials.
Technology accessibility	Course materials should be device agonistic, easy to use, and easy to access. Materials can be used on a computer, tablet, smartphone application, or mobile phone.
	Provide materials that use low bandwidth and make class activities browser based.
	Make multimedia interactive apps more user-friendly by not engaging Flash-based platforms.
	Encourage simple navigation.
	Create user-directed FAQs.
	Videos and transcripts should be available for download later.

In the following discussion section, we reflect on some of the cultural sensitivity suggestions and advice from the MOOC and open education experts listed in Table 3 as well as the recommendations of the MOOC instructor survey respondents noted in Table 4. We also reflect on our other survey findings.

DISCUSSION

The first of the key research questions providing an impetus for this mixed-methods study sought to better understand the degree to which MOOC instructors and their instructional design teams were creating learning environments that accommodated the cultural and linguistic diversity of the participants. Results of the online survey indicate that these MOOC instructors were placing modest efforts in addressing the cultural, linguistic, and other needs of their MOOC participants in their most recent MOOC. Nevertheless, nearly one in three of these instructors indicated that they placed high effort and attention on this issue when designing and delivering their MOOCs. Suffice to say, their responses were quite varied.

The second research question was related to the in-class instructional practices that MOOC instructors rely upon to address diverse learner needs and backgrounds. As part of such efforts, MOOC personalization practices were explored. While half of these instructors rated themselves as having limited prior experience

in teaching blended or fully online learning courses, they were experimenting with many different types of instructional methods to address participants from different cultural and linguistic backgrounds.

According to the survey data, among the most common adaptations of content was to provide transcripts of video and audio content as well as embedding subtitles with video content. Slightly more than half of the instructors were also aware of the need to be careful with their language use and hand gestures; in particular, many were self-aware of their rate of speech in their video lectures. Some were concerned about the complexity of the content as well as the navigation within that content. The preference for text over pictures was also an indication that they were sensitive to bandwidth issues. And some MOOC instructors designed courses in multiple languages.

While these were general strategies or approaches that instructors used to address their diverse populations, there were many more specific tactics mentioned in the open-ended survey items as well as in the earlier email interviews of MOOC and open education experts. Among these tactics included creating user-directed FAQs, utilizing case studies, asking international learners to pilot the content, organizing schedules of the instructional team to address student concerns in the discussion forums, keeping video content under a certain length limit, testing content on different platforms, and not commenting on participant language or grammar use. They also relied on many different technologies to accomplish these goals, including social media such as Twitter and Facebook, screencast technology, shared online videos, and synchronous Web conferencing.

We should also point out that some of the instructors were very conscious of the power of crowds. As observed by Kim and Chung (2015), nearly one in five MOOC instructors we surveyed indicated that they encouraged their participants to translate and localize content for their peers. Such volunteer services for one another may be a factor which is unaccounted for in much of the prevailing MOOC research and deserves some follow-up. For instance, examples of MOOC participant crowdsourcing may improve the attitudes towards MOOCs and their overall sustainability.

The qualitative coding of the interview data added to the insights. Addressing cultural diversity in MOOCs is multifaceted. As shown by both Table 3 and Table 4, there are an assortment of instructional variables for instructors to ponder related to the technology use and accessibility, the design of multimedia presentations, the forms and type of content, supplemental resources provided, feedback mechanisms and approaches, pace of language, communication channels established, collaboration tactics employed, and the degree and type of course instructions and task structuring. Clearly, teaching a MOOC stretches the edges of one's instructional abilities and prowess.

MOOC instructor participants in this study echoed the suggested approaches of Bates and Poole (2003) and Moore and Kearsey (2005), where relying on a singular technology or approach did not meet the learning needs of all learners. In terms of this issue, MOOC instructors in the current study tended to create learning environments that used several technologies in varying interaction modes to overcome course specific problems. Through the narrative responses and interviews, it became evident that the MOOC instructors did not have a singular understanding of culture. Some MOOC instructors interpreted 'culture' by referring to nation specific approaches, while others related culture with certain language competencies.

Overall, the findings from this study indicate that MOOC instructors see a need to adapt their courses in both design and delivery to better address cultural diversity. Strategies such as collaborative, small group-based assignments and adaptation of instructional content for specific cultures and nationalities are steps in the right direction (Gunawardena et al., 2019; Sieffert, 2006). Furthermore, many MOOC instructors not only attempt to address diversity in their course resources and activities, but also collaborate with various university departments and international learners in preparing the learning materials.

Across out research questions related to cultural sensitivity and personalization in the design and delivery of MOOCs, there were many recommendations and suggestions. In this study, most MOOC instructors focused on strategies to address cultural and linguistic diversity by supplementing video with text, providing text with video or audio, and being cautious with gestures. Besides such solutions, other strategies that were utilized included the adaptation of instructional content for specific populations and multimedia usage. Of course, this is just the start of a long evolution of addressing cultural diversity and personalizing MOOCs and other forms of open education.

LIMITATIONS

One of our key limitations relates to our database of MOOC instructors. More specifically, while we had collected the course and contact information for over 1,000 MOOC instructors from dozens of countries, such data for courses outside of English-speaking countries was limited by the lists provided. And, while most of the lists from which we gathered data were from the United States, there are still more such lists that we could mine. In response, we continue to expand our database of MOOC instructors. Another limitation is that the survey was voluntary or opt-in; as such, it is plausible that MOOC instructors who completed this survey were more attuned with how to address cultural differences and personalize their courses than those who did not participate. A third limitation was that the researchers did not evaluate MOOC courses to evaluate the validity of self-reporting. Additional follow-up research is warranted to understand the approaches that were deemed successful in MOOCs and how instructors modified them over time. Finally, MOOCs and other forms of open education remain a relatively new and fast changing field of study. The technologies and instructional practices related to teaching a MOOC are still evolving; especially in terms of adapting to diverse learner needs and experiences. Given these various limitations, any results here should be viewed as preliminary and evolutionary.

FUTURE DIRECTIONS

Millions of people are impacted each day by emerging technologies for designing and delivering education, such as MOOCs and other forms of open education. Consequently, there is a mounting need for MOOC and open education instructors to better empathize with and adapt to their learning participants. Follow-up interviews and focus groups based on our findings, either with some of our original MOOC instructor survey participants or with others from our expanded database of 3,200 MOOC instructors, might prove particularly interesting and significant. There is also a need to interview other MOOC and open education experts as well as MOOC learners. Future research might explore how to build awareness of not only the need to be more culturally sensitive in the design and delivery of MOOCs, but also the instructional strategies and approaches that are proven to be effective. Of course, this research might also explore cost variables and scalability measures related to different instructional approaches and strategic initiatives for addressing participant diversity.

This study showed that MOOC instructors are attempting to understand and better address the challenges and problems related to cultural differences. Unfortunately, while Tables 3 and 4 are intended to offer some inroads, at present there is no universal understanding of cultural diversity and definitive best practices in this area. In addition to retrospective interviews, real-time interviews during course delivery are now needed to better understand the instructors' practices and ideas related to addressing cultural diversity in MOOC design. Given the enormous scale of these courses and the global impact, it is vital for such research to result in a set of guidelines and best practices to address learner diversity.

Research is also needed on how different types of MOOCs and hybrid models might be used to better address learners from different cultural, social, educational, political, and linguistic backgrounds. As part of such efforts, content analyses of MOOCs as well as direct observation or participation in a range of MOOCs might lend insight into the MOOC-related components and approaches that tend to entail greater cultural inclusivity and sensitivity.

As we continue to expand our list of MOOC instructors, we are beginning to also address the learner side of the equation. It is vital to attempt to align perceptions of MOOC instructors regarding cultural sensitivity with those of their MOOC participants and vice versa. This large database of MOOC instructors also allows us to target our research efforts in specific countries (e.g., Malaysia, Indonesia, China, Korea, etc.) and regions of the world (Zhu, Bonk, & Sari, 2019).

Clearly, there are so many directions for research in this field to proceed. For instance, as groundbreaking advances occur in learning technologies, such as artificial intelligence, personal digital assistants, and virtual and augmented reality, so, too, must educators and researchers think beyond the stakeholders and learners in their country or region of the world to those who might benefit later or in a different way or scale from today. How might MOOCs be designed, delivered, and evaluated in ways that reach out to learners in the Global

South and beyond (Gunawardena, 2014; Zhang, Bonk, Reeves, & Reynolds, 2020)? MOOC localization in the form of J-MOOCs (Japanese MOOCs), K-MOOCs (Korean MOOCs), Thai MOOCs, and so on, is one clear result.

IMPLICATIONS AND CONCLUSIONS

It is evident from these findings that instructors are making strides in addressing issues of cultural and linguistic diversity when designing and implementing their MOOCs. Our research indicates that many MOOC instructors have begun a reflection process on how to improve their next MOOC offerings in terms of addressing learner diversity and linguistic differences. However, while these MOOC instructors are attempting to better understand and address the participants in their MOOCs, much more could be done. The present study does offer some guidance and perhaps a hint of optimism or hope to those who are considering becoming a MOOC instructor.

Given the trendlines of MOOCs, the next wave of MOOCs and MOOC instructors will continue to impact hundreds of millions of learners each year (Shah, 2015, 2016, 2019). As such, the diversity of the participants of such massive courses will not subside. What is certain is that additional studies that expand upon the present one are crucial.

There is a pressing need to better understand how MOOCs can address learner diversity and cultural backgrounds. This study of 25 MOOC and open education experts, as well as 152 MOOC instructors, offers insights about how this can be accomplished in both MOOC design and implementation. The results can inform instructional designers, instructors, and policy makers of what is required for higher quality and more effective MOOC experiences. Since thousands of MOOC instructors around the planet are waiting, we will keep expanding our database of MOOC instructors and MOOC courses in the hopes of making additional contributions soon.

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BIODATA and CONTACT ADDRESSES of AUTHORS

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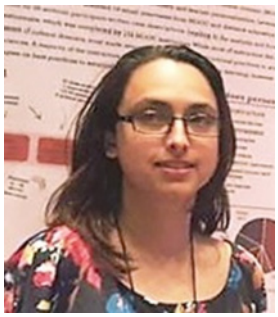

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TEACHERS' TECHNOLOGY INTEGRATION AND DISTANCE LEARNING ADOPTION AMIDST THE COVID-19 CRISIS: A REFLECTION FOR THE OPTIMISTIC FUTURE

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ABSTRACT

All of a sudden, teachers and students around the globe have to deal with distance learning amidst the coronavirus disease 2019 (COVID-19) crisis. It is becoming increasingly important to understand teachers' technology integration and distance learning adoption after a sudden implementation of the working-from-home policy as a precaution towards the further transmission of the virus. The present study examines the issues particularly regarding the used technologies, the process of distance learning, and the teachers' distance learning adoption levels. This study was conducted using an online survey involving 572 teachers in Indonesia. The results reveal that teachers tend to use devices and applications for remote instruction that already they used for daily life, and global applications are more likely chosen by teachers for managing virtual classrooms rather than the local ones. The teachers stand on an enhancement level of technology integration thus yet integrate technology as a transformation of learning. Most teachers have immediately prepared for teaching remotely when the working-from-home policy has been implemented so that they can be categorised as early adopters of distance learning. Teachers' agility in adopting distance learning during the crisis raises an optimistic signal to effectively adapt and adopt remote instruction to formal school environments in the future. Since the current study has only examined teachers in one country regardless of teaching subjects and school levels, a cross-national study on a specific subject and school level is needed in the next study.

Keywords: Teachers' technology integration, distance learning adoption, distance learning, coronavirus disease 2019 (COVID-19) crisis.

INTRODUCTION

All of a sudden, teachers and students around the globe have to deal with distance teaching and learning during the coronavirus disease 2019 (COVID-19) crisis as a consequence of a working-from-home policy to prevent further transmission of the virus. In fact, the outbreak is causing various levels of disruptions in education globally commenced with school closures in 165 countries that impact over 1.5 billion students (Doucet et al., 2020). A variety of learning approaches and strategies attempted by teachers in order to run remote learning smoothly so that the students could learn as convenient as in face-to-face learning. There is no formal preparation in advance to face this challenge; consequently, teachers were dealing with this situation by their own creativity. The students stayed away from schools and thrust into a vastly different circumstance than the one they have known. Additionally, it was inevitable for parents to get involved in the learning processes to educate their children because they are studying from home. Teaching in a tumultuous time, therefore, requires a high sense of innovativeness as well as generous flexibility to promote delightful rather than painful learning activities (Martinez-Cola et al., 2018).

Amidst unprecedented worldwide impacts of the COVID-19, particularly toward the education sector, it is becoming increasingly important to understand teachers' technology integration and distance learning adoption after a sudden implementation of the working-from-home policy. The term technology integration means as effective use of information and communication technologies (Tondeur et al., 2009) and appropriate implementation of educational technologies to accomplish intended learning outcomes (Davies & West, 2014). Adoption is about the individual choice to accept or reject particular innovations integrated into an appropriate context (Hall & Khan, 2003; Straub, 2009). Furthermore, technology adoption refers to an individual consideration to reach a decision for accepting and using new technology or even rejecting the one (Sepasgozar & Davis, 2018). The teachers' technology integration and distance learning adoption in this study thus defined as the decision and choice of teachers for conducting distance education programs by harnessing certain technologies. Generally speaking, it appears that the teachers use assorted technologies to conduct an asynchronous or synchronous remote learning from home whilst there is distinctive agility in adopting distance learning to their hand. Nevertheless, exact detail about the integrated technologies and the adoption levels in the thick of the COVID-19 outbreak remains a question.

THEORETICAL BACKGROUND

Understanding teachers' technology integration and distance learning adoption levels can be interpreted by using various frameworks including substitution, augmentation, modification, and redefinition (SAMR) model of technology integration (Puentedura, 2006), typical process of technology adoption (Prensky, 2005), technology integration matrix – TIM (Florida Center for Instructional Technology, 2019), technological pedagogical content knowledge – TPACK (Koehler & Mishra, 2005; Mishra & Koehler, 2006), and adoption curve (Rogers, 1962). Those frames of reference beneficial for identifying to what extent teachers adapt and adopt technologies to their hands for learning at a distance.

SAMR is a classroom technology integration framework consisting of two main levels with four different steps (Puentedura, 2006). Enhancement is the basic level that includes substitution and augmentation steps. Technology merely plays as a direct tool with minor functional improvement at this level. The advanced level is transformation containing modification and redefinition steps in which technology allows for redesign and new creation of tasks. Cencerning the process of technology adoption, it has a four-step typical process namely dabbling, doing old things in old ways, doing old things in new ways, and doing new things in new ways (Prensky, 2005). It is a gradual process that technological and societal aspects are two major factors in progressing technology adoption faster. While TIM serves as a framework for describing and targeting the use of technology to enhance instruction incorporating five interdependent characteristics of meaningful learning environments: active, collaborative, constructive, authentic, and goal-directed associated with five levels of technology integration: entry, adoption, adaptation, infusion, and transformation that apply equally to face-to-face and online learning (Florida Center for Instructional Technology, 2019).

Meanwhile, TPACK is a framework for assessing as well as developing teachers' knowledge in terms of integrating technology into learning and instruction processes that introduces relation and complexity to the basic knowledge of teaching: content, pedagogy, and technology (Cox & Graham, 2009; Koehler & Mishra, 2009; Koehler, Mishra, & Cain, 2013). There are seven knowledge domains of the TPACK framework, including technological knowledge (TK), pedagogical knowledge (PK), content knowledge (CK), pedagogical content knowledge (PCK), technological content knowledge (TCK), technological pedagogical knowledge (TPK), and technological pedagogical content knowledge (TPACK). Hence, TPACK is not only a framework but a new kind of knowledge for teaching as well. Teachers or educators in general who confidently mastering TPACK may integrate technology appropriately in the classroom.

The adoption curve concept (Rogers, 1962) divides adoption rates into five levels. Each level has its own common percentage and description as follows: 1) innovators (2.5%) = the first individuals to adopt an innovation who willing to take risks and have the highest social class, a great financial fund, and access to scientific sources; 2) early adopters (13.5%) = the second fastest individuals to adopt an innovation who have the highest degree of opinion leadership, a higher social status, and more well-educated among the other adopter categories; 3) early majority (34%) = individuals who adopt an innovation after a varying degree of time, tend to be slower in the adoption process, and have above-average social status as well as contact with

early adopters; 4) late majority (34%) = individuals who adopt an innovation after the average member of society has adopted the innovation, have a high degree of skepticism and below-average social status; and 5) laggards (16%) = the last individuals to adopt an innovation who have an aversion to agents of change, likely to have the lowest social status, tend to be advanced in age, and typically focus on traditions.

LITERATURE REVIEW

Several studies have suggested that pivotal importance to study teachers' educational technology adoption in different situations. Technology adoption is a dynamic and complex societal process while cognitive, emotional, and contextual concerns should be taken into account seriously for facilitating a successful technology adoption (Straub, 2009). The different qualifications, experiences, and concerns in diverse teaching situations lead to the variation of adoption processes (Gabby et al., 2017). Besides, particular local realities such as philosophical, organisational, and political interests might also be impacting teacher's adoption decisions (Kotrlik & Redmann, 2009). More specifically, school stakeholders play a significant role in the teacher's decisions for adopting technology (Sugar et al., 2004), they have to provide a clear message about how technology benefitting for effective classroom and affecting teacher's roles. A better understanding of what technologies are available and useful for teachers valuable to encourage educational technology integration into teaching and learning practices (Smith et al., 2018). Accordingly, investigating the way in which the teachers integrate technology and adopt distance learning in the time of uncertainty during the COVID-19 crisis is fruitful to inform key stakeholders in education to develop specific interventions for appropriate technology integration and distance learning adoption in the future.

So far, however, there has been little discussion about teacher's technology integration in the context of distance learning. Most studies in the technology integration of teachers have only been carried out in the face-to-face learning environments, in case of general technologies (Cubeles & Riu, 2016; Perea, 2016; Merç, 2015; Ruggiero & Mong, 2015; Vecino, 2017) or with regard to the specific one such as computer technologies (Adegbenro & Olugbara, 2019; Wang, 2014; Budiman & Ngadiso, 2018), mobile technologies (Wang, 2016) including tablets and smartphones (Dees et al., 2017; Fuentes & Albertos, 2017), and other avant-garde technologies for examples robots (Rosanda & Starcic, 2019) and 3D printing (Song, 2018). While some studies touching in the context of distance learning (Adewara & Lawal, 2015; Dillinger, 2000; Pange et al., 2004), those merely address the teachers' attitude, perception, and interaction of technology-enhanced distance learning. In addition to the research gap, far too little attention has been paid to the study of teacher's distance learning adoptions. A number of studies focus on distance learning adoptions as an institutional movement instead of personal action by teachers. The institutional adoptions of distance learning varied from distance learning itself (Cassidy & Lane, 1994), to blended learning (Humbert, 2007; Porter et al., 2014), e-learning (Kisanga & Ireson, 2015; Okazaki & Renda dos Santos, 2012; Yu et al., 2007), and m-learning (Sarrab, 2013).

PURPOSE OF THE STUDY

The present study tries to understand teachers' technology integration and distance learning adoption levels after a sudden implementation of the working-from-home policy. Accordingly, the main issues addressed in this study including technology used by teachers as tools for distance learning, the process of distance learning conducted by teachers, and teachers' distance learning adoption levels. Research questions of the study therefore are:

1. What technologies used by teachers as tools for distance learning?
2. How was the process of distance learning conducted by teachers?
3. What are the teachers' distance learning adoption levels?

The primary findings revealed that teachers integrate various devices and applications for facilitating learning to students remotely. There are common activities, tasks, and resources frequently used for learning at a distance, and the majority teachers are early adopters of distance learning. Hereinafter, this study provides discussion as well as reflection for the optimistic future.

METHOD

The study of teachers' technology and distance learning adoption during the COVID-19 crisis is a descriptive cross-sectional research conducted in Indonesia by using an online survey. The research design was chosen because of its effectivity to collect data and study multiple outcomes at a one-time point (Levin, 2006; Wang & Cheng, 2020). Following the research design, the survey was administered two weeks after the Indonesian Government implementing a working-from-home policy for all employees including teachers starting from 16 to 27 March 2020. In this critical situation, teachers should teach students remotely from home without any formal preparations.

A questionnaire was developed on Google Form and distributed to teachers by a convenience sampling method through a variety of social media such as WhatsApp, Facebook, and Twitter within five working days between 30 March and 3 April 2020. The questionnaire, in particular about the process of distance learning, was developed based on the revised version of Bloom's taxonomy cognitive domain (Anderson et al., 2001), learning theories of behaviorism, cognitivism, constructivism and connectivism, and the classification of learning resources (Betrus, 2008). Additionally, the teachers' reflection on the level of distance learning adoption was adopted from the Rogers's innovations adoption curve (1962). All items in the question sheet aim to measure frequency with an exception on the adoption rates.

Regarding the data analysis technique, a descriptive statistic has been utilised to simplify, analyse, and describe the main features of collected data as well as visualise the data in highly apprehensible graphs (Holcomb, 2016). As the ethical study as concerned, it was explicitly stated in advance that all collected data is used merely for research purposes and the teachers voluntarily participated in this study.

Apart from the policy prolongs to the end of the school semester, this study portrays an early experience of teachers teaching their students in the first two weeks of the working-from-home policy in Indonesia. Until this article was written in May 2020, the teachers remain to continue practicing learning and instruction at a distance by various technologies in hand.

FINDINGS AND DISCUSSIONS

After the one-week spreading, there were 572 teachers completely filled in the online questionnaire. Hereby in the table below is the detail information about teachers' profile regarding their gender, age, educational background, teaching experience, school status, and location. The technology used by teachers as tools for distance learning, the process of distance learning conducted by teachers, and the teachers' distance learning adoption levels are presented in the following sections.

Table 1. The Profile of Teachers in the Study

Gender	Male	Female			
	182	390			
	31.82%	68.18%			
Age	<25 years	25-35 years	36-45 years	46-55 years	>55 years
	68	260	124	101	19
	11.89%	45.45%	21.68%	17.66%	3.32%
Educational background	Associate	Bachelor	Master	Doctor	
	8	471	87	6	
	1.40%	82.34%	15.21%	1.05%	
Teaching experience	<5 years	5-10 years	11-15 years	16-20 years	>20 years
	185	154	111	46	76
	32.34%	26.92%	19.41%	8.04%	13.29%
School level	Elementary	Middle	High		
	176	135	261		
	30.77%	23.60%	45.63%		

School status	Private	Public				
	191	381				
	33.39%	66.61%				
Location	Sumatera	Java	Kalimantan	Sulawesi	Papua	Others
	137	323	2	76	0	34
	23.95%	56.47%	0.35%	13.29%	0.00%	5.94%

Table 1 describes the teacher's profiles participated in this study. Almost 70% of the participants are female teachers. The majority of teachers aged between 25 and 35 years reaching over 45% while teachers with the age of more than 55 years are the minority one. Additionally, the vast majority of teachers hold a bachelor degree achieving over 80%. However, more than half of the teachers have experience in teaching less than 10 years. Around 45% of teachers teach at the high school level, this number is almost double compared to that of in middle school level. Meanwhile, the number of elementary school teachers is just under a third. Regarding the school status, around two-third of teachers work in public schools while the rest work in private schools. Moreover, over 50% of teachers living in Java and almost one-quarter of them living in Sumatera. Unfortunately, there were no teachers from Papua who participated in this study and merely a small number of teachers from Kalimantan and other islands.

Technologies Used by Teachers for Distance Learning

Teachers use ample technologies for conducting distance learning examined with regard to devices and purposes. The devices include computer desktop, laptop, smartphone, and tablet. Purposes of using technologies are investigated around the issues of online live teaching, communication to students, and virtual classroom organisations, which can bee seen in the table below.

Table 2. Technologies Used by Teachers for Distance Learning

Devices				
Desktop computers	Laptops	Smartphones	Tablets	
43	443	508	40	
7.52%	77.45%	88.81%	6.99%	
Synchronous lessons				
Facebook live	Google meet	Instagram live	Skype	Tiktok live
36	54	25	9	4
6.29%	9.44%	4.37%	1.57%	0.70%
WhatsApp VC	Whereby	YoutTube live	Zoom	Not teaching live
323	0	38	121	201
56.47%	0.00%	6.64%	21.15%	35.14%
Communication with students				
Email	FB Messenger	Instagram	Line	Slack
198	107	69	11	0
34.62%	18.71%	12.06%	1.92%	0.00%
Telegram	Twitter	WeChat	WhatsApp	No communication
17	4	6	550	5
2.97%	0.70%	1.05%	96.15%	0.87%
Virtual classroom				
Brainly	Edmodo	Google Classroom	KelasKita	Office 365
14	28	306	6	22
2.45%	4.90%	53.50%	1.05%	3.85%

Ruang Guru	Rumah Belajar	Schoology	Sekolahmu	Quipper
53	66	5	7	28
9.27%	11.54%	0.87%	1.22%	4.90%
Zenius	Using own app	Not using virtual classroom		
18	34	149		
3.15%	5.94%	26.05%		

Table 2 summarises various technologies used by teachers as pedagogical tools for conducting distance learning. Overall, there are some devices and applications commonly utilised in terms of facilitating learning to students remotely. Smartphones and laptops by far are the most popular devices preferred by 88.81% and 77.45% of teachers respectively. For online live teaching, over 56% of the teachers use WhatsApp video call and Zoom was used by around 21% of teachers. While other applications were used by less than 10% of teachers, there are over 35% of teachers do not teach live. Regarding applications for communicating with students, WhatsApp is the most popular one used by almost 100% of the teachers while in contrast, no one was operating Slack, and harnessing Line, Twitter, and WeChat was also uncommon. Email was used by almost 35% of teachers whilst there are mere less than 20% of teacher using FB Messenger and Instagram to get in touch with students. Finally, Google Classroom is the most popular application for conducting a lesson in the virtual environment. Other applications were merely used by less than 15 % of teachers and there are over 25% of teachers do not using a virtual classroom platform.

It is not a surprise that the vast majority of teachers harness smartphones for conducting distance instructions since smartphones are the most popular mobile device used in Indonesia. The latest survey by Kemp (2020) reported that 94% of the adult population in Indonesia owned at least a smartphone whilst 66% of them have laptop or desktop computers and the tablet device handed by 23% of the adult population. The total population of Indonesia nowadays is 272.1 million people. However, from this finding could be draw a conclusion that smartphones are considerable for conducting distance learning programmes in K-12 setting. Unfortunately, few studies working on the use of smartphones as tool for distance education and the existing studies mostly work with university students. Although harnessing smartphones for remote learning in higher education context is also relatively a new practice, it has been proven that the uses improve student's learning engagements and facilitate students-lecturers communication (Vazquez-Cano, 2014; Tuncay, 2016). Smartphones support real-time distance learning and synchronous collaboration between students and lecturers (Lee, 2012). Hence, smartphones as smart pedagogical tools promote ubiquitous learning environment (Shin et al., 2011). Maximising the use of smartphones in this case could be also a solution of the traditional distance learning based on computers that not fully suitable due to the lack of laptop and desktop computers (Gopalan et al., 2011).

Interestingly, WhatsApp application used by over one half of the teachers for synchronous teachings while the other applications are less popular with the exception of Zoom. Additionally, WhatsApp is also the main medium for distance teachers-students communications. This finding reveals that WhatsApp is potential for facilitating teaching and learning at a distance. Reasons that WhatsApp is highly acceptable for distance learning owing to the great user friendliness, accessibility, and cost effectiveness (Nawaila & Bicen, 2018; Singh et al., 2018). Some studies have confirmed the potentiality in different ways based on the features such as WhatsApp chat (Çetinkaya & Sütçü, 2018; Ahmed, 2019) and WhatsApp group (Annamalai, 2019; Rahmadi, 2020) for supporting effective learning and instruction activities. Zoom and the other conferencing tools recently gains more and more popularity in the midst of COVID-19 outbreak as a medium for having synchronous online classrooms. Another important point to note is that the teachers have also attempted to use various social media for distance learning. Over one-third of teachers, however, do not conduct an online live teaching. This is quite reasonable owing to the teachers do not get used to a synchronous teaching facilitated by new media, limited broadband or mobile bandwidth, and limited resources of students. This a new way of teaching is highly challenging both for teachers and students (May et al., 2015) that require different teaching and learning strategies compared to face-to-face live instructions (Safei et al., 2011).

Teachers use a variety of applications for managing virtual classroom environments which the majority utilise Google Classroom. This could be the case as a matter of fact that Google Classroom is a free and easy-

to-use learning management system (Heggart & Yoo, 2018; Rozak & Albantani, 2018). The platform in the view of usability is useful with regard to the understandability, attractiveness, and operability (Ventayen et al., 2018). Other virtual classroom platforms are less popular while some teachers develop and use their own application. Developing own platform is possible by using learning management systems such as Moodle, Chamilo, and Blackboard; however, it looks more complicated rather than simply adopting Google Classroom. In addition to the virtual classroom concern, around a quarter of teachers do not teach in a virtual classroom environment. Integrating a learning management system into teaching practices require not only specific technical knowledge but new pedagogical knowledge as well (Anderson & Dron, 2017; Adnan et al., 2017; Ouadoud et al., 2018). The pedagogical nature and technical issues might decrease teachers' intention to take the opportunity in using a system for managing virtual learning (Walker et al., 2016). Hence, developing teachers' specific technological and pedagogical knowledge is of importance before integrating certain technologies for learning.

Reflecting on the various technologies chosen by teachers, it seems that the teachers tend to use technologies for remote instruction that already they used for daily life. For instance, smartphones and the WhatsApp application that been widely used in everyday activities are also used by teachers for online live teaching and communicating with students from their homes. Another important point to reflect is that global products are more likely chosen by teachers for managing virtual classrooms rather than the local ones. As an example, Google Classroom is much preferable than made-in-Indonesia applications such as Rumah Belajar, Ruang Guru, KelasKita, and Sekolahmu, just to name a few. Apart from the tendencies, it looks normal that other teachers integrate other technologies suitable for themselves since there is no one-size-fits-all in distance learning (Doucet et al., 2020), different subjects and age groups require different approaches to distance learning. Hence, trusting the teachers to run as convenient distance instruction as possible in their version at this critical time may be appropriate for the meantime. For the future, the trends identified in this study should be taken into account wisely to make a technology integration policy for distance learning practices in school environments.

The Process of Distance Learning Conducted by Teachers

Issues described in the distance learning processes include learning activities, tasks, and resources that were given to students and used by teachers as a means of teaching remotely. The learning activities were categorised based on the revised version of Bloom's taxonomy cognitive domain that includes remembering, understanding, applying, analysing, evaluating, and creating (Anderson et al., 2001). In addition, learning theories of behaviorism, cognitivism, constructivism, and connectivism applied to classify the task types. To be more detail, the tasks and related learning theories include: working on multiple-choice and essay tests assigned by and collected to teachers (behaviorism), reading textbooks then write a summary (cognitivism), discussing learning materials with peers or parents then conclude the discussion by writing a summary or drawing a picture such as concept maps and infographics (constructivism) and creating a particular product from the learning material then share it to peers or other people through various digital media (connectivism). Several learning resources used during remote learning such as textbooks, environments, peers, parents, and online resources outlined as well in the following table.

Table 3. The Process of Distance Learning Conducted by Teachers

Activities					
Remembering	Understanding	Applying	Analysing	Evaluating	Creating
109	455	233	304	285	307
19.06%	79.55%	40.73%	53.15%	49.83%	53.67%
Tasks					
Doing homework	Reading textbooks	Discussing materials	Creating products		
470	286	162	234		
82.17%	50.00%	28.32%	40.91%		

Resources				
Textbooks	Environments	Peers	Parents	Online resources
476	263	169	267	464
83.22%	45.98%	29.55%	46.68%	81.12%

Table 3 reveals the distance learning processes conducted by teachers to their students. All in all, there are typical activities, tasks, and resources frequently used for learning at a distance. Almost 80% of activities are about understanding and it four times higher than those of remembering. Surprisingly, the activities of analysing and creating something from the learning material have slightly a shared number of around 53%, and the two other activities are recorded fewer than 50%. It is clear from this data that the vast majority of teachers give a task to students for doing homework reached over 80%. Conversely, discussing materials seems less common tasks during the distance learning that merely under 30% of teachers give this task to students. While 50% of teachers ask students to read textbooks, the students were asked to create products by around 40% of teachers. Concerning the learning resources, textbooks and resources on the Internet by far are the most frequent resources used by teachers reaching over 80%. Around 45% of teachers harness environments and parents as resources for learning whilst peers were only utilised by around 30% of teachers.

Understanding learning material, as the main students' learning activities facilitated by their teachers from a distance, implies that the learning process runs on the lower order thinking skills. This is a general problem in Indonesia teaching and learning processes regardless of face-to-face or distance learning mode, and in particular within the implementation of a new curriculum in Indonesia called Kurrikulum 2013 (Alinurdin & Rahmadi, 2018). Teachers' previous knowledge and beliefs about higher-order thinking skills assumed as principal factors affecting the level of pedagogical practices in the classroom (Kusumastuti et al., 2019). Although around half of the teachers have undergone activities based on higher-order thinking skills, it is pivotal to encourage all teachers for moving forward from the lower-level ones.

As doing homework is the common day-to-day student's task, it seems that the majority of teachers are teaching remotely in a behaviorism way. The teachers are more likely to give test-based assignments rather than activity-based assignments, which can stimulate students to think, construct, or create a certain product from the learning materials. Homework behavior was just like a tradition in education around the world that exists for some reason. It is true that homework plays an important role for reinforcement of school learning and for development of personal responsibility (Xu & Yuan, 2003; Corno & Xu, 2004); however, using homework as main distance learning task could be stressful than meaningful not only for students but also for parents during the COVID-19 outbreak (Suldo et al., 2008; Xu, 2011; Galloway et al., 2013; Clausen et al., 2020). Looking at homework differently might be a solution by actively involving social and cultural aspects that increase a sense of community between students, peers, parents, and teachers in their social environments (Corno, 2000). Hence, for example, constructing and discussing learning material with peers or parents as well as creating and sharing a product to the community appeals as more fruitful tasks during the distance learning.

The majority of teachers rely on textbooks and other resources on the Internet as distance learning resources inline with the fact that the majority of distance learning tasks are more about doing homework rather than assigning other tasks involved with their peers, parents, and environments around them. Likewise, this is also a common case in Indonesia's face-to-face teaching practices that the teachers mostly use textbooks as the main learning resources. Textbooks have been widely used for teaching in the early decade of education and are indeed highly important for basic learning resources (Davey, 1988). Nowadays, more appropriate use of paper-based textbooks should be combined or integrated with other electronic or digital resources (McDonald, 2016). At the time of social and physical distancing, encouraging active interaction among students, parents, and their learning environments is valuable for the resource of learning. Additionally, having a virtual meeting with peers might be beneficial to support each other about their study progress.

Reflecting on what teachers have been done with the distance learning processes facilitated by various technologies opens up the possibility to predict their technology integration levels. It can be said that the teachers stand on an enhancement level of technology integration thus yet integrate technology as a

transformation of learning. Based on the SAMR model of technology integration (Puentedura, 2006), the teachers integrate technology mainly for substituting and augmenting a distance learning process instead of modifying and redefining learning. In other words, framing from Prensky (2005), the teachers remain dabbling and doing old things in old ways although multiple smart technologies already in their hands. Hence, measuring within the technology integration matrix (Florida Center for Instructional Technology, 2019), it appears that the teachers are in between adoption and adaptation level since they use modern technologies in conventional ways of teaching. Furthermore, looking from the TPACK perspective (Koehler & Mishra, 2005; Mishra & Koehler, 2006), the teachers do not yet integrate technology in active relation to pedagogy and content. However, this teacher's experience in initiating the integration of technology for enhancing learning could be valuable to move forward into the transformation stage. Perhaps encouraging professional developments either for pre-service or in-service teachers with a focus on educational technology issues will result in a higher level of technology integration in the future.

Teachers' Distance Learning Adoption Levels

The teachers' distance learning adoption levels address various levels of teachers in adopting remote learning to their hands after a sudden implementation of the working-from-home policy. Adopted from the Rogers's innovations adoption curve (1962), there are five levels of adoption used in this study and described as follows: 1) innovators = teachers are ready for distance learning before the implementation of working-from-home policy; 2) early adopters = teachers immediately prepare for distance learning when the working-from-home policy have been implemented; 3) early majority = teachers start to prepare for distance learning when the working-from-home policy have been implemented because seeing other teachers were preparing for it; 4) late majority = teachers start to prepare for distance learning when the working-from-home policy have been implemented after seeing that other teachers are able to teach remotely from home; 5) laggards = teachers do not prepare for distance learning although the working-from-home policy have been implemented and think to prepare it later. The teacher's adoption levels of distance learning are illustrated in the figure below.

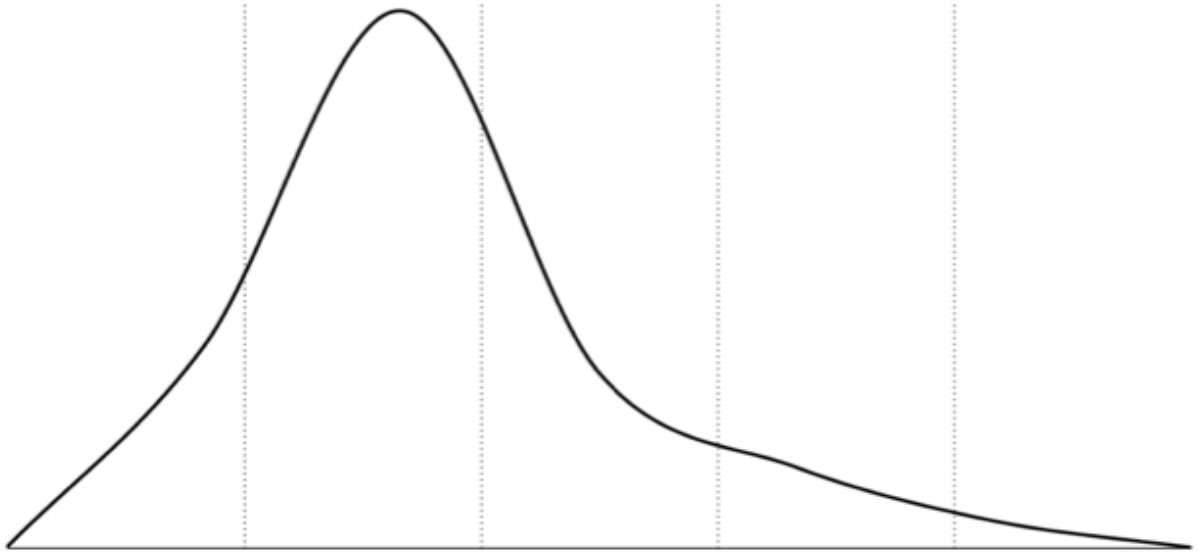

Figure 1. Teachers' Distance Learning Adoption Level Based on the Adoption Curve (Rogers, 1962)

Figure 1 illustrates the teachers' distance learning adoption levels. In general, the majority of teachers defined themselves as early adopters of distance learning. More than half of teachers fall into the category whilst the figure for the early and late majority reached 17.13% and 7.87% respectively. The number of innovators is

almost 20% and the figure for laggards less than 3%. The curve is fairly different from the origin theory since conceptually there should be 2.5% of innovators, 13.5% of early adopters, 34% of early majority, 34% of late majority, and 16% of laggards (Rogers, 1962). While in this case the early adopters much higher than the early and late majority, and there are more innovators than laggards.

The teachers' adoption level in this study is consistent with the study of Aldunate & Nussbaum (2013) revealed that most teachers in their study about teacher's adoption of technology fall into the category of early adopters and followed by innovators. Teachers who are early technology adopters have a significant time in incorporating educational technology and they are more likely to adopt new technology to their teaching practices. Another study, particularly about technology adoption for learning, is also shown that teachers have substantially adopted technology at a moderate level (Kotrlik & Redmann, 2009; Redmann & Kotrlik, 2009), however, the technology have not integrated adequately. This sounds interesting since have been adopting technology does not automatically mean that teachers have been utilised the technology in appropriate ways for teaching and learning purposes.

Reflecting on the teachers' distance learning adoption levels, it is great that most teachers have immediately prepared for distance learning when the working-from-home policy has been implemented. Surprisingly, one-fifth of the teachers are innovators and there are merely a few teachers who are laggards. Thus it can be said that so far the teachers are agile in adopting distance learning during the COVID-19 crisis. Although further investigation is still needed to clarify whether the teachers adopting and practicing distance learning appropriately or vise versa, this fact is an optimistic signal to effectively adapt and adopt remote instruction to the formal school environments in the future.

CONCLUSION

The present study has given a description, discussion and reflection of teachers' technology integration and distance learning adoption after the working-from-home policy has been implemented as a precaution towards the further transmission of the COVID-19 in Indonesia. This study set out to investigate technology used by teachers as tools for distance learning, the process of distance learning conducted by teachers, and teachers' distance learning adoption levels. The results of this investigation reveal that teachers tend to use devices and applications for remote instruction that already they used for daily life, and global applications are more likely chosen by teachers for managing virtual classrooms rather than the local ones. The teachers stand on an enhancement level of technology integration thus yet integrate technology as a transformation of learning. Most teachers have immediately prepared for distance learning when the working-from-home policy has been implemented so that they can be categorised as early adopters of distance learning.

The evidence from this study suggests that trusting teachers to conduct distance learning with technologies they are familiar with is essential during the critical time. Furthermore, the trends identified in this study should be taken into account seriously to draw a proper technology integration policy for distance learning practices in school environments. Teacher's experience in initiating the integration of technology for enhancing learning is rewarding to move forward into the transformation stage by professional developments either for pre-service or in-service teachers with particular interest concerning educational technology. One of the ideas might be TPACK-based professional development in various modes of teacher education programmes (Rahmadi et al., 2020). The teachers' agility in adopting distance learning during the COVID-19 crisis raises an optimistic signal to effectively adapt and adopt remote instruction to the formal school environments in the future.

The empirical findings in this study provide a new understanding of teachers' technology integration and distance learning adoption amidst the unprecedented global impacts of the COVID-19. However, the current study has focused on examining teachers' technology integration and distance learning adoption in one country regardless of teaching subjects and school levels. What is now needed is a cross-national study involving multiple countries on a specific subject of teaching and level of school due to the different subjects and student groups require different approaches to remote learning. Otherwise comparing among teaching subjects could be a further comparative study.

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INVESTIGATION OF PARENTS' OPINIONS ABOUT DISTANCE EDUCATION DURING THE COVID-19 PANDEMIC

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ABSTRACT

The purpose of the current study is to investigate the distance education given via the Education Information Network platform, TRT EBA-TV and EBA live lesson during the Covid-19 pandemic on the basis of parents' opinions. The current study employing the survey model was conducted with the participation of 709 parents. The research data were collected by an online questionnaire prepared by the researchers. Descriptive statistics were used to analyze the data. As a result of the study, it was determined that during the distance education process, parents ensured that their children followed the lessons and motivated them, and students were eager to participate in the lessons. It was determined that student motivation was negatively affected for reasons such as connection problems and being closed at home during the pandemic. Parents stated that their awareness of their children's education increased and they better understood the value of the teacher and school. It was revealed that there were technical problems in the process but support was received for the problems encountered. Though the parents think that face-to-face education cannot be replaced by distance education, they are of the opinion that distance education was good during the pandemic so that their children did not get alienated from the school.

Keywords: Distance education, EBA, Covid-19, pandemic, parents.

INTRODUCTION

According to the data of the World Health Organization (WHO, 2020), millions of people have been infected and hundreds of thousands of people have died due to the Covid-19 pandemic that has spread worldwide. According to the data issued by UNESCO (2020a), it affected more than 800 million learners worldwide. Almost all countries have taken a series of precautions across the globe to reduce the speed of the spread of the virus and especially to prevent the health system from being overloaded. One of these measures was to temporarily suspend face-to-face education in schools and universities. Education at school has been completely suspended in most of the European countries and locally suspended in some others since March 16, 2020. This caused disruption in education worldwide. Countries have brought distance education to the forefront using various national education portals (UNESCO, 2020b) to help students overcome this process with minimal damage. One of these countries is Turkey.

The first Covid-19 case was announced to be seen in Turkey on March 11, 2020 by the Ministry of Health. After this announcement, face-to-face education was suspended on March 16, 2020, and it was decided to continue the education of primary, secondary, high school and university students through distance education as of March 23, 2020. Thus, a total of 10 million primary and secondary school students (Ministry

of National Education [MoNE], 2020a) started to continue their education with distance education due to the pandemic. Many governments worldwide have instructed their institutions to continue education online (Daniel, 2000).

With the suspension of education in schools, distance education process was immediately initiated all over Turkey at the same time in order for students not to stay away from education for a long time. Then, people under the age of 20 were prohibited from going out on April 3, 2020. Therefore, students could not leave their houses. Universities and private schools continued their distance education through their distance education infrastructure. The MoNE conducts distance education in public schools via the Education Information Network [EBA] platform, Turkish Radio and Television Corporation [TRT] EBA TV and EBA live lessons.

The purpose of the EBA platform is to support effective material use through information technologies and to integrate technology into education. The EBA platform consists of five main components; 1) Educational search engine 2) Educational content 3) Effective use of IT in curriculums 4) In-service training for teachers 5) Ensuring conscious and secure IT usage by providing the required network infrastructure and broadband internet. The EBA platform has been updated since 2012 and used in distance education (MoNE, 2020b). In its most recent version, teachers can use features such as classroom wall and school wall as a social media environment to interact with students they teach, share activities, ask questions, start discussions and send questionnaires. In EBA, which is defined as a social education platform, many education services are offered together under the names of news, e-content, e-journal, e-book, video, audio, visual, document, let's discuss and EBA market. The curriculum of the Turkish National Education System forms the basis of the EBA platform. The EBA platform is accessible to students, teachers, parents and educational scientists and is free of charge.

TRT EBA TV is a distance education platform established with the cooperation of the MoNE and the TRT to be consisted of three separate channels: TRT EBA TV primary school, TRT EBA TV middle school and TRT EBA TV high school. Students can follow the courses, which are broadcast twice a day, at the appropriate time for their own level of schooling. Lessons are delivered during the week. There are also programs to inform parents. It is possible to access and log in to the EBA platform via an internet browser or mobile application. Through this platform, students can participate in live lessons (EBA live lessons) given by their school teachers. In addition, homework assignments and other educational activities given by teachers are performed through the EBA platform by students.

The distance education conducted in public schools in Turkey does not differ by school or region (city). It can be said that one of the most important differences of distance education during the pandemic from the distance education given in normal periods is that parents who have to stay at home for reasons such as flexible / distance working, closed workplaces or anxiety to go out participate in the educational process of their children. When the literature is reviewed, it is seen that the existing research about the EBA platform is focused on teachers and students (Aktay & Keskin, 2016; Ates et al. 2015; Coskunserce & Isciturk, 2019; Kapidere & Cetinkaya, 2017; Saklan & Unal, 2018; Sahin & Erman, 2019; Turker & Guven, 2016; Tuysuz & Cumen, 2016). Research results show that teachers do not use the EBA platform frequently, yet they consider the EBA platform necessary. Huang et al. (2020), in their large-scale reports, discussed the components of distance and flexible learning in all aspects in China, as a result of interruption of education due to the Covid-19 pandemic. There is no study in the literature that examines the views of parents about the education of their children and the distance education their children receive during the Covid-19 pandemic. For these reasons, it is thought that the evaluation of distance education through the eyes of parents during the pandemic will contribute to the literature. Moreover, the results of the current study may be useful for preventing other countries from committing possible mistakes in distance education.

PURPOSE OF THE STUDY

The purpose of the current study is to determine parents' opinions about distance education (EBA platform, TRT EBA-TV, EBA live lesson) during the pandemic. To this end, answers to the following questions were sought;

1. What are the parents' interest in distance education and their opinions on child follow-up?
2. What are the parents' opinions about their children's interest in distance education?

3. What are the parents' opinions about their awareness of distance education?
4. What are the parents' opinions about the home environment and access to distance education?
5. What are the parents' general opinions about distance education?

METHOD

Research Model

The current study employing the qualitative research model is designed according to the survey model. *"Survey models are research approaches aiming to describe a past or present state as it was or is. The event, individual or object being researched is attempted to be described in its own conditions as it is. There is no intention to change or affect it in any way"* (Karasar, 2019, p.109).

Population and Sample

Population of the current study is comprised of parents at least one of whose children attends a state elementary or secondary school in Turkey. According to the statistics issued by the MoNE, the total number of students attending elementary and secondary state schools in Turkey in the 2018-2019 school year is 10,104,489. Since the research was conducted with parents and only one of the parents would be included in the study, the sample size was calculated by accepting the number of parents as 10,104,489. In order to calculate the sample size, an application was conducted with a group of 45 people. The sample size was calculated by using σ = 1,25, d = 0,1 and $z_{\sigma/2}$ = 1.96 *for* a = 0.05 (Karagoz, 2019):

$$n = \frac{N.\sigma^2.z_{\sigma/2}^2}{d^2(N-1)+\sigma^2.z_{\sigma/2}^2}$$

n= Sample size

σ = Standard deviation of the main mass

d= Amount of deviation for the estimation of median

$z_{\sigma/2}$ = Theoretical value found according to Z table at a certain significance level.

N= Main mass

When all these values were placed in the formula in MS Excell, the sample size for the current study was found to be n=609.84. The sample of the current study was selected by using the convenience sampling method, one of the non-probability sampling methods. In the convenience sampling method, the sample is constructed starting with the most available respondents. An important limitation to be noted here is that the use of non-probability sampling in studies conducted with online surveys reduces the generalizability of the findings (Cohen, Manion & Morrison, 2018).

In elementary and secondary school levels, teachers usually constitute parent groups via WhatsApp to communicate with parents quickly and personally. In this connection, the researchers sent online questionnaires to parents via WhatsApp Parent Groups, with the support of the heads of parent-school associations and parents from different provinces. EB, mentioned in the first part of the current study, was planned as a distance education platform for students in public schools in Turkey. Private schools use different infrastructures. In addition, in order for the questionnaire items to be answered in a healthy way, parents should use all three platforms for distance education. Based on the idea that high school students act more independently from their parents, the criteria for inclusion and not inclusion in the current study were determined.

Criteria for inclusion in the study

- At least one of the parents' children should be attending an elementary or secondary school
- At least one of the parents' children should be attending a state school
- At least one of the parents' children should be following TRT-EBA TV, EBA platform and EBA live lesson

Criteria for not inclusion in the study

- Child/children of the parents should be attending a private school
- Child/children of the parents should be attending a high school or university
- Child/children of the parents should not be following all the lessons in TRT-EBA TV, EBA platform and EBA live lessons

Within the scope of the current study, a total of 1375 parents were reached online. Instead of giving a detailed explanation of the criteria of inclusion in the current study in the online form instruction, an approach was adopted in the form of exclusion by obtaining information from the parents before the analysis was initiated. The reason for adopting this approach is the possibility that parents might not read the online survey instruction carefully. Thus, those that should have been outside the scope of the research were prevented from being included in the analysis. After the data that did not meet the inclusion criteria were excluded from the analysis, the study was conducted on a total of 709 parents. The socio-demographic features of the parents are given in Table 1:

Table 1. Socio-demographic features of the parents

Gender	Frequency (N)	Percentage (%)
Female	574	81.0
Male	135	19.0
Age	Frequency (N)	Percentage (%)
Under 25	18	2.5
25-34	129	18.2
35-44	437	61.6
45-54	120	16.9
55-64	5	.7
Education level	Frequency (N)	Percentage (%)
Elementary	94	13.3
Secondary	106	15.0
High school	213	30.0
Undergraduate	266	37.5
Graduate	30	4.2
Profession	Frequency (N)	Percentage (%)
Housewife	331	46.7
Civil servant	158	22.3
Worker	79	11.1
Tradesman	36	5.1
Retired	15	2.1
Framer (Agriculture and Animal Husbandry)	4	.6
Unemployed	19	2.7
Others	67	9.4
Income level	Frequency (N)	Percentage (%)
2500 TL and less	145	20.5
2500-5000	294	41.5
5001-7500	136	19.2
7500 TL and more	134	18.9

When Table 1 is analyzed, it is seen that the majority of the parents (81.0%) participating in the study are women and in the 35-44 age group (61.6%). It is seen that the majority of the teachers have undergraduate

(37.5%) and high school (30.0) education. Nearly half of the participating parents are housewives (46.7%), followed by civil servants (22.3%) and workers (11.1%). When the income levels of the parents are examined, it is seen that nearly half of the parents (41.5%) have 2500-5000 monthly income while the remaining parents are equally distributed across the other income levels. In 2020 the minimum wage in Turkey was determined to be 2324.70; that is, approximately $342. In this regard, 20.5% of the participants have income lower than this minimum wage.

Development of the Data Collection Tool

A questionnaire was developed by the researchers to collect the research data. While developing the questionnaire, first the existing research in the literature on the subject of distance education was reviewed (Aktay & Keskin, 2016; Berge, 2013; Bilgic & Tuzun, 2015; de Oliveira, 2018; Coskunserce & Isciturk, 2019; Liu, 2002). Then, a questionnaire containing 5 open-ended questions was sent to 10 parents that the researcher could easily reach by e-mail and the answers were received by e-mail. These questions are:

- What are the responsibilities of father / mother in terms of following their children's distance education activities? What did you do in this regard?
- How do you evaluate your children's interest and motivation to follow their lessons during the distance education process? What did you do as a parent in this regard?
- What are the problems you have experienced as a parent during the distance education process (if any)? How did you cope with these problems?
- What are the positive / negative aspects of distance education?
- What are your general opinions about the distance education process conducted during the pandemic?

Table 2 gives examples of the questionnaire items written in line with the opinions of the parents. Only one of the similar parent opinions is given.

Table 2. Examples of the questionnaire items written in line with the opinions of the parents

Questionnaire item	Parent opinions
• As the lesson period is shorter in TRT EBA-TV, it is difficult for my child to focus on them.	(V_1) *"Children's motivation seems to be positively affected by the shortness of the lesson periods"* (V_6) *"Lessons periods are too short, it is difficult for the student to focus on"*
• The mobile internet quota given for distance education is sufficient.	(V_2)*"…internet data should be supported better by the MoNE for digital connections …. For digital data interaction, GB support should be given through GSM operators"*
• We have frequently experienced technical problems in EBA live lessons. • We have frequently experienced technical problems in the EBA platform.	(V_3)*"We had problems in having access to EBA internet page (portal) due to excessive use"* (V_5)*"We experienced problems in connection in the first days of the application"*
• I have been able to receive assistance and support from the concerned people and institutions (MoNE-School-Teacher).	(V_{10})*"We have never been informed about by classroom teachers or school administration during the process of the EBA live lessons…"* (V_8)*"We have been given information by our teachers about the problem of having access to EBA"*
• I have made efforts to motivate my child for distance education lessons. • For my child to follow distance education, I have used rewards / punishments.	(V_4)*"I try to motivate my child by using positive expressions"* (V_8)*"The child gets bored. He/she is not very interested in fact. Sometimes I sit next to him/her. We try hard for his/her attention not to be distracted."* (V_9)*"I can say that it is very difficult to motivate the child in this education process. We have tried to motivate our child by playing games and giving promises"*

• During the pandemic, my child is not alienated to the school because of distance education.	(V_5)*"No system can take the place of face-to-face education yet during such a process, at least our children stay connected to school, partially experience the school environment; thus, it is useful, in my opinion"*
• Delivery of the lessons in the virtual environment makes it difficult for me to control my child's internet use outside the lessons.	(V_5)*"The fact that there are lessons continuously delivered in the virtual environment makes it difficult for us to control the internet usage of our children outside the lesson periods"*

Finally, taking into account the researchers' own observations in the process, a five-point Likert-type questionnaire having 38 items was constructed to elicit the parents' opinions about "their interest in distance education and following their children", "interest of their children in distance education", "development of awareness about education", "home environment and access to distance education" and their general opinions.

For the content validity of the questionnaire, opinions of two teachers; one with a master's degree in computer and instructional technologies and the other in a psychological counselling and guidance, were sought. The experts were given the expert opinion form designed as a four-point Likert scale (1=Not suitable at all, 2=Major revision is needed, 3=Minor revision is needed, 4=Completely suitable). They were asked to provide short explanations about the items they did not find suitable. Krippendorff alpha reliability coefficient showing the consistency between four evaluators was calculated to be .82. This shows that there is a high consistency between the four evaluators. In line with the feedbacks given by the experts, four items were corrected and six items were discarded from the questionnaire. The corrected four items were submitted to the expert review once more. Lyn (1986) states than when the number of the experts is under five, then the experts should be in agreement. Thus, a total of 32 items on which the experts agreed (they assigned 3 and 4 points) are included in the questionnaire.

An online questionnaire was sent to nine parents and a Turkish teacher to minimize the problems that may arise in the actual application. Then the parents were called by phone and their opinions about the questionnaire were taken. Opinions of the experts, parents and Turkish teacher regarding face validity were obtained. Finally, *the questionnaire of parents' perceptions of distance education during the pandemic* including items to elicit demographic information and 32 items was constructed.

Data Collection and Ethics

The data of the current study were collected by using the online survey technique. The reason for the selection of this technique is the isolation measures taken in the pandemic. In addition, it was attempted to reach parents with the help of parent-school association and parents in order to obtain reliable data. WhatsApp parent groups in Turkey made it easier to reach parents. The data were collected through an online questionnaire designed by using the Google Forms. In the first page of the online form, information is given about the purpose of the study. In the second page, there is the informed consent form. When the participants pressed the button *"I have read and understood",* they went on with the questionnaire items. The study was approved by ethics committee.

Data Analysis

In the analysis of the data collected online, descriptive statistics such as means, standard deviations, frequencies and percentages were used for individual items. In the evaluation of item means, the following criteria were taken into consideration.

Table 3. Criteria to Evaluate Item Means

Group Intervals	Scale
1.00-1.79	Strongly disagree
1.80-2.59	Disagree
2.60-3.39	Partially agree
3.40-4.19	Agree
4.20-5.00	Strongly agree

While interpreting the tables on the basis of the evaluation criteria, the options "Strongly disagree" and "Disagree" were evaluated by the researchers as the respondents' disagreeing with the given statement while the options "Partially agree", "Agree" and "Strongly agree" were evaluated as the respondents' agreeing with the given statement.

FINDINGS

The findings obtained for the sub-problems of the current study are presented in the order specified by the sub-problems**.** By using the data collected from the parents, frequencies, percentages means and standard deviations for each item were calculated and are presented here. In relation to the first sub-problem of the study, the opinions about the parents' interest in distance education and following their children are presented in Table 4.

Table 4. Interest in distance education and following children

	Strongly Disagree		Disagree		Partially Agree		Agree		Strongly Agree			
	n	%	n	%	n	%	n	%	n	%	$\bar{x}$	Ss
1. I have had difficulty in following what is done within the context of distance education activities.	***237***	***33.4***	129	18.2	185	26.1	79	11.1	79	11.1	2.48	1.34
2. I have not been adequately interested in the process of distance education.	***395***	***55.7***	108	15.2	89	12.6	47	6.6	70	9.9	1.99	1.35
3. I am following how my child conducts distance education activities.	14	2.0	17	2.4	49	6.9	123	17.3	506	71.4	4.53	.87
4. I helped my child to follow his/her lessons in the correct times.	20	2.8	12	1.7	34	4.8	97	13.7	***546***	***77.0***	4.60	.88
5. I have made efforts to motivate my child for distance education lessons.	19	2.7	8	1.1	42	5.9	115	16.2	***525***	***74.0***	4.57	.86
6. Delivery of the lessons in the virtual environment makes it difficult for me to control my child's internet use outside the lessons.	***248***	***35.0***	71	10.0	137	19.3	100	14.1	153	21.6	2.77	1.56
7. For my child to follow distance education, I have used rewards / punishments.	***473***	***66.7***	58	8.2	80	11.3	38	5.4	60	8.5	1.80	1.31
I have had some problems with my child in terms of his/her following distance education as he/she behaves indifferently in this subject.	***271***	***38.2***	74	10.4	153	21.6	83	11.7	128	18.1	2.60	1.52

When the parents' opinions shown in Table 4 in relation to "*interest in distance education and following children"* are examined considering the means, it is seen that the parents stated that they disagree with the items "I have had difficulty in following what is done within the context of distance education

activities" ($\bar{x}$=2.48); "I have not been adequately interested in the process of distance education" ($\bar{x}$=1.99); "For my child to follow distance education, I have used rewards / punishments" ($\bar{x}$ =1.80). On the other hand, it is seen that they partially agree with the items "Delivery of the lessons in the virtual environment makes it difficult for me to control my child's internet use outside the lessons" ($\bar{x}$=2.77); "I have had some problems with my child in terms of his/her following distance education as he/she behaves indifferently in this subject" ($\bar{x}$=2.60). Yet, the parents were found to strongly agree with the items "I am following how my child conducts distance education activities" ($\bar{x}$ =4.53), "I helped my child to follow his/her lessons in the correct times" ($\bar{x}$=4.60); "I have made efforts to motivate my child for distance education lessons" ($\bar{x}$=4.57).

When the parents' opinions shown in Table 4 are examined considering percentages and frequencies, it is seen that 70.9% of the parents have been adequately interested in the process of distance education, that 95.6% of them follow how their children conduct distance education activities; that 95.5% of them helped their children to follow their lessons in correct times, that 96.1% of them have made efforts to motivate their children for distance education lessons, that 74.9% of them have not used rewards / punishments for their children to follow distance education. In relation to the second sub-problem of the study, the parents' opinions about their children's interest in distance education are given in Table 5.

Table 5. Children's interest in distance education

	Strongly Disagree		Disagree		Partially Agree		Agree		Strongly Agree			
	n	%	n	%	n	%	n	%	n	%	$\bar{x}$	Ss
1. My child is willing to participate in EBA live lessons.	35	4,9	35	4,9	101	14,2	124	17,5	***414***	***58,4***	4,19	1,15
2. My child is willing to participate in TRT EBA-TV lessons.	63	8.9	62	8.7	171	24.1	142	20.0	***271***	***38.2***	3.69	1.29
3. My child is willing to do the activities and assignments in the EBA platform.	58	8.2	58	8.2	155	21.9	161	22.7	***277***	***39.1***	3.76	1.27
4. My child carefully follows his/her lessons until the end.	30	4.2	33	4.7	133	18.8	186	26.2	***327***	***46.1***	4.05	1.10
5. As the lesson period is shorter in TRT EBA-TV, it is difficult for my child to focus on them.	***225***	***31.7***	92	13.0	135	19.0	97	13.7	160	22.6	2.82	1.55
6. Connection problems negatively affected the interest of my child.	133	18.8	71	10.0	146	20.6	110	15.5	***249***	***35.1***	3.38	1.50
7. The belief that there is not going to be any evaluation decreased my child's interest in distance education.	***252***	***35.5***	100	14.1	145	20.5	76	10.7	136	19.2	2.63	1.51
8. As my child is closed at home due to the pandemic, his/her motivation for distance education is negatively affected.	***180***	***25.4***	87	12.3	162	22.8	107	15.1	173	24.4	3.00	1.50

When the parents' opinions shown in Table 5 in relation to "*children's interest in distance education*" are examined considering the means, it is seen that the parents stated that they partially agree with the items "Connection problems negatively affected the interest of my child" ($\bar{x}$= 3.38); "The belief that there is not

going to be any evaluation decreased my child's interest in distance education" ($\bar{x}$ = 2.63) and "As my child is closed at home due to the pandemic, his/her motivation for distance education is negatively affected" ($\bar{x}$ = 3.00). The parents were found to agree with the items "My child is willing to participate in EBA live lessons" ($\bar{x}$ = 4.19); "My child is willing to participate in TRT EBA-TV lessons" ($\bar{x}$ = 3.69); "My child is willing to do the activities and assignments in the EBA platform" ($\bar{x}$ = 3.76); "My child carefully follows his/her lessons until the end" ($\bar{x}$ = 4.05).

When the parents' opinions shown in Table 5 are examined considering percentages and frequencies, it is seen that more than 80% of the parents stated that their children willingly participated in and followed distance education lessons (items, 1, 2 and 4). Nearly 70% of the parents stated that connection problems decreased their children's interest. Nearly half of the parents stated that their children's being closed at home and lesson periods' being shorter negatively affected their motivation for distance education. In relation to the third sub-problem of the study, the parents' opinions about the development of awareness of distance education are presented in Table 6.

Table 6. Development of awareness of distance education

	Strongly Disagree		Disagree		Partially Agree		Agree		Strongly Agree			
	n	%	n	%	n	%	n	%	n	%	$\bar{x}$	ss
1. My awareness of my child's education process has increased during the distance education process.	104	14.7	60	8.5	163	23.0	140	19.7	***242***	***34.1***	3.50	1.40
2. I have realized what my child has learned in school lessons in the process of distance education.	107	15.1	57	8.0	119	16.8	129	18.2	***297***	***41.9***	3.63	1.46
3. I have better understood the importance of education at school during the process of distance education.	23	3.2	7	1.0	48	6.8	62	8.7	***569***	***80.3***	4.61	.90
4. I have better understood the importance of teachers during the process of distance education.	20	2.8	10	1.4	54	7.6	74	10.4	***551***	***77.7***	4.58	.90

When the parents' opinions shown in Table 6 in relation to "*awareness of education*" are examined considering the means, it is seen that the parents stated that they agree with the items "My awareness of my child's education has increased during the distance education process" ($\bar{x}$ = 3.50); "I have realized what my child has learned in school lessons in the process of distance education"($\bar{x}$ = 3.50). The parents were found to strongly agree with the items "I have better understood the importance of education at school ($\bar{x}$ = 4.61) and teachers ($\bar{x}$ = 4.58) during the pandemic.

When the parents' opinions shown in Table 6 are examined considering percentages and frequencies, it is seen that nearly 75'% of the parents stated that their awareness of their children and what they learned increased. More than 95% of the parents stated that they better understood the importance of education at school and teachers. In relation to the fourth sub-problem of the study, the parents' opinions about the home environment and access to distance education are given in Table 7.

Table 7. Home environment and access to distance education

	Strongly Disagree		Disagree		Partially Agree		Agree		Strongly Agree			
	n	%	n	%	n	%	n	%	n	%	$\bar{x}$	Ss
1. We have had to make considerable arrangements in the home environment.	139	19.6	103	14.5	136	19.2	83	11.7	**248**	**35.0**	3.27	1.53
2. Physical conditions at home (desk-computer-room) are adequate for distance education.	49	6.9	44	6.2	74	10.4	105	14.8	**437**	**61.6**	4.18	1.24
3. Some stimulants (sibling-noise and other problems) have distracted the attention of my child.	**242**	**34.1**	108	15.2	129	18.2	94	13.3	136	19.2	2.68	1.52
4. I have been able to receive assistance and support from the concerned people and institutions (MoNE-School-Teacher).	123	17.3	40	5.6	112	15.8	123	17.3	**311**	**43.9**	3.64	1.50
5. We have frequently experienced technical problems in EBA live lessons.	76	10.7	76	10.7	126	17.8	110	15.5	**321**	**45.3**	3.73	1.39
6. We have frequently experienced technical problems in the EBA platform.	97	13.7	80	11.3	154	21.7	110	15.5	**268**	**37.8**	3.52	1.43
7. The mobile internet quota given for distance education is sufficient.	**245**	**34.6**	53	7.5	156	22.0	64	9.0	191	26.9	2.86	1.61

When the parents' opinions shown in Table 7 in relation to "*home environment and access to distance education*" are examined considering the means, it is seen that the parents stated that they partially agree with the items "We have had to make considerable arrangements in the home environment" ($\bar{x}$ = 3.27); "Some stimulants (sibling-noise and other problems) have distracted the attention of my child ($\bar{x}$ = 2.68) and "The mobile internet quota given for distance education is sufficient" ($\bar{x}$ =2.86). The parents were found to agree with the items "Physical conditions at home (desk-computer-room) are adequate for distance education" ($\bar{x}$ = 4.18); "We have frequently experienced technical problems in EBA live lessons" ($\bar{x}$ = 3.73); "We have frequently experienced technical problems in the EBA platform" ($\bar{x}$ = 3.52) and "I have been able to receive assistance and support from the concerned people and institutions (MoNE-School-Teacher)" ($\bar{x}$ = 3.64).

When the parents' opinions shown in Table 7 are examined considering percentages and frequencies, it is seen that 85% of the parents stated that the physical conditions in the home environment are adequate. Nearly 75% of the parents stated that they experienced technical problems and received assistance and support from the concerned people and institutions for the problems they experienced. Nearly 55% of the parents stated that the mobile internet quota given to children by GSM operators is sufficient for them to follow distance education lessons. In relation to the fifth sub-problem of the study, the parents' general opinions about distance education are given in Table 8.

Table 8. General opinions about distance education

	Strongly Disagree		Disagree		Partially Agree		Agree		Strongly Agree			
	n	%	n	%	n	%	n	%	n	%	$\bar{x}$	Ss
1. Distance education may take the place of face-to-face education in future.	470	***66.3***	45	6.3	77	10.9	77	10.9	72	10.2	1.87	1.38
2. Distance education should be continued after schools have been opened.	***218***	***30.7***	48	6.8	145	20.5	88	12.4	210	29.6	3.03	1.61
3. I think that distance education is useful for my child.	112	15.8	71	10.0	168	23.7	125	17.6	***233***	***32.9***	3.41	1.43
4. During the pandemic, my child is not alienated to the school because of distance education.	69	9.7	38	5.4	141	19.9	138	19.5	***323***	***45.6***	3.85	1.31
5. I think that distance education is a good application during the pandemic.	29	4.1	16	2.3	85	12.0	130	18.3	***449***	***63.3***	4.34	1.04

When the parents' opinions shown in Table 8 in relation to "*general opinions about distance education*" are examined considering the means, it is seen that the parents stated that they disagree with the item "Distance education may take the place of face-to-face education" ($\bar{x}$ = 1.87). The parents were found to partially agree with the item "Distance education should be continued after schools have been opened" ($\bar{x}$ = 3.03); to agree with the items "I think that distance education is useful for my child" ($\bar{x}$ = 3.41) and "During the pandemic, my child is not alienated to the school because of distance education" ($\bar{x}$ = 3.85) and to strongly agree with the item "I think that distance education is a good application during the pandemic" ($\bar{x}$ = 4.34).

When the parents' opinions shown in Table 8 are examined considering percentages and frequencies, it is seen that 70% of the parents think that distance education will not take the place of face-to-face education and that distance education is useful for children. Nearly 85% of the parents think that through distance education, their children are not alienated to the school and more than 90% of them think that distance education is a good application during the pandemic.

DISCUSSIONS AND CONCLUSION

One of the difficulties experienced because of the COVID-19 outbreak is the suspension of the educational and instructional activities for students, teachers and parents with the closing of schools (Cullinane & Montacute, 2020). The study of the distance education system, which is offered to millions of students simultaneously in such a period, creates an opportunity for future mass distance education studies. During the pandemic, parents had to take part in the education process of their children who were closed at home. Coordination of all activities related to education, previously coordinated by schools and teachers, was carried out by parents. Parents have taken part in many parts of distance education such as elimination of technical problems related to distance education via the EBA platform, provision of the necessary internet infrastructure, organization of the physical environment at home, following children's curricular and extracurricular activities, and motivating children to participate in lessons and other educational activities. The proportion of the female parents participating in the current study is high and almost half of the women are housewives.

The results related to the parents' opinions about their interest in distance education and fallowing their children revealed that the parents followed and were interested in what was done in the distance education process. It was also revealed that almost all of the parents followed how their children carried out distance education activities, enabled their children to follow their lessons during lesson hours and made efforts to

motivate their children for distance education. Khamis, Dukmak & Elhoweris (2008) stated that families are among the factors affecting students' motivation to learn. It can be said that parents play an important role in increasing children's motivation in a process which they are not accustomed to and in which they are only instructed through distance education.

However, it is positive that families followed the distance education process and did not use rewards / punishments during the process. The parents stated that the control of their children about the use of the internet became more difficult as lessons were taught in the virtual environment. In different studies, it has been reported that technology-addiction causes posture disorders (Ozdincler et al., 2019), developmental problems (Akbulut, 2013), physical inactivity (Hazar et al., 2017) and obesity (Muslu & Gokcay, 2019). Today, the issue of internet security (Karakus et al., 2014; Celen, Celik & Seferoglu, 2011) is frequently discussed. These risks can be cited as the reason for parents' concerns about the negative effects of the internet and being addicted to the screen and the need to control them.

The results related to the parents' opinions about their children's interest in distance education revealed that more than 80% of the parents followed their children willingly in distance education lessons. According to Motte (2013), e-learning has become an increasingly suitable option for many students who want to improve the quality of education for various reasons. It is noteworthy that children are more willing to attend EBA live class than TRT EBA TV and EBA platform. This shows the emotional attachment of children to their teachers. Children prefer to listen to their own class teachers instead of teachers they do not know. This gives rise to the question "Is central distance education or local (given by the school) distance education more effective?" In EBA live lessons, children can communicate online with their teachers and classmates in their schools. It can be concluded that for distance education, which is seen as the learning tool of the future, to be effective in primary and secondary school levels, stronger sense of real classroom environment should be generated.

The parents stated that their children's interest decreased because of the connection problems. In the studies on technology, it has been revealed that technical problems are frequently experienced in distance education (Bilgic & Tuzun, 2015) and that these problems distract the attention of children. The parents' stating that their children's being closed at home due to the pandemic negatively affected their motivation for distance education indicates that physical and outdoor activities for children should also be planned in a distance education system that will be planned, except in extraordinary situations. This can be perceived as a sign that the interest in distance education may decrease gradually after the prolonged period of stay at home during the pandemic. In short, sustainability of the distance education system during a pandemic should also be considered as a subject of discussion.

Results regarding the parents' opinions about the development of their awareness of education show that the parents' awareness of their children's education increased. If this situation continues to show its effect during the normalization process, it means that we will have more conscious parents about the education of children. In addition, the parents' stating that they better understood the importance of teachers and the school during the pandemic is of great importance for the development of a better image of the teacher and school in the society. This may positively affect the participation of parents whose awareness of education has increased during the normalization process. It has been revealed in studies that school-family solidarity has an important effect on students' school success (Celenk, 2003; Gumuseli, 2004).

The results related to the parents' opinions about the home environment and access to distance education show that the home environment was sufficient for students to follow distance education, but arrangements had to be made in the home environment. Seventy five percent of the parents stated that they had technical problems and received support from the concerned people and institutions for the problems they experienced during the distance education process. As mentioned earlier, this is one of the known disadvantages of using technology (Oliveira, Penedo & Pereira, 2018). Here, it is very important that the parents could receive support. Half of the parents found the internet quota given free of charge adequate and the other half did not find it inadequate, which might be related to their financial conditions.

Results regarding the parents' general opinions about on distance education show that their opinions about distance education are positive. As a matter of fact, the parents stated that distance education was useful for their children and that through distance education, their children did not get alienated to the school. The

Minister of National Education in the Republic of Turkey made the following statement regarding distance education "our goal is to take the necessary measures for our children not to be alienated to the school" (MoNE, 2020c). The minister's stating that the main goal of distance education is to prevent children from getting alienated to the school is an indication that the MoNE has achieved its goal in distance education. The parents' thinking that distance education is a good application during the pandemic also shows that transition to distance education is a good decision. Another noteworthy result is that two-thirds of the parents (66%) think that distance education cannot replace face-to-face education. Sahin & Tekdal (2005) investigated 50 experimental studies in their meta-analysis study and stated that internet-based distance education is statistically more effective than face-to-face education. The same results have been obtained in experimental studies (Usta & Mahiroglu, 2008; Yorganci, 2013). These results can be interpreted that distance education is successful when used as integrated to formal education and on a course basis, but its success is low if distance education is the only means of instruction.

In short, in the current study evaluating distance education during the pandemic on the basis of parents' opinions, it was determined that students needed the support of their parents in following lessons and that students were willing to take part in lessons. It was also revealed that because of such reasons as being closed at home and connection problems, students' motivation was negatively affected. During the pandemic, the parents' awareness of their children's education was found to have increased. While parents think that distance education will not take the place of face-to-face education, distance education during the pandemic was a good application and thus many children did not get alienated to the school according to them.

In the study conducted by Cakir, Karademir and Erdogdu (2018) on university students, the reasons for the dissatisfaction of the students having low and medium levels of motivation towards distance education were found to be lack of interaction, negative perceptions and dependence on traditional education. The fact that mass distance education systems are far from the school climate and offer limited communication and interaction opportunities for students reduces the interest and motivation of students. For this reason, these mentioned disadvantages should be taken into account when developing mass distance education tools. Minimizing the technical problems experienced and increasing the internet (data) security in live lessons will significantly increase the efficiency of the system. Offering free internet infrastructure to disadvantaged groups and increasing free mobile internet opportunities in the distance education process are measures to reduce inequality of opportunity. Repeating the research on mass distance education systems of different countries and including student views are recommended for future research. The current study is limited to the parents who could access the distance education system. It is known that there are people who cannot access distance education for reasons such as lack of suitable devices such as computers or tablets. Studies on who cannot access or partially access distance education across the country can be useful for determining the scope of distance education. Furthermore, similar research needs to be done for teachers, students and other stakeholders of distance education.

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IDENTIFYING FACTORS AFFECTING INTENTION TO USE IN DISTANCE LEARNING SYSTEMS

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ABSTRACT

The use and benefit of Distance Learning Systems (DLS) can be increased by a detailed analysis of the factors affecting students' intention to use. This study aims to analyse the effect of various independent variables on the user satisfaction and intention to use DLS via Perceived Ease of Use and Perceived Usefulness. In addition, Time Effectiveness is proposed as a new variable with the claim that the time spent in DLS is valuable. Data were collected from 925 undergraduate students currently enrolled in 9 state universities in Turkey. Data were analysed through Structural Equation Modelling (SEM). Results show that while Interaction, Compatibility and Time Effectiveness have a positive effect on user satisfaction and intention to use via Perceived Usefulness; Self Efficacy, Subjective Norm and Enjoyment have no influence. Moreover, Self Efficacy, Interaction, Anxiety and Time Effectiveness have a significant impact on Perceived Ease of Use, yet Subjective Norm and Enjoyment don't.

Keywords: Distance Learning System, Technology Acceptance Model, intention to use, user satisfaction, e-learning.

INTRODUCTION

Rapid developments in information and communications technologies have caused massive shifts in every aspect of life, including education, which paved the way for the emergence of Distance Learning Systems (DLS). DLS provide unique opportunities to cater for the ever-increasing needs of the modern education system via facilitating learning without time and location constraints (Chen, Wei, & Chen, 2008). Nevertheless, functions and operations of DLS are more complicated than conventional technologies (Liao, 2006) and their operating and maintenance expenditures can create financial burdens for educational institutions. Therefore, analysis and identification of factors influencing DLS performance is a strategic research topic.

Researchers have made use of various theories such as Technology Acceptance Model, Task-Technology Fit Theory, Theory of Planned Behaviour and Three-Tier Use Model in order to explain distance learning' acceptance. Among these, Technology Acceptance Model is the most frequently used theory (Sumak, Hericko, & Pusnik, 2011). It is a theoretically and empirically validated, influential theory that aims to clarify users' technology adoption (Heijden, 2003). This theory argues that the intention to use information technologies is triggered by two belief (Perceived Ease of Use and Perceived Usefulness) variables (Davis, Bagozzi, & Warshaw, 1989). Perceived Ease of Use is the degree that a user has faith in the belief that he/she will not make an extra effort during the use of technology. Perceived Usefulness is the degree to which a user has faith in the belief that the use of technology will improve work performance (Venkatesh & Bala, 2008). Numerous studies have examined the relationship between independent variables and system usage through belief structures. This study starts with a detailed literature review to identify the variables and hypotheses that are most frequently found to have significant impact on Perceived Ease of Use and Perceived Usefulness of DLS' acceptance. The extended model which these variables and hypotheses are added is tested on DLS users.

In order to shed light on the untested issues prevalent in the literature, a new variable to the model is proposed. A large majority of students studying at tertiary level institutions belong to the Z generation, a term given to those born after 2000. This generation regards technology as a part of life, lives fast, thinks in a target-oriented way, has a relatively shorter attention span and their acceptance of DLS depends on the positive correlation between the time spent on the system and the rewards it brings. Therefore, a new variable called Time Effectiveness is introduced, which questions whether spending time on the system is worth it. One of Technology Acceptance Model's belief variables, Perceived Usefulness, focuses on whether the system improves work performance or not, while Perceived Ease of Use pays attention to whether the use of the system requires any considerable effort. As Time Effectiveness focuses on whether the user thinks the time spent is used efficiently, this study tests the impact of Time Effectiveness on the aforementioned belief variables.

Although many models related to information systems have Satisfaction variable (Al-Azawei & Lundqvist, 2015, Al-Azawei, Parslow, & Lundqvist, 2017, Al-Hawari & Mouakket, 2010, De Lone & Mc Lean, 1992, Joo, So, & Kim, 2018), this variable does not exist in the Technology Acceptance Model. In order to assess the factors that explain the user contentment in DLS, the variable Satisfaction which is defined as 'a measure of pleasant feeling when expectations of customers are met at desired levels with provided services' is also included in the model. In the literature, studies investigating the acceptance of distance learning through the Technology Acceptance Model, using the Satisfaction variable, have been examined. Based on the results of these studies, Satisfaction variable was added to the proposed model.

The study aims to;

(i) identify and test the frequently accepted hypotheses in the literature

(ii) propose the Time Effectiveness variable into the Technology Acceptance Model and determine its effect on belief variables,

(iii) incorporate Satisfaction as an explanatory variable into the Technology Acceptance Model and assess its inter-correlation via the independent variables of the model,

(iv) shed light on the factors that influence DLS acceptance of Turkish university students and

(v) providing guidance for studies aimed at expanding the use of DLS. The model proposed in this study has the advantage of bridging the gap in DLS acceptance studies. An integrated approach, in which the most accepted variables in the literature are used, is developed with the Time Effectiveness and Satisfaction variables.

The rest of the paper is organized as follows: First, brief information regarding the frequently tested hypotheses in the current literature and the justification for doing so is given. Then, steps taken to adapt the scale items, the data collection and analyses processes are presented in detail. Then, the results of the tests are set forth and their implications are scrutinized. In the end, implications of these empirical tests are evaluated, limitations of the study are discussed and potential research questions are put forward.

Literature Search and Proposed Hypotheses

Low acceptance rate in information technologies is the biggest obstacle to system success. In the literature, researchers have used numerous theories to explain users' DLS acceptance. The Technology Acceptance Model (Figure 1) is the most frequently used theory in the literature (Sumak et al., 2011). Technology Acceptance Model is a theoretically and empirically validated, influential model aiming to clarify users' technology adoption (Heijden, 2003). According to the theory, a person's use of a system is identified by the two belief variables Perceived Ease of Use and Perceived Usefulness. Perceived Ease of Use is the degree that a user has faith in the belief that he/she will not make an extra effort during the use of technology. Perceived Usefulness is the degree to which a user has faith in the belief that the use of technology will improve work performance (Venkatesh & Bala, 2008).

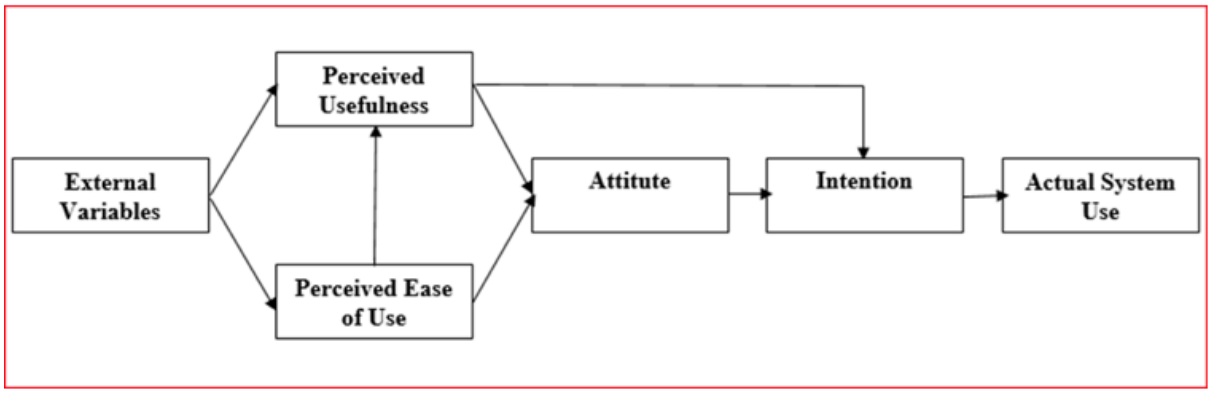

Figure 1. Technology Acceptance Model

External variables are known as antecedents of belief variables and have a strategic role in determining technology acceptance behaviours (Abdullah & Ward, 2016). Incorporating these external factors into the model helps explaining system usage, since they facilitate a better understanding of belief variables and their triggering forces (Legris, Ingham, & Collerette, 2003). The main target of Technology Acceptance Model is to establish a base for observing the influence of external variables on belief and intention (Davis et al., 1989). For this reason, many researchers have expanded and tested model with different external variables. For instance, Technology Acceptance Model 2 incorporates the antecedents of Perceived Usefulness (Venkatesh & Davis, 2000) and by including the explanatory variables deemed to influence Perceived Ease of Use, Technology Acceptance Model 3 is structured (Venkatesh & Bala, 2008). Extending and testing the Technology Acceptance Model with social and personal variables in DLS acceptance studies will contribute to the spread of the system.

This study assesses the explanatory power of seven independent variables (Self Efficacy, Subjective Norm, Interaction, Enjoyment, Compatibility, Anxiety and Time Effectiveness) on user satisfaction and intention to use through belief structures. Hypotheses proposed in the model are determined after a systematic and thorough literature review. Table 1 lists the studies that accept those hypotheses.

The reviewed researches were identified after a careful assessment of Google Scholar, Science Direct, ProQuest Dissertations & Thesis Global, EBSCOhost and Taylor & Frances databases. Criteria taken into consideration upon this identification are listed as follows:

(i) Studies should focus on usage or acceptance of distance learning technologies or systems,

(ii) Models proposed in those studies should at least include one of the belief structures (Perceived Usefulness and Perceived Ease of Use),

(iii) Studies should test at least one explanatory variable's effect on belief structures,

(iv) The model proposed in the study should be empirically tested and the results should be clearly communicated. Rationales behind hypotheses selected from literature review can be described as follows;

Table 1. Proposed Hypotheses are Accepted in Distance Learning Literature (External Variables → Belief Variables)

	Hypothesis	Studies in which the hypothesis is accepted
H1	Self Efficacy→Perceived Usefulness	Al-Ammari & Hamad, 2008, Al-Ammary et al., 2014, Al-Azawei & Lundqvist, 2015, Al-Azawei et al., 2017, Al-Mushasha, 2013, Althunibat, 2015, Aypay et al., 2012, Chen & Tseng, 2012, Chow et al., 2012, Coskuncay & Ozkan, 2013, Hsiao & Chen, 2015, Jung, 2015, Kang & Shin, 2015, Karaali et al., 2011, Lee et al., 2014, Lee & Lehto, 2013, Nagy, 2018, Ong & Lai, 2006, Ong et al., 2004, Park, 2009, Song & Kong, 2017
H2	Self Efficacy→Perceived Ease of Use	Abbad et al., 2009, Abdullah et al., 2016, Abramson et al., 2015, Al-Ammari & Hamad, 2008, Al-Ammary et al., 2014, Al-Azawei & Lundqvist, 2015, Al-Azawei et al., 2017, Al-Gahtani, 2016, Ali et al., 2013, Al-Mushasha 2013, Althunibat, 2015, Basoglu & Ozdogan, 2015, Bhatiasevi, 2011, Brown et al., 2006, Chang et al., 2017, Chen & Tseng, 2012, Chow et al., 2012, Chow et al., 2013, Cigdem & Topcu, 2015, Hsia et al., 2014, Hsiao & Chen, 2015, Kilic et al., 2015, Lee, 2006, Lee et al., 2011.b, Lee et al., 2013, Li et al., 2012, Lin et al., 2010, Liu, 2010, Mei et al., 2018, Moghadam & Bairamzadeh, 2009, Motaghian et al., 2013, Moreno et., 2017, Nagy et al., 2018, Ong & Lai, 2006, Ong et al., 2004, Padilla-Melendez et al., 2008, Park, 2009.a, Park et al., 2012, Pituch & Lee, 2006, Punnoose, 2012, Shen, & Chuang, 2010, Song & Kong, 2017, Tran, 2016, Tseng & Hsia, 2008, Wang & Wang, 2009, Wu et al., 2013, Yalcin & Kutlu, 2019, Yang & Lin, 2011, Yi-Cheng et al., 2007, Yuen & Ma, 2008
H3	Subjective Norm→Perceived Usefulness	Agudo-Peregrina et al., 2014, Al-Gahtani, 2016, Al-Sharafi et al., 2019, Chang et al., 2017, Cigdem & Topcu, 2015, Coskuncay & Ozkan, 2013, Davis & Wong, 2007, De Smet et al., 2012, Farahat, 2012, Kang & Shin, 2015, Karaali et al., 2011, Kimathi & Zhang, 2019, Lee, 2006, Lee et al., 2011.b, Liu & Wei, 2019, Martin, 2012, Mei et al., 2018, Moghadam & Bairamzadeh, 2009, Motaghian et al., 2013, Olson & Brown, 2018, Park, 2009, Park et al., 2012.a, Park et al., 2012.b, Post, 2010, Punnoose, 2012, Raaij & Schepers, 2008, Song & Kong, 2017, Wang & Wang, 2009, Wu & Chen, 2017, Yalcin & Kutlu, 2019, Yang & Lin, 2011, Yuen, & Ma, 2008
H4	Subjective Norm→Perceived Ease of Use	Abdullah et al., 2016, Abramson et al., 2015, Cigdem & Topcu, 2015, Coskuncay & Ozkan, 2013, Farahat, 2012, Kang & Shin, 2015, Kimathi & Zhang, 2019, Lee et al., 2011.b, Motaghian et al., 2013, Olson & Brown, 2018, Yuen & Ma, 2008
H5	Interaction→Perceived Usefulness	Baharin et al., 2015, Binyamin et al., 2019, Chang et al., 2017, Cheng, 2011, Cheng, 2012, Cheng, 2013, Jung, 2015, Lin et al., 2014, Martin, 2012, Martinez-Torres et al., 2008, Moreno et al., 2017, Pituch & Lee, 2006, Shen & Chuang, 2010
H6	Interaction→Perceived Ease of Use	Armenteros et al., 2013, Binyamin et al., 2019, Chang & Liu, 2013, Cheng, 2011, Cheng, 2012, Cheng, 2013, Li et al., 2012, Lin et al., 2014, Shen & Chuang, 2010
H7	Enjoyment→Perceived Usefulness	Abdullah et al., 2016, Al-Aulamie et al., 2012, Al-Rahmi et al., 2019.a, Al-Rahmi et al., 2019.b, Armenteros et al., 2013, Chang et al., 2017, Chen et al., 2013, Lai & Ulhas, 2012, Lin et al., 2010, Park et al., 2012.b, Wu & Gao, 2011, Yi-Cheng et al., 2007, Zare & Yazdanparast, 2013, Zhang et al., 2007
H8	Enjoyment→Perceived Ease of Use	Abdullah et al., 2016, Al-Ammary et al., 2014, Al-Aulamie et al., 2012, Al-Gahtani, 2016, Al-Rahmi et al., 2019.a, Al-Rahmi et al., 2019.b, Al-Sharafi et al., 2019, Arenas-Gaitan et al., 2010, Armenteros et al., 2013, Chang et al., 2017, Chen et al., 2013, Huang et al., 2007, Kimathi & Zhang, 2019, Martinez-Torres et al., 2008, Ramirez-Correa et al., 2015, Shyu & Huang, 2011, Zare & Yazdanparast, 2013
H9	Compatibility→Perceived Usefulness	Al-Rahmi et al., 2019.a, Brown et al., 2006, Chang et al., 2017, Cheng, 2015, Jung, 2015, Lai & Ulhas, 2012, Lee et al., 2011.a, Post, 2010, Purnomo & Lee, 2013, Tung & Chang, 2008.a, Tung & Chang, 2008.b
H10	Anxiety→Perceived Ease of Use	Agudo-Peregrina et al., 2014, Al-Gahtani 2016, Ali et al., 2013, Chang et al., 2017, Chen & Tseng, 2012, Calisir et al., 2014, Karaali et al., 2011, Kimathi & Zhang, 2019, Lefievre, 2012, Park et al., 2012.b, Raaij & Schepers, 2008, Saade & Kira, 2006, Song & Kong, 2017

Self Efficacy is considered as a significant determinant of human behaviour (Bandura, 1982). From a technological perspective, Self Efficacy is the belief that one has the ability to undertake certain computer operations. This determinant is used frequently in predicting users' adoption of various information technologies applications (Hsia, Chen, Chiang, Hsu, & Tseng, 2018). A user with high Self Efficacy is expected to find DLS easy to use. Moreover, it is likely that he/she will presume the circumvention of possible obstacles of DLS usage and expect to benefit from the system.

Hyp. 1; Self Efficacy has an impact on Perceived Usefulness of learners that uses the DLS.

Hyp. 2; Self Efficacy has an impact on Perceived Ease of Use of learners that uses the DLS

Subjective Norm is the social pressure that people sense from their social circle during any action (Ajzen, 1991). Subjective Norm from the perspective of DLS means the social pressure that the students' sense in the use of DLS in their social circles. The social pressure on whether to use DLS or not, can affect the learner's perception that the system is beneficial and easy to use. Thus, subjective norm affects the intention to use DLS through the Perceived Usefulness and Perceived Ease of Use of users.

Hyp. 3; Subjective Norm has an impact on Perceived Usefulness of learners that uses the DLS.

Hyp. 4; Subjective Norm has an impact on Perceived Ease of Use of learners that uses the DLS.

The interaction of learners with each other and with their instructors is a strategic element of the learning process. Interaction in DLS occurs via tools such as e-mail or chat room. Students can communicate and exchange ideas with each other through forum discussion platforms or video conferencing tools. A user's perception regarding the level of advanced interaction, which can be described as the degree of belief that the DLS acts as an impetus for facilitating interaction with teachers and students, can contribute to the perceived advantageousness of the system. Moreover, it is highly likely that a user's effective and agile communication with other parties will trigger her perception regarding the ease of use.

Hyp. 5; Interaction has an impact on Perceived Usefulness of learners that uses the DLS.

Hyp. 6; Interaction has an impact on Perceived Ease of Use of learners that uses the DLS.

Enjoyment is the degree to which a technology-use activity is perceived to be fun on its own, without considering any expected performance result (Lubbe & Louw, 2010). In the perspective of DLS, it is the degree of the belief of user that use of system is an exciting and fun activity, except for the learning output of the user. It is expected that a student, who finds the DLS enjoyable without thinking about its learning outcome, considers that she/he will able to use the system without extra effort. It is also possible that as a result of system usage, student may consider that she/he will benefit from the system.

Hyp. 7; Enjoyment has an impact on Perceived Usefulness of learners that uses the DLS.

Hyp. 8; Enjoyment has an impact on Perceived Ease of Use of learners that uses the DLS.

Compatibility is the degree of, for any innovation, potential users to comply with value judgments and requirements (Moore & Benbasat, 1991). A greater degree of compatibility results in a faster system adoption. In the literature, compatibility is generally tested against and found out to have a significant relationship with Perceived Usefulness. A student's perception of the DLS in accordance with his/her needs, experiences and values may affect the perception that the system is beneficial for the user.

Hyp. 9; Compatibility has an impact on Perceived Usefulness of learners that uses the DLS.

Computer Anxiety is the inclination to feel uneasy and worried about the usage of computer technologies (Igbaria & Parasuraman, 1989). An individual's anxiety regarding computers and technology is highly likely to impede her utilization of DLS or usage of any systems tool to facilitate possible learning activities. According to the conducted literature search, it was obtained that the effect of Anxiety on Perceived Ease of Use was tested mostly and had a negative effect. If a student is worried about the use of the DLS, he/she may consider the system as more complex than what it actually is, and presumes that the system is hard to use. For this reason, anxiety of students, through Perceived Ease of Use, is expected to influence negatively their intention to use the DLS.

Hyp. 10; Anxiety has an impact (negative) on Perceived Ease of Use of learners that uses the DLS.

Abdullah and Ward (2016) analyse 107 researches that investigate users' distance learning acceptance via utilizing Technology Acceptance Model, concluding that Self Efficacy, Subjective Norm, Enjoyment, Anxiety and Experience to be the most frequently used external variables in explaining this behaviour. In another study by Baki, Birgoren and Aktepe (2018), 203 papers were investigated. In their study, Self Efficacy, Subjective Norm, Interaction, Enjoyment, Compatibility and Anxiety variables were found to be the independent variables whose effects on belief variables were most frequently accepted.

A large majority of students from higher education institutions who are born after the year 2000, called the generation Z, in the near future. It is obvious that internet technology and digital equipment are part of everyday life for the generation Z. However, individuals of this generation deal with more than one subject at the same time, consume quickly and easily lose their interest about events (Ozen, Altunoglu, & Oztornaci, 2015). Compared to other generations, this generation loves speed and lives faster. Generation Z consists of individuals who are target-oriented, less loyal and who emphasize flexibility (Vogel, 2015).

Considering the characteristics of the Z generation representatives, their acceptance of a DLS depends on not spending too much time in the system and the thought of being rewarded for the time spent on the system. In the literature review, it is observed that no variable is defined and tested in the time perspective that the users spent. In order to fill this gap, a new variable, defined as Time Effectiveness, is included as a new dimension. Time Effectiveness can be defined as the perception that users think the learning output, they gain from the system is worth the time they spend on the system. The items that measure the Time Effectiveness variable in the scale, are positive questions, indicating that users spend time efficiently when using the system (Appendix A).

Hyp. 11; Time Effectiveness has an impact on Perceived Usefulness of learners that uses the DLS.

Hyp. 12; Time Effectiveness has an impact on Perceived Ease of Use of learners that uses the DLS.

Satisfaction is a measure of nice feeling when the services assured meet the expectations of the customers at the desired level. A consumer's purchase of a product, and adoption of a technology by using it consistently, are analogous. User satisfaction is one of the significant criteria determining the effectiveness of information technologies (De Lone & Mc Lean, 1992). Original Technology Acceptance Model does not include Satisfaction variable, which is a strategic determinant of information technologies' success. In this study, research analysing students' distance learning technology acceptance through Technology Acceptance Model is reviewed and Satisfaction is included into the proposed model (Table 2). 11 and 6 of these studies accept Perceived Usefulness and Perceived Ease of Use as positive and significant determinants of User Satisfaction, respectively. Moreover, 13 studies put forth User Satisfaction as an antecedent of Intention to Use. Therefore, User Satisfaction a variable lacking in the original Technology Acceptance Model, is introduced into the model.

Users tend to use a practice to the extent that they think they will do their task better (Davis, 1989). Perceived Usefulness is considered as a predictor of learning satisfaction (Olsen & Brown, 2018). It is likely that, if a student using DLS thinks that the system is useful and that it will improve his or her performance, then this situation has an effect on the learner's satisfaction with the system.

Hyp. 13; Perceived Usefulness has an impact on satisfaction of learners that uses the DLS.

Table 2. The Relationships of Satisfaction Variable with Belief Variables and with Intention in Distance Education Literature

Hypothesis	Studies in which the hypothesis is accepted
Perceived Usefulness→Satisfaction	Al-Azawei & Lundqvist, 2015, Al-Azawei et al., 2017, Al-Hawari & Mouakket, 2010, Joo et al., 2018, Lee 2010, Lee & Lehto, 2013, Ma et al., 2013, Olson & Brown, 2018, Park et al., 2012.b, Roca et al., 2006, Shih et al., 2013
Perceived Ease of Use→Satisfaction	Al-Azawei et al., 2017, Joo et al., 2018, Nagy, 2018, Olson & Brown, 2018, Park et al., 2012.b, Roca et al., 2006, Shih et al., 2013
Satisfaction→Intention	Cheng 2019, Cho et al., 2009.a, Cho et al., 2009.b, Joo et al., 2018, Lee 2010, Lee & Lehto, 2013, Ma et al., 2013, Mohammadi 2015.a, Mohammadi 2015.b, Olson & Brown, 2018, Ramayah & Lee, 2012, Roca et al., 2006, Shih et al., 2013

Even when a user believes that an application is beneficial, she or he will question the level of effort for using the application and the advantages of performance of use, if it is claimed that the system is difficult to use. Thus, together with usefulness, ease of use is also influential in the system acceptance (Davis, 1989). Perceived Ease of Use is also a direct determinant of Perceived Usefulness. The perception of a system's level of ease of use can affect the perception of system usability. Perceived Ease of Use has an effect on the intention, in two ways; directly and through the perception of the benefit. It is expected that students will be

satisfied with a system if they perceive the use of the system as easy to use and think that they will not make an effort to force themselves when use the system. Furthermore, it is possible that the user's opinion of the system as easy or difficult may have an effect on the opinion that the system is beneficial.

Hyp. 14; Perceived Ease of Use has an impact on satisfaction of learners that uses the DLS.

Hyp. 15; Perceived Ease of Use has an impact on Perceived Usefulness of learners that uses the DLS.

Hyp. 16; Satisfaction has an impact on intention of learners that uses the DLS.

Intention variable is used as a key dependent variable in the proposed model. It is aimed to guide corrective actions that will increase intention of students to use these systems, by identifying concepts that have a powerful effect on the intention to use. The model proposed in this research is presented in Figure 2.

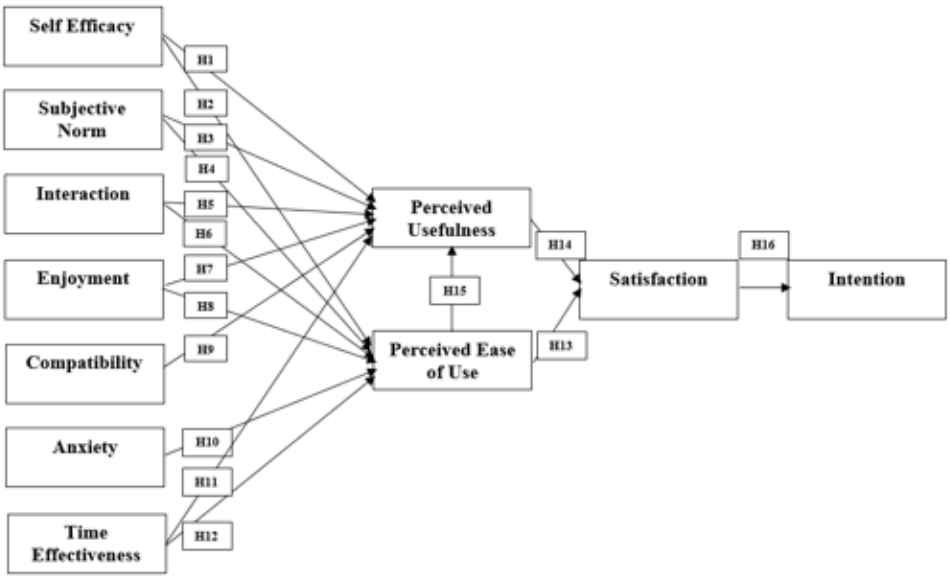

Figure 2. Hypothetical Model

METHOD

This section gives information about the preparation process of the surveys, the respondents, method used in data-and-output analysis and hypothesis results.

Participants

A survey is developed for testing the hypotheses put forward in the model. Items used in this questionnaire are collected from previous research, translated into Turkish and adapted to DLS (Appendix A). Since Time Effectiveness was not included in the models proposed in the literature review, items regarding the variable are newly developed for this study.

The developed questionnaire, firstly, was tested via a pilot program to identify the compatibility, comprehensibility and the completion period of the scale. The pilot study took place in two state universities between February and March, 2018 with 303 participants. Responses of participants that have not used DLS and incomplete / insufficient responses were eliminated and a sample size of 239 was reached. The ultimate version of the questionnaire was constructed after a thorough analysis of this pilot test.

The survey comprises two parts where the first section has 7 demographic questions and the second part contains 35 questions evaluated on a five-level Likert type scale. The main study has been conducted between April 2018 and June 2018. In order to collect data rapidly and to provide reliability, it was carried out via face to face meeting, rather than online methods. The criteria used for sample selection are as follows; participants must be a student at a state university in Turkey, they must have followed at least one distance education course for a full semester and university that the students are enrolled in must have offered some of

their compulsory courses through its DLS. In order to obtain a comprehensive result, 9 different universities, 11 different faculties and 28 different departments were included in the study. A total of 1080 questionnaires were distributed to the learners. After omitting partially or incorrectly completed questionnaires and those filled by students who had not taken a distance education course, 925 (85,65%) valid questionnaires remained for the analysis. Data were analysed via Structural Equation Modelling (SEM) in SPSS AMOS 20 software. The model tested in this study was estimated using maximum likelihood estimation.

Among participants, rate of females is greater than number of males (56,4%). A large portion of the participants are between 18-21 years old (69.3%). Freshmen students comprise the largest participating class (37,1%). Most participants have at least 3 years of computer experience (78,1%); however, no information is acquired regarding their experience processes on DLS (Table 3). In the current system used by the participants, there is no interaction method used for education.

Data Collection and Analysis

Data gathered were analysed via a two-step methodology that comprises of the assessment of measurement model and structural model. No revisions to the model were made during these steps. Following the evaluation of the reliability and internal consistency of the factors used in the model, the aforementioned hypotheses were tested.

The item reliability for the underlying items for each construct was measured using standardized factor loadings. The results show that the loading of all items is higher than the recommended value of 0.5 (Hair, Black, Babin, & Anderson, 2010). The lowest three factor loadings are between 0.621 and 0.685 (Anxiety 1 - 0.621, Perceived Usefulness 4 - 0.678 and Perceived Ease of Use 2 - 0.685). The highest three factor loadings are between 0.950 and 0.959 (Subjective Norm 2 - 0.950, Perceived Usefulness 2 - 0.957 and Enjoyment 2 - 0.959). Items with high factor loadings are highly loaded to their underlying constructs and show higher item reliability (Table 4).

Table 3. Demographic Profiles of the Participants

Demographic Profile (n=925)	Frequency	Percentage (%)
Gender		
Female	522	56.1
Male	403	43.6
Age		
18-21	641	69.3
22-25	252	27.2
26<	32	3.5
Year of Study		
1	343	37.1
2	202	21.8
3	252	27.2
4	128	13.8
Experience in Using Computers (Year)		
<1	109	11.8
1-3	93	10.1
3-6	134	14.5
6-9	215	13.2
9<	374	40.4
Faculties of Students		
FEAS	276	29.8
Faculty of Engineering	202	21.8
Faculty of Art and Sciences	194	21
Faculty of Law	81	8.8
Faculty of Health Sciences	61	6.6

Note: There is no interaction method used for training in the current system.

The convergent validity of the measurement model is tested via Confirmatory Factor Analysis (CFA) where the correlation among variables expected to have a relationship with underlying convergent validity. Theory suggests that Composite Reliability (CR) (Hair, Anderson, Tatham, & Black, 1998) and Average Variance Extracted (AVE) (Fornell & Larcker, 1981) should be higher than 0.7 and 0.5 respectively, to ensure convergent validity. Moreover, the explanatory power of Cronbach's Alpha values on internal consistency are evaluated on a six-level scale where coefficients above 0.7 are considered acceptable (George & Mallery, 2003).

In this research, all constructs are tested for reliability and validity. Reliability test is an evaluation of the degree of consistency between multiple measurements of a variable (Hair et al., 2010). Cronbach's Alpha value is used for reliability analysis. The results showed that alpha values for all variables are above the recommended value in the literature and the scale is reliable. Based on the six cut-off points proposed by George and Mallery, Cronbach's Alpha results show that four construct has excellent reliability (Enjoyment-0.951, Compatibility-0.902, Perceived Usefulness -0.959 and Satisfaction-0.940) and seven constructs has good reliability (Self Efficacy-0.900, Subjective Norm-0.839, Interaction-0.850, Anxiety-0.815, Time Effectiveness -0.883, Perceived Ease of Use -0.851 and Intention-0.880).

The result of the CFA on the model's proposed variables demonstrate the CR values to vary between 0.823 and 0.952 while AVE values have a range of 0.541 to 0.868, leading to the conclusion that the CR and AVE values of all variables are above the acceptable cut-off threshold of the literature. Moreover, Cronbach's Alpha values of these variables vary between 0.815 and 0.959, which are shown to exhibit a good level of reliability (Table 4).

Table 4. Measurement Model Outcomes of the Analysis

Constructs	Item	Factor Loading	Cronbach's Alpha	CR	AVE
Self Efficacy	1	0.800	0.900	0.904	0.758
	2	0.935			
	3	0.872			
Subjective Norm	1	0.761	0.839	0.850	0.741
	2	0.950			
Enjoyment	1	0.926	0.951	0.952	0.868
	2	0.959			
	3	0.910			
Compatibility	1	0.857	0.902	0.903	0.755
	2	0.861			
	3	0.889			
Interaction	1	0.709	0.850	0.853	0.662
	2	0.853			
	3	0.869			
Anxiety	1	0.621	0.815	0.823	0.541
	2	0.709			
	3	0.840			
	4	0.754			
Time Effectiveness	1	0.816	0.883	0.885	0.719
	2	0.849			
	3	0.878			
Perceived Ease of Use	1	0.719	0.851	0.857	0.601
	2	0.957			
	3	0.852			
	4	0.832			
Perceived Usefulness	1	0.937	0.959	0.933	0.781
	2	0.957			
	3	0.933			
	4	0.678			
Intention	1	0.912	0.880	0.887	0.725
	2	0.862			
	3	0.775			
Satisfaction	1	0.925	0.940	0.942	0.843
	2	0.944			
	3	0.885			

Common theory uses various indexes to test the fit of the structural model, while the most frequently used indexes in the reviewed literature within the scope of this research can be listed as λ^2 / df (df: degrees of freedom), TLI, NFI, CFI, RMSEA and SRMR. Fit index results of the proposed model are presented in Table 5; it shows that the measurement model has a satisfactory level of fit. In the literature, it is stated that λ^2 / df should be lower than 3 for good fitting models (Owen, 2011). However, especially in large samples, λ^2 / df value to be less than 4 is considered sufficient (Adornetto, Hensdiek, Meyer, In-Albon, Federer, & Schneider 2008).925 students participated in the study and the study has a large sampling. Therefore, λ^2 / df value, 3.773 is at least acceptable.

To identify a factor model, at least three items are required per factor (Brown, 2014). However, most of the items in the literature measuring the Subjective Norm factor are not suitable to use for DLS. For this reason, in many studies in the distance learning literature, researchers measured the Subjective Norm factor with two items (Abbad, Morris, & Nahlik, 2009, Chang, Hajiyev, & Su, 2017, Davis & Wong, 2007, Lee, 2006, Park, Son, & Kim, 2012.b, Raaij & Schepers, 2008, Song & Kong, 2017, Yuen & Ma 2008). In the study, the Subjective Norm factor is measured with two items in order to ensure that the items are suitable for the subject and the participants are able to evaluate them properly.

Table 5. Model Fit Results

Fit Indices	Model	Recommended Values	References
/ df	3.773	≤ 4-5	Schumacker and Lomax (2004)
TLI	0.941	>0.90	Hu and Bentler (1999)
NFI	0.931	>0.90	Bollen (1989)
CFI	0.948	>0.90	Corrigan et al. (2001)
RMSEA	0.055	<0.08	Jarvenpaa et al. (2000)
SRMR	0.0582	<0.08	Hu and Bentler (1999)

FINDINGS

Interaction (β = 0.108, p<0.001), Compatibility (β = 0.167, p=0.001) and Time Effectiveness (β = 0.355, p < 0.001) were found out a significant and positive impact on Perceived Usefulness (Figure 3). Nevertheless, no significant relationship was found between Self Efficacy (β = -0.041, p=0.051), Subjective Norm (β = -0.011, p = 0.584), Enjoyment (β = 0.021, p = 0.595), Perceived Ease of Use (β = -0.041, p = 0.101) and Perceived Usefulness. In conclusion, Hypotheses 5, 9 and 11 accepted while 1, 3, 7 and 15 rejected. In addition, Self Efficacy (β = 0.319, p < 0.001), Interaction (β = 0.134, p = 0.01) and Time Effectiveness (β= 0.355, p < 0.001) are inferred to have a significant and positive relationship with Perceived Ease of Use while Anxiety (β = -0.081, p = 0.027) has a negative and significant relationship with this belief structure. However, no significant relationship between Subjective Norm (β = -0.045, p = 0.2), Enjoyment (β = 0.000, p = 0.996) and Perceived Ease of Use could be found. Hence, Hypotheses 2, 6, 10 and 12 were accepted while 4 and 8 rejected. Both Perceived Usefulness (β = 0.646, p < 0.001) and Perceived Ease of Use (β = 0.349, p < 0.001) were detected to have a significant and positive influence on user satisfaction, while a significant correlation between Satisfaction and Intention to Use was also observed (β = 0.857, p < 0.001), leading to the accepted of Hypotheses 13, 14 and 16.

The direct and indirect effects of the independent variables on the dependent variables are given in Appendix B. Considering the total effect, The most effective variables on Perceived Usefulness are the exogenous variables Time Effectiveness and Compatibility, on Perceived Ease of Use are the exogenous variables Time Effectiveness and Self Efficacy, on Satisfaction and Intention are the exogenous variables Time Effectiveness and Interaction, respectively. Independent variables introduced explain 38.2% and 83.3% of Perceived Ease of Use and Perceived Usefulness, respectively; while they uncover 73% of User Satisfaction and 73.5% of Intention to Use.

DISCUSSIONS AND CONCLUSION

This study analyses the impact of various explanatory variables on students' satisfaction on and intention to use DLS through Perceived Usefulness and Perceived Ease of Use. Therefore, a model that is based on Technology Acceptance Model is developed and empirically tested. Results of these assessments are summarized below:

First, the outcomes of the tests conducted show that Time Effectiveness, Compatibility and Interaction have a significant impact on Perceived Usefulness. Thus, students' expectation that they will achieve a high learning output while spending a short time in the system (Time Effectiveness) will increase their perception of finding the system useful. The strong correlation between time and usefulness is anticipated for generation z, a generation characterized by fast consumption. Moreover, the learners' opinions that the system is suited to their current values, needs and experiences (Compatibility) have a positive effect on the system being deemed as beneficial. It is likely that a student who has undergone through getting education via a digital platform for the first time may find that process to be inharmonious with her previous experiences. Nevertheless, it should also be stated that the student will deem the experience similar to watching instructive videos online to find solutions to everyday problems. In addition, system's enabling of effective and rapid communication between instructors and pupils (Interaction) have an effect on the perception regarding advantageousness. For instance, upon receiving feedback after asking a question about the course or voicing a concern regarding the classes, a student is more probable to think that the system will enhance her performance.

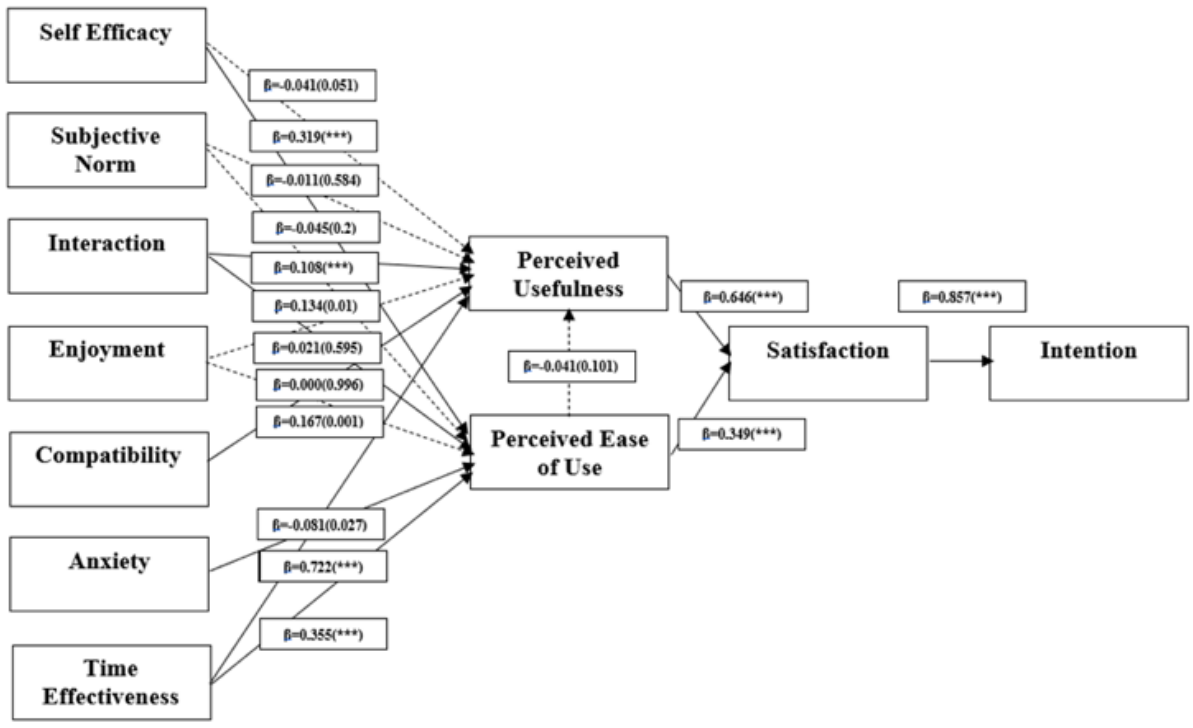

Figure 3. Results of Hypothesis Testing

Note: n = 925, The p values are presented in the parentheses, '***' meaning p < 0.001

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Second, according to our findings, Time Effectiveness, Self Efficacy, Interaction and Anxiety have a significant effect on Perceived Ease of Use. If a user worries that no significant return is gotten for time spent using DLS (Time Effectiveness), she will think that extra effort would be showed for utilizing the system and possibly shy away from doing so. Moreover, students' self-confidence in undertaking certain tasks during systems usage (Self Efficacy) has a positive influence on the perception regarding system's user-friendliness. An individual who is confident about her skills on technology is likely believe that she can overcome any obstacles upon utilizing DLS. In addition, rapid and effective communication between users (Interaction) has a positive impact on Perceived Ease of Use. If problems encountered while utilizing the system are shared with peers and instructors, will facilitate the resolution of the issue and ease the usage. Last, inclination of the learners to feel uncomfortable, worried and stressed about the current and/or potential utilization of the system (Anxiety) bears negative implications on ease of use. Thus, if a student feels worried while utilizing DLS, she might agonize that potential problems upon usage may not be resolved and hence, the system may not be user-friendly.

Thirdly, in this study Satisfaction was tested both as a dependent and independent variable. Despite being one of the most frequently used antecedents of information technology success (De Lone & Mc Lean, 1992), Satisfaction is not included in Technology Acceptance Model. Previous research based on the aforementioned theory that incorporates Satisfaction into their respective models are reviewed during this study, and in light of those, the variable is decided to be embedded into the model. Results show that both Perceived Usefulness and Perceived Ease of Use have a positive and significant impact on User Satisfaction. It can be inferred that users are pleased with systems that facilitate their academic performance without sparing any additional effort. Likewise, satisfaction is a robust determinant of intention to use. The results show that identifying and assessing the factors that influence student satisfaction bear a vital role in DLS success.

Lastly, model proposed in this study is tested in 9 different state universities based in Turkey, where the results put forward a high degree of explanatory power for User Satisfaction and Intention to Use. If one pays special attention to investments made in distance learning in Turkey and the number of users utilizing those systems, the materiality of these outcomes is magnified. Moreover, the distance learning market is growing rapidly in the Middle East, as Turkey and Egypt are the two biggest customers in the region (Docebo, 2016). In many universities, several courses such as foreign language are taught through this medium (Kirkan & Kalelioglu, 2017). Nevertheless, the fact that these systems are newly implemented leads to adaptation problems for both instructors and students (Duzakin & Yalcinkaya, 2008). All in all, this research aims to yield benefits for system designers, instructors and educational institutions to pursue their objective of widespread, active and motivated usage of DLS.

Contributions and Implications

In this part of the study, based on the findings obtained as a result of the analysis, inferences that can be used by instructor, system developers and system designers are presented. It can be stated that instructors and educational institutions can reach a wider span of students with relatively lower costs through DLS. For this reason, they should strive to increase users' intention to use via modifying the system before, during and after utilization. In the study, it was seen that the external variable that had the greatest effect on belief variables was the Time Effectiveness variable. For example, educational institutions can convince users that they will

achieve a great output in a very short time thanks to DLS with a promotion they will make at the beginning of the semester. Instructors, on the other hand, can tell students how effective the system is in terms of time with the announcements they make during the semester. Self Efficacy is another variable that has an effect on system usage. With the training videos to be prepared, students can be guided on how to use the system and thus their confidence in using DLS can be increased. Educational institutions can communicate with system designers to create platforms that will enable students to interact healthily among themselves and with their instructors. For example, users can communicate with each other effectively through forum discussion platforms and video conferencing tools. Moreover, instructors should answer questions posed by students quickly and explicitly. In addition, senior management can reduce the anxiety of both instructors and students with the institutional support.

Systems developers and designers should transform DLS into being more user-friendly and functional so that a more positive attitude towards the system is established and the benefits upon utilizing DLS is more easily reaped. Positive attitudes towards system use can be created with innovations to be developed. Therefore, they should focus on the variables that are observed to strongly affect the intention to use. For example, if they purify the system from unnecessary complexities and make it user-friendly, students' anxiety will decrease and their self-confidence in using the system will increase. It should be ensured that students do not spend too much time watching the lecture videos and accessing the lecture notes shared by the instructor. Thus, they are convinced that they will achieve a high output in a short time through the system. Designers should demonstrate that the use of the system does not require an advanced knowledge of computers and technology, and that the system is not incompatible with the current values and needs of the users. In addition, the system should be designed in a way that users can easily communicate with each other.

Limitation and Suggestions

Even though the model proposed in this study have significant implications for researchers and systems developers, some limitations are prevalent. First, the perceptions of users are calculated within only one, and a certain time frame; as students' opinions on ease of use and usefulness can change within time with new information and experience.

In the study, the effects of seven external variables on belief structures were tested. In future studies, new and original variables can be added to the model and their effects on Perceived Usefulness and Perceived Ease of Use can be observed.

As a result of the widespread use of internet, advances in information technologies, and economic developments in developing countries, DLS have been used in many different regions (Baki, Aktepe, & Birgoren, 2019). Especially Middle Eastern countries are investing in DLS to change their dependencies on their natural resourced based economies and foreign labour force (Docebo, 2016). Therefore, the model proposed in this research should be tested for various countries, particularly for the ones in the Middle East. The model is expected to maintain its effectiveness in different regions and cultures.

Testing the model for different user types and varying information technologies to compare and cross-check the theory can also be of an added value, as the effects of the pre-determinants may vary across users and technologies.

The study accepts that Time Effectiveness has a robust effect on belief structures. Yet it should be stated that the survey respondents are using DLS for taking elective courses that have less credit and are not directly related to their majors. It is likely that when students use DLS for taking lessons that are deemed to bear more significance for their careers, they will attribute less importance to the time spent using the system, so the magnitude of the effect will be lessened. Therefore, testing Time Effectiveness for varying distance learning platforms will prove valuable for the literature.

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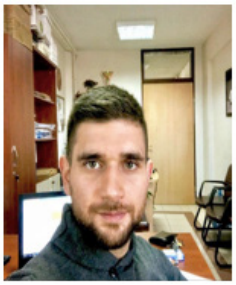

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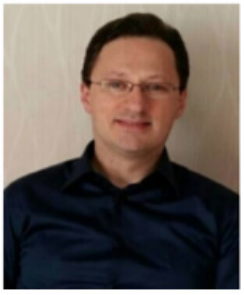

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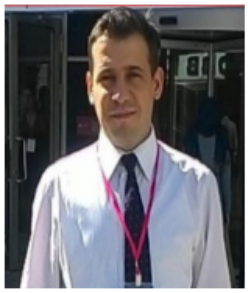

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Appendix A

Instrument

Constructs	Item	Measures	References
Self Efficacy	1	I am confident of using the system even if there is no one around to show me how to do it.	Abdullah et al. (2016)
	2	I am confident of using the system even if I have never used such a system before.	
	3	I am confident of using the system even if I have only a manual for reference.	
Subjective Norm	1	People who influence my behaviour think that I should use the system.	Venkatesh and Davis (2000)
	2	People who are important to me think that I should use the system.	
Interaction	1	The system enables interactive communication between instructor and students.	Pituch and Lee (2006)
	2	The system enables interactive communication among students.	
	3	The communicational tools in the system are effective.	
Enjoyment	1	I find using the system enjoyable.	Venkatesh and Bala (2008)
	2	The actual process of using the system is pleasant.	
	3	I have fun using the system.	
Compatibility	1	Using the system is compatible with most of my learning.	Tung and Chang (2008.a)
	2	Using the system is appropriate for my life style.	
	3	Using the system is appropriate for my learning.	
Anxiety	1	Computers do not scare me at all.	Venkatesh and Bala (2008)
	2	Working with a computer makes me nervous.	
	3	Computers make me feel uncomfortable.	
	4	Computers make me feel uneasy.	
Time Effectiveness	1	I am rewarded for the time I spent on system.	Self developed
	2	One hour I spend on the system is as efficient as an hour I take lessons in class.	
	3	I feel I have benefited from time spent within the system.	
Perceived Ease of Use	1	My interaction with the system is clear and understandable.	Venkatesh and Bala (2008)
	2	Interacting with the system does not require a lot of my mental effort.	
	3	I find the system easy to use.	
	4	I find it easy to get the system to do what I want it to do.	
Perceived Usefulness	1	Using the system improves my learning performance.	Venkatesh and Bala (2008)
	2	Using the system in learning increases my productivity.	
	3	Using the system enhances my effectiveness in education.	
	4	I find the system useful for my education.	
Intention	1	Assuming I had access to the system, I intend to use it.	Venkatesh and Bala (2008)
	2	Given that I had access to the system, I predict that I would use it.	
	3	I plan to use the system in future.	
Satisfaction	1	I am satisfied with the performance of the system.	Roca et al. (2006)
	2	I am pleased with the experience of using the system.	
	3	My decision to use the system was a wise one.	

ADAPTATION TO EMERGENCY REMOTE TEACHING: PEDAGOGICAL STRATEGY FOR PRE-SERVICE LANGUAGE TEACHERS AMID COVID-19 PANDEMIC

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ABSTRACT

Due to the COVID-19 pandemic, face-to-face instructions suspended; numerous campuses worldwide closed and were forced to initiate emergency remote teaching (ERT). Thus, this study explores an existing pedagogical strategy to adapt to ERT in the Indonesian context. The study focuses also on the challenges of implementing ERT-based instructions to promote students' engagement during instructional practices. The researcher made a case study in which YouTube, Zoom, and SPADA platforms were employed for ERT-based instructions at a university. Seventeen pre-service language teachers joining the microteaching course in which English as a medium of instruction were voluntarily recruited during the study. The results indicated that ERT-based instructions were praiseworthy as a successful instructional mode to cope with the suspension of face-to-face instructions. However, the prominent challenges were that the low-achieving students were typically lack of self-discipline to engage virtually during the class and teachers had limited control over such students. It is advocated that teachers are supposed to find out the effective instructional strategies to cope with students' negative learning attitude and to ensure that ERT-based instructions are effective for achieving learning objectives.

Keywords: COVID-19, emergency remote teaching, pre-service language teachers, pedagogical strategy.

INTRODUCTION

In early 2020, Indonesian education has been a period of uncertainty due to the COVID-19 pandemic. Face-to-face instructions were suspended; teachers and students were forced to adapt to the virtual-based instructions. Even, the closure of all levels of education ranging from elementary schools to universities is planned until the end of the year. Also, a survey by Alvara Research Center shows that 54.5 percent of respondents disagree to open the schools shortly because of the concern that students will be infected and carry the virus (2020). The survey suggests that the majority of people seek the students to continue studying from home to prevent the spread of COVID-19 and to protect them and teachers from exposure to the virus. Also, the Indonesian COVID-19 Task Force reports that until the mid of August 2020, the spread of COVID-19 in Indonesia continues to increase throughout the regions. More than a thousand people are confirmed positive for COVID-19 every day. This data imply that the face-to-face instructions cannot be carried out shortly and emergency remote teaching (ERT) is becoming the priority so that the students still have an access to education. ERT has been used in many countries, such as Palestine, Syria, Afghanistan, and the South of Africa (Affouneh et al, 2020) due to the political crisis, but it is completely novel in Indonesia.

The nature of ERT-based instruction is different from that of online language instructions. The online language instruction has gained its popularity over the last decade with the growth of the internet and the proliferation of computer at home (Compton, 2009). However, the online language instructions do not run well amid the COVID-19 pandemic because of poor preparation and planning (Atmojo & Nugroho, 2020). This suggests that online language instructions cannot be abruptly implemented without careful and intentional design and preparation (Hodges et al, 2020; Zuniga, 2020). The online language instructions prompted the need for new teaching approaches and teaching skills that are different from those used in face-to-face language instructions (Hampel & Stickler, 2005). Grounded in the theories, it can be concluded that there are misconceptions related to what and how online language instruction is (Bozkurt & Sharma, 2020). Not all virtual-based language instructions can be categorized as online language instructions if they are not prepared and designed carefully in advance from the very beginning of the semester. Therefore, what teachers might do is that they need to adapt to ERT into their language classroom. As such, ERT should not be labeled as online teaching considering the difference in educational approaches (Bozkurt & Sharma, 2020).

Much research has already been carried out on the implementation of online instructions, both in language and non-language classes. It is reported that online learning helps the students in practicing language skills, acquiring new vocabularies, and improving their understanding of the contents of the lesson (Cakrawati, 2017); is very helpful amid the COVID-19 pandemic (Allo, 2020); and enhance learner motivation to communicate in the target language, promote autonomy and social presence (Kruck, 2012). Other studies also report that online instruction during the COVID-19 is flexible as teacher-student and student-student interaction are not restricted merely in the classroom (Andrade, 2015; Hodges et al, 2020; Martin & Parker, 2014). Those studies provide new perspectives regarding the effectiveness of online instructions in language classrooms. Due to the rapid development of information technology, online language instructions are relatively easy to apply, both synchronously and asynchronously. In contrast, a few studies on ERT in language classrooms have been conducted. A research by Affouneh et al (2020) reports how to design an e-learning environment for emergency remote teaching in a coronavirus crisis. Moorhouse (2020a) researched in Hong Kong that aimed to describe the adaptations made to the initial teacher education course designed for face-to-face instruction that was required to be delivered online due to the COVID-19 pandemic. The latest was a research by Talidong (2020) to explore how Philippine teachers implement remote English language instruction. It was a research at primary schools and merely tried to identify teachers' perceptions of ERT and what considerations lead teachers to implement ERT in language classrooms. Grounded in those previous studies, no pieces of evidence on how pedagogical strategies are implemented during the implementation of ERT in language classes. An effective pedagogical strategy is an important factor to achieve predetermined instructional goals.

For this purpose, the subsidiary research questions are formulated as follows:

a. How is the existing language pedagogical strategy to adapt to emergency remote teaching (ERT) amid the COVID-19 pandemic?
b. What are the challenges of implementing ERT-based instruction to promote students' engagement during instructional practices?

LITERATURE REVIEW

Due to the temporary cessation of face-to-face instructions, many schools have tried hard to adapt to virtual language instructions by making use of information technology, including language instructional practices in many universities. In particular, the Ministry of Education and Culture mandated the schools and universities to provide alternative platforms for students to access education amid the COVID-19 pandemic. Instructional practices must keep continuing so that no students stop learning (2020). In a university context, this requires teacher educators to think of an alternative pedagogical strategy for pre-service language teachers to keep them served to complete their education in the remaining semester amid the COVID-19 pandemic. The abrupt changes allow teacher educators to move their instructional strategy from face-to-face to virtual-based instructions. The pedagogical strategy that was originally designed for face-to-face instructions must be adapted to virtual-based instructional practices. Wong and Moorhouse (2020) note that the process of adaptation is not easy due to the lack of knowledge on virtual instructions and what learning management

system (LMS) is supposed to use. Furthermore, Hodges et al (2020) elucidate that teacher educators may not immediately be able to implement effective virtual teaching and learning because it requires careful design and planning. It implies that the virtual or online instructional system cannot necessarily be carried out by teacher educators without the pedagogical strategy that has been designed for this purpose in advance. In fact, teacher educators originally designed their pedagogical strategy for face-to-face instructions. Thus, they require to adapt the pedagogical strategy that is originally designed for face-to-face instructions to emergency remote teaching (ERT), rather than adapting it directly to the online instructional system.

Online Teaching vs. Emergency Remote Teaching

The differences between online teaching and ERT come from the idea of Hodges et al (2020) who clearly state that well-planned online learning experiences are meaningfully different from courses offered online in response to a crisis or disaster. Moreover, Bozkurt & Sharma (2020) point out that online distance education is one thing and emergency remote teaching is another thing. The distinctive terminology of online teaching and ERT has been hotly debatable, but what should be noted is that ERT is not typically planned from the very beginning of the semester. It involves an abrupt shift from face-to-face language instructions into a remote in a view of the emergency crisis and it is supposed to go back to normal face-to-face instructions after the emergency is over (Hodges et al, 2020, Bozkurt & Sharma, 2020) and it is different from online learning in a normal situation (Affouneh et al 2020). Online language teaching involves more than merely uploading educational content, rather, it is a learning process that provides learners agency, responsibility, flexibility, and choice (Bozkurt & Sharma, 2020), but it needs complex preparation, such as careful planning, designing, and determination of instructional objectives to excogitate an effective instructional environment. That is why ERT is a temporary solution for language instructions and the quality of instructions might not be parallel to truly online instructions (Hodges et al, 2020). However, it enables the flexibility of language instruction anywhere and anytime.

To sum up, online language teaching is designed carefully in advance, but ERT is a temporary shift of instructional delivery to an alternate delivery mode due to crisis circumstances (Hodges et al 2020; Bozkurt & Sharma, 2020; Manfuso, 2020; Shisley, 2020). The ERT-based instructional practice is not originally planned and designed for online teaching, but because of the particular crisis, such as the COVID-19 pandemic, natural disaster, political conflicts, etc., the practice of instructions is adapted online to provide access for education to students. It can be fully remote teaching as a solution for instruction or can be blended or hybrid courses. When the crisis has abated, the instructional practices will return to its original format, which is the face-to-face format of instruction.

Pedagogical Strategy

Owing to the COVID-19 pandemic, moving the face-to-face language instructions to ERT might increase the flexibility of teaching and learning anywhere and anytime. However, teacher educators are supposed to plan and design the pedagogical strategy carefully to provoke student teachers' engagement and interaction during the class. A pedagogical strategy can be defined as a set of procedures in learning, thinking, teaching, etc. that is used as a way to achieve a certain goal (Richards et al, 2001); it involves the teacher's capacity to design instructional scenarios adapted to distance that truly engage learners emotionally and cognitively (Guichon, 2009); and it is not easy to design online pedagogical strategy (Sun, 2011). What pedagogical teaching strategy a teacher educator is supposed to carry out involves a thoughtful design and planning (Orlich et al., 2010). A thoughtful design of a pedagogical strategy can be empowering the pre-service teachers or student teachers to become independent learners beyond the classroom and they are no longer passive recipients (Chambers, 2005). Furthermore, he advocates that to achieve an emerging pedagogical strategy that is powerful for student teachers to learn, the teacher educators are supposed to create extraordinary procedures or ways of teaching that are no longer teacher-centered pedagogy. It means that the pedagogical strategy designed by the teacher educators must be able to provoke the student teachers to learn independently. Moreover, the course contents, learning tasks and activities, group work, assessment – all of which resembles teaching in a teacher-driven environment and seldom goes beyond "automated learning

resource delivery" (Palmer & Holt, 2009). Besides, Sun (2011) advocates that online and ERT teacher educators must constantly review and reflect on their pedagogical strategy and remain committed to change.

METHODOLOGY

This is a case study that means research focuses on a single unit to produce an in-depth description that is rich and holistic (Ary, et al 2010). In addition, McMillan (2008) elucidates that a case study is an in-depth analysis of one or more events, settings, social groups, individuals, or communities that use qualitative methods to gather the data and obtain a detailed description. Specifically, this study aimed to explore an existing pedagogical strategy to adapt to ERT in an Indonesian context. The study also focused on identifying the challenges of implementing ERT-based instruction to promote students' engagement during instructional practices. The instructions were initially designed for face-to-face classroom and the social interactions were also in persons in the classroom. Due to the COVID-19 Pandemic, the teacher educator adapted the instructions to ERT with synchronous and asynchronous sessions offered as the solution for these issues. The learning management systems (LMS) adopted to implement ERT-based instructions were YouTube, Zoom, and SPADA.

Participants

This research involved 17 pre-service language teachers from a university in Indonesia who enrolled in the microteaching course in which English was used as a medium of instruction. They were 20 – 22 years of age and fifteen of them were females, while the rest were males. Those pre-service language teachers were recruited purposively on the basis of the following criteria: they were voluntarily willing to be included in this research; they have enrolled in the course that has been adapted to emergency remote teaching; and they had adequate knowledge on technology-supported teaching and learning.

Data Collection and Analysis

Fifteen questions were designed for an online survey on several points regarding the implementation of the pedagogical strategy adapted to emergency remote teaching amid the COVID-19 pandemic. The survey was then followed with the interviews with eight pre-service language teachers through a video conference system (VCS). To analyze the data acquired, the existing research used an interactive model of data analysis (Miles et al, 2014) with four fundamental stages, i.e. data collection, data condensation, data display, and drawing and verifying conclusion.

Procedure

The pre-service language teachers who joined the microteaching course were recruited voluntarily for the current study. The course was initially designed for face-to-face instructions. After it has been going on for four weeks, the instructions were shifted and adapted to ERT in which the pedagogical strategy was delivered by utilizing the instructional platforms, such as YouTube, Zoom, and SPADA. The ERT-based instructions followed a flipped-classroom approach (Santikarn & Wichadee, 2018; Turan & Akdag-Cimen, 2020) that involves class group discussion and engaging in online video lessons and assignment that must be completed additionally outside of the class time.

Adapted from Moorhouse (2020b), the pedagogical strategy entails of four stages, i.e. (1) providing input to the course contents; (2) checking pre-service language teachers' understanding/providing practice in the subject area; (3) analyzing pre-service language teachers' understanding, development and areas for improvement; and (4) providing feedback to the pre-service language teachers on understanding, development, and areas for improvement. To make it clear, the practices and instructional sequence are presented in table 1.

Table 1. Practices and instructional sequence

Stages	Instructional Approach	Pedagogical Strategy	Activities and Digital Technologies Utilized
1.	Tailor-made video	Providing input to the course contents	The input was in the form of a YouTube video depicting the practices of English language microteaching. The pre-service language teachers scrutinized the video to understand the eight basic skills of teaching English they are supposed to master.
2.	Post-viewing activity / exercise	Checking the pre-service language teachers' understanding/providing practices in the subject area	The pre-service language teachers discussed asynchronously the contents of the video by uploading their written ideas on the SPADA wall.
3.	Analyzing the pre-service language teachers' responses	Analyzing the pre-service language teachers' understanding, development, and areas for improvement	The teacher educator analyzed the pre-service language teachers' understanding, development, and areas for improvement by scrutinizing the variety of ideas the students uploaded on the SPADA wall.
4.	Individual/class feedback	Providing feedback to the pre-service language teachers on understanding, development, and areas for improvement	The teacher educator provided any feedback to the pre-service language teachers on understanding, development, and areas for improvement synchronously by leveraging Zoom as a platform of instruction.

The digital technologies used for every single stage were different from one another. Firstly, YouTube was used to provide the pre-service language teachers input to the course contents. The input was in the form of a video depicting the practice of English language microteaching. Secondly, the pre-service language teachers discussed asynchronously the contents of the video by uploading their written ideas on the SPADA wall. Each pre-service language teacher then commented on the ideas uploaded by their peers. Thirdly, the teacher educator analyzed the pre-service language teachers' understanding, development, and areas for improvement by scrutinizing the variety of ideas the pre-service language teachers uploaded on the SPADA wall. Lastly, the teacher educator provided any feedback to the pre-service language teachers on understanding, development, and areas for improvement synchronously by leveraging Zoom as a platform of instruction.

FINDINGS

In the current research, ERT was implemented in the microteaching class in a university in which English was used as a medium of instruction. YouTube, Zoom, and SPADA were three different platforms used to deliver the course contents; platforms with which synchronous and asynchronous instructions and discussions were designed; platforms in which engagements and interactions were managed by the teacher educator and the pre-service language teachers; platforms in which assignment were supposed to submit by the pre-service language teachers; and platforms through which individual and classical feedback were provided by the teacher educator. Then, the researcher sought the consent of the pre-service language teachers to respond to the online survey on the implementation of an existing pedagogical strategy to adapt to ERT and what challenges were likely to emerge in terms of its implementation to promote the pre-service language teachers' engagement during instructional practices.

Participants' Responses to an Existing Pedagogical Strategy to Adapt to ERT

The majority of pre-service language teachers were optimistic that an existing pedagogical strategy to adapt to ERT was beneficial to implement amid the COVID-19 pandemic. The online survey results on this perception are presented in the percentages; and they are followed by the data taken from interviews to ensure that they were consistent.

Table 2. Participants' responses to an existing pedagogical strategy to adapt to ERT

Statements	Yes	No
I assume that the existing pedagogical strategy to adapt to ERT is beneficial to implement amid the COVID-19 pandemic	92%	8%
I believe that a well-planned ERT allows the instructional practices to achieve the predetermined goals	97%	3%
I get some difficulties to attend the ERT-based instructions	27%	73%
If you get difficulties to attend ERT-based instructions, which of the following causes you to get such difficulties:		
a. Unstable internet connection	70%	
b. Technical problems, such as inadequate technological devices, outdated technological devices, etc.	9%	
c. Overloading of online courses to attend	14%	
d. The passive pre-service language teachers	7%	
When ERT-based instructions are carried out, which platform of instruction do you like best:		
a. Zoom	92%	
b. SPADA	8%	
If you do not like one of those platforms (Zoom/SPADA*) for mediating ERT-based instruction, why:		
a. It is relatively hard for synchronous engagement and interaction	86%	
b. I am not highly familiar with the features of this platform	12%	
c. The features in this platform are less operational	2%	
If synchronous instructions are implemented, how long should the instructional practices last?		
a. 30 – 50 minutes	72%	
b. 51 – 100 minutes	28%	

*please cross the unnecessary one

The pre-service language teachers' perceptual descriptions about an existing pedagogical strategy to adapt to ERT were generally positive. They assumed mostly that this pedagogical strategy was manageable, and few of them assumed otherwise. However, they noted that it was manageable if the internet network was always in stable conditions and teachers possessed good creativity and ability to take advantage of a variety of instructional platforms, such as Zoom, Google meet, SPADA, YouTube, and many others. Lack of teacher's knowledge and skills to operate those various instructional platforms have resulted in the instructional practices being ineffective and unattractive. Nevertheless, they were still several participants got some difficulties to attend the ERT-based instructions, although most of the participants did not get any difficulties. This was because of the problems they had in ERT-based instructions, such as highly unstable internet connection; overloading of online courses to attend; technical problems such as inadequate technological devices, outdated technological devices, etc.; and passive pre-service language teachers. The instability of the internet network was due to the fact that they had to pay more to buy internet quota and some of them live in the blank spot areas. They required that the ERT-based instruction schedules did not collide with other courses. There needs to be good coordination among the teacher educators in arranging the schedules so as not to burden the pre-service language teachers.

Concerning what platforms to use for ERT, Zoom was a primary choice to carry out ERT in the class in which English is used as a medium of instruction. Almost all of the pre-service language teachers chose Zoom as a platform of instruction, and very few of them chose SPADA as an instructional platform. The reason why Zoom was to be the best choice is that Zoom facilitates easily students' interactions and engagements during the class. They could interact directly with their teacher educators and their peers so that when they had some difficulties in terms of the course contents, they could easily seek their teacher educator to clarify them out and to receive direct responses. In addition, they could also be actively engaged during instructional practices. SPADA was not popular among the pre-service language teachers due to its inflexibilities. The majority of pre-service language teachers stated that SPADA was relatively hard for synchronous engagement and interaction; some of them stated that they were not highly familiar with any features in SPADA; and very few of them stated the features in SPADA were less operational. Since YouTube was exclusively used to provide input on microteaching practices and was not used too much during ERT, the pre-service language teachers' views on this platform were not widely explored.

In this current study, ERT was designed to follow a flipped-classroom approach in which the pre-service language teachers were initially introduced to a variety of instructional techniques through videos to scrutinize offline. Next, the synchronous discussions were carried out using Zoom as an instructional platform. It means that the instructional practices were carried out online, both synchronously and asynchronously. The duration of asynchronous instructions was designed to be longer than that of synchronous ones. This is in line with the choice of pre-service language teachers who preferred mostly synchronous instructions which are designed for a shorter time. Therefore, pre-service teachers consider that 30 – 50 minutes was more appropriate to carry out synchronous classes. Some of them chose 51 – 100 minutes. There were two main reasons why they did not want to stick to the synchronous instruction for too long. Firstly, they were scheduled to take the other courses synchronously as well, so they had to prepare themselves for other courses. Secondly, they believed that staring at too long to the computer screen or smartphone might result in a lot of radiation which causes a person to feel dizzy and have headaches.

A successful ERT depends much on the quality of teacher educators. Preparation is an important stage the teacher educators are supposed to execute before ERT-based instructions are carried out. Without proper preparation, instructional practices might not run smoothly. Moreover, the pre-service language teachers highly believed that a well-planned ERT allowed the instructional practices to achieve the predetermined goals; and very few of them did not observe such practices. Furthermore, they believed that there were supposed to adequate supports through systematic workshops from the institution to equip teacher educators with the skills to run technology for instruction. ERT is something new today and teacher educators are not frequently ready to encounter these abrupt changes due to the COVID-19 pandemic.

The Challenges of Implementing ERT-Based Instructions

The quality of engagement and interaction is a significant determinant to establish the success of the instructional practices to achieve the predetermined goals. Therefore, it is important to get the pre-service language teachers to engage and interact actively during the implementation of ERT in which English is used as a medium of instruction. The online survey results on these issues are presented in the percentages and they are strengthened with the interview results to ensure that the data were consistent. The interview was also intended to dig deeper related to the pre-service language teachers' perceptions of this issue.

Table 3. The challenges of implementing ERT-based instructions

Statements	Yes	No
I believe that ERT has been able to facilitate the students to actively engage and interact during the class	82%	18%
I opt to participate more actively in classroom activities rather than virtual activities	78%	22%
I am sure that it is possible to assess students' performance in the ERT class	84%	16%
I occasionally get some difficulties to understand the course contents delivered by the teacher virtually	45%	55%

Specifically, the pre-service language teachers mainly stated that ERT has been able to facilitate them to actively engage and interact during the class. They had no significant obstacles to engage and interact actively during the class. They were well-motivated to participate in ERT as they had to prepare themselves for the next semester's teaching internship. Also, they had no significant obstacles with the internet network so that they could participate in ERT properly. There were only small parts of the pre-service language teachers who could not engage and interact well. No specific reasons why they could not do so, but it should be suspected that this is due to their lower discipline and motivation to learn. Unfortunately, most of the pre-service language teachers reported themselves that they actually opted to participate more actively in the classroom activities; and some of them opted otherwise. On the other hand, the pre-service language teachers claimed that assessing learners' performance is possible in ERT class, while a few of them asserted the opposite. The assessment could be carried out in ERT-based instructions as well, although this assessment required that it be carried out online. However, they argued that to avoid the cheating that the students might commit, the test items should not allow the students to rely solely on their ability to remember and understand the course contents to answer the test items. The test items must require the students to use their ability to think critically and logically to respond to all the test items.

Having the pre-service language teachers all come to the virtual classroom at the same time was a tough challenge during the implementation of ERT. Some of them did not participate consistently during instructional practices. They were identified as low-achieving students having a lack of discipline to actively engage when the class is in progress. In addition, the prominent challenges were that the students occasionally got some difficulties to understand the course contents delivered by the teacher educator virtually. Nearly half of the pre-service language teachers sometimes had difficulties to grasp the course contents and teacher's explanation. The problems were due to the loss of lip synchronization and verbal clues, time lags, poor sound, and images. It happened very often so that the pre-service language teachers were frustrated during a virtual classroom.

DISCUSSION

The current study emphasizes more on exploring an existing pedagogical strategy to adapt to ERT and the challenges of implementing ERT-based instruction to promote students' engagement during instructional practices. The current ERT is specifically implemented in response to the COVID-19 pandemic. It is different from that of online teaching or instruction that is typically planned and designed carefully in advance from the very beginning of the semester. It means that the quality of ERT-based instructions could be different from that of the quality of truly online instructions. For the current study, ERT-based instruction has successfully been executed to cope with the suspension of the face-to-face classroom due to the COVID-19 pandemic. Grounded in the flipped-classroom approach, the pedagogical strategy makes the pre-service language teachers engage and interact effectively during the class. However, the prominent challenges are supposed to take into account by the teacher educator to make ERT run well. Therefore, the entire discussions are based on those pivotal issues.

Adaptation to ERT-based instruction can be a significant and quick solution in response to the current crisis of COVID-19 pandemic worldwide. Due to the COVID-19 pandemic, face-to-face instructions cannot find their ways and they are supposed to suspend until the crisis is over. That is why that ERT is beneficial when the teacher educator and the pre-service language teachers cannot find a day and time for having face-to-face instructions (Sun, 2020; Bozkurt & Sharma, 2020). ERT is a flexible teaching and learning approach to apply during the COVID-19 pandemic because it enables the pre-service language teachers to access education without time and space restrictions. The pre-service language teachers can communicate with the teacher educator and their peers even though they are not in the same place. This suggests that the instructional practices can be still ongoing even though the COVID-19 crisis is hitting and disrupting their direct interactions in the classroom. Moreover, Hodges et al (2020) emphasize that moving instructions into ERT enables the flexibility of teaching and learning anywhere and anytime, although the impacts with which this move expected to happen are staggering. However, to get the staggering impacts of this adaptation to ERT, teacher educators need to possess adequate knowledge and skills concerning the digital technology utilized to design an appropriate pedagogical strategy.

Because of the COVID-19 pandemic, many universities encounter decisions about how to keep continuing the instructional practices while they keep their faculty, staff, and students safe from a health emergency that is changing fast and poorly understood. Therefore, those universities opted to suspend all face-to-face instructions and mandated teacher educators to change their courses into ERT to prevent the spread of COVID-19. However, many teacher educators are not ready yet to adapt to abrupt changes. They have a lack of knowledge, skills, and time to operate a variety of instructional platforms. Therefore, Sun (2011) points out that ERT offers flexibility in both place and time, but many teacher educators cannot work with a fixed timeframe required by the virtual classrooms. Also, Compton (2009) confirms that they are mostly familiar only with hardware and software and it is not enough to teach virtually. In other words, many teacher educators are still accustomed to conventional instructional practices and are not yet fully familiar with virtual-based instructions. To be able to design pedagogical strategies in an effective virtual classroom, they have to possess at least the ability to build an online environment that is different from that of a face-to-face classroom environment. Besides, teacher educators are supposed to have an adequate ability to facilitate pre-service language teachers to build their communicative competence by reiterating the value of "task design" and "tutor intervention" and see that as the ways to achieve "online interaction" (Sun, 2011). This advocates that teacher educators need to receive ample supports from the university in the form of training. However, it seems that this training does not bring many changes to the performance of the teacher educators because the training is typically carried out in a short time and are given to the restricted personnel. Hence, Hodges et al (2020) point out that due to a narrow preparation window, the universities will not be able to offer the same level of supports to all teacher educators in the present situation. Thus, the training needs to be carefully designed and planned within sufficient time for many more personnel to have a significant impact on the performance of teacher educators.

The instructional platform is an important aspect that affects the success of ERT-based instruction, both synchronously and asynchronously. To support effective ERT-based instructions, teacher educators have to select a platform that suits for the pre-service language teachers' needs so they can interact and engage effectively. Furthermore, Wang and Chen (2009) underline that synchronous oral and visual interaction is a crucial component in virtual language learning, and fostering real-time synchronous interaction is an important principle in distance language teaching. The instructional platforms are supposed to facilitate the pre-service language teachers and the teacher educators to interact and engage simultaneously and effectively amid the COVID-19 pandemic. Therefore, Sun (2020) asserts that the platforms to support ERT-based instruction are supposed to provide the students and teachers the entire network that simultaneously holds multi-level interactions amongst its members: one-to-one, one-to-many, or many-to-many. Since interaction and engagement are two important principles for the success of virtual-based instruction, teachers have to opt for which platform is under the students' needs to make these two things happen.

The existing ERT-based instructional practice follows the flipped classroom approach. It refers to an instructional model that minimizes direct instructions by the teacher; the students are firstly supposed to learn the course contents at home; and the instructional activities are mostly in the form of assignments and discussion on the particular course contents. This model of instruction is beneficial to encourage pre-service language teachers to engage effectively and efficiently during the class (Turan & Akdag-Cimen, 2020). Most of the pre-service language teachers become more autonomous and independent (Santikarn & Wichadee, 2018) as they are motivated to discuss the course contents that are substantial or even to broaden the scope of the course contents they are supposed to master. Therefore, Murillo-Zamorano et al (2019) point out that there are four fundamental benefits the flipped classroom could present for successful instructions in the 21st century, i.e. the instructional practices will be more interesting; time efficiency; students will be more independent; and the instruction will be more effective. The instructional process becomes more interesting because of the use of various instructional media, such as videos or digital applications. Student teachers will enjoy the learning process more while absorbing the materials provided. Due to the course contents provided before the class, it is clear that time efficiency will occur. The pre-service language teachers can access the course contents via the instructional platforms with their smartphone or PC and those aim to streamline the instructional practices.

The pre-service language teachers' engagements and interactions are the central and pivotal place in a successful instruction, whether it is online or ERT-based instruction. This is because building the skills, such as how to teach language skills and how to assess the students' learning outcome, requires constant synchronous and asynchronous interaction with their teacher educator and peers (Martin & Parker, 2014; Sun, 2011). The pre-service language teachers and their teacher educators are supposed to throw themselves enthusiastically into the virtual learning communities who are working hard to bring about effective ERT-based instructions amid the COVID-19 pandemic. Furthermore, Wang and Chen (2009) emphasize that synchronous and asynchronous oral and visual interactions and engagements are of great importance in ERT-based instructions. The real-time synchronous interactions and a wide variety of asynchronous engagements are important principles in distance language teaching.

It is, however, in our case, ERT-based instructions do not always work out well. There are at least two prominent challenges that need to address so that ERT becomes an effective instructional model amid the COVID-19 pandemic. Firstly, teacher educators have to possess the skills to teach and manage the class effectively in a virtual classroom. That is why Guichon (2010) stresses that the pressure provided by synchronous communication and the technical failings of the videoconferencing platform make ERT-based instructions more complex to carry out. This implies that teacher educators are supposed to learn how to coordinate their pedagogical strategy by utilizing the available instructional platforms and to rethink their pedagogical strategy to make it appropriate to apply in their virtual classrooms. Secondly, ERT-based instruction which is implemented synchronously and asynchronously requires the simultaneous presence of the pre-service language teachers. However, the pre-service language teachers who are initially enthusiastic about participating in the entire instructional practices and enjoy the flexibility in both place and time which ERT-based instruction offers, many of them ultimately lack discipline in taking the classes. Even, Sun (2011) reports that it is especially true that many of them are unable to work with the fixed length of time required by virtual classrooms. This condition can be beyond the teacher educator's control because he cannot provide all of his time and energy for everyone on various occasions.

CONCLUSION

For the context of the current study, the instructions are initially designed for the traditional, face-to-face-based model. Due to the COVID-19 pandemic, the instructional practices were then sifted to emergency remote teaching. ERT-based instruction is laudable as a successful instructional mode for overcoming the suspension of face-to-face instructions. However, the shift to ERT requires the teacher educators to take more control over their pedagogical strategy and its implementation. Due to the rapid shifts from traditional instruction to ERT, numerous teacher educators in need of support, and the university must find some ways to meet the institutional need to provide the continuity of instructions amid the COVID-19 pandemic. Although ERT has been successful in replacing the conventional face-to-face instructions and the pre-service language teachers generally have a positive view of it, there are also the challenges that occasionally result in ERT does not work well. The challenges come from two parties, both the teacher educator and the pre-service teachers. The teacher educator has to possess the skills to teach and manage the class effectively in a virtual classroom. However, many of them have a lack of knowledge of virtual instructions and what learning management system (LMS) is supposed to use. On other hand, some of the pre-service language teachers have a lack of self-discipline to engage and interact virtually during the class and the teacher educator occasionally has limited control over such students. Whatever the challenges, the instructional practices are dynamic and must adjust to the demands in force at that time. It is recommended that teacher educators are supposed to find out the effective instructional strategies to cope with students' negative learning attitudes and to ensure that ERT-based instructions are effective for achieving the learning objectives.

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SATISFACTION OF OPEN EDUCATION STUDENTS ABOUT THE LEARNING MATERIALS OF MATHEMATICS

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ABSTRACT

Changes and developments that take place in technology also cause changes in education and learning. In defining the sufficiency, appropriacy and sustainability of new student services, knowing about the student satisfaction levels carry an imporant role. For this purpose, this study aimed to find about the student satisfaction level regarding the education services provided for Mathematics I class in the Open Education system at Anadolu University, Turkiye. In this study, student satisfaction levels regarding the learning materials such as printed Mathematics I course book, e-book, e-seminars, e-exam, e-learning, face-to-face learning, all of which are presented to the students for Mathematics I class are examined. In order to determine the student satisfaction level regarding the education services provided for Mathematics I class in the Open Education system; a questionnaire was given to the Mathematics class students who take the class in six different cities. Based on the data gathered, the highest satisfaction level of the students is face-to-face learning whereas the lowest one is the television programmes.

Keywords: Student satisfaction, Mathematics I, learning materials, open education.

INTRODUCTION

The changes and developments that take place in technology also cause changes in education and learning. In the distance education where the Internet and similar techonologies are used, in parallel to the developing techonology, new learning environments and new learning materials are being designed and applied (Naveh et al., 2010). Along with the developing information and communication technologies in distance learning, new programmes are being opened and therefore, the number of new students and student profiles are constantly changing.

As a sign for the education and general quality of an educational organisation, student satisfaction can be shown (Goho and Blackman, 2009). Marozzi (2012) stated that defining the student satisfaction is a key concept for higher educational organisations. Teachers play an important role in determining the general quality of the syllabus and curriculum, and also the student satisfaction (Martin-Rodriguez et al., 2015). Marozzi (2012) pointed out that, with regards to the changes done in the educational organisations, there could be changes in the student satisfaction levels, and thus the student satisfaction should be constantly evaluated.

Anadolu University is a university which designs and applies new learning environments and new learning materials by following and using the recent technological developments in distance education. In addition to the student services that are developed and changed in time, increase in student numbers, changes in student profiles and opening of new programmes affect the student satisfaction in general. It is important to know the student satisfaction levels in determining the sufficiency and appropriacy of the developed and changed student services. From this perspective, the study aimed to determine the student satisfaction levels regarding the student services provided for Mathematics I class which is available in most of the programmes in Open Education system at Anadolu University. For this reason, the materials that are presented for Mathematics I class have been examined are as follows: Printed Mathematics I course book, e-book, e-seminar, e-exam, e-learning, face-to-face learning, television programmes.

LITERATURE REVIEW

In the literatue, Oliver (1999) described the word 'satisfaction' as the perception that a service has been accomplished in a pleasing way. According to the dictionary, it is "the good feeling that you have when you have achieved something or when something that you want to happen does happen" (Oxford Advanced Learner's Dictionary, 1989).

Zakariya et al. (2020) has studied Self-efficacy and approaches to learning mathematics among engineering students. Their findings show that a high sense of perceived self-efficacy has a strong tendency to induce a deep approach to learning mathematics. In contrast, a low sense of perceived self-efficacy induces a surface approach to learning mathematics with a strong effect. This study represents a shift from the usual correla- tional studies that characterize quantitative research in mathematcs education literature to causal relation research. Therein, causal assumptions are made and tested against the collected data, and some recommendations are made for future studies.

Kantoglu et al. (2013) stated that the satisfaction of a customer is a key component in the success of company and the long-term competition goals. Within this context, they pointed out that the planning that is carried out during this time is based on carrying out the customer demands on the time and place given, and also to ensure their satisfaction in general.

Sahin (2009), by stating that the universities were interested in total quality management and customer satisfaction in a way that is increasing day by day, included Flood's definition as the human centred managing system which aims to increase total quality management and customer satisfaction in a permanent way (Flood, 1993). Customer satisfaction is defined as the fact that the customer is pleased with a product or service that meets a customer's needs or expectations (Zainol et al., 2012). In the presentation of education and learning services, traditional marketing logic is generally adopted (Jurkowitsch et al., 2006: Enache and Brodsky, 2011). In a type of education where marketing strategies are used, student satisfaction is reported to be a part of these strategies.

Sahney et al. (2004) showed the students to be in the first-place customers among the other customers in the higher education. If the students are seen as the customers of higher education, then they should be customers that are satisfied, which leads more students to come (Thomas and Galambos, 2004). Oliver and DeSarbo (1989) defined student satisfaction as "students' evaluating various outcomes about the education and their experiences in a personal way." Based on the studies carried out, it is possible to see the importance that the universities give to defining the student satisfaction levels.

Zakariya (2019) studies approaches in higher education mathematics: investigating the statistical behaviour of an instrument translated into Norwegian. The revised two-factor study process questionnaire (R-SPQ-2F) has widely been considered valid and reliable in many contexts for measuring students' learning approaches. However, its cultural specificity has generated considerable discussion, with inconclusive results when translated to different languages. The findings of this study provide empirical evidence for the cultural specificity of the instrument that is consistent with the literature. The R-SPQ-2F is therefore recommended to assess students' approaches to learning, and further studies into its cultural specificity are recommended.

Goho and Blackman (2009) stated that student satisfaction can be an indicator of general quality of the organisation and the education it provides. According to Thomas and Galambos (2004), student satisfaction is a reflection of "an aim that provides a rewarding and pleasing environment." Student satisfaction play an important role in evaluating the general quality of teachers, curriculum and syllabus (Martin-Rodriguez et al., 2015). Sahin (2009), in his study, stated that universities aim to be in the higher places among other universities by taking student satisfaction to the higher levels and lowering the dissatisfaction as much as possible. Many colleges and universities use the data gathered from student satisfaction in order to evaluate their organisational efficiency (Beltyukova and Fox, 2002). In their studies, Elliot and Shin (2002) pointed out that higher education organisations give much importance to satisfaction in the mission statements, objectives and introduction activities. A number of studies show the necessity of defining student satisfaction for an educational organisation to continue its existence and also to increase its quality.

Student satisfaction is being constantly shaped by the experiences revoling around the campus life (Elliott and Shin, 2002). Student satisfaction is generally accepted as a short-term manner, resulting from evaluating the education experience of the student (Elliott and Healy, 2001).

In their study, Erdogan and Usak (2007), pointed out that since student motivation is connected with student satisfaction and their academic success, it is basic to meet student expectations and their needs. Marozzi (2012) stated that in order to define the strengths of the higher education orgsanisations and the areas to be improved, student satisfaction should be evaluated in a meticuluous way. As a reason, he showed the increasing number of students in the higher education, increase in the educational services and the new models that are being developed.

Student satisfaction has a multi-dimensional and complicated nature in an organisation has educational and learning activities (Benjamin, 1994; Elliot and Shin 2002). Eygu and Karaman (2013) stated that this fact can be examined with an approach that includes different dimension like educational quality, physical environment, application opportunities presented, socio-cultural and spotie activities, individual qualities of the student. In their studies, they examined the satisfaction perceptions of the students regarding the distance education they were having. They showed that the scale they developed was suitable to determine the satisfaction level of the students under 8 categories (individual appropriacy, efficiency, learning, programme evaluation, technology, material evalution).

In their study, Erdogan and Usak (2007), with regards to evaluating Science teacher-candidates' satisfaction levels, took into consideration various features such as general satisfaction, management, curriculum, academic staff, facilities, courses and skills developed in the laboratories.

Information and communication technologies have affected contemporary societies and economies as well as the education in a common manner (Martin et al., 2015).

The developments in the Internet and information techonologies have also caused a variety of changes in the methods of education and learning in the distance learning. These changes enriched the learning environments with developing technology suich as text, audio, video and animation. In this way, richened environments are also called "multi-media environments" at the same time. Thus, appropriate learning environments can be provided for students with different learning styles.

The Internet has provided a new mechanism that connects students and teachers. In a study Heinich et al. (2002) carried out, they found out that multi-media environments can increase the motivation. Wu (2014) researched about the connected between satisfaction and learning styles in the distance education. In his study, he took into consideration visual, audiotry, read/write and kinaesthetic learning styles (VARK).

E-learning is a distance learning method in which learning services are provided on a web platform to teachers, students and other useless regardless of location and time (Arbaugh, 2002; Sun, 2008). In e-learning, student satisfaction is an important issue as the new technology affects the student interaction with their peers and teachers (Kaminski et al. 2009).

In e-learning, student satisfaction can be evulated among with other factors such as success, performance, technology and interaction. With regards to satisfaction in e-learning, Bower (2001) emphasised that access to the content, the interaction between student and teachers, time control and cost should be taken into consideration. Palmet and Holt (2010) drew attention to technological factors, whereas Hye-Junk et al. (2009) drew the attention towards interaction factors in the satisfaction of e-learning. Sun and others (2008) proposed a model which included social and technical factors. Apart from these, Kantoglu et al. (2013) also proposed a model which aimed to examine the factors that affect the student satisfaction. In their models, they examined the student satisfaction under five dimensions. Their model included student attention and attitude, the quality of course material and accountability of individual progress, problems accessing to and convenience of the system, efficiency and actuality of the materials, and finally, the quality of the support services. In another study, the connection between the variables of the student satisfaction and the model has been researched with regards to the teaching quality, student interaction, individual appropriacy, factual learning, active learning student anatonmy (Sahin, 2007).

In relation to Mathematics, in this postgraduate thesis, Davis (2014) tried to define the student satisfaction and perfomance via a questionnaire he himself developed. Shukla et al. (2014) looks a comparison of delivery methods for distance learning mathematics courses. The implementation of this study has enabled them to collect data and evidence about the effectiveness of varied distance learning delivery method for curriculum development purposes through the use of grades, teacher observations and a comparison of students' performance in core mathematics courses and mathematical related major courses. A comparison is made of the techniques, experiences, applications and data that are being utilized in the different formats. Topics discussed will include logistics, online resources, and form of assessments, curriculum development, and indications of a review of the results.

As it can be seen from the literature, it can be seen that in defining the appropriacy and sufficiency of the developed and changed teaching servies, it is essential to know the level of student satisfaction. Marozzi (2012) pointed out that, because of the changes carried out in educational organisations, there could be changes in student satisfaction and thus the student satisfaction should be regularly checked.

METHOD

In this study, a questionnaire form has been designed in order to learn the student satisfaction regarding the services provided in Mathematics I class at Anadolu University Open Education system. In this questionnaire, there are 20 questions which ask about the satisfaction regarding printed Mathematics I course book, e-book, e-seminar, e-exam, e-learning, face-to-face learning and television programmes along with other 7 questions about students' demographic information. Satisfaction questionnaire has been designed within the context of 5-point Likert scale. An official permit regarding the use of the questionnaire is obtained from Anadolu University Ethics Board. The population of the study is the Economy and Management students who studied at Anadolu University Open Education system in 2016-2017 Academic year. 207 students from Istanbul, Ankara, Izmir, Antalya, Trabzon and Eskisehir participated in the questionnarie. These are the students who actively participate in face-to-face classes provided to open education students. The reliability of the students' answers to questionnarie is measured by Cronbach's □. All the statistical analysis of the data is carried out by SPSS 24.

Data Analysis

The data analysis is carried out by SPSS 24. The initial cleaning process of the data is carried out then a descriptive analysis of the data is created. Then the students' answers to the questionnaire are analysed to see their satisfaction levels about the services they receive. In order to choose a sample of students, stratified sampling is used. Stratified sampling is a common type of sampling in such applications. This method is done by dividing the main group into one or more sub-groups and creating a new sampling from each sub-group as a result. Each sub-group is called a stratum. Whereas units that create these strata have the common features as the other strata based on the variables, they must show great differences when compared to the others in the other strata. Furthermore, all the units in the main group will be present in only one stratum, and it must be structured so that no main group unit will be left out. In this case, as each stratum will be considered as a main group, the most appropriate sampling can be applied to these strata. In the end, Stratified Sampling can be described as applying the known sampling applications on the present strata. Applying the Simple Random Sampling method to the strata that are created in the main group is called Stratified Random Sampling.

EDUCATION SERVICES PROVIDED IN OPEN EDUCATION SYSTEM FOR MATHEMATICS

Printed Mathematics I Course Book

Printed Mathematics I course book is the primary learning tool that the Open Education system provides for the student. Using the developing technology, this book is designed so that the students can learn on their own and in a way that it would be different than the previous Mathematics course book. Striking differences are that it makes use of dialogue telling, benefits a lot from real life examples, mentions the histrorical development of the topics and uses side explanations to emphasise some of the points elaborated. These issues are described in detail.

Dialogue Telling in Teaching

As opposed to the traditional way, the printed Mathematics I course book tells the topics using dialogues. This method is an ancient way that can be even found in Platon's books (BC 5^{th} and 4^{th} centuries). The topics are discussed by two teachers and four students. The questions that may come to the mind of the students are asked by the students in the dialogues, discussed by them and in the end, the answers are again found by them. When distance learning is taken into consideration, one of the most important problems for the students is the lack of concentration. Under normal teaching and learning environments, the students can be naturally made ready to learn the topics through the help of the teachers present. The advantage of dialogue telling is that it increases students' motivation and it can lure the students into a classroom atmosphere whether they are at their homes, workplaces or a public transportation. The choice of two teachers help the lesson move away from its monotony. Moreover, in the dialogues, there has been an effort to move the Mathematics topic into its course as naturally as possible. In this way, the focus of the students will be more easily drawn to the target topic. When the topic is being discussed, the key points are asked by the students and the answers are provided by the teachers; at other points, the students are asked to brainstorm their way into the correct answer. Thanks to this approach, a warm and friendly classroom atmosphere is planned to be created. To illustrate, beginning the polymonial, a teacher and three students are having a dialogue in Figure 1 (Kocak and Erdogan, 2017).

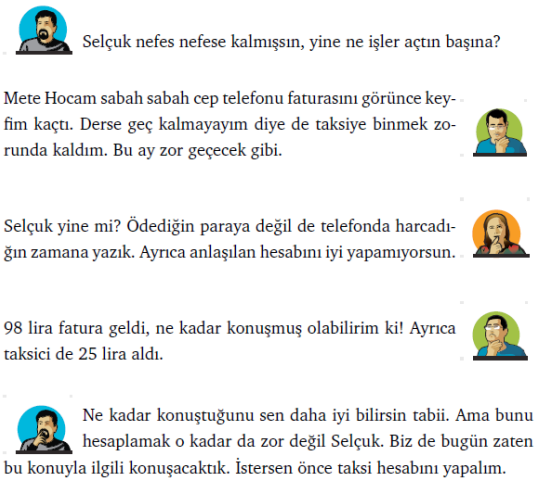

Figure 1. Dialogue about Polynomials

The dialog given in Figure 1 is as follows:

- Selcuk, you are out of breath, what have you been up to?
- Dear Mete, My mood is changed since I saw the phone bill this morning. Additionally I had to take a cab to catch my class. Looks like it will be a tough month.
- Not again Selcuk! The amount of Money you pay for your phone bill is not the problem but it is a pity that you spent too much time on your phone. Also It looks like you can't handle your expenses.
- My phone bill is 98 Turkish liras, how long could I have spoken on the phone?
- You are the one to know how much time you spent on the phone. But it is not too difficult to calculate, Selcuk. We were going to talk about on this issue today. Let's study your taxi bill first.

Real Life Examples

The topics in the printed Mathematics I course book have been explained through examples selected from real life. Including real life examples in the introduction and presentation of topics will be answer to the question "what good will this topic do to me?" and it will also draw the attention of the students. This method motivates students in the distance learning system more than the method adopted in the traditional teaching. Of course, this situation is not applicable for every topic in Mathematics. However, even the most abstract topic in the course book has been tried to be associated with a real-life event. Examples from the notes in music and marginal value in Economy can be seen. The reading texts at the end of each unit will also help the students. In Figure 2, an example about the real-life situation regarding Polynomial can be seen (Kocak and Erdogan, 2017).

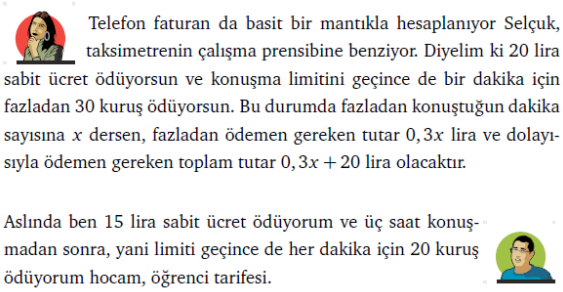

Figure 2. A real-life example for Polynomials

The dialog given in Figure 2 is as follows:

- Your phone bill, Selcuk, is calculated by a simple logic that is also used for calculating taxi-meters. Suppose you pay 20 Turkish Liras for a fixed period and when you get over the limit/period you pay extra 0.30 Turkish Liras for every minute. If you let x as the minutes you spent extra, the extra money you should pay is $0.30x$ and therefore the total amount you owe to the phone company is $0.30x$+20 Turkish Liras.
- Actually, I am paying 15 Turkish liras as fixed period charge and after three hours talking time, that is the limit, I pay extra 0.20 Turkish Liras per minute, that is the student tariff.

Historical Accounts about Mathematics

In the introduction of some topics, Mathematics history has been used. In this way, the fact that scientists have contributed to the topics through some efforts in time has been emphasised. This situation was affected sometimes by a problem surging or sometimes by an intellectual curiosity. Therefore, Mathematics is not a branch of science a certain person or people created in a specific time in history. Mentioning these processes during the introduction of topics will draw the students' attention. Knowing that Mathematics is product of the humans and not some other world's science will help student want to learn more. Thanks to these reasons, even in secondary school course books, Mathematicsal history is included. In addition to this, in Mathematics I course book, how Harezmi solved the quadratic equated as can be seen in Figure 3 (Kocak and Erdogan, 2017).

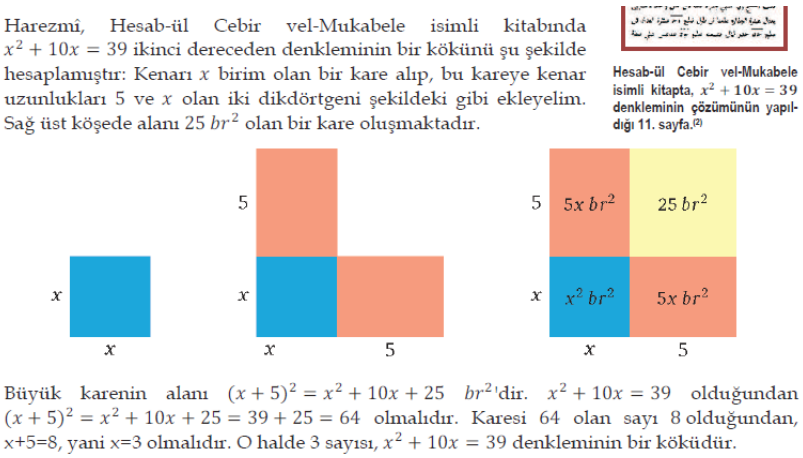

Figure 3. An example for Mathematics history

Side Notes

In the printed Mathematics I course book, pictures, graphics and introductions which will make understanding easier are given in side notes. Definitions and formulas along with other information that the students will have easy access to have been given in the sides of the main paragraph. To illustrate, as can be seen in Figure 4 where irrational numbers are explained, Pythagorean Theorem has been explained through a side activity (Kocak and Erdogan, 2017).

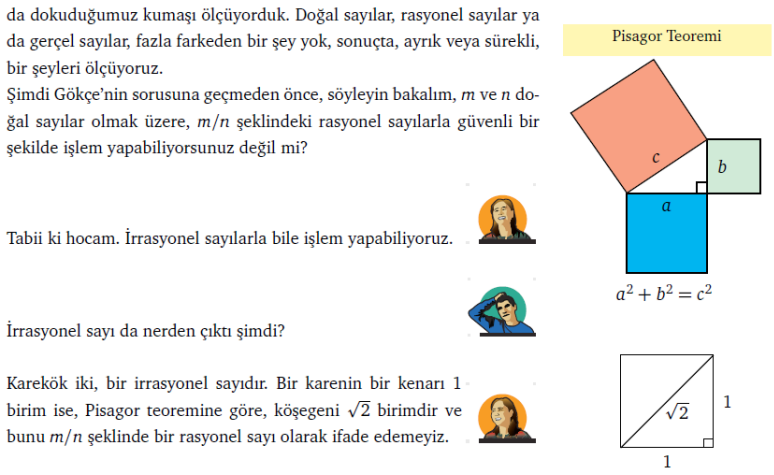

Figure 4. Pythagorean Theorem

With such features, the book is more than a course book, and it turns into a book that raises curiosity about the topics it includes. Also, the summaries and "papers out" parts at the end of each unit enables students to reinforce what they have learnt so far. At the same time, when a student who cannot study except a time that is close to the exam dates is taken into consideration, reading the dialogues will be seen as a waste of time and the student will just study the questions that can be asked in the exam. A student in this situation will prefer a straightforward telling and a book which possibly includes a section called "questions that may be asked in the exam and their answers." By using the Internet effectively, Open Education system aims to meet the needs of the students through practice exams, summary parts and questions from the previous exams.

e-Book

Interactive e-book presents something more than a book. A fully interactive learning environment, e-book, which is enriched by multimedia elements such as audio, video and animation has been designed to draw the learner to the centre of learning and so that efficient learning can take place more easily. Desktop computers, laptops, tablets or cell phones…Windows, Mac, iOS or Android…They make no difference! Interactive e-books are always read at every place. One of the most important principles of Interactive e-book Project is that it is independent from a platform. Students can use all of the interactive e-books without needing any kind of equipment of software, but using their desktops, laptops or smarthpones. (http://aop.eogrenme.anadolu.edu.tr/ sayfalar/etkilesimli-ekitap.aspx). Figure 5 shows the use of such platform, explaning the cluster topic.

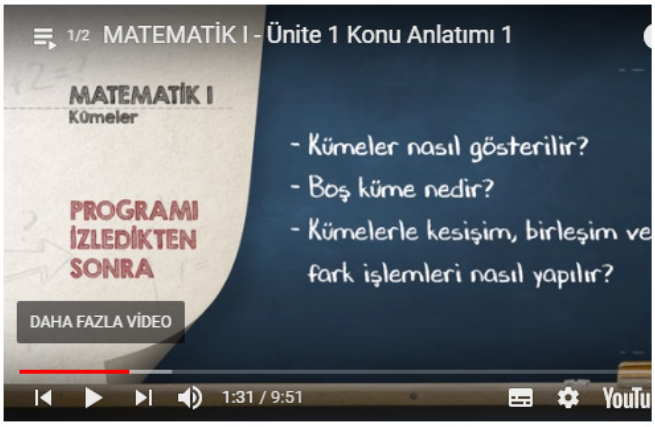

Figure 5. Interactive Teaching of Mathematics course book

e-Seminar

Designed as a virtual classroom application, e-Seminar Project enables open education students to participate in the online face-to-face lesson on the Internet. Students can actively take part in the seminar and ask questions. Lasting for a full academic year, e-seminars take place every week with a full unit of the course.

e-Exam

Prepared exams consist of 20 questions. Students have the opportunity to test themselves and complete what they are missing in the courses. For each exam, a new set of questions get prepared for the students.

e-Learning

e-Learning can be called as the learning in an electronic environment. In other words, it is the web-based education, learning and information managed, all of which are carried out through Internet technologies. While it has some positive aspects, there are also some negative aspects, as well.

Positive aspects of e-learning

- Students decide when to learn
- Wherever there is Internet, the sources are within reach
- Information can be reached again and again
- It saves money on cost of education

Negative aspects of e-learning

- Students need to have enough knowledge about e-learning
- There are difficulties in transferring the traditional course content
- There might be problems about the feedback
- The reliability of the published information

In order to develop e-learning, the equipment and software tools need to be developed as well. Equipment includes personal computers, media applications and ever-accessible Internet servers. Software tools are developed by the people who does the e-learning presentations according to the need. Developed by Anadolu University Open Education Faculty, the portal named Anadolum is one of such creation. Anadolum is a systematic design with a modular structure which presents the open and distance learning service as a package in a general way. Just as new modules can be added to this design, old modules can also be excluded from it. The fact that the designs the organisations that give distance learning services as an institution under normal circumstances do not have an integral layout has been the reason behind Anadolum Project. The fact that modules can work independently and that, at the same time, they can also work in connection with the other modules is the main purpose of the whole project. (https://farukerdogan.wordpress.com/2009/02/23/e-ogrenmenin-faydalari).

By focusing on the learning and communication technologies, Anadolum e-Campus System is a project that aims to move interaction to higher levels and to increase student motivation. e-Campus System includes: Learning Management Sysmte (OYS), Following the Learner Analytics, Live Lessons (e-seminar) Platform, e-book, e-exam and mobile application (https://ekampus.anadolu.edu.tr/).

Face-to-face Learning

Anadolu University Open Education System provides face-to-face learning which enables students to ask about the topics they couldn't understand it in the Mathematics I classes done by the teachers. This service is provided in the evenings during weekdays or at the weekends. People who take this service are students who have trouble learning on their own. Open Education faculty take help from teachers from other universities in order to keep this service going. The teachers who are responsible for the lessons tell the topic based on the content and later answer the questions asked by students.

Television Programmes

According to the agreement done with TRT-School, programmes that are prepared in the TV production centres for the purpose of open education lessons are broadcast. Before the exam, live solutions of the questions are done and students participate in the programme with their questions. In the following days, these

programmes that are recorded live can be watched on the Internet. Apart from this, television programmes which are prepared with pieces from Mathematics history, contemporary and real life in accordance with Mathematics I course book content are also broadcast. Figure 6 shows an excerpt from a programme in which students participate with their questions.

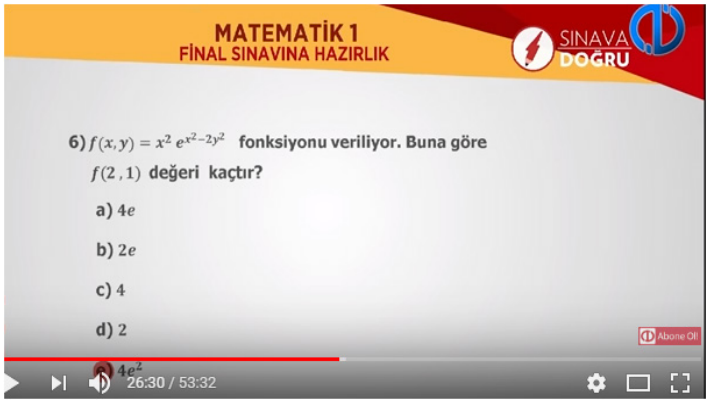

Figure 6. An Example of a question directed by a student

FINDINGS

In this part, the findings and the comments of the data gathered from the students who are taking Mathematics I lesson at Anadolu University Open Education System is given in detail. This data, which has been taken in a questionnaire designed to define student satisfaction, will have been statistically evaluated before it is interpreted in a meaningful way.

Gemographical Characteristics of the Participants

In Table 1, 7 questions about the demographic information of 207 students who took Mathematics I class and the data gathered from these questions can be seen.

Table 1. Demographic information of the participants

Questions	Options	N	
Which programme are you registered on Open Education system?	Management	127	61.4
	Economy	80	38.6
Your age?	18 and under	19	9.2
	19-24	93	44.9
	25-34	56	27.1
	35-44	23	11.1
	45 and above	16	7.7
3- Gender?	Female	122	58.9
	Male	88	41.1
4-Have you ever studied in a higher education organisation before?	Yes	60	29
	No	147	71
5- Do you work?	Yes	88	42.5
	No	119	57.5
6- Can you use a computer as much as necessary?	Yes	176	85
	No	31	15
7- How often do you have access to the Internet?	Every day	165	79.7
	3-4 days a week	25	12.1
	1-2 days a week	11	5.3
	A couple of days every month	6	2.9

As can be seen in Table 2, 61.4% of the participants are students at Faculty of Economy whereas the rest 38.6% are students at Faculty of Management.

According to the data given in Table 2, 45% of the participants area aged between 19 and 24. However, the rate of participants at the age of 25 or above is around 49.5%. As a policy of life-long learning, Anadolu University Open Education system gives students a great opportunity to get their diplomas. When the percentages are taken into consideration, the number of students at their normal age for university is almost the same as the number of students in higher ages.

According to the data in the Table, the number of female students in this study is around 58.9%.

Question 4 was asked to define whether there were any students who already finished a degree in another higher education programme and who entered Anadolu University Open Education system. Within the light of this, 29% of the students were reported to have gotten education from another higher education programme, which supports the idea that the number of individuals who want to get a diploma thanks to the life-long learning philosophy has started to increase. 71% of the students have never studied at a higher education programme before.

Question 5 was prepared to define the number of students who were also working. According to the data, nearly 43% of the students are working.

Question 6 was prepared to define the students' attitude toward using computers. According to the data, 85% of the students who participated in the study stated that they were using computer as much as it was necessary. The fact that the study showed a high percentage of computer usage is a sign that students can be given extra computer materials especially in a lesson like Mathematics. Extra materials like live lessons, problem solving, sample event explanations and e-seminar will affect students' learning experiences in a positive way. For this reason, Anadolu University provides such services from a website, ekampus.anadolu.edu.tr.

Taking a look at the frequency of how much Internet the students used, it can be said that a majority of the students were using the Internet every day or 3-4 days every week. The sum of these two categories were found out to be around 91.8%. As a result, it is clear that the student can have easy access to the support services that are given on the Internet.

Findings Related to Student Satisfaction

There are 20 questions below which asked about the satisfaction levels of the students regarding the printed Mathematics I course book, e-book, e-seminar, e-learning, face-to-face learning and television programmes. Also, in Table 2, to gather the data, a three-way scale has been adopted in order to better see the results.

In the first question in Table 2, whether the fact that the book was written in dialogues was eye-opening and interesting for the student was studied. According to the results, 34.3% of the students stated that dialogue telling is eye-opening and interesting. In the second question, the promoting effect of dialogue telling was studied. According to the data, 29% of the students found dialogue telling effective. The third question included students' views regarding the effect of real life samples on the information itself. Accordign to the results, 30.9% of the students stated that the real-life examples enabled them to focus more on the information.

According to the data gathered from the fourth question, 29% of the students stated that including the history of Mathematics I in the course book in some of the topics made it easy for them to learn. Including more of the history in the course books to be written in the future, this issue can have a facilitating effect. In the fifth question, 29% of the students stated that the printed Mathematics I course book increased their motivation to learn. According to the data gathered from the sixth question which asked about whether the other course books should include dialogue telling, 29.5% of the students leaned towards the idea that other course books can be written in in the same style. For the seventh question, the percentage of the students who thought that the pictures, graphics and explanations in the course book made it easier for them to learn was found to be 41%.

Table 2. Survey questions and answers organised in to 3 level Likert scale

Questions	Disagree	Undecided	Agree
	%	%	%
The fact that Mathematics I course book was written in dialogues was eye-opening and interesting.	49.3	16.4	34.3
The fact that Mathematics I course book was written in dialogues promoted me to study.	51.2	19.8	29.0
The fact that the topics in the Mathematics I course book was told through real life events enabled me to focus on the information.	46.9	22.2	30.9
The fact that some of the topics in the Mathematics I course book was told from the history of Mathematics made it easy for me to learn.	45.4	25.6	29.0
Printed Mathematics I course book increased my motivation to learn.	51.7	19.3	29.0
I wish other course books were written in dialogues.	55.1	15.5	29.5
The pictures, graphics and explanations in the Mathematics I course book made it easy for me to understand.	32.4	26.6	41.1
I prefer Mathematics I e-book to study than the printed material.	22.8	46.1	31.1
In the interactive e-Mathematics I book, multimedia acitivies such as audio, video and animation made me interested in the lesson.	23.7	30.4	45.9
Because the e-Mathematics I book provided multi media learning environment with audio, video and animation, my learning performance increased.	26.1	29.5	44.4
Because the e-Mathematics I book provided multi media learning environment with audio, video and animation, I studied in my own style.	23.8	25.2	51.0
In the concurrent e-seminar activity, I learnt more easily by asking the parts I had trouble understanding.	22.2	34.8	43.0
When I couldn't participate in the e-seminar acitivity, I watched the videos on the e-learning platform and I found it efficient.	24.8	29.6	45.6
In the e-seminar activity, I think that I got enough information from the instructors who were doing the activity.	24.2	34.3	41.5
Practice exams of the Mathematics I lesson helped me to find and define the problems and issues in my learning.	20.8	29.0	50.2
I think that the practices exams of the Mathematics I lesson will increase my success.	19.8	22.7	57.5
E-learning about Mathematics I enabled me to study on my own pace.	17.9	37.2	44.9
I prefer the e-learning of Mathematics I to the traditional learning.	31.9	36.7	31.4
I learnt the topics of the Mathematics I lesson easier in the academic support lessons that are done face-to-face.	15.0	14.0	71.0
Because the television programmes of the Mathematics I lesson included current and real-life examples, they were interesting and informing.	34.8	36.7	28.5

According to the eighth question which showed students' preferences of using e-book rather than printed Mathematics I book, the percentage of students who preferred e-book is 31.1, whereas the undecided percentage stayed at 46.1. For the ninth question, 45.9% of the students were attracted to the supplementary material such as video, audio and animation in Mathematics I course book. According to the data gathered from the tenth question, 44.4% of the students regarded the supplementary materials like audio, video and animations as increasing their performance. According to the eleventh question, the percentage of the students who stated that they liked working in their own style was 51%.

According to the question twelve, 43% of the students said that they learnt the topics they had trouble understanding easily thanks to the e-seminar activity. In question thirteen, the number of students who continued their learning experiences even if they couldn't participate in the concurrent e-seminar activities was around 45.6%. This situation can be as an indicator that these e-seminar activities should go on in the future. For question fourteen, 41.5% of the students thought that they take enough feedback from the instructors who were doing the e-seminar activities in the Mathematics I lesson. As a result, increasing the interaction between students and instructors can also increase students' learning experiences.

Question fifteen was asked to define students' views about the practice exams. According to the data gathered, 50.2% of the students stated that the practice tests were helpful in defining their mistakes and problems they were having in the Mathematics I lesson. This situation can be an indicator that such practices can continue in the future. According to the data gathered from question sixteen, 57.5% of the students thought that practice exams increase their success in the exams.

Question seventeen aimed to find the relationship between e-learning and students' pace. According to the data, 44.9% of the students thought that e-learning in Mathematics I lesson enabled them to study at their oown pace. Question eighteen looked at the student preferences between e-learning and traditional learning. According to the data, 31.4% of the students prefer e-learning to traditional learning.

The percentage of the students who stated that they learnt better in the face-to-face academic support Mathematics I lessons was found to be 71%. Based on the data, it can be said that continuing the face-to-face education services can contribute more to the student's general learning and their success in the exams.

Question twenty reflects the view regarding the television programmes. Accordign to the data, 28.5% of the students thought that the television programmes were eye-opening and interesting as they included contemporary and real-life examples. More materials from this area can be developed in the years to come.

CONCLUSION

This research which was carried out with students who took Mathematics I lesson within the context of Anadolu University Open Education system was done with the permit of Anadolu University Scientific Research Commision's 01.07.2016 and 11/5 file number. The project was within the context of a title accepted by the Commission under the project number 1606E533 and the statement "Student satisfaction regarding the Mathematics I lesson given in the Open Education sytem." In this part of the study, the findings about the printed Mathematics I course book, e-book, e-seminar, e-exam, e-learning, face-to-face learning and television programmes about the Mathematics I lesson will be given in detail. In the study, according to the demographic information of the students, the difference between the the levels of satisfaction regarding the Mathematics I lesson in the Open Education system was found to be low. While this finding is parallel to what Davis (2014) proved in thesis that student satisfaction did not change according to the gender, the study contradicts his findings with regards to the age. In his thesis that studied the student satisfaction according to the age, he stated that "younger students were more satisfied with online Mathematicss courses than older students."

The seven questions were designed to ask about the student satisfaction about the printed course book, dialogue telling, explaining the topics through real life examples, making use of Mathematics history and side explanations. In the seventh question where the student satisfaction is high, students stated that the pictures, graphics and the animations in the Mathematics I course book made it easy for students to understand the topic. As a result, it can be said that such use of pictures, graphics and animations along with other supportive visual details affect student satisfaction in a positive way. To illustrate, Eisenberg and Dreyfus argue that when one uses functions, one should "see" a diagram, and this visual interpretation should be just as dominant in the mind as the analytic formulation.

In the examining of student satisfaction regarding the e-Mathematics I book (8-11), as the e-book provided multi media materials such as audio, video and animation, the rate of students who stated that they worked best for their own style is higher than the others. The student satisfaction regarding the e-book was found out to be higher than the satisfaction with the printed course-book. As Sahin and Yildirim (1999) stated, the fact that the learning materials have the ability to carry the content from abstract to something concerete and that they make the learning easier by using audio-visual features has affected the student satisfaction in a positive manner.

As for the student satisfaction regarding e-seminar, the rate of students who stated that they could ask the areas they had trouble understanding and the rate of students who stated that they could take sufficient feedback from the instructors are close to one another. Since these rates are twice the percentage as the students who have negative opinions, it shows that the student satisfaction should be increased nonetheless. Sahin (2007) stated that "although distance education is a learner-centered instruction, this finding confirms that instructor support, such as timely help, useful feedback, or easy communication, is still a key factor for student satisfaction in distance learning. Thus, instructors of distance education should be accessible, provide prompt responses, and encourage their students through online learning activities." With these words, he emphasised the support that the instructors could give to the distance education.

According to the data gathered from the e-exam satisfaction, the rate of the students who thought that the practice exams increase their success in the general exams is really high. The students, who cannot spare enough time to study, who think reading the dialogues is a waste of time and who studies the questions that may be asked in the exams, can be the reason for this finding.

Based on the data gathered from the satisfaction findings about the e-learning, the number of students who stated that they would prefer e-learning to traditional learning was found out to be even. This situation is supported by Kendall's (2001) statement that "online courses can achieve the student success and learning outcomes, though not so much as traditiona courses."

According to the data about the face-to-face learning of the Mathematics I lesson, the percentage of the students who stated that they learnt the topics easier in the academic support lessons is higher than the other satisfaction questions asked in the questionnaire. This situation supports the statement by Rodriguez and others: "Even though students may have opted for e-learning freely, they still express a high regard for contact with their professor and classmates."

As for the student satisfaction regarding the television programmes, the number of students who thought that the television programmes are interesting and informing as they included contemporary and real-life examples was found out to be the lowest among other questions that asked about the satisfaction levels.

Universities are expected to meet the needs and expectations of the students, and therefore, it is essential to find about what the students give importance to and what they are less satisfied with (Elliott and Shin, 2002). Within this light, in this study, whereas the rate of students who are satisfied with face-to-face learning is highest, the satisfaction level for the television programmes is the lowest. Yildirim et al. (2015) stated that the lower satisfaction areas in the universities are indicators of where some improvements should be made in order to increase the student satisfaction in those areas. According to this, it can be said that further action should be taken into consideration regarding the television programmes of Mathematics I lesson so as to increase the student satisfaction in this area.

The fact that this study included students only from six cities that gave Mathematics I lesson is a limitation in itself. Therefore, in the researches to be carried out in the future, it can be suggested that all students that take Mathematics I lesson in the Open Education system can be included in the questionnaire. Apart from these, the reasons why certain student satisfaction levels were found to be so low can also be researched in the future studies.

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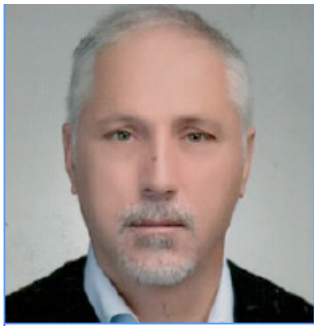

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THE RELATIONSHIP BETWEEN CLASSROOM MANAGEMENT AND SENSE OF CLASSROOM COMMUNITY IN GRADUATE VIRTUAL CLASSROOMS

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ABSTRACT

Communication, motivation, time management, rules and behavior management, plan program activities and physical order are important in the management of virtual classrooms, as they are in the management of traditional classrooms. On the other hand, "sense of classroom community" in online learning environment is classified with connectedness and learning dimensions. Hence, both constructs are crucial for virtual classrooms, the aim of the study was to examine the relationship between classroom management and sense of classroom community. The research design of the study was correlational survey design in quantitative research paradigm. The population of the study consisted of 524 graduate students enrolled in distance education non-thesis master degree programs in one of the university in Central Anatolia Region of Turkey. The sample of the study consisted of 224 graduate students determined by using random sampling technique. The data were collected via Classroom Management Scale and Classroom Community Scale. The findings of the study revealed that leadership and instructional planning and implementation dimensions of classroom management predicted connectedness dimension of classroom community positively while leadership and instructional planning and implementation, organization and communication of classroom management predicted learning dimension of classroom community. The findings of the study provided useful information in designing virtual classrooms and increasing student satisfaction.

Keywords: Virtual classroom management, sense of classroom community, graduate education, distance education.

INTRODUCTION

Changes in the views of individuals towards the sustainability of learning based on the developments in science and technology cause changes in the views on education in virtual classrooms. Moreover, distance education is getting wider throughout the world and attracts attention of a great deal of students day by day. Hence, tenets for enhancing quality of distance education has been widely discussed in the literature. Since distance education is computer-oriented online environment, it may have some difficulties stemming from lack of interaction and feeling of isolation that would cause student dropouts (Rovai, 2002a). Individuals who feel isolated in online learning environments are less interested in lessons (Rovai, 2002b). Community building should be highlighted in order to keep the students in the program and in the class since it is necessary collaborative learning atmosphere. According to DiPietro et al., (2008) classroom management is a key component in quality development of instruction during distance education and it helps to build community in online classrooms. On the other hand, in a holistic view of educational management and leadership the processes of teaching and leading are related to connectedness, collaboration, community and commitment (Beattie, 2002). Hence, in order to increase effectiveness in online learning environments, it is thought that it is important to manage virtual classrooms for the purposes and to create a sense of community in classrooms.

LITERATURE REVIEW

Classroom Management

Classrooms are educational settings where students and instructors work together in order to reach educational goals. Effective management of goal achievement process is crucial in educational systems. Hence, managing classrooms and creating effective learning environment is at the core of educational outcomes. Classrooms include diversity of events and complexities that reveal challenges for classroom management (Wolff, Jarodzka, & Boshuizen, 2020). They are multidimensional learning environments that require numerous different skills and point of views in the process of management. Classroom management used to be conceptualized as management of student misbehavior and discipline of the classroom. However, building effective learning environment requires something more than systematic method of managing misbehavior and keeping students under control (Allen, 2010). Some of the scholars who consider the concepts such as; managing classrooms or classroom management refer to activities that involve organizing, planning and running the classroom. It requires undertaking specific actions influenced by self-efficacy (Slater & Main, 2020). Thus, classroom management can be conceptualized as actions taken by the teachers in order to establish the environment, which aims to enhance students' social and moral growth and enables students' engagement in meaningful academic learning (Evertson & Weinstein, 2006, p. 4). Accordingly, it is the sum of the actions behaving like an orchestra leader in order to build community and support learning environment (Evertson & Harris 1999, p.60). Teachers, considered as, effective managers in the classroom perform management styles that match students' characteristics and classroom activities with previously-set instructional goals. (Emmer & Stough, 2001).

Technologies that have an impact on classroom management could also have an impact on educator collaboration and relationship development with students (Cho, Mansfield, & Claughton, 2020). A virtual classroom is an online classroom that enables students and teachers participants to interact with each other, communicate with one another (Iftakhar, 2016). As it is in physical classrooms, virtual classrooms include pedagogical interaction between teachers and students (Oparaji, Igbokwe & Ugwude, 2020). They are the places that offer learning and teaching opportunities beyond the limitations of physically existed classes (Hsu, et. al., 1999). It is not difficult to state that virtual classrooms offer opportunities to facilitate active learning environments. Not only do virtual classroom environments provide material to learners, but they also offer live, interactive learning environments. Teachers in online learning environments can control their learning and teaching processes as they do in traditional classrooms (Yang & Liu, 2007). Virtual classroom management refers some of the tasks as it does in managing traditional classrooms. Moreover, communication, motivation, time management, rules and behavior management, instructional planning and organizational order are also important in the management of virtual classrooms, as they are in the management of traditional classrooms (Polat, 2016).

Sense of Classroom Community

The sense of community can be defined as feelings that individuals belong to each other or to the group and it is a common belief that posits their needs would be met when they are committed to be together (McMillan & Chavis, 1986). Sense of community maintains a sense of emotional connection, identity, belonging and wellbeing. Individuals with a sense of community have connections to goals and others and feel reinforced. They are better adjusted to common outcomes. Strong sense of community provides a place in which individuals can easily express their identities and enables acting as a buffer against threats (Rovai & Wighting, 2005). If individuals had a high level of community feeling, they would feel more supported, feel more compatible with their situation, and can start targeting more than their own limited goals (Fisher et al., 2002). Besides, strong community feeling can increase sense of cooperation, satisfaction, well-being and warm relationship development (Bacete, Marande, & Mikami, 2019). There needs to be community feeling within virtual learning environment that contributes common sense of vision during the course (Blaine, 2019). Moreover, classroom community is associated with student motivation and student engagement fostering classroom culture (Xudong & Li, 2020). It is also remarked that the sense of community in online education environments ensures that the participants remain in the lessons, provide information flow in the point of owning common goals among students, and supports cooperation among the members (Wellman,

1999). Sense of community is closely related to learning (Kosnik & Beck, 2009) and Cross (1998) states that strong sense of community and desirable learning outcomes are correlated with each other. Rovai and Ponton (2005) found that there is positive relationship between student learning and sense of community in online learning environment. Studies indicate that interdependence and trust between individuals, shared beliefs, expectations and connectedness are among the main components of community feeling (Fisher et al., 2002; Wellman, 1999). Students who are geographically and physically far from each other, should be connected in virtual learning environments. According to Hagerty et al., (1993, p.293), "Connectedness occurs when a person is actively involved with another person, object, group, or environment, and that involvement promotes a sense of comfort, well-being, and anxiety-reduction". Sense of connectedness is also regarded as a critical factor in having sense of belonging, enhancing retention and decreasing turnover intention (Laux et al., 2016). Moreover, students who have sense of connectedness in online courses tend to show better academic performance (Gallien & Oomen-Early, 2008) and tend to show more persistence (Sidman-Taveau & Hoffman, 2019). Discussions on sense of classroom community can be gathered under two dimensions. According to Rovai (2002b), dimensions of the sense of classroom community includes connectedness and learning. While connectedness dimension includes concepts such as consistency, inter-individual commitment and trust, learning dimension includes concepts such as meeting educational goals and expectations.

Classroom Management and Classroom Community

It is possible to state that meeting the educational goals and the educational expectations of individuals is related to the effective management of both face to face and virtual classrooms. Management and organization of classrooms as learning communities can be posited as powerful process for improving students' personal, social and academic knowledge in educational environments (Richmond & McCroskey, 1992). It is also believed that classroom management is a process about interpersonal relationships--about providing a sense of caring, keeping connected with students and building community in the classroom (Weinstein, 2007). Building classroom community is something related with "internal control" of classroom management, where there is focus on constructing relationships with students and social learning. According to Watson and Battistich (2006), a sense of community has robust indications for student learning, which led to principals and teachers looking for variety of strategies for classroom management. Hence, community development can be regarded as a strategy that can be used to manage classrooms (Wubbels, 2011). In terms of classroom management, different areas of skill and knowledge were described such as building supportive atmosphere, creating student-teacher and peer relationships, determining appropriate behavior standards and establishing caring and safety classroom community (Jones & Jones, 2004). All the experts in educational settings should notice that classroom management requires building healthy student-teacher relationships, which generates classroom community (Scarlett, 2015, p.33). Moreover, Wubbels (2011) moves the claim one-step further by indicating that community development is among the aims of classroom management. He indicates that community feeling in the classroom is the result of well-managed classrooms.

Based on the literature about classroom management and classroom community, it is not difficult to claim that there are several theoretical implications and hints about the relationships of the two concepts. However, it is not easy to encounter variety of empirical and descriptive researches that examine the relationships between the two concepts. Therefore, this study aims to address the gap in the literature by examining the relationship between classroom management and sense of classroom community in virtual classrooms. In this context, answers of the following questions were sought for:

- Are the dimensions of virtual classroom management statistically significant predictors of connectedness dimension of classroom community?
- Are the dimensions of virtual classroom management statistically significant predictors of learning dimension of classroom community?

METHODOLOGY

Design and Procedure

The research was designed as correlational survey design based on the quantitative research paradigm. The research design, which aims to determine and describe the relationship between two or more variables, tries to explain human behavior or predict possible outcomes, is defined as a correlational design (Fraenkel et al., 2012).

Having been approved by the ethical committee of the University, the required permissions was obtained in order to distribute the data collection instruments. After that author prepared data collection instruments in Google Forms which allowed attendees to respond directly online. Graduated students in the research sample were reached through the distance education information system, WhatsApp groups created within the scope of the courses and directed by advisors, and the data were collected from students who participated in the research voluntarily.

Participants

The population of the study consisted of 524 graduate students that were enrolled in distance education non-thesis master degree programs in one of the university in Central Anatolia Region of Turkey in 2018-2019 academic year. The sample of the study consisted of 224 graduate students determined by using random sampling technique. Random sampling is a sampling method "in which each and every member of the population has an equal and independent chance of being selected" (Fraenkel et al., 2012, p. 94). Descriptive statistics about the sample were presented in Table 1.

Table 1. Descriptive statistics of the sample

Features	Variable	f	%
Gender	Female	142	63.4
	Male	82	36.6
Program	Educational Administration	61	27,2
	Mathematics Teacher Education	28	12,5
	Educational Technologies	22	9,8
	Character and Value Education	66	29,5
	Visual Communication Design	18	8,0
	Measurement and Data Analytics	15	6,7
	Program in Distance Education	14	6,3
Bachelor's degree	Faculty of Education	198	54,4
	Other	166	45,6
Occupation	Teacher	132	58,9
	Principal in School	10	4,5
	Vice-Principal in School	28	12,5
	Student/Unemployed	2	,9
	Other	52	23,2
Total		224	100

Data Collection Tools

Classroom Management Scale: Classroom Management Scale developed by Polat (2016) includes 46 items. The factors of the scale are instructor leadership (α =.94), motivation (α =.92), classroom rules and behavior management (α =.77), management of communication (α =.90), planning and implementation of teaching (α =.82), classroom organization (α =.80) and time management (α =.88). The items of the 5-likert type scale are rated from strongly disagree (1) to strongly agree (5). The total score that can be obtained from the scale can range from 46 to 230. Internal consistency coefficient of the scale was reported as α = .94. Internal consistency coefficient for this study was found as α = 89. The scale explained % 65.07 of total variance with 7 factors.

Classroom Community Scale: Classroom Community Scale was developed by Rovai (2002b). The original form of the scale includes 20 items and 2 factors. The scale adopted to Turkish context by Ozturk (2009). Having completed the adaptation process, the scale with 13 items and 2 factors revealed. The factors of the scale are connectedness (α =.94) and learning (α =.92). The items of the 5-likert type scale are rated from strongly disagree (1) to strongly agree (5). The total score that can be obtained from the scale can range from 13 to 65. Cronbach's alpha internal consistency coefficient value for the whole scale was .85. Internal consistency coefficient for this study was found as α = 87. The scale explained %50.62 of total variance with 2 factors.

Data Analysis

Distribution of the data was checked, before the necessary analyses were performed. In order to determine whether the data were normally distributed, skewness and kurtosis values were examined. Skewness values of all variables were between -.23 and .95 while kurtosis values were between -.22 and .86 which were in reasonable intervals. Arithmetic mean and standard deviation were calculated in order to determine classroom management perceptions and classroom community feeling of the participants. Stepwise regression analyses were run in order to investigate the predictor levels of independent variables. However, the assumptions of regression analysis were tested first. Mahalanobis test was applied in order to determine the outliers. Since the data of two of the participants were identified as outliers, they were removed from the data set before running the regression analyses. Since the correlation coefficients between variables were under .70, there was not singularity problem in the data. Moreover, possible collinearity among the potential predictor variables was checked by referring VIF and tolerance values. VIF value of the predictors for connectedness dependent variable was 1.552 and the tolerance value was .644 as well. VIF values of predictors for learning dependent variable were ranged from 1.704 to 2.038. Tolerance values for the same predictors were ranged from .491 to .587. VIF and tolerance values in this study were acceptable since the literature recommends that VIF value should be under 10 and the tolerance value should be above .01 (Cohen et al. 2003). Last, Durbin-Watson values were calculated for each regression analysis in order to check autocorrelation. For the first regression analysis, Durbin-Watson value was 1.646 and 1.521 for the second one. Durbin-Watson values were between the acceptable interval of 1 and 3, which is recommended in the literature (Field, 2009, p.224). Hence, it was proved that there wasn't autocorrelation in the residuals.

Findings

In order to determine whether classroom management factors are statistically significant predictors of classroom community factors, stepwise regression analysis was used in the study. However, Pearson correlation coefficient was employed in order to test the strengths of relationship between predictors and dependent variables before performing regression analyses. Correlation coefficients were displayed in table 2. As seen in Table 2 there were statistically significant and positive relationships between classroom community factors (connectedness and learning) and most of the classroom management factors such as; leadership ($r = .418$ and $r = .617$, $p < .001$), motivation ($r = .357$ and $r = .565$, $p < .001$), rules and behavior management ($r = .394$ and $r = .566$, $p < .001$), communication ($r = .283$ and $r = .449$, $p < .001$), instructional planning and implementation ($r = .388$ and $r = .624$, $p < .001$) and organization ($r = .241$ and $r = .430$, $p < .001$). However, there were not statistically significant relationships between classroom community factors and

time management factor of classroom management. Hence, time management variable was not included in stepwise regression analyses. The results of the analyses, which were performed with the remaining six correlated variables reveled two regression models for connectedness dimension and four regression models for learning dimension of classroom community.

Table 2. Relationships Between Classroom Management and Classroom Community Factors

	1	2	3	4	5	6	7	8	9
Leadership	-								
Motivation	,702**	-							
Rules and Behavior Management	,726**	,672**	-						
Communication	,632**	,444**	,577**	-					
Instructional Planning and Implementation	,635**	,590**	,597**	,369**	-				
Organization	,325**	,464**	,372**	,093	,513**	-			
Time Management	,003	,040	-,052	,092	,071	,085	-		
Connectedness	,418**	,357**	,394**	,283**	,388**	,241**	-,036	-	
Learning	,617**	,565**	,566**	,449**	,624**	,430**	-,003	,560**	-

***p <.001*

Having completed correlation analysis, stepwise regressions were employed. Table 3 indicates results of stepwise regression analysis for prediction of connectedness factor of classroom community. As seen in table 3, first model of the stepwise regression analysis included leadership. According to the first model, leadership in virtual classrooms, predicted 17.4% of classroom community feeling in virtual classrooms (R^2 = .174). In the second model instructional planning and implementation was entered. Instructional planning and implementation, as an additional variable, created .03 R^2 change. More specifically, leadership variable solely explained 17.4% of the variation in predicting connectedness in virtual classrooms. Instructional planning and implementation variable explained 3% additional variation. To sum up, aforementioned variables predicted connectedness positively and they explained 20.4% of the variation in connectedness scores.

Table 3. Results of Stepwise Regression Analysis for Prediction of Connectedness factor of Classroom Community

Model		B	Std. Err.	β	t	p	R^2	ΔR^2	R^2 Change	F
1	Leadership	,316	,046	,418	6,849	,000	,174	,171	,174	46,910
2	Leadership	,219	,057	,289	3,865	,000				
	Instructional Planning and Implementation	,273	,095	,216	2,886	,004	,204	,197	,030	28,393

Table 4 indicates results of stepwise regression analysis for prediction of learning factor of classroom community. As seen in table 4, first model of the stepwise regression analysis included instructional planning and implementation. According to first model, instructional planning and implementation in virtual classrooms, predicted 39% of learning in virtual classrooms (R^2 = .390). In the second model leadership was entered. Leadership, as an additional variable, created .081 R^2 change. At the third step, organization variable was entered in the model. Organization variable created .016 R^2 change as well. At the end communication variable was entered in the fourth model. Communication, as the last additional variable, created .013 R^2 change. More specifically, instructional planning and implementation variable solely explained 39% of the variation in predicting learning. Leadership variable explained 8.1% and organization variable explained %1.6 additional variation while communication explained %1.3 additional variation. To sum up, aforementioned variables predicted classroom community feeling positively and they explained 50% of the variation in learning scores.

Table 4. Results of Stepwise Regression Analysis for Prediction of Learning factor of Classroom Community

Model		B	Std. Err.	β	t	p	R^2	ΔR^2	R^2 Change	F
1	Instructional Planning and Implementation	,777	,065	,624	11,907	,000	,390	,387	,390	141,776
2	Instructional Planning and Implementation	,485	,079	,390	6,148	,000	,471	,466	,081	98,427
	Leadership	,278	,048	,369	5,831	,000				
3	Instructional Planning and Implementation	,389	,086	,313	4,539	,000	,487	,480	,016	69,747
	Leadership	,278	,047	,370	5,917	,000				
	Organization	,190	,072	,149	2,650	,009				
4	Instructional Planning and Implementation	,387	,085	,311	4,561	,000	,500	,491	,013	54,746
	Leadership	,205	,056	,273	3,657	,000				
	Organization	,214	,072	,168	2,983	,003				
	Communication	,127	,054	,146	2,341	,020				

DISCUSSION

The results of the study revealed that Leadership and Instructional Planning and Implementation were statistically significant predictors of connectedness dimension of classroom community. According to this result, Leadership and Instructional Planning and Implementation predicted sense of connectedness positively in virtual classrooms. Namely, when students perceive leadership that is more effective and more planned instruction in virtual classrooms, they would feel more connected to the online learning environment. Although there was a lack of research examining the relationships between connectedness and dimensions of classroom management, it is possible to discuss the findings based on the framework in the literature. Thereby, it is possible to say that this finding is consistent with the literature on classroom management and connectedness. Classroom management literature highlights the importance of planning

an implementing the instruction by focusing on preventative role of classroom management. Classroom management prevents problems and keep students engaged in dynamic learning atmosphere (Evertson & Emmer, 2008). The perspective of preventative management emphasizes that a great deal of classroom problems can be solved through effective teaching, good planning, relevant and interesting lessons. (Arends, 2012). According to McNeely et al., (2002) positive classroom management is positively associated with stronger school connectedness and one of the major threats in connectedness is poor classroom management (Blum, 2005). More specifically, well-planned teachers implementing appropriate teaching methods within proactive classroom management increase the connectedness (Monahan et al., 2010). Leadership, on the other hand, is something that can influence students' classroom community behavior either positively or negatively (Allison et al., 2001) and it can be regarded as a useful tool in transforming nature of the classroom (Bolkan et al., 2011). According to Bower et al., (2015), leadership roles build connectedness by encouraging students. Leadership as encouragement, improvement and transformation tool influence how students perceive their learning environment and their willingness to get involved in the learning environment (Yuen et al., 2012). Indeed leadership practices like weaving several different worlds together through interpersonal relationships and creating equitable governance opportunities, can be accepted as integrated framework that enable connectedness (Ospina & Foldy, 2010).

The second finding of the study indicated that Instructional Planning and Implementation, Leadership, Organization and Communication are statistically significant predictors of learning dimension of classroom community. In the other words when students perceive high level of well-planned instruction and its implementation, high level of leadership, organization and communication in virtual classroom, they would learn much more in online learning environment. For instance, scheduling, planning and implementing of instruction in the classroom during online education enable students love the courses and acquire the needed educational outcomes (de la Varre et al., 2014). Teachers who plan convenient tasks and classroom activities and who have a background about instructional approaches and strategies are tend to build a learning atmosphere that assures student collaboration on learning tasks and minimizes behavioral problems (Arends, 2012). Since each instructional design model emphasizes planning (Lynch, 2002), it would be regarded as a step that should not be overlooked during the process of behavioral management (Arends, 2012). Moreover, align with the findings of this study, the literature suggests that leadership and learning in educational settings are considered as inseparable (Barth, 2001) and it is a multi-faceted and complex process, appears in both social and instructional roles in educational settings. It enables autonomous learning for students (Katyal & Evers, 2004). Leadership is an influential, expansive and on-going process that have an effect on student engagement in schools. According to Frost (2008), teachers are leaders of learning in classrooms and teacher or classroom leadership includes instructional leadership (Katyal & Evers, 2004). The concept of teacher leadership argues that the position of teachers is central in learning. Instruction and educational development involve leadership by teachers in classrooms. (York-Barr & Duke, 2004). Taking this view, leadership is something about meaning and knowledge construction collectively and it is about learning (Harris, 2008). Hence, the results of the studies revealed that leadership is a factor to predict educational outcomes and enhances student innovation (Hoehl, 2008). According to findings of the researches by Leithwood and Jantzi (1999; 2000), classroom management is an aspect of leadership that promotes student learning. There were also results indicating that teacher leadership is a way of developing self efficacy in relation to child learning (Katzenmeyer and Moller 2001). Besides; Vesely et al., (2007) found that leadership role and instructor modelling are vital in community building in virtual classrooms. The third variable of the second model that predicted learning in virtual classrooms was organization. This finding of the study is consistent with the literature indicating that organization of the classroom includes sustaining learning environments which support aims of academic instruction (Brophy, 1988). Instructors have the responsibility of organizing and designing e-learning environments to implement educational goals (Richardson, et al., 2012). Researches also revealed that well organized classrooms were better in instruction and student development (Cameron et al., 2005) and learning communities should include supportive and structured environment (Vesely et al., 2007). The last variable of the second model was communication in predicting learning in virtual learning environment. Literature suggest that teachers who construct community on learning, are supposed to focus on impressive communication in educational process and highlight affects of interactions on learning outcomes (Richmond & McCroskey, 1992, p.22). The researches revealed that teachers who were lack of communication skills would have problems in leading

students (Katyal & Evers, 2004) since classroom management was correlated with problem solving and communication skills (Kavrayici, 2020). Moreover, coefficients in the study of Ni and Aust (2008) indicated that the effects of sense of classroom community and teacher verbal immediacy on learning and satisfaction were positive. Rovai (2003) also found that open, precise, friendly and collaborative communicator styles in virtual learning environment were positively related to learning and connectedness.

CONCLUSION

The results of the study revealed that leadership, motivation, rules and behavior management, communication, instructional planning and implementation and organization dimensions of classroom management were positively correlated with connectedness and learning dimensions of classroom community. However, only leadership and instructional planning and implementation dimensions of classroom management predicted connectedness dimension of classroom community positively while four dimensions (leadership and instructional planning and implementation, organization and communication) of classroom management predicted learning dimension of classroom community. As a practical implication, instructors and educational designers may need to rethink about designing virtual classrooms and educational programs to incorporate factors of classroom management and approaches to develop a sense of community. By doing so it would be possible to enhance student satisfaction when taking online courses. Instructors are supposed to find strategies to help students feel more comfortable and strongly connected with the instructor and with each other to make learning activities more meaningful. Instructors who manage the classroom effectively by leading, planning and purposefully organizing, thereby increasing sense of classroom community in terms of learning and connectedness (DiPietro et al., 2008), are likely to be successful in distance education (Rovai, 2002b).

Limitations and Implications

Although the study is the first one to examine the relationships between classroom management and sense of classroom community in virtual classrooms, it has limitations. A self-reported instrument was employed to gather the data about students' perceptions on classroom management and classroom community. There are always limitations in interpreting the constructs that the self-reported data collection instruments were measuring. Other respondent characteristics which were not checked in this study might have an effect upon the results of the study. Some variables like duration they spent in online courses, their technological opportunities could add more information for interpretation of the findings.

Future researches may be built on this study by more directly testing and investigating whether these factors are related with sense of classroom community in online courses of other samples (e.g., undergraduate students, college students and other countries). Studies designed in experimental or quasi-experimental designs would be helpful in confirming findings of this study in larger scale. Researches with qualitative or mixed method designs would also be helpful for us to get more detailed results on classroom management and sense classroom community in virtual classrooms.

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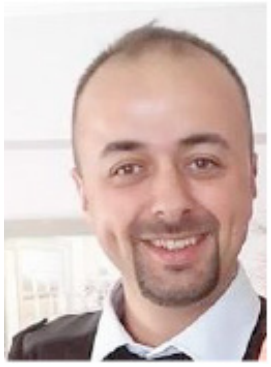

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AN INNOVATIVE WAY OF DESIGNING BLENDED LEARNING THROUGH DESIGN-BASED RESEARCH IN HIGHER EDUCATION

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ABSTRACT

Within higher education, the use of blended learning (BL) is exponentially increased in the 21st century, which poses a number of challenges in designing the process of BL for educators. The aim of this design-based research (DBR) study was to assist an inexperienced educator in teaching and designing a BL course in higher education to convert a face-to-face (F2F) course into a BL course. During the design and delivery of the BL course, what appropriate practices were needed to achieve creating an efficient and effective BL course were determined and the educator's reflections on the first experience of teaching the BL course were documented over three iterative design cycles. Mixed methods including learning environment observations, educator interviews, student surveys were employed. The results demonstrated that BL enabled the educator to adopt active learning approaches, engage students in critical thinking and promote the quality of interactive and collaborative learning assignments. Although the educator indicated the time limitation as an obstacle to teach a more efficient BL course, the educator was contented with teaching and designing the BL course and found it useful and supportive overall. Findings were presented and discussed for future studies and implications.

Keywords: Cooperative/collaborative learning, interactive learning environments, teaching/learning strategies, improving classroom teaching, blended learning.

INTRODUCTION

The evolution of internet technology makes instruction online possible, which is seen as significant progress in the learning and teaching process (Chou & Chou, 2011). Online learning (OL) exceeds the boundary of traditional learning that provides opportunities for distance students to get educated. Also, educators still promote written communication, critical thinking, collaboration, and problem-solving by using, managing or generating flexible, open, and ubiquitous online applications in their online courses (McKeachie & Svinicki, 2014, p. 233). However, the absence of F2F interactions and communications between an educator and students is one of its inherent hindrances that students are deprived of enough educator support. For instance, students who have a lack of study skills such as self-disciplined have difficulty in maintaining motivation, meeting commitments and managing time in OL (McKeachie & Svinicki, 2014, p. 302). Due to the drawbacks of OL, a new approach, blended learning (BL) has emerged to alleviate the disadvantages of OL. Garrison and Kanuka (2004) state that BL has massive versatility that offers increased efficient and effective learning experience and enhances meaningful learning outcomes. In this sense, the popularity of BL has increased among most researchers (Chou & Chou, 2011) in parallel with the adoption of BL has become prevalent in the number of higher education institutions (Garrison & Vaughan, 2007).

Although there is an ambiguity in the definition of BL by researchers, the combination of F2F and online instruction is a widely accepted definition of BL (Graham 2006). According to Graham (2006), this perspective in the literature exactly mirrors the historical emergence of BL approaches. In this study, BL is defined as thoughtfully and vigilantly integrating the best features of F2F learning and the best features of OL (Bonk & Graham, 2006; Garrison & Kanuka, 2004; Graham, 2013; Osguthorpe & Graham, 2003). The rigorous and thoughtful integration of OL and F2F means taking advantage of the strengths of them and avoiding weaknesses of them. It is also necessary to achieve the right balance between F2F and OL to take full advantage of BL (Vanslambrouck, Zhu, Lombaerts, Philipsen & Tondeur, 2018). Garrison & Kanuka (2004) elucidate how to make this integration by stating that

> *"the core issue and argument is such that, when we have solid understandings of the properties of the Internet, as well as knowledge of how to effectively integrate Internet technology with the most desirable and valued characteristics of face-to-face learning experiences, a quantum shift occurs in terms of the nature and quality of the educational experience" (p. 97).*

BL has commonly seen as an effective learning approach (Chou & Chou, 2011; Graham, 2006; Wu, Tennyson, & Hsia, 2010) because many studies have shown that BL promotes the acquisition of knowledge and skills in a variety of disciplines (Maza, Lozano, Alarcón, Zuluaga, & Fadul, 2016). One of the key benefits of BL is to manage, create, and promote collaborative and interactive learning environments (Graham 2006). Discussions are an essential part of BL to provide high-quality learning experiences that improve performance (Han & Ellis, 2019). The availability of appropriate various online tools and resources can be adapted to F2F learning in response to constructing a collaborative and interactive BL environment. The utilization of BL increases interaction between student-student and educator-student through virtual communities, social networks and computer-supported collaboration if OL technologies are appropriately selected and rigorously integrated into the learning environment. (Geng, Law, & Niu, 2019; Graham, 2006). Another key benefit of BL is that BL enables students to study at their own pace and allows educators to provide personalized instruction (Shand & Glassett Farrelly, 2017). For instance, BL provides opportunities for students to acquire additional clarifications about any topics that remain unclear in the F2F setting from each other and the educator (Vanslambrouck et al., 2018). Karaoglan Yilmaz (2020) states that learning analytics can be utilized to design a personalized learning environment that improves students' academic self-efficacy, problem-solving skills, reflective thinking skills and metacognitive awareness in online, BL or flipped classrooms. BL also offers an accessible and flexible learning environment in which students find opportunities to conveniently reach course materials in various ways such as accessing course materials anywhere, anytime. When students are involved in flexible learning activities and interactive learning experience, the possibility of their satisfaction and learning outcome increases. It has been shown in the literature that student satisfaction can be improved by adopting a BL approach (Bradley et al., 2007; Halverson, Graham, Spring, Drysdale, & Henrie, 2014) and there is a positive and statistically meaningful correlation between interaction and learning outcome in BL (Al-Ani, 2013; Wu et al., 2010).

While BL has commonly been exalted by scholars, significant challenges of designing a BL course such as facilitating students' learning processes incorporating flexibility, fostering an effective learning climate and stimulating interaction have been identified by Boelens, De Wever and Voet (2017). Although it is easy to declare that BL transforms the learning environment from a traditional classroom setting to an active learning classroom setting, Baehr (2012) indicates that consolidating best practices of F2F and OL is a complex process that requires educators to invest enough time to select and test the right technological resources in accordance with intended tasks, knowledge sharing, activities, and learning outcomes of a particular course. Bilgic and Tuzun (2020) point out that there is an essential need to make a detailed plan to achieve the desired outcomes when teaching an online course or, failing that, OL will end up posing new obstacles that educators and students face. Another challenge might be the insufficiency or absence of institutional support that is related to professional development orientations, institutional policies, technical and pedagogical support, structures and incentives. The findings of the study conducted by Porter, Graham, Spring and Welch (2014) show that educators' technical and pedagogical training offered by institutions

are significant determinants that optimize the design and implementation of BL and increase the adoption of BL. When taking the challenge of BL into account, it is not a straightforward process to design and implement BL. Kanuka and Garrison (2004) indicate that BL might bring about "daunting challenges" in the design process because of its "implementation with challenge of virtually limitless design possibilities and applicability to so many contexts" (p. 96).

PURPOSE OF THE STUDY

The process of designing a BL environment requires educators to take many factors into consideration (Galvis, 2018). The balance between the best features of OL and F2F learning is the major consideration in designing a BL course. Osguthorpe and Graham (2003) identify student characteristics, instructional goals, online resources, and educator background as the points to be paid attention to when finding out an optimal balance in a BL course. Contemplating how to balance, select, prepare and enact instructional method, personalized course content, new tools, assessment strategy, etc. may produce many other challenges educators might encounter while teaching and designing a BL course. This process requires educators to demonstrate their problem-solving skills (Hew & Cheung, 2014). However, educators' decisions that impede or facilitate their BL adoption regarding the design and implementation of BL have been explored by an insufficient number of studies (Porter & Graham, 2016). Particularly, a gap that there remains a need to investigate an educator's initial experience in teaching, designing and implementing a BL course in higher education exists in the research literature. The aim of this DBR study research is to find out what practices were needed to assist an educator who was inexperienced in teaching and designing a BL course to successfully design and deliver it in a systematic and holistic manner. The following three research questions were addressed in the study:

1. What practices are associated with making a blended learning course efficient and effective?
2. What are the educator's perceptions about their first experience of teaching a blended learning course?
3. Does the iterative process of this design-based research study improve the effectiveness and efficiency of a blended learning course throughout the semester?

METHOD

This study followed a DBR method documenting an instructional design effort. Although DBR is defined as "a systematic but flexible methodology aimed to improve educational practices through iterative analysis, design, development, and implementation, based on collaboration among researchers and practitioners in real-world settings, and leading to contextually-sensitive design principles and theories" (Wang and Hannafin, 2005, p. 6), McKenney and Reeves (2014) state that it is not a methodology but "it uses quantitative, qualitative and –probably most often- mixed methods to answer research questions" (p. 133). Multiple sources such as observation, interviews, documents, and reports are used to gather information by using data collection tools (Creswell, 2007). Interviews along with surveys and observations were utilized to gather data in this study to make in-depth and comprehensive analyses and guide the design effort.

Participants

A purposeful sampling was used in the study because it is a suitable method to gather data for a particular study when researchers seek specific informants who are reflective, articulate, and willing to share their experiences with the interviewer (Morse, 1991 & Tongco, 2007). Identifying the criteria to make purposeful sampling was necessary because prospective participants should meet the specific requirements to be the actual participants (Patton, 1990). Thus, the following criteria were established to determine a suitable participant for the study:

- A participant needs to have a moderate degree of proficiency in utilizing online components, asking questions, supervising students, and provoking a discussion in OL.
- A participant is not reluctant to improve IT capabilities.

- A participant is not prejudiced against utilizing technology inside and outside the classroom.
- A participant's institution needs to provide the technological and physical infrastructure to deliver an online course.

A Psychology educator who met the selection criteria was determined to be a suitable participant for this study. The educator is a full-time faculty and professor in Psychology. Even though the educator has been teaching F2F undergraduate and graduate level courses, the educator have not taught and designed a BL course. After realizing the potential benefits of this study, the educator agreed to cooperate with the lead researcher to transform a F2F graduate course to a BL course in the Fall term of the academic year 2016-2017. It was a four credit course and had strict requirements including attending lectures and doing reading assignments. Also, the students who enrolled in this graduate level course was the second participant group. They were eleven students comprising ten female and one male. They fulfilled the criterion as they had a moderate degree of proficiency to attend online instruction. They were able to send e-mails, conduct videoconferences, post threads, etc. If they didn't show enough proficiency, a preliminary meeting was scheduled to prepare them for this BL course. Finally, instructional design experts who worked at The Office for Teaching & Learning at the research university were recruited to examine the BL course and provide feedback.

Data Collection

This DBR study applied quantitative and qualitative collection methods. Qualitative data were collected at the three appointed times throughout the research. The schedule of three data collection times was as follows:

- Phase 1: From August 19, 2016 to October 7, 2016
- Phase 2: From October 7, 2016 to November 11, 2016
- Phase 3: From November 11, 2016 to December 16, 2016

During Phase 1, interviews were conducted with the educator and instructional design experts. Understanding of the educator's weaknesses and strengths in utilizing technological tools and grasping the objectives of the course and deliberating over designing and implementing a BL course were the main aims of the educator interview. The BL environment was shaped in accordance with the interview. The designed BL environment was judged by the instructional design experts. According to their suggestions, adjustments in the BL environment were made. After it was seen and approved by the educator, the BL environment was implemented. Besides, the lead researcher observed the educator while the educator was teaching the implemented BL course.

During Phase 2, interviews were conducted with the educator and experts again. The main goals of the educator interview were the investigation of the weaknesses and strengths of the educator's online capabilities, and the determination of what practices were related to creating an efficient and effective BL course. The designed BL environment was reshaped based on the interview. This BL environment was judged by the experts to make adjustments according to their suggestions. After the final version of the BL was seen by students and approved by the educator, it was implemented. In addition to that, the lead researcher observed the educator while the educator was teaching in the redesigned BL course.

During Phase 3, an interview was conducted with the educator to unveil the educator's notions about how, why, and what to manage, select, and use technological resources and processes throughout the term. Revealing the educator's thoughts about the first teaching, designing, and implementing experience of the BL course throughout the semester was the main aim of the interview.

The validated Likert instructional materials motivation survey (Keller, 2010) was used as the collection of quantitative data for the enhancement of utilizing instructional tools and activities at the two appointed times throughout the research. Data collection times were scheduled as follows:

- First instructional materials motivation survey: Fifth week of the term (October 5, 2016)
- Second instructional materials motivation survey: Tenth week of the term (November 9, 2016)

Data Collection Instrumentation

The Semi-Structured Interviews validated by experienced faculty in designing and teaching BL courses were developed and conducted to obtain reliable qualitative data from the educator. The observation tool derived from "Seven Principles for Good Practice in Undergraduate Education" written by Chickering and Gamson (1987) was used to help evaluate the efficiency and effectiveness of OL. Particularly, the observation of the BL environment assisted the lead researcher to ascertain what remained concealed in the interviews. The Instructional Materials Motivation Survey (IMMS) created by Keller (1987, 2010), a validated survey instrument consisting of 36 items and using a Likert type scale with 5 choices, was used to determine students' motivational attitudes toward using technological tools and instructional activities. It helped assess the effectiveness of the tools and activities employed in the implemented BL course. The use of data collection instruments through three phases is shown in Figure1.

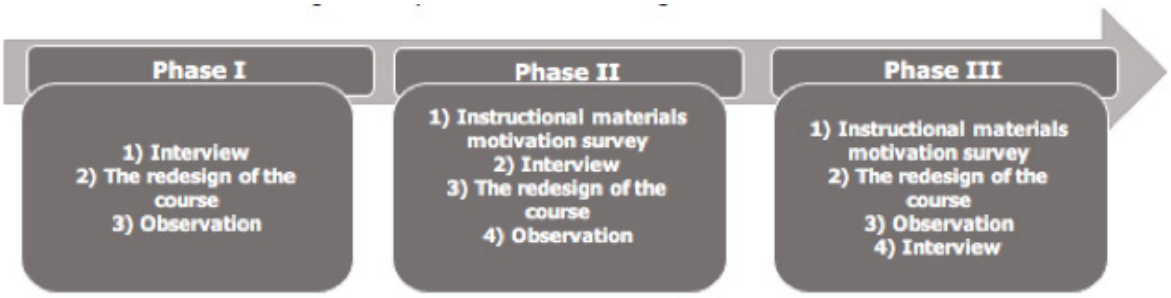

Figure 1. Data collection instruments in each phase

Data Analysis

The importance of qualitative data analysis was to protect and convey the participants' meanings while analyzing the data (Ruona, 2005). The interviews and observations were rigorously analyzed to extract the meaning and recognize the contradictions between the data collected by both techniques. Therefore, data analysis began at the same time with the first pieces of data being collected and new questions and issues drove further data collection and analysis (Gay, Mills, & Airasian, 2012; Ruona, 2005). Data analysis was conducted in iterative three stages as follows, (1) reading the data to be acquainted with it and identify possible themes, (2) describing the setting in detail by examining the data and (3) classifying themes derived from pieces of the data (Gay et al., 2012, p. 467). Furthermore, the mean score of the validated survey instrument was computed to help analyze qualitative data.

FINDINGS

Phase One

Phase One commenced three weeks prior to the beginning of the Fall term in 2016 and finalized the fourth week of the term. Phase One comprised 1) An educator interview, 2) The redesign of the course, and 3) The observation of the learning environment.

Interview

The purpose of the interview was to obtain an accurate and deep understanding of the educator's competence, desires and needs for creating a BL course. In order to analyze data, the constant analysis method was used because it was "the explicit coding and analytic procedures" (Glaser, 1965, p. 437) and suitable technique to extract meaning from the data. The lead researcher and two doctoral students studying in the Learning Design and Technology analyzed the interview to secure coding reliability and discover all implicit and explicit themes from the raw data. Three themes, illustrated in Table 1, emerged from the analyses: prior experience, motivation to change and expectation. Respectively, the first theme refers to the educator's former experiences with utilizing technological activities, resources or tools. The second theme refers to

the educator's desire to transform a F2F course to a BL course. The third theme refers to the educator's expectations of teaching a BL course.

Table 1. Summary of Themes from Initial Interview Result

Emerging Themes	Sample interview comments
Prior experience	"I can go into blackboard and I can post things"
	"I've been old school…I haven't really done much besides just giving them links to articles and then we discuss them in class"
	"I'm not using technology really. Besides, in this class, I sometimes use PowerPoints and readings online. That's all."
Motivation to change	"I don't think I can make a statement about overall what I'd like to use. I just think I will"
	"We just work together to come up with some enhancements or the way these classes run because like I said it's just been run like a classic old school"
Expectation	"I just want it (blended learning) to be interesting for the students. I want it to be more stimulating and not the same routine all the time."
	"Maybe there's a better way for them (students) to show what they learned than just writing a paper."
	"what I'm thinking is going to happen it's going to make them (students) happier and more it will be more applied more relevant."

Redesign of the Course

Converting the traditional F2F learning course to an optimal BL course was the process of redesigning the course that contained converting the syllabus, designing a course Blackboard site and creating instructional activities.

Syllabus. The educator and the lead researcher updated the conventional course syllabus to have the combination of F2F and OL environments reflected in the syllabus via the F2F meetings along with a total of 32 email correspondences. The F2F elements of the course were tightly interwoven with the online elements of the course in the updated syllabus that contained (1) the major revision of the requirements, office hours, course schedule, attendance policy, grading policy, and (2) providing online communication guidelines and new learning activities. For instance, attendance at each F2F class meeting with the expectations such as the interactive discussion on in-depth knowledge of assigned readings and online participation with the expectations such as the number and quality of your discussion posts were clearly indicated in the updated syllabus.

The Course Blackboard Site. The educator designed the course Blackboard site together with the lead researcher in order to provide the online instructional materials that were previously delivered during F2F seat time and a variety of supplemental tools that promoted F2F teaching and facilitated learning. Also, we advertently designed a well-organized and straightforward site that facilitated the preparation, delivery, editing of the course content for the educator and made usability and accessibility of the course content, materials and tools easier for the students. A syllabus, course content, grade book, calendar, announcements, discussions and assignments were fundamental tools to benefit from the features of the course Blackboard site.

Making course materials available, activating the announcement feature and implementing the "Grade Center" were three example tasks outweighing other tasks to demonstrate how to design the course Blackboard site. First, the links for reading materials including articles, reports, and case scenarios and readings assignments were uploaded and delivered through the site to let the students break the chains of traditional learning such as time and location limitations. Second, the main aim of using the announcement tool was to give the students timely notice of critical information for their success. the "Grade Center" was implemented because it was a convenient feature to collect the assignments, manage the grades, give feedback.

Instructional Activities. Online discussions and online quizzes were two instructional activities to increase communication between the students and educator, promote student interactions and improve self-paced learning. For the first instructional activity, the Blackboard Groups feature in the course Blackboard site was set up for small group discussions that contained multiple forums where a group of students discussed the assigned topics. This activity helped students undertake responsibility for their learning and promoted interaction between themselves. It also enabled the educator to monitor the students' participation, thoughts and reflections upon the assigned readings and to get involved in any group discussions when the group encountered a confusing issue about a course topic. For instance, the educator gave feedback on a thread when a group needed as follows:

> *"remind me to comment in the class about personal therapy notes and gifts from clients…and anything else that I comment on in my comments back to you guys. When you have specific unanswered questions, just email or call me directly."*

Another instructional activity was online quizzes consisting of open-ended questions that sought the students' detailed answers to demonstrate their deep understanding of the course topics. It was a suitable way for the educator to assess each student's reading comprehension and to provide detailed feedback if needed.

Observation of the Learning Environment

The lead researcher observed the BL environment by utilizing the observation tool while the educator was teaching. The tool was a useful scheme to assess the educator's weaknesses and strengths of teaching the BL course in an efficient and effective way. For the next phase of the study, the observation data were considered to enhance the BL environment as presented in Table 2.

Table 2. Summary of Observation of Learning Environment for Phase One

Phase One of Case	
Feedback for the Educator	**The Educator**

Strengths	• The educator updated the course syllabus in accordance with the BL course. It provided
	  • Expectations and requirements for due dates of assignments, course interactions and exams
	  • Netiquette guidelines for online communications
	  • Explanation of course learning activities, assessments and goals
	  • Clear criteria for assignment grading
	  • The explicit and detailed course schedule
	• The educator created a positive class atmosphere for learning
	• The educator provided interaction space for groups
	• The educator provided collaborative learning activities
	• The educator created a well-organized and straightforward course Blackboard site providing easily accessible learning materials, organized content, easy navigation and free of errors and dead links
	• The educator provided clear, specific and positive feedback that focused on observable behavior
	• The educator allowed peer-to-peer collaboration and responded to students' emails
	• The educator used different assessment tools
	• The educator provided supplemental online materials
	• The educator drew students' attention to the main ideas
	• The educator assigned students with thinking, talking, and writing about their learning
	• The educator prevented particular students from dominating discussions

Weaknesses	• The educator needed to be more proactive, present and engaged in the course Blackboard site
	• The educator needed to show modeling of good discussion participation practices
	• The educator needed to provide more personalized learning opportunities
	• The educator needed to lead students when they digress the main issue
	• The educator needed to give more detailed and frequent feedback
	• The educator needed to provide feedback in a reasonable time frame
	• The educator needed to facilitate discussions by questioning, probing, summarizing
	• The educator needed to encourage and motivate students to participate in discussions
	• The educator needed to create a discussion forum in which students could ask questions and get feedback
	• The educator needed to elicit and guide student participation
	• The educator needed to provide alternative assignments
	• The educator needed to foster a healthy exchange of ideas among students by encouraging them in the OL environment

Phase Two

Phase Two occurred between the fourth week and the ninth week, a five-week period in the term. Phase Two consisted of 4) The first student instructional materials motivation survey, 2) An educator interview, 3) The redesign of the course and 4) Observation of the learning environment

Instructional Materials Motivation Survey

The first student IMMS (Keller, 2010) was administered by the lead researcher in the 5th week of the term to find out students' opinions of using the instructional activities and tools. Their opinions helped determine whether utilizing the activities and tools were needed to change in the BL environment. The survey was completed by eleven students.

Reliability is the "degree to which evidence and theory support the interpretation of test scores entailed by proposed uses of tests" (Gall, Borg & Gall, 1996, p. 191) and George and Mallery (2003) state that _ < .5 – Unacceptable, _ > .5 – Poor, _ > .6 – Questionable, _ > .7 – Acceptable, _ > .8 – Good, and _ > .9 – Excellent (p. 231) are the minimum requirements to ascertain the level of internal reliability. Internal consistency reliability was found as .873 according to the SPSS analysis. Internal consistency reliability of the items showed a good value in the first student IMMS .

Keller (2010) points out that the highest score on the IMMS is 180 and the minimum score is 36 with a midpoint of 108. Eleven students took the survey. The students (n=11) had a mean score of 117 (3.25 out of 5). Yurdakul (2011) asserts that in order to interpret the findings from data analysis, the arithmetic average between "5,00 – 3,68", "3,67 – 2,34" and "2,33 – 1,00" score range respectively refers to a high, moderate and low. Therefore, the score of 117 (3.25 out of 5) demonstrated that students were moderately satisfied with the utilization of instructional tools and activities and implied that they demonstrate a positive attitude towards using instructional materials in the BL environment in the fifth week of the term.

Interview

The purpose of the interview was to uncover the educator's weaknesses and strengths and assess whether the instructional activities were successful practices in the learning environment. The method of the previous phase was practiced for analyzing the interview. Six themes including motivation to change, benefit, expectation, ambiguity/concern, limitation and resistance emerged from the analysis of the interview as presented in Table 3. "Motivation to change" refers to what motivated the educator to transform the F2F course into the BL course. "Benefit" refers to if the educator obtained the advantage of teaching the BL course. "Expectation"

refers to what the educator expected while teaching the BL course. "Ambiguity/concern" refers to whether the educator encountered any challenges while teaching and designing the BL course. "Limitation" refers to whether the educator had difficulty in teaching the desired BL course because of the educator's limitations. "Resistance" refers to whether the educator was reluctant to teach the BL course.

Table 3. Summary of Design Improvement Interview Result for Phase Two

Emerging Themes	Sample interview comments
Motivation to change	"Your help in accentuating the utility of my materials has been great like I like the online stuff you know I like having them because I had too much material for the class. I like them doing that part online and then I don't have to cover it in class, and it gets them stimulated and thinking about that.
	I like the group contribution to a document. I like that a lot."
	"I like group contribution to a document."
Benefit	"It (blended learning) made them (students) accountable…I think ultimately they learn a little bit better because they're held a little more accountable for the online discussion board."
	"That's (participation) a positive for the online. Everybody has to chime in….. in class I don't get as much direct participation because there just isn't time and not everybody is comfortable in that format."
	"You have facilitated some nice enhancements to my materials to make them have better utility for instruction."
Expectation	"I anticipate them (learning activities) being a really neat way for them to put their materials all together to look at it and reflect its collaborative in the sense that everybody gets to see each other's responses and then we can do a better visual comparison."
Ambiguity/ Concern	"There'd be like six, seven, eight different files that I have to look in and I couldn't follow the thread. I got it well enough, but I haven't done this and so but just some of them I lose the thread of what they're talking about."
	"Discussion board takes a little bit of time to figure out where it is"
	"I didn't quite figure out how to do the grading on the Blackboard but that's me"
Limitation	"I would go through and make comments. I honestly don't have time for it. So, I would go through and scan and make token comments… I was reading and I did see some interesting things"
	"I could spend more time I probably didn't do a good enough job."
Resistance	"I'm not that impressed by the online stuff"

Redesign of the Course

The educator and the lead researcher jointly strove to foster the course Blackboard site to increase its efficiency and effectiveness by modifying the instructional activities and course site.

The Course Blackboard Site. The well-organized and straightforward design of the course Blackboard site was kept in the second phase. This layout facilitated the delivery and utilization of the instructional materials and a variety of supplemental tools. The use of the site was also a convenient way to make rapid changes as needed. For instance, there were several links to the reading assignments provided in the syllabus. However, some of them were not working because of any longer availability of websites, changes in the URL structure of websites or moving websites without adding URL redirection. This issue was resolved easily by providing the renewed links and announcing the availability of new links on the Blackboard site.

Instructional Activities. In the previous phase, online discussions and online quizzes were created as instructional activities. However, the online discussion activity was not going well as intended because the discussion questions looked for only factual information that could be found in direct quotations from the assigned readings. The questions were modified to allow the students to show their higher-order thinking skills like interpretation, synthesis, or analysis. Also, the educator spent more time in the OL environment to be informative, motivating and encouraging. These modifications enabled the students to be active

knowledge seekers and participate in thoughtful and in-depth discussions. The educator's quotes from different discussions are below as evidence.

> *"discussion looking good this week! liking reading your thoughts and what you are digesting."*
>
> *"Thanks for the insightful sharing of personal info, everyone. you guys are getting at some really good issues."*

Observation of the Learning Environment. The lead researcher utilized the same observation. Although the educator had weaknesses in efficiently and effectively teaching the BL course, the strengths of the educator were heightened. The findings of the observation in terms of what changed in the strengths and weaknesses of the educator are indicated in Table 4. For the next phase of the study, the data were taken into account for enhancement in the BL environment

Table 4. Summary of Observation of Learning Environment for Phase Two

Phase Two of the Case	
Feedback for the Educator	**The Educator**
Strengths	The educator fostered a healthy exchange of ideas among students by encouraging them in the OL environment • The educator strove to enhance the navigational skills and provided simply graspable navigational instructions • The educator asked challenging questions prompting students to think more deeply • The educator provided an announcement area where students received important up-to-date course information • The educator conveyed the aim of the assignments • The educator led students when they digress the main issue • The educator presented divergent viewpoints by making distinctions between fact and opinion The educator provided more constructive and informative feedback • The educator asked critical questions about course activities and assignments • The educator provided feedback in a reasonable time frame • The educator needed to elicit and guide student participation • The educator facilitated discussions by questioning, probing, summarizing
Weaknesses	• The educator needed to be more proactive, present and engaged in the course Blackboard site • The educator needed to show modeling of good discussion participation practices • The educator needed to provide more personalized learning opportunities for students • The educator needed to give more detailed and frequent feedback • The educator needed to open a discussion forum in which students could ask questions and get feedback • The educator needed to provide alternative assignments

Phase Three

Phase Three occurred between the ninth week and at the end of the fourteenth week, a five-week period in the term. Phase Three consisted of 1) The second student instructional materials motivation survey, 2) The redesign of the course, 3) Observation of the learning environment and 4) An educator interview.

Instructional Materials Motivation Survey

The second student IMMS (Keller, 2010) was administered by the lead researcher in the 10th week of the term to find out students' opinions of utilizing the instructional tools and activities. Their opinions were considered to ascertain if using instructional activities and tools were needed to change in the BL environment. Eleven students agreed to complete the survey.

According to the SPSS analysis of the second student IMMS, internal consistency reliability was found as .901. Internal consistency of the items showed a good value in the second IMMS. The students (n=11) got a mean score of 114.8 (3.19 out of 5). Yurdakul (2011) asserts that in order to interpret the findings from data analysis, the arithmetic average between "5,00 – 3,68", "3,67 – 2,34" and "2,33 – 1,00" score range respectively refers to a high, moderate and low. Therefore, the score of 114.8 (3.19 out of 5) demonstrated that students were moderately satisfied with the utilization of instructional tools and activities and implied that they demonstrated a positive attitude towards using instructional materials in the BL environment in the 10th week of the term.

Redesign of the Course

Redesign of the course including the course Blackboard site and instructional activities was to enhance the efficiency and effectiveness of the BL course.

The Course Blackboard Site. The educator continued to do online discussions, deliver course content, make announcements, comment on student assignments, grade quizzes and use calendar through the course Blackboard site. Also, the same design of the site was preserved.

Instructional Activities. A new instructional activity was added to increase interactions between student-student and student-educator and improve collaboration among students in this phase. The educator assigned the students with solving two different case studies by experiencing real-life learning. Groups of students consisting of two to three students had to make in-depth investigations such as interviewing with teachers and an administrator, analyzing official documents to meet the clear requirements of cases. All groups of students convened in the prepared Google Documents to concisely write their findings on topics being addressed in each case. The use of the Google Documents enabled them to scrutinize the findings of other groups and to synchronously or asynchronously discuss, compare and assess any resemblance and discrepancy between their findings. These documents also assisted the educator to guide the students in terms of any groups that stayed back from other groups, needed additional support or advanced toward solving their cases. In addition to creating a new instructional activity, the educator devoted more time to be available in the OL environment, which increased the students' activities, interactions and learning efforts overall.

Observation of the Learning Environment

The educator exhibited a lack of some essential competencies while teaching the BL course and what changed in the educator's strengths and weaknesses was found by using the observation tool. The educator provided alternative assignment options that personalized student learning and required the students to gather, synthesize, and analyze information to solve problems. Also, although the learning environment was conducive to student learning in terms of exchanging ideas and sharing experiences among students in the previous phase, their collaboration and cooperation exponentially increased by means of drawing advantage of the alternative learning activities. However, the educator's efforts to be present in the course Blackboard site and to be a role model for the students to show how good discussion participation should be were not enough even if there was an explicit increase in the educator's availability in OL. Besides, the students were deprived of a discussion forum in which they could ask questions and receive the educator and peer feedback about course content and activities.

Interview

The educator's reflection on teaching a BL course, specifically if BL was an efficient and effective learning environment and if using technological resources was easy to employ in the BL course was revealed through the final interview. The interview was analyzed by using the same techniques employed in previous phases. Five themes including motivation to change, benefit, ambiguity/concern, limitation and resistance emerged from the analysis of the interview as presented in Table 5. "Motivation to change" refers to the educator's desire to convert the classical learning course into the BL course. "Benefit" refers to if the educator benefitted from the advantage of teaching the BL course. "Ambiguity/concern" refers to any difficulties the educator encountered during teaching the BL course. "Limitation" refers to the educator's own restrictions that resulted in ineffectively teaching the BL course. "Resistance" refers to any reason if the educator was reluctant to teach the BL course.

Table 5. Summary of Educator Experience Evaluation Interview Result for Phase Three

Emerging Themes	Sample interview comments
Motivation to change	"You and I create it (blended learning) together it works pretty well. I think they (students) learned more than they had learned in the prior semesters because these assignments that we made online/blended forced them to go a little deeper into material that in the past."
	"I don't concentrate very well reading excessive amounts of dialogue right. But if I would have, I would have tailored it and made it smaller I would have been able to. So I go back to my fault with that."
	"I will use them (online learning materials) again. I thought they were very helpful. But I have to refine because I had too much."
	"I will probably put more classes online in the future"
Benefits	"What it (blended learning) did for me personally is help alleviate having too much that I had to cover in class.
	They (online activities) allowed me to assess (students) without taking up class time."
	"If I just discussed it in class as I have the last 15 years they wouldn't really have read it in that depth because they (all students) cannot say something in class that I don't have enough time and I can't get everybody to talk through that."
	"The online stuff that makes them more accountable."
	"That was excellent. A group product (Google Doc) where everybody put their information into a big table two different tables and then we were all able to go through it and do a comparison and contrast across everybody's insertions into the table."
	"The discussion boards and the group products Google Docs definitely made them (students) work more collaboratively and invest time for learning."
Ambiguity/ Concern	"I think they (student) might complain that it was too much extra work for them too."
	"The problem is that it's very hard to come up for all material to come up with a rich conversational assignment. It's hard to come up with an assignment that forces them to have a deep conversation in a meaningful way that doesn't make them feel like they're just doing an obligatory response"
	"I wasn't really able to come up with good questions like I had too much, and I wasn't really clear about what they were supposed to discuss really"
	"Things that I picked to be on the discussion boards are part of it was my fault. I didn't narrow down the topics probably enough I probably had too much in there"
Limitations	"I honestly didn't have time to read. So that would be another weakness, so I really didn't read what they (students) wrote very much. I skimmed it and I did some responding to them."
Resistance	"I don't think I would like it if I felt like I had to read all of their discussions. I don't enjoy that"

DISCUSSION

The first research question sought to find out what practices are associated with making a BL course efficient and effective. Creating a BL course requires designers to combine the best features of OL and the best features of F2F learning by considering the student characteristics, educator background, instructional goals, and online resources (Osguthorpe & Graham, 2003). We began the redesign of the course syllabus by determining and combining the best practices of online and F2F learning. We focused on the educator's prior experiences, particular goals of the course, availability of appropriate technological resources and student characteristics. Converting the traditional course into the BL course, gave a chance to establish a strong rapport with the educator and determine the educator's weaknesses and strengths in teaching a BL course. For instance, the educator stated limited prior experience of the use of technological processes and resources that "I've been old school…I haven't really done much besides just giving them links to articles and then we discuss them in class".

The educator benefited from the use of the course Blackboard site because of the requirements for intense reading assignments. The site provided the means to deliver reading materials online, manage course content easily and mitigate evaluating the assignments and giving feedback on them. BL has been cited as a collaborative and interactive learning environment where students become active participants in their own knowledge construction (Deslauriers, Schelew, & Wieman, 2011; Graham 2006). Also, Baturay and Toker (2019) express that online collaborative learning activities can be utilized to facilitate student interactions and increase information sharing among students. In this sense, the course Blackboard site enabled the educator to adopt active learning approaches such as discussion activities that engaged the students in critical thinking and promoted collaboration among them. The educator stated that "what I require them (students) to do with the online discussions they definitely had to be active knowledge seekers. They couldn't just passively read the information and then sit back and not really talk in class and I think it encouraged them to work collaboratively with their classmates". The educator implied the effectiveness of the discussion board activities by stating "I think ultimately they learn a little bit better because they're held a little more accountable for the online discussion board". Similarly, Yilmaz (2016) indicates that active learning strategies promote students' participation in virtual learning activities, which results in the enhancement of the learning process and results. Besides, Hosseinpour, Biria and Rezvani (2019) reveal that BL through utilizing Edmodo mobile application enables students to collaboratively work in writing class and therefore, they enhanced their writing skills statistically better than students who are in the traditional classroom setting. They also reveal that most students indicate the effectiveness, helpfulness and attractiveness of learning activities offered in the BL class.

BL has the potential to offer a rich, effective and collaborative learning experience (Garrison & Kanuka 2004; Picciano 2009). The utilization of Google Documents exponentially increased the quality of interactive and collaborative learning assignments. The educator stated that "Better than my expectation was the group product documents, the Google documents". The use of Google Docs enabled the educator to lead the students to make progress on solving their case studies and motivate them to work collaboratively and productively. The educator stated that "The group products, Google Docs, definitively made them work more collaboratively and invest time for learning". This aligns with the study conducted by Isiguzel (2014) who uncover that BL offers plenty of opportunities such as collaborative learning activities that increase students' motivation in the foreign language classes according to the findings. Zioga and Bikos (2020) investigate the effects of using Google Documents as an online collaborative learning tool on writing skills and found that collaborative writings provide constant feedback from peers and teachers, which helps students enhance their critical and conceptual ability. Besides, Azodi and Lotfi (2020) find that online collaborative tasks on writing performance positively contribute to the enhancement of students' cognitive development and motivate them to strive to overcome various problems they face through the learning process.

The second research question sought to reveal the educator's perceptions of teaching the BL course. The educator pointed out that the limitation of time was an obstacle in teaching the BL course. This aligns with the study conducted by Mozelius and Rydell (2017) who reveal that educators' one of the major challenges for implementing BL courses is a shortage of time. In spite of the time constraint, the educator was very satisfied with teaching the BL course and found the designed BL course useful and overall supportive as indicated in the statement "my overall perception is that it was helpful in alleviating too much in class… the version of a blended learning course you and I create it together it works pretty well…better than my expectation."

The educator highlighted four benefits of teaching the BL course. First, improved learning was emphasized: "I think they learned more than they had learned in the prior semester". It coincides with the study conducted by Hoic-Bozic, Mornar and Boticki (2009) that shows students who took the course in the BL manner achieved academically higher scores than those who previously took the course taught in the traditional manner. Second, the educator stressed the availability of varied assessment practices: "they [online learning activities] allowed me to assess without taking up class time". Valuable information can be extracted from student interactions to assess student progress in the inclusive BL course (Donnelly, 2010). Third, active learning strategies can be utilized to involve students in group activities and encourage them to contribute to knowledge construction in a BL approach (Garrison & Kanuka, 2004; Picciano, 2013). Being an active learner was emphasized by the educator stating that "they definitely had to be active knowledge seekers. They couldn't just passively read the information and sit back in class…They are accountable more, the online stuff makes them more accountable". In accordance with that, Maza et al. (2016) found as a result of their study that being an active learner in a flexible BL environment facilitates achieving the target competencies and improves learning for students who even feel contented and in a learning environment in which their educator is a transmitter of knowledge and they passively absorb information and knowledge. Finally, BL has widely been considered as an alternative and effective learning (Chou & Chou, 2011; Wu et al., 2010). The educator highlighted BL as a supplementary teaching environment by stating that "what it did for me personally is that help alleviate having too much that I had to cover…I could accomplish a similar thing in class but it just sucks up more time and they would never go as deep".

The study was conducted by Geng et al. (2019) who compared a BL course with a nonBL course and found that BL facilitates learning through increasing the sense of engagement and interaction. The educator appreciated the use of Google Docs that promoted student learning through rich peer discussions under the educator's guidance in the BL course. The educator stated that Google Docs was a highly useful collaboration tool to support learning activities, helped shift from a passive teaching style to an active teaching style and encouraged students to embrace deep learning by stating "That was excellent… A group product where everybody put their information into two big different tables and then we were all able to go through it and do a compare and contrast across everybody's insertions into the table". Similarly, Yilmaz, Karaoglan Yilmaz and Kilic Cakmak (2017) reveal that interactive learning tools enable students to collaboratively work with each other and the increase of collaboration enhances their perceptions of social presence in the learning environment.

Ocak (2011) asserts that technical issues and lack of time are barriers that prevent educators from designing and teaching a BL course. The lead researcher closely worked with the educator to design and implement the BL course and provided technical support as needed. Therefore, the educator didn't experience any unresolved technical problems. Even if the educator did not cooperate with the lead researcher and get help for technical issues, most universities in the United States have technology support services to quickly solve such technical problems the educator encountered while teaching the BL course. However, the educator explicitly implied that the shortage of time hampered efficiently teach the BL course by stating "I could spend more time I probably didn't do a good enough job," "I don't have as much time available to spend on the discussion board". This aligns with the study conducted by Napier, Dekhane, and Smith (2011) who revealed that educators who design and teach a BL course possibly encounter a time challenge. Another study conducted by Ibrahim and Nat (2019) found that the design and implementation of a BL course requires a time commitment that negatively influences educators' motivation for creating a BL environment.

The last research question examined if the iterative process of this DBR study improves the efficiency and effectiveness of a BL course throughout the term. The process of three iterative design cycles helped extend and create knowledge about design principles (Reinholz, 2017; The Design-Based Research Collective, 2003). Iteratively analyzing, designing, implementing, and redesigning the BL environment allowed the designers to make an in-depth investigation and gain a comprehensive understanding of what, why and how learning practices worked in the learning environment. Each design cycle systematically refined and improved the previous design of the BL course (Wang & Hannafin, 2005) that promoted the quality of the BL course. The design of the effective and efficient BL course was achieved through assisting and cooperating with the educator and these refinements of the learning environment in a systematic but flexible manner. After determining the lack of depth in the discussion questions, where students provided only

factual information, the educator modified questions requiring students to show their higher-order thinking skills such as analysis, synthesis, or interpretation in the second phase. This modification made a significant difference in stimulating the sharing of experiences among the students and promoting a healthy exchange of ideas. It is possible to design and implement the desired BL environment by finding practical solutions when facing real-world problems through iterative refinements of learning activities and enhancements of the learning process.

Dynamic Google Docs and interactive discussion board activities were added to maximize the efficiency and effectiveness of interactive learning activities. Google Documents were employed in response to the educator's demand in using a practical and useful interactive and collaboration tool. Also, the educator's competencies improved in terms of teaching the BL course through each subsequent cycle to provide personalized tasks through alternative assignment options, engage the students in collaborative learning activities under the educator's guidance and support and respond to students' diverse learning inquiries. These are the vital roles in teaching a BL course such as coaching, mentoring and counseling to establish a highly effective and meaningful learning experience (Bonk, Kim, & Zeng, 2006, p.564). DBR was carried out by Jepchumba and Gaceri (2013) who revealed that educators' teaching practices, professional development regarding selecting and using technologies and students' learning experiences are considerably improved in the BL environment.

IMPLICATIONS FOR PRACTICE

This study indicated that BL is an effective approach if the optimal balance between online and F2F learning is built. The educator who teaches a BL course takes a role in the plan, design and development of BL and the related literature highlights that this role is as critical as consideration of students' role in the learning (Hew & Cheung, 2014). The importance of the research was to explore the wide range of designed innovations and an optimal method for educators to plan, teach and enact a BL course. We discussed creating a BL course in a flexible and holistic way in terms of what steps educators should take, how to manage, use, and select suitable technological resources and processes, what obstacles they may encounter, and how to design, implement, evaluate and redesign a BL course. Instructional designers might find the process of assisting an educator in the design and delivery of BL beneficial and apply similar approaches to deal with uncertainty about how to design an efficient and effective BL course for those who have a few experiences or no experience in teaching and designing BL.

The study employed a DBR method that required the researchers to iteratively practice designing, implementing, evaluating and redesigning the BL course to create the best learning environment. Instructional designers should not ignore the refinement of a learning environment at least one time after the initial implementation. For instance, discussion board activities are the primary activities that stimulate critical thinking on a topic or issue through the right questions (Picciano, 2009). However, discussion board activities didn't serve as its intended purpose because of the questions seeking only factual information. Refining the questions made a substantial change in the learning environment in which the students exchanged information among themselves and shared their own perspectives.

Instructional designers might use multiple design possibilities to transform educator-led learning into student-led learning. A variety of instructional activities, specifically Google Documents, and the course Blackboard site were utilized to increase student engagement, promote active and collaborative learning activities in this study. Discussions are a key factor to share knowledge and experiences among students in BL environments (Han, & Ellis, 2019). However, instead of asking yes-no questions, it is important to ask slightly challenging or highly complex discussion questions that require students to exchange their ideas and share knowledge and experiences. Also, educators do not need to tie to Blackboard to create their own dynamic course sites. Instead, they have opportunities to create their own dynamic course sites by benefitting from free learning management systems (Gkemisi, Paraskeva, Alexiou and Bouta, 2016). The significant point was to take into account educator background, students' needs, attitudes and expectations, and course content when designing a learning environment where students became active knowledge seekers and choosing technological tools, resources and processes to support teaching and learning. Also, the basic and well-organized design of a learning environment was important to improve the quality of teaching and learning experiences.

CONCLUSION

There is a lack of scientific investigation with the systematic implementation and development of a BL in terms of an inexperienced educator in teaching and designing a BL course in the current literature. The present study addressed this gap by assisting an inexperienced educator in teaching and designing a BL course by selecting suitable technological resources and processes to create the desired BL course, and determining the strengths and weaknesses of the educator to efficiently and effectively enhance the BL course via the iterative designed intervention phases. Therefore, the aim of the research was to decide what appropriate practices were needed to assist an educator who had no experience in designing and delivering BL to accomplish creating and implementing an efficient and effective BL and to document the educator's thoughts on the initial teaching experience of BL. According to the results, determining the particular goals of the course, the educator's prior experiences and availability of appropriate technological resources guided the lead researcher to assist the educator in the design, implementation and redesign processes of the BL course. BL allowed the educator to adopt active learning approaches, engage students in critical thinking and promote the quality of interactive and collaborative learning assignments by means of benefitting from Google Documents and Blackboard Learn (Learning Management System) as learning resources. It was the key consideration to provide online collaborative learning activities to have students share knowledge and experiences with peers. In this sense, they became active knowledge seekers who construct their own knowledge through the interaction and sense of engagement in a learning community in BL. Although the educator indicated the time limitation as an obstacle to teach more efficient BL course, the educator was contented with teaching and the designing BL course and found it useful and supportive overall. Although the study was conducted with a limited number of participants, the results are expected to contribute to insight for educators inexperienced in teaching and designing an efficient and effective BL course. It is also expected to contribute insight for instructional designers who consider the iterative refinement of a learning environment to design and deliver high-quality instructional products and experiences and to increase the awareness of the designers about the process of designing and implementing the desired BL course through iterative phases in a real-life context.

Authors' Note: This study was generated from a part of the first author's PhD dissertation.

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EVALUATION OF THE EFFECTIVENESS OF ONLINE COURSES BASED ON THE COMMUNITY OF INQUIRY MODEL

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ABSTRACT

The purpose of the study, in order to improve the courses presented in online environments based on Community of Inquiry, is to investigate relations among the Community of Inquiry' presences (teaching, social and cognitive), learners' characteristics (e.g. gender, age, occupational status, and the type of registered program), "e-readiness and expectations", and satisfaction by using the structural equation model. The study group consisted of 714 students enrolled in distance education programs. Three data collection tools were used to collect data. The findings revealed that "the presence of the students was at a moderate level, teaching and social presence had a significant positive effect of on cognitive presence, the level of presence did not vary based on the variables of demographic and discipline, the e-presence and expectation levels had a low impact on presence levels, and the level of presence had a significantly high impact on satisfaction." The findings also indicated that the online courses examined in this study were found to be sufficient by students in forming a community of inquiry. However, it also revealed that certain aspects of the courses should be improved. Therefore, it could be concluded that there is a need for more social, more active and engaging learning activities that enable students to think critically in an online environment.

Keywords: Online learning, The Community of Inquiry, e-presence and expectation, satisfaction.

INTRODUCTION

Online and blended environments in higher education are rapidly growing thanks to the benefits of interactive technologies that improve active learning and offer students flexibility (Giering, 2013; Johnson, Adams Becker, Estrada, & Freeman, 2014; Seaman, Allen, & Seaman, 2018; Siemens, Gasevic, & Dawson, 2015; Roscorla, 2012). Reports on e-learning state that more than 65% of faculty support the use of Open Educational Resources (OER), such as eLearning courses, and more than 49% of learners had taken part in some form of eLearning activity in the last 12 months (Duffin, 2019; Statista, 2019). Therefore, inevitably, educational institutions should investigate pedagogical perspectives on the effectiveness of online or blended education in parallel with technological developments.

Some studies have investigated the effectiveness of online learning in the literature. Simsek (2012) addressed the dimensions of quality, educational effectiveness, financial efficiency, accessibility, teaching staff satisfaction and student satisfaction in distance education. Crowther, Keller, and Waddoups (2004) examined the effectiveness and nature of online courses by means of usability methods. They discussed the dimensions of benefit, learning, productivity, and satisfaction. Levy (2008) attempted to determine the critical value factors of online course activities based on the Cognitive Theory of Value (Ragowsky, Somers, & Adams, 2005) to

study the effectiveness of online learning programs. Hence, from the students' perspective, the following aspects are important in a course: (1) collaborative, social and passive, and corporate communication, (2) corporate learning, (3) support, and (4) written/informative activities. Liu (2012) evaluated the distance education system through student self-reporting on the following dimensions: (1) organizing and planning course, (2) communication, (3) faculty/student interaction, (4) homework, exams, and grading, (5) teaching methods and materials, (6) learning outcomes, (7) student effort and participation,(8) course difficulty, and (9) workload, and speed.

"International Association for K-12 Online Learning" (INACOL), in striving to enhance the quality of education and focusing on student-based approaches in this process, has set various standards on blended learning design (INACOL, 2011), outcome-based quality (INACOL, 2012) and skills of online teachers (INACOL, 2011). Apart from these studies, the Community of Inquiry on the design of online or blended learning is one of the pedagogical models on which many studies were based. It has been widely used as a guide for developing and evaluating online courses as well as for education faculty to teach online (Heilporn & Lakhal, 2020; Nolan-Grant, 2019; Rubin, Fernandes, & Avgerinou, 2013; Shea & Bidjerano, 2012; Stenbom, 2018; Szeto, 2015). Further, The Community of Inquiry has been used effectively to examine learning experiences and to compare different learning environments in many contexts (Stenbom, 2018). The combined result of Stenbom's systematic review is that the Community of Inquiry Survey is a widely accepted tool for revealing learners' perceptions of learning experience, and its measurement invariance was tested for many variables (gender, age, ethnicity, discipline, online experience) (Dempsey & Zhang, 2019). So, it is a guide for the design of courses (Akyol, Vaughan, & Garrison, 2011; Swan, Day, Bogle, & Matthews, 2014).

A Community of inquiry is defined as a group of people cooperatively engaging in critical discussion and reflection in order to develop personal meaning and affirm understanding in reciprocation (Garrison, 2011). Cognitive, social, and teaching presence components at a high level online learning environment are necessary for an effective community of inquiry (Garrison, Anderson, & Archer, 2000). Rockinson-Szapkiw, Wendt, Wighting, and Nisbet (2016) found that the students with high social presence, cognitive presence and teaching presence had higher grades. Additionally, perceived learning was positively correlated with students' grades. In community of inquiry model, deep learning is associated with cognitive presence level. Social and teaching presence levels explained at least 69% of the variance in cognitive presence (Gutierrez-Santiuste, Rodriguez-Sabiote, & Gallego-Arrufat, 2015). The current study tested students' perceptions of presence as predicted in the literature. Therefore, it is possible to discuss which dimensions come into prominence for the design of the courses.

Cognitive presence derives from the epistemological, cultural and social expression of the particular content to support critical thinking (Anderson, 2008). If a community of inquiry emerges, along with other components, in an environment based on deep and meaningful learning, it enables a student to think critically and increases the level of cognitive presence (Kanuka & Garrison, 2004). Cognitive presence has a positive effect on educational effectiveness (Lin, Hung, & Lee, 2015). Social presence is the ability of students to present themselves as a real person and the degree of comfort and confidence needed to express their ideas by working collaboratively. It is an important indicator of emotional expression and persistence in online learning (Boston, Diaz, Gibson, Ice, Richardson, & Swan, 2010). In an environment with low levels of social presence, students cannot share ideas, express disagreements, explain differences, and accept their peers' support. The purpose of social presence is to provide open communication and group cohesion (Garrison, 2011). Teaching presence is to design and implement learning processes to ensure cognitive and social presence (Anderson, 2003). Teaching and social presence have a significant impact on cognitive presence and teaching presence affects social presence (Garrison, Cleveland-Innes, & Fung, 2010). An effective teaching presence in an online environment can be formed through accurate and timely use of group and independent study activities via synchronous and asynchronous interaction.

Figure 1. The Community of Inquiry Model (Garrison et al., 2000)

In the literature, the findings of some studies examining the Community of Inquiry and various variables (e.g. discipline, course duration, learner characteristics, satisfaction) revealed some indicators regarding the structuring of the courses (Arbaugh, 2013; Arbaugh, Bangert, & Cleveland-Innes, 2010; Moreira et al., 2013; Stenbom, 2018). For example, learners' presences (teaching, social and cognitive) differ in terms of pure or applied disciplines and discipline affects the relationship between presences (Arbaugh, 2013). Stenbom's study comparing hard and soft disciplines found that the harder disciplines prioritized more teaching presence (Stenbom, 2018). Moreira et al. (2013) community feeling of polytechnic students is stronger than university students. Akyol et al. (2011) found differences in the three presences in short- and long-term courses. In terms of social presence, when a course was given for a shorter duration (6 weeks) than 13 weeks, students had a higher perception of group cohesion and lower effective communication. Besides, in terms of teaching presence, the perception of direct instruction is higher in the short course, while the perception of facilitating discourse is lower. In this context, it can be stated that the unique dynamics of each course have effects on the presences, so variables that address different dimensions (e.g. learner characteristics, e-presence and expectation, and satisfaction) need to be examined.

Learner characteristics can affect the development of teaching, social, and cognitive presence at different levels in the online learning environment (Akyol et al., 2011). Studies examining the Community of Inquiry and learner characteristics (e.g. gender, age) show inconsistent results. For example, Shea and Bidjerano (2009) found that gender, age, and academic level have a direct effect on only teaching presence. Akyol, Ice, Garrison, and Mitchell (2010) found age to be significant for presences. However, regardless of age, Decker and Beltran (2016) discovered that students have a feeling of belonging and can communicate comfortably in an online environment. Moreover, no significant relationship was found between students' ages and social presence (Horzum, 2015). Therefore, these results show that learner characteristics do not have the same effect on the Community of Inquiry in each course. One reason for the inconsistency may be that every learner comes to an online course with different e-presence and expectations that can affect learners' success (Hung, Chou, & Chen, 2010; Ilgaz & Gulbahar, 2015; Yeh et al., 2019). Learners contribute to the improvement of the community through their skills and knowledge while teachers design learning experiences and make necessary changes in building a community of inquiry. Therefore, the learners' level of readiness and expectations are significant from the viewpoint of the course teacher and/or the instructional designer with the role of designing activity. E-readiness and expectations, through which the important inputs of the online learning process are obtained, provides insight for the designer about the interventions that should be made in the phase of course design and implementation (Ilgaz & Gulbahar, 2015).

Another indicator of the effectiveness of online courses is learners' satisfaction (Eom & Ashill, 2016; Yukselturk & Yildirim, 2008). But, there are contradictory results in some studies in which Community of Inquiry presences and satisfaction are examined relationally. Students' satisfaction has high correlations with cognitive and social presence (Gutierrez-Santiuste, 2016) or only the cognitive presence (Choy & Quek, 2016). In one study, satisfaction was predicted by each of the three presences (Giannousi & Kioumourtzoglou, 2016) while another study found that social presence was not an indicator of satisfaction (Kucuk & Richardson, 2019).

In summary, the effectiveness of online courses, which has been increasingly important in the last years, is a process full of challenges as each course has its dynamic. However, it is also necessary to discuss the effectiveness of online courses through theoretical models. Thus, the weaknesses of the course and the requirements for improvement are discovered. This study aims to evaluate the effectiveness of online learning courses based on Community of Inquiry Model. This model, providing insights for instructors on the strengths or weaknesses of a course (Dempsey & Zhang, 2019; Lambert & Fisher, 2013), can produce special practices that include facilitating elements of learning such as affective explanations, group discussions, research activities and course organization to create a more attractive and engaging course. While examining the effectiveness of online courses based on the Community of Inquiry, it can be stated that learner characteristics and satisfaction variables are still worth examining due to inconsistent results in the literature. On the other hand, no studies addressing e-readiness and expectation with Community of Inquiry have been found. In this context, the examination of the Community of Inquiry and various variables (such as learners' characteristics, "e-readiness and expectation" and satisfaction) with the Structural Equation Model may come up with suggestions to course design according to the student needs.

PURPOSE OF THE STUDY

The purpose of the study, in order to improve the courses presented in online environments based on Community of Inquiry, is to investigate relations among the Community of Inquiry' presences (teaching, social and cognitive), learners' characteristics (e.g. gender, age, occupational status, and the type of registered program), "e-readiness and expectations", and satisfaction by using SEM. In this context, answers are sought for the following research questions.

1. What are the levels of cognitive, social and teaching presence of the learners registered in online courses?
2. To what extent is cognitive presence predicted by the social and teaching presence in online courses?
3. Do the levels of cognitive, social and teaching presence of the students vary depending on gender, age, occupational status, and the type of registered program such as undergraduate and/or graduate degree?
4. What is the effect of the level of e-presence and expectations of the students on the perception of a community of inquiry?
5. What is the effect of the satisfaction levels of the students on their perception of a community of inquiry?

METHOD

In this study, the relationships among the three presences, demographics variables and different disciplines (the type of registered program), e-presence and expectation and satisfaction were investigated a structural equation modeling (SEM) approach.

Participants

This study examined 2100 students who were enrolled in distance education programs and attended online courses. The participants in the online scale comprised of 1178 students. After excluding invalid records, data obtained from 714 students were available for use. Of the participants, 69% (493) were female and 46% of them (329) were enrolled in an undergraduate degree completion program. From the 691 students

who stated their occupational status, 328 students (46%) worked in some professions. Furthermore, the age of participants varied between 17-59 years old and the average age was 25,9 (see. Table 1).

Table 1. Distributions on the Demographic Characteristics of the Participants

Programs	Gender				Marital Status				Profession						Ave. of Age
	M		F		Yes		No		Unknown		Yes		No		
	f	%	f	%	f	%	f	%	f	%	f	%	f	%	
Judicial Services	29	49,15	30	50,85	35	59,32	24	40,68	13	22,03	36	61,02	10	16,95	27,9
Banking and Insurance	15	28,85	37	71,15	44	84,62	8	15,38	9	17,31	23	44,23	20	38,46	22,1
Computer Programming	74	64,35	41	35,65	104	90,43	11	9,57	23	20,00	61	53,04	31	26,96	22,3
Medical Documentation	24	19,35	100	80,65	68	54,84	56	45,16	24	19,35	53	42,74	47	37,90	25,2
Tourism and Hotel Management	15	42,86	20	57,14	32	91,43	3	8,57	6	17,14	19	54,29	10	28,57	24,5
Divinity Diploma	64	19,45	265	80,55	64	19,45	265	80,55	66	20,06	136	41,34	127	38,60	33,1
Total	221	30,95	493	69,05	347	48,60	367	51,40	141	19,75	328	45,94	245	34,31	25,9

Data Collection and Analysis

Four separate data collection tools were used to obtain the necessary data: the "Personal Information Form" prepared by the researchers, and the scales of "e-Presence and Expectation", "Community of Inquiry", and "e-Satisfaction." The Scale of e-Presence and Expectation was administered to the students in the first week of the fall semester, whereas the Scale of Community of Inquiry was applied in the 12th week, and the Scale of e-Satisfaction was applied in the 14_{th} week in an online environment.

This study utilized a confirmatory factor analysis for the reliability and validity of the scales. As a result, only Personal Characteristics dimension in e-Presence and Expectation was not confirmed. The load of two items out of four items was 0.5 and below. Validity and reliability results of the scales are shown in Table 2.

Table 2. Reliability Coefficients of the Scales in the Study

Scales	Factors	Reliability Coefficient (α)	Confirmatory Factor Analysis	
			Item Load	Criterion
e-Presence and Expectation (Gulbahar, 2012)	1. Personal Characteristics	0.80	Item1: 0.38 Item2: 0.73 Item3: 0.40 Item4: 0.76	This dimension was not included in the analysis since the load of two items out of four items was 0.5 and below.
	2. Access to Technology	0.77	0.58-0.85	RMSEA= 0.066; RMR= 0.061; CFI = 0.98; NFI=0.98; NNFI=0.98
	3. Technical Skills	0.79	0.75-0.92	
	4. Motivation and Attitude	0.79	0.68-0.85	
	5. Factors Affecting Success	0.77	0.62-0.85	
The community of Inquiry (Ozturk, 2012)	1. Teaching Presence	0.92	0.66-0.81	RMSEA=0.061; RMR= 0.021; CFI = 0.99; NFI = 0.98; NNFI = 0.99
	2. Social Presence	0.88	0.67-0.81	
	3. Cognitive Presence	0.75	0.71-0.85	
e-Satisfaction (Gulbahar,2012)	1. Communication and Usability	0.91	0.77-0.92	RMSEA = 0.078; RMR = 0.043; CFI = 0.99; NFI = 0.98; NNFI = 0.99
	2. Teaching Process	0.93	0.76-0.87	
	3. Teaching Content	0.94	0.88-0.92	
	4. Interaction and Evaluation	0.96	0.81-0.91	

This study utilized a confirmatory factor analysis for the reliability and validity of the scales, descriptive statistics for the first research question and a structural equation model (SEM) for the other four research questions. The study further used SPSS 20.0 and LISREL 8 programs to perform the analyses. Structural equation model (SEM) is evaluated through some independent criteria. These criteria are called goodness of fit statistics and allow for the evaluation of the model's acceptability as a whole.

A difference between the covariance matrices (i.e., analyzed data and theoretical expectation) is expected in SEM studies. Accordingly, the first criterion that can be used is that the Chi-square value is not significant. However, as the size of the sample increases, the Chi-square value is generally found to be significant; for that reason, other goodness of fit statistics (GFI, AGFI, CFI, NFI, NNFI > .95; RMSEA, RMR, SRMR<.08) were also used (Hooper, Coughlan, & Mullen, 2008; Simsek, 2007). Although the fit statistics are reported, there is no need for specifying every one of them. There is no consensus on which fit statistics method leads to a more valid result on the model's suitability in the literature. The most commonly used compliance indicators are CFI, GFI, NFI, NNFI, and RMSEA (McDonald & Ho, 2002). Nevertheless, the GFI and AGFI may lead to misinterpretations on the model with latent variables (Hu & Bentner, 1999). Thus, this study reported the indicators of CFI, NFI, NNFI, and RMSEA.

Structure of the Evaluated Online Courses

Regarding all the online courses in distance education programs available in the institutions, in which these practices were performed, the students can typically follow their courses on the Moodle Learning Management System where they communicate with instructors and access their exam results and announcements. In addition, the students can report questions and problems on the forums. They can follow the courses via online contents uploaded to the system (e.g., SCORM, fascicle, or video) and virtual classrooms. The courses in virtual classrooms were conducted by means of web conferencing at a date and time planned by the instructor. A commercial product (Adobe Connect) was used as the web conferencing system. Every practice in the virtual classrooms was recorded by the course teacher and accessed by the students who had not participated in the course. Further, the students can also access the camera recordings of the lecture provided by the instructor. The forums consisted of three different parts: (1) "student affairs forum" where the students can ask anything about student affairs, (2) "technical forum" where they can report on the technical issues they experience, and (3) "student forum" where they can communicate with each other.

FINDINGS

The Levels of Cognitive, Social, and Teaching Presence of the Students registered in Online Courses

In order to answer first research question, the average scores of the sub-dimensions were calculated. Table 3 presents the data distribution related to the question. The students opted for "I agree" on the statement that online courses create a feeling of presence. Accordingly, since the 4-point Likert-type scale comprised the agreement scale of "I strongly disagree," "I disagree," "I agree," and "I strongly agree," there is no definite distinction between the presence levels; for that reason, it can be stated that the students' presence was at a moderate level on a scale of four ($X_{teaching}$=2,91, X_{social}=2,98, $X_{cognitive}$=2,96) (see. Table 3).

Table 3. Distributions of the Cognitive, Social and Teaching Presence Levels of the Students

Sub Dimensions	Mean	99% Confidence Interval		Variance	Std. Dev.	Skewness	Kurtosis
		Lower Limit	Upper Limit				
Personal Characteristics (pc)	3,11	3,05	3,18	0,78	0,88	0,02	-0,06
Access to Technology (at)	3,95	3,88	4,03	1,03	1,01	-0,98	0,36
Technical Skills (ts)	4,01	3,94	4,08	0,97	0,98	-0,92	0,10
Motivation and Attitude (mt)	3,63	3,56	3,70	0,86	0,93	-0,42	-0,15
Factors Affecting Success (fas)	4,19	4,13	4,26	0,75	0,87	-1,30	1,61

Teaching Presence (t_pre)	2,98	2,94	3,03	0,31	0,56	-0,36	0,85
Social Presence (s_pre)	2,91	2,87	2,95	0,35	0,60	-0,40	0,74
Cognitive Presence (c_pre)	2,96	2,92	3,00	0,32	0,57	-0,51	1,20
Communication and Usability (cu)	3,65	3,58	3,72	0,93	0,96	-0,72	0,37
Teaching Process (tp)	3,50	3,43	3,57	0,93	0,97	-0,54	0,07
Teaching Content (tc)	3,68	3,61	3,75	1,00	1,00	-0,65	0,13
Interaction and Evaluation (ie)	3,45	3,37	3,52	1,01	1,01	-0,42	-0,20

The Extent Social and Teaching Presence Predict Cognitive Presence in Online Courses

In order to answer second research question, the fit statistics of the structural equation model developed in the study were analyzed. It can be stated that the fit of the model was at an acceptable level (CFI=0.98, NFI=0.99, NNFI= 0.99, RMSEA=0.061). Figure 2 shows the established structural equation model.

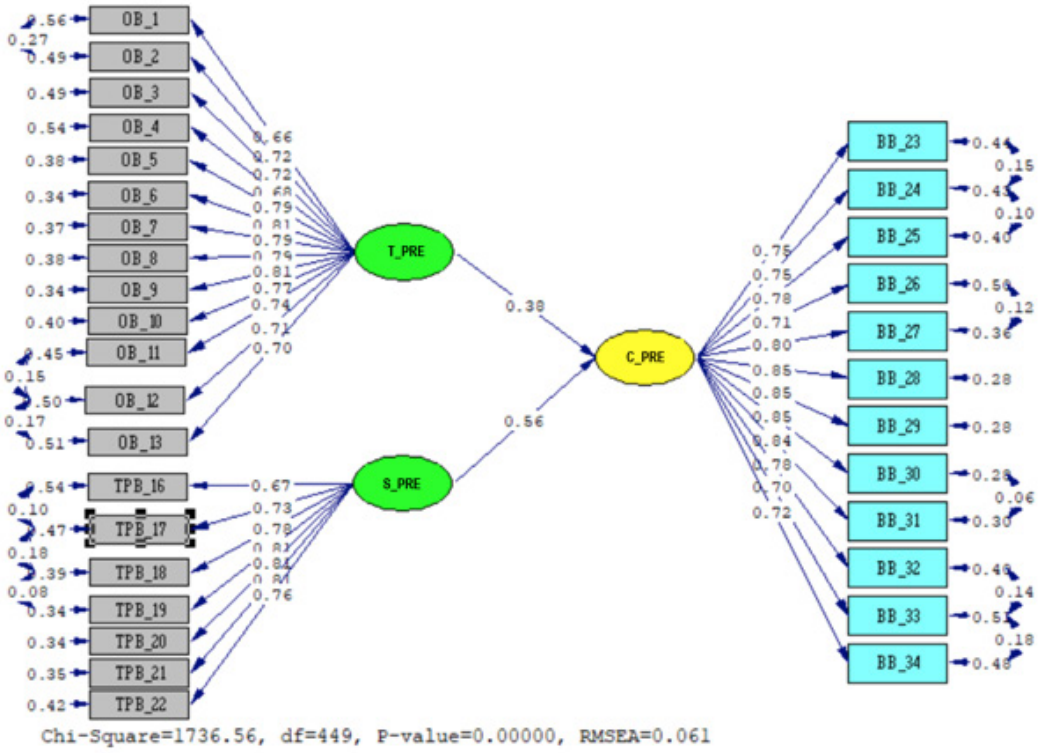

Figure 2. Structural equation modeling of the effects of social presence and teaching presence on cognitive presences.

By model, there is a significant positive effect of teaching and social presence on cognitive presence (t_{s_pre} =12.82, β_{s_pre} =0.56, t_{t_pre} =10.50, β_{t_pre} =0.14). The two variables ($R^2_{s\_pre}$ = 0.314, $R^2_{t\_pre}$ = 0.144) together account for 45,8 % of the total variance in cognitive presence (see. Table 4).

Table 4. The Effects of Social Presence and Teaching Presence on Cognitive Presence

Latent variables	Beta	t	R2
Social Presence (s_pre)	0.56	12.82	0.314
Teaching Presence (t_pre)	0.38	10.50	0.144
Total Variance			0.458

The Analysis of the Levels of Cognitive, Social, and Teaching Presence of the Students Based on Various Variables

In order to find answers to the third research question, the fit statistics of the structural equation model of this study were analyzed. It can be stated that the fit of the model was at an acceptable level (CFI=0.98, NFI=0.98, NNFI= 0.96, RMSEA=0.67). The latent variables of the categorical variables, such as sex, marital status, occupational status, and the type of registered program, were formed by being multiplied by 1 value.

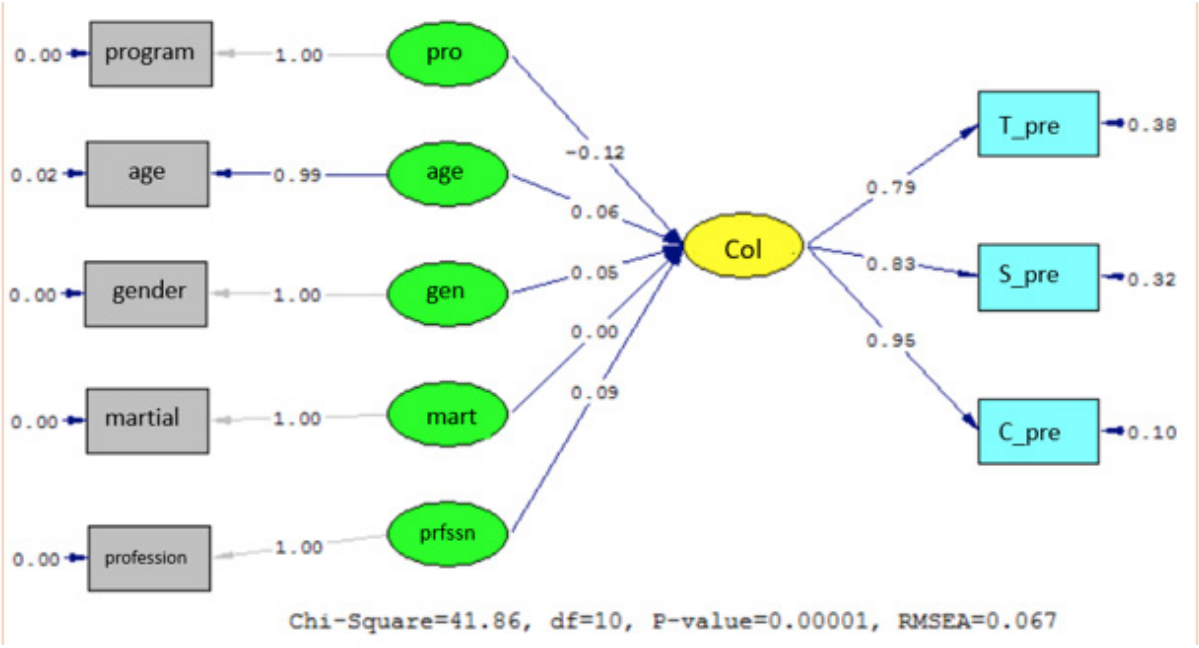

Figure 3. Structural equation modeling of the perception levels of the community of inquiry of the students according to various variables.

As seen in Figure 3, the effect size of the variables of gender, marital status, occupational status, program, and age on the perception level of the community of inquiry was very low (β_{gender}=0.05, $\beta_{martial}$=0.00, $\beta_{profession}$= 0.09*, β_{age}= 0.06, $\beta_{program}$= -0.12*). The students' perception on the community of inquiry did not vary significantly depending on age, gender, martial (t_{age}=1.01, t_{gender}=1.07, $t_{martial}$=0.08). The students' perception levels on the community of inquiry varied significantly depending on program and profession status ($t_{profession}$=2.25, $t_{program}$=-2.41). Furthermore, the effect size of each presence level of the students on the community of inquiry was significant and high ($_{tc\_pre}$=31.73, β_{c_pre}=0.95, t_{s_pre}=25.83, β_{s_pre}=0.83, t_{t_pre}=24.27, β_{t_pre}=0.79).

Effect of the Level of e-Presence and Expectations of the Students on Social, Cognitive, and Teaching Presence

In order to answer the fourth research question, the fit statistics of the structural equation model of this study were analyzed. It can be stated that the fit of the model was at an acceptable level (NNFI= 0.97, CFI =0.97, NFI=0.96, RMSEA=0.07).

Since the relevant items in the personal characteristics dimension in the e-presence and expectation scale in the structural equation model were not loaded above 0.5, this dimension was not included in the study. In the subsequent analysis, it was found that the effect size of the levels of e-presence and students' expectations on the presence levels were low. Figure 4 demonstrates the effect sizes for the sub-dimensions.

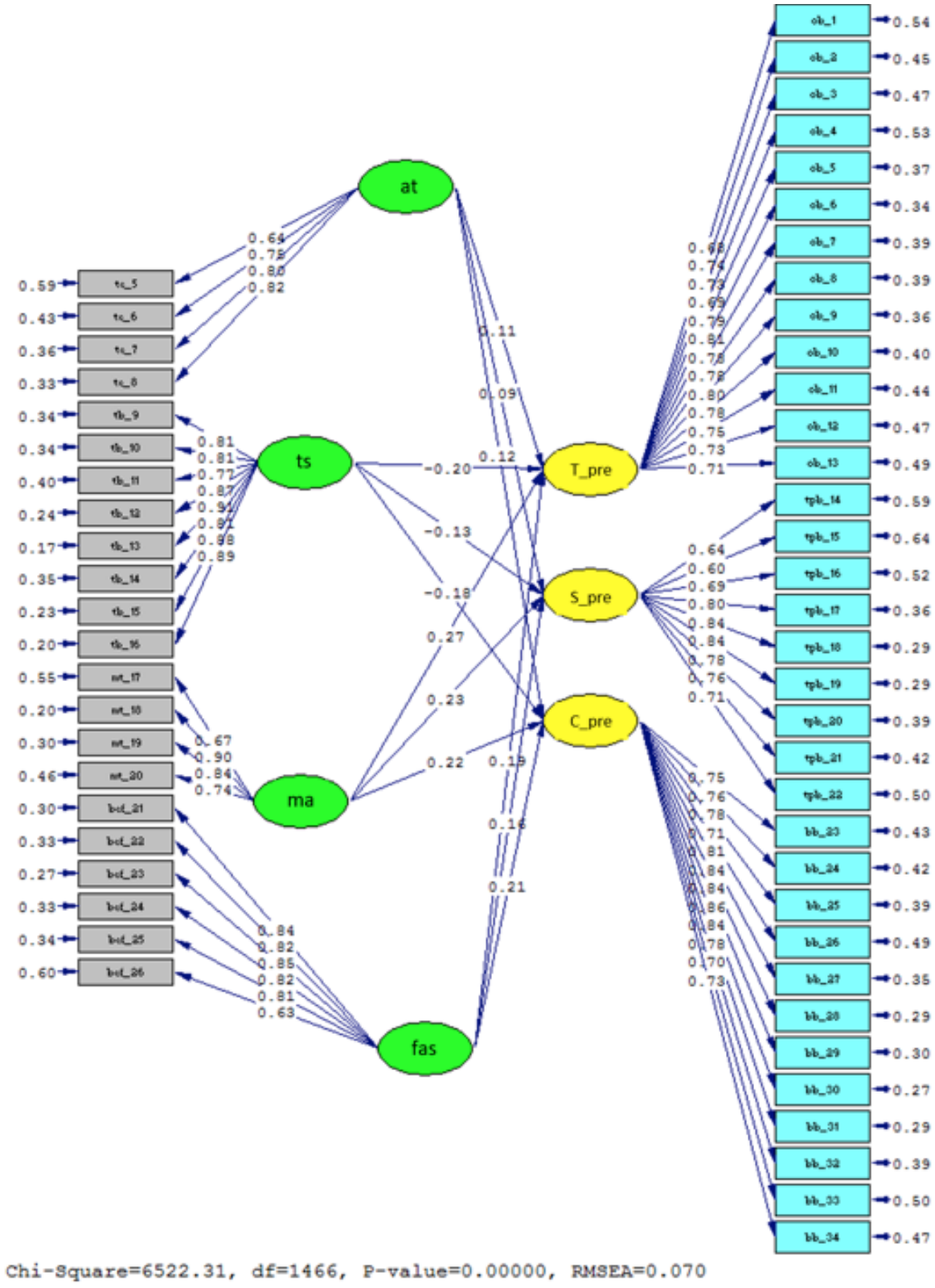

Figure 4. The effect of e-presence and expectation levels of the students on the students' presence levels

Table 5 demonstrates the effect of e-Presence and Expectation on Col Presences. "e-Presence and Expectation Dimensions" explain 16% of teaching presence, 11% of social presence and 19% of cognitive presence. Other dimensions, except for technical skills, have a small but significant effect on all Col Presences. In this context, students with high technical skills have higher presence perceptions than those with low technical skills.

Table 5. The Effects e-Presence and Expectation on Col Presences

e-Presence and Expectation Dimensions	Teaching Presence			Social Presence			Cognitive Presence		
	Beta	t	R2	Beta	t	R2	Beta	t	R2
Access to technology	0,11	1,77	0,01	0,12	1,42	0,01	0,09	1,95	0,01
The technical skills	-0,20	-3,53	0,04	-0,13	-2,33	0,02	-0,18	-3,24	0,03
Motivation and attitudes	0,27	4,79	0,07	0,23	4,05	0,05	0,33	3,97	0,11
The factors affecting the success	0,19	3,51	0,04	0,16	2,86	0,03	0,21	3,78	0,04
Total Variance			0,16			0,11			0,19

Effect of the Levels of Cognitive, Social, and Teaching Presence of the Students on Student Satisfaction

In order to find answers to the fifth research question, the fit statistics of the structural equation model of this study were analyzed. It can be stated that the fit of the model was at a good level (NNFI= 0.98, CFI =0.99, NFI=0.98, RMSEA=0.078).

The structural equation model demonstrated that the effect size of the perception levels of the students' community of inquiry on student satisfaction was high. Hence, the increased perception levels of the students' community of inquiry may also increase their satisfaction levels in the dimensions of communication and usability, teaching process, learning content, interaction, and evaluation in the online course. Figure 5 shows the effect sizes for the sub-dimensions ($t_{col->cu}$=22.52, $\beta_{col->cu}$=0.88, $t_{col->tp}$=22.75, $\beta_{col->tp}$=0.97, $t_{col->tc}$=26.83, $\beta_{col->tc}$=0.89, $t_{col->ie}$=23.94, $\beta_{col->ie}$=0.90) (see Figure. 5).

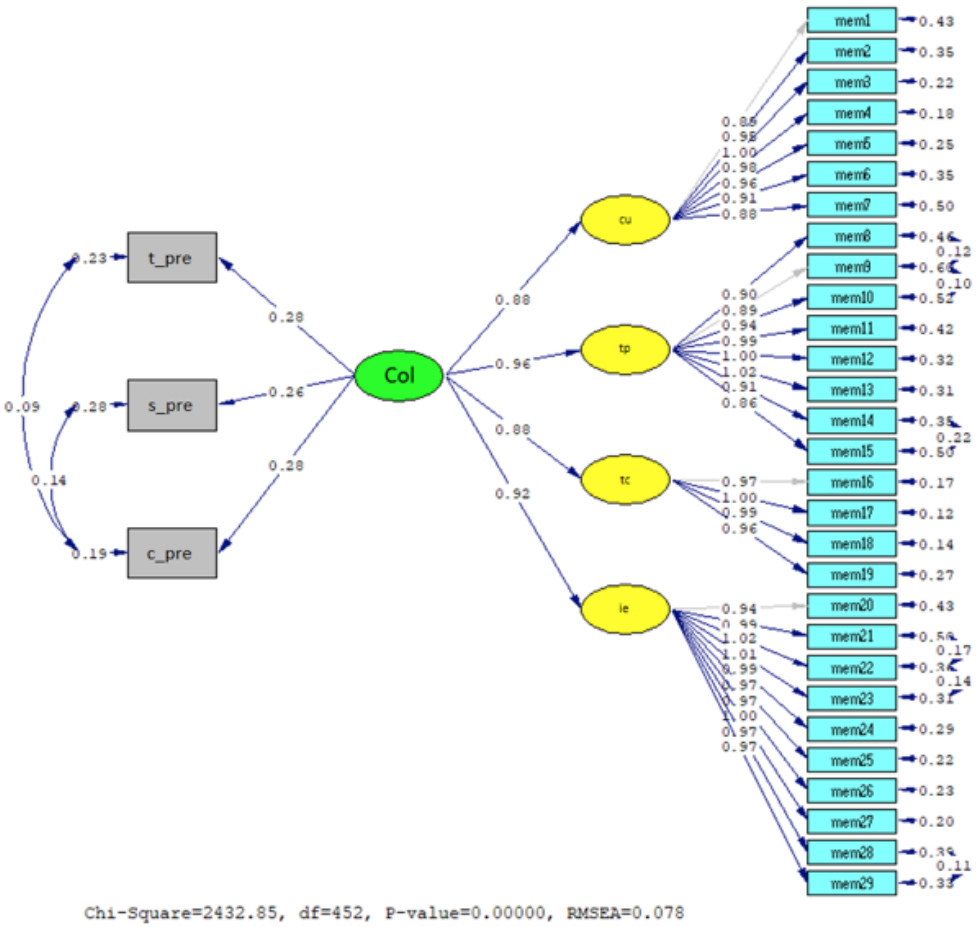

Figure 5. The effect of the presence levels of the students on student satisfaction levels

DISCUSSIONS

Firstly, the online courses, which were evaluated in this study, were considered as efficient in creating a community of inquiry and promoting students' critical thinking. However, given the average scores, the courses should be improved. Although the average scores of the students' presence levels were closer to "I agree" (X_{t_pre}=2,91, X_{s_pre} =2,98, X_{c_pre}=2,96), considering the courses evaluated in this study, there may be some controversial issues concerning the design of the online courses from the viewpoint of both instructors and instructional designers as well as of the institution.

First, it was found that teaching presence and social presence have a significant positive effect on cognitive presence ($\beta_{teaching}$ =0,38; β_{social} = 0,56). Therefore, it can be stated that the impact of social presence is higher for cognitive presence in an online learning environment. In this context, a parallel result was obtained by Kovanovic, Gasevic, Joksimovic, Hatala, and Adesope (2015). They found that the use of different technology profiles (task-focused, content-focused, discussion-focused, social, high-active by the students in online environments) has a high effect size in terms of cognitive presence (β=0.54), which leads to significant differences. Moreover, socially-focused intensive users were found to have higher cognitive presence than other profiles (Kovanovic et al., 2015). Therefore, diversification of learning pathways, including more social interactions for students, can be beneficial for the perception of a community of inquiry. For example, it was reported that the interactions concerning social presence were limited in online environments. For that reason, vision and design interventions should be developed to enable the integration of social networking sites such as Facebook, Instagram and Twitter, and online learning environments for education/learning (Al-Balushi & Al-Abdali, 2015; Ozturk, 2015). Moreover, in this study, social presence and teaching presence explained %45,8 of cognitive presence at a lower rate than the literature. Gutierrez-Santiuste et al. (2015) found that these variables explained 81% of cognitive presence. However, it was found that the tools used in the course (e.g. chat, forum mail) affect this rate. For example, when tools were used together (forum, chat, and mail), this rate was %81. When the only chat was used, this rate was %63. When the only forum was used, this rate was %79. Therefore, the structure of courses in this study found may be a reason for the low rate (45.8%). For example, the forums in the online learning environment where the research is conducted (e.g. student affairs, technical support) are used for support services beyond learning activities. Since the lessons are carried out mainly with live-lessons, the learning experiences may not have created an opportunity for the adequate development of social and teaching presence. On the other hand, Akyol et al. (2011) found differences in the three presences in short- and long-term courses. Similarly, when the changes by weeks in social and cognitive presence are examined in Rolim et al.'s research findings, it is seen that the dimensions related to social presence are more affected by time (Rolim, Ferreira, Lins, & Gasevic, 2019, p.61). Therefore, the predictive power of social presence on cognitive presence may differ depending on the time when the Community of Inquiry perception is measured.

In this study, the community of inquiry did not vary significantly depending on age, gender, martial (t_{age}=1.01, t_{gender}=1.07, $t_{martial}$=0.08). In this case, maybe, it can be stated that the distance education courses evaluated in this study are provided with quality standards that meet the needs of students with different demographic characteristics (e.g. age). However, if such a situation had occurred, it would be expected that the students' average perception of presences and the relations of presences (e.g. effect of social and teaching on cognitive) would be higher. Therefore, age and community of Inquiry relationships are still open to discussion. In the current study, it can be said that there is low linear relationship between age and the Community of Inquiry since age is considered as a continuous variable. Akyol et al. (2010), while examining the effect of epistemological orientation (objectivist, constructivist) on the perception of community of inquiry, interestingly, found that in the data of learners between the ages of 18-22 and 48-62, regardless of epistemological orientation, teaching and cognitive presences were loaded in the same dimension. At the same time, they found that in the age group of 23-37 (regardless of objectivist or constructivist) and 38-47 (when epistemological orientation is constructivist), each presence dimension was loaded separately, and in the 38-47 age group (when epistemological orientation is constructivist), teaching and cognitive presence were loaded in the same dimension. Accordingly, the relationship between age and the community of inquiry is likely to be affected by the teaching/learning approaches adopted in the courses.

In the current study, the community of inquiry varied significantly depending on program and profession status (tprogram=-2.41, tprofession=2.25), but the effect size was very small (tprofession= 0.09*, tprogram=

-0.12*). The registered programs do not have a similar feature according to the structure (e.g. "pure or applied" and "hard" or "soft"). For example, (C) Computer Programming is more application-based and hard discipline than (F) Divinity. However, the average scores of both the social and teaching presences of the two programs (C and F) are close to each other (C_{SP}=2.90; F_{SP}=2.93; C_{TP}=2.93; F_{TP}=2.83). Considering the researches (Arbaugh et al., 2010; Arbaugh, 2013; Vo, Zhu & Diep, 2020) in the literature, the difference can be expected to be greater. Learners' presences (teaching, social, and cognitive) differed in terms of pure or applied disciplines (Arbaugh et al., 2010) and hard or soft discipline (Arbaugh, 2013). Vo et al. (2020) found that learners in soft disciplines (such as social sciences, political science) obtain higher grades than peers in hard disciplines. Therefore, even if the effect of the registered programs on the Community of Inquiry is small, programs' features should be investigated in more depth. For example, are courses' goals and expectations announced in all programs? How are the material qualities? What types of learning activities are organized? In terms of profession, learners who have a profession can be expected to have high self-confidence in terms of forming the Community of Inquiry as they have work experience. Also, they may have made more use opportunities of online learning (e.g. flexible time). In this context, the expectations of the learners who have a profession may have been met more due to the nature of distance education (flexible place and flexible time).

Since e-presence and expectation level had a low effect size, the perception of the community of inquiry may be interpreted as "the students enrolled in the program had very similar characteristics in terms of their perception on technical skills, access to technology, motivation and attitude, or the factors affecting success." However, such interpretation may also contain some contradictions within itself. When the age range of the students (17-54) was evaluated, there might have been different student profiles in terms of technical skills, as well as the factors affecting success, motivation and attitude. In this regard, a more reasonable interpretation may be that "online courses make it easier for students to access the system and use it, and meet the students' needs in terms of student motivation and attitude or the factors affecting success." But, access to technology, motivation and attitudes, factors affecting success, positively affect the presences of Col, while technical skill level adversely affects. Normally, a reverse finding may be expected given that those with high technical skills may use the system's facilities more actively. But, students with high technical skills have higher presence perceptions than those with low technical skills. In this context, it could be claimed that online courses may be inadequate to meet the expectations of students with high technical skills.

Lastly, the structural equation model demonstrated that the effect size of the perception levels of community of inquiry of the students on student satisfaction was high. In order to ensure the consistency of the study, the impact of community of inquiry on students' satisfaction level can be analyzed, which, in turn, will enable us to make some predictions. As expected in this study and other similar studies, the students' presence perceptions predict high satisfaction levels (Alaulamie, 2014; Giannousi & Kioumourtzoglou, 2016; Gutierrez-Santiuste, 2016; Horzum, 2015; Joo, Lim, & Kim, 2011).

CONCLUSIONS

This study aims to evaluate the educational effectiveness of online courses based on the Community of Inquiry model and to make suggestions for the improvement of these courses. To this end, this study revealed the differences in demographic characteristics of the participants and their e-presence and expectation levels in online learning, and analyzed the impact of demographic characteristics and e-presence and expectation on cognitive, social, and teaching presence. Moreover, to eliminate the concerns on the model to be used for the evaluation of educational effectiveness, the impact of the students' perception levels of a community of inquiry on their satisfaction levels was also examined in the study.

In the evaluated courses, teachers give live lessons with their students every week and the records of the lessons can be watched by the students later. Such a course structure includes the components that must be included in the courses of Distance Education programs as required by the "Procedures and Principles Regarding Distance Education in Higher Education Institutions" (Council of Higher Education, n.d.). Also, the system allows teachers to design various activities (discussion, assessment, content transfer) for learners in terms of asynchronous interaction. The findings of the current study indicated that the online courses examined in this study were found to be sufficient by students in forming a community of inquiry. However, the average scores of their presence levels and predictive relationship between the presence of Community

of Inquiry and other variables revealed that certain aspects of the courses should be improved. The current study can be concluded that there is a need for more social, more active, and engaging learning activities that enable students to think critically and in an online environment. Thus, an environment can be prepared for deeper learning by increasing the social, cognitive and instructional presence for the evaluated lessons. In this context, practitioners responsible for structuring the course should be aware of the use of tools that will increase their teaching, social, and cognitive presence perception in the online learning environment. Units responsible for Distance Education (Faculty, Vocational High School, or Distance Education Center) should create sample lesson designs showing the use of these tools in line with the learner's needs and set quality standards for the Community of inquiry. The more the Community of Inquiry synergy can be increased in the courses, the more students' satisfaction or academic success will increase.

The research sheds light on future research in four aspects. First, while looking effectiveness of online courses, learners' characteristics and disciplinary differences could not provide insight into the design of courses. The relationships between the age variable and the Community of Inquiry are still a subject that needs to be investigated according to both instructional approaches and the way the age variable is handled. In this study, a linear effect of age on the Community of Inquiry was not observed. However, there are findings in the literature that these relationships may not be linear (Akyol et al., 2010). In this context, future researches may test the Community of Inquiry relationships by considering the age variable categorically. Second, it is not answered why students with high technical skills have lower the Community of Inquiry. An in-depth study of the expectations of the students with high technical skills from online courses may be beneficial. Third, if the registered programs actually have an effect on the the Community of Inquiry, the effects programs' features on the Community of Inquiry perceptions can be investigated further by separating the programs by types of disciplines (hard or soft, pure or applied) or by considering the course structure (clear goals and expectation, material quality, learning activities) in the programs. Lastly, further studies may examine the impact of the students' presence perceptions on their academic success, and the type and frequency of activities in online environments they used or prefer.

The findings of this study should be evaluated considering the context of distance education. The educational effects of the levels of teaching, social, and cognitive presences vary depending on the situation and context (e.g. blended, face to face, or only online) (Szeto, 2015). In the context of blended learning, the advantages of face-to-face interaction can be useful in creating a community of Inquiry synergy online. In this case, learners can benefit from this advantage at different rates depending on demographic variables (e.g. age, gender). For example, the social presence of younger learners may be higher, and the teaching presence of the older ones. However, due to some limitations of the online environment (e.g. not using a facilitating tool such as a forum in the lesson), the effect of demographic variables may not be observed. The current study presents a context featuring individual responsibility for only online environments. Therefore, it is possible that there may be different conclusions on the presence components when it comes to mixed (online, blended, or face-to-face) learning schemes with higher instructive control.

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IMPACT OF QUALITY ANTECEDENTS ON SATISFACTION TOWARD MOOC

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ABSTRACT

Literature emphasized the importance of quality antecedents on the successful implementation of MOOCs. However, rare studies are available on how to examine the quality antecedents in the MOOC context. Thus, the objective of this study is to assess the impact of quality antecedents on satisfaction toward MOOC. This study is mainly quantitative, adopted the D&M IS Success Model to examine the relationships between quality antecedents (i.e. system quality, information quality, service quality) and satisfaction toward MOOC. An online survey method was used to collect data from 1000 undergraduate students from five universities in Malaysia; 622 questionnaires were returned for a response rate of 62.2 percent. The questionnaire comprised of two parts. Part1 collected the demographic data, part2 elicited data related to satisfaction and quality antecedents. Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) technique. The results partially supported the effect of the quality antecedents on learner satisfaction toward MOOC. There was full support for the relationship between system quality and learner satisfaction toward MOOC. The findings provided by the study have significant practical and theoretical implications about the implementation of MOOC successfully.

Keywords: Massive open online courses, MOOC, satisfaction, quality antecedents.

INTRODUCTION

Massive Open Online Courses (MOOC) are a new trend in e-learning that include a set of learning activities, video lectures, resources, web-based, and forums that can be accessed for free-of-charge and with no prerequisites by a huge number of interested learners around the world (Alraimi, Zo, & Ciganek, 2015). MOOC gained a wide acceptance from high-profile universities due to its significant contribution to improving the educational system quality and openness (Nagashima, 2014). For example, Harvard and

Stanford have shown strong attention to MOOC and were among the early providers of MOOC initiative (Kovanovic, Joksimovic, Gasevic, Siemens, & Hatala, 2015).

Despite the potential of MOOCs to provide high quality, low-cost education, and the ability to increase access to higher-education learning (Albelbisi, Yusop, & Salleh, 2018), a huge number of learners do not complete MOOC courses. The completion rate in MOOC is not exceeding ten percent (Alraimi et al., 2015).

The discrepancy between the enrollment and the dropout rates in MOOC suggests that learning via MOOC presents unique challenges (Liyanagunawardena, Lundqvist, Mitchell, Warburton, & Williams, 2019; Rai & Chunrao, 2016). Kovanovic et al. (2015) highlighted that the high dropout rates in MOOC indicate the need for determining the factors that influence success in MOOC. Thus, issues associated with MOOC successful such as courses, services, and quality should be examined (Azevedo & Marques, 2017; Aparicio, Oliveira, Bacao, & Painho, 2019).

MOOC quality considers one of the most critical factors influencing MOOC success (Azevedo & Marques, 2017), however, there is insufficient literature investigating the quality factors that influence MOOC success (Albelbisi, 2019). For example, Gamage, Fernando, and Perera (2015) have examined 4745 peer-reviewed papers conducted from 2012 to 2015 to determine the factors that impact MOOC quality. The results revealed that only 7 papers provided models for the factors influencing the quality of MOOCs and only three publications provided empirical evidence regarding evaluating MOOC quality. Thus, more research is needed to fully understand the MOOC quality issue that leads to the successful implementation of MOOC.

Evaluating MOOC learning needs new measures of success that reflect the quality of systems and participant's intentions (Yang, Shao, Liu, & Liu, 2017). Thus, this study attempts to fill this knowledge gap by adapting the D&M IS Success Model (2003) to evaluate the quality antecedents of MOOC.

Aim of the Study

This study aims to investigate the influence of the quality antecedents on learner satisfaction toward MOOC. This study adapted D&M IS Success Model (2003) to examine the relationships between the quality antecedents (system quality, information quality, service quality) and satisfaction toward MOOC.

Significance of the Study

The significance of this study is provided empirical evidence and theoretical basis that explain the effect of the quality antecedents on satisfaction toward MOOC. The findings of this study should guide MOOC's instructors, scholars, and designers to develop effective MOOC environments that improve learner's satisfaction toward MOOC. This study also adds to the body of literature by empirically validating D&M IS Success Model (2003) in the MOOC context.

LITERATURE REVIEW

System Quality, Information Quality, and Service Quality

Literature has emphasized the importance of evaluating the factors that influence the success of MOOCs as it provides critical information for stakeholders and scholars to implement of MOOC efficiently (Yang et al., 2017). One of these factors is MOOC quality that should be seen as a key factor influencing MOOC success (Albelbisi, 2019; Aparicio et al., 2019; Liyanagunawardena et al., 2019).

Yang et al. (2017) investigated the factors that influencing learner continuation in using MOOC, the finding revealed that the factors that impact learner continuance in using MOOC are: (1) system quality, this factor measured the reliability and functionality of the MOOC, (2) course quality, this factor defined by the quality and up-to-date of course content, (3) service quality, refers to the support offers from the MOOC providers such as instructors and IT staff, (4) learner perception about ease of use MOOC; and (5) learner perception about the usefulness of MOOC.

Fianu, Blewett, Ampong, and Ofori (2018) also examined the factors that impact the adoption and use of MOOCs on students (N= 204). The findings indicated that continuance intention to use MOOC is affected by system quality, computer self-efficacy, and performance expectancy. Their findings exposed that actual use of MOOC can be determined by instructional quality; this factor represents the quality of MOOC information as well as student's perception of the competence of MOOC instructors.

This study examines the influence of the quality antecedents (system quality, information quality, service quality) on learner satisfaction toward MOOC. Examining such variables is due to the importance of these variables in the MOOC environment (Albelbisi, 2019; Aparicio et al., 2019; Rai & Chunrao, 2016).

System quality factor refers to the quality of the features of the system, it operationalized based on aspects such as ease of use and learn the system, features, accuracy, flexibility, and integrity of the system (Albelbisi, 2020; Yakubu & Dasuki, 2018).

Information quality refers to measure the quality and relevance of the information that the system produced; it is the measurement of system output (Albelbisi, 2019). Information quality measures by aspects such as usability, understandability, importance, availability, and conciseness of the system (Albelbisi, 2020; Yakubu & Dasuki, 2018). The information system is a determinant of learner satisfaction in MOOC settings (Drake, O'Hara, & Seeman, 2015; Yepes-Baldo et al., 2016).

Service quality refers to the levels of the services that are provided by the system, it represents the instructor and institutional support (Albelbisi & Yusop, 2019). Many studies have indicated that service quality significantly impacts user satisfaction in the e-learning context (Mohammadi, 2015; Yakubu & Dasuki, 2018).

Satisfaction

Satisfaction factor has achieved great attention in MOOC literature (e.g., Gameel, 2017; Gutierrez-Santiuste, Gamiz-Sanchez, & Gutierrez-Perez, 2015). Satisfaction is defined as users' level of gratification with the systems, in other words, satisfaction is the user's perception of being satisfied with the system (Albelbisi, 2020).

There is a mounting consensus on the influence of satisfaction on the success of MOOC (Albelbisi, 2020; Aparicio et al., 2019). Understanding the satisfaction of learners toward MOOC has become increasingly important due to the effect of this factor on the use and adoption of MOOC (Kevan, Menchaca, & Hoffman, 2016).

THEORETICAL FRAMEWORK

D&M IS Success Model (2003) has been adopted because it fulfills the objective of this study, which is to examine the influence of quality antecedents on satisfaction toward MOOC. D&M IS Success Model hypothesized that information quality (IQ), system quality (SQ), and service quality (SRQ) factors influencing satisfaction and systems use/intention to use positively. D&M IS Success Model (2003) is displayed in Figure 1.

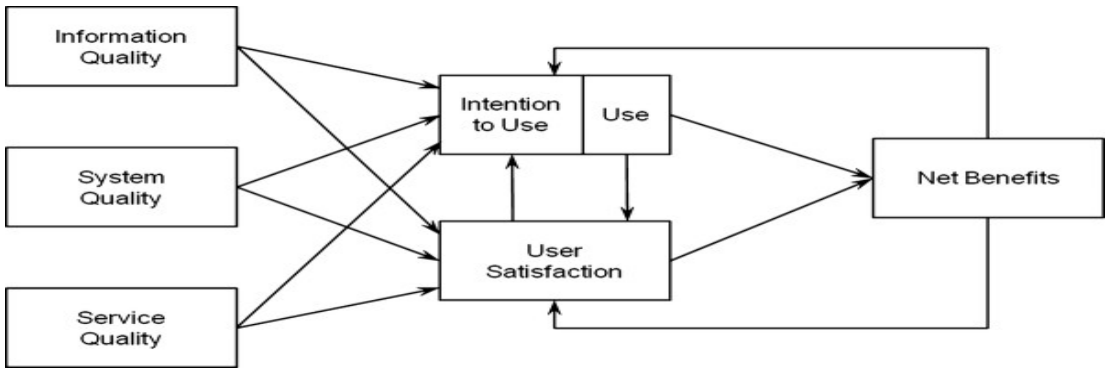

Figure 1. D&M IS Success Model

Previous e-learning studies shown strong attention to the D&M IS Success Model (e.g. Yakubu & Dasuki, 2018), reliability and validity of the D&M IS Success Model (2003) have been tested and achieved in many e-learning studies (e.g. Mohammadi, 2015; Yakubu & Dasuki, 2018). However, employing the D&M IS Success Model (2003) in MOOC is very rare (Aparicio et al., 2019), thus, this study provides an empirical test of the D&M IS Success Model in the MOOC context.

Research Model

This study adopted a part of the D&M IS Success Model (2003), as shown in Figure 2. The justification for selecting the D&M IS Success Model in this study is to meet the aims of this study, which is to examine the influence of the quality antecedents (i.e. SQ, IQ, SRQ) on satisfaction toward MOOC. Figure 2 displays the research model.

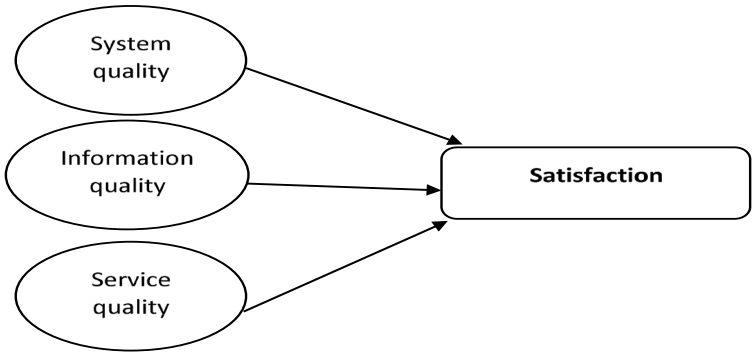

Figure 2. Research model

Satisfaction

In this study, satisfaction refers to the learner's level of gratification with MOOC usage and performance. Satisfaction can be measured by aspects such as the usefulness and the effectiveness of MOOCs. MOOC literature emphasized that learner satisfaction significantly influenced the use of MOOC (Gameel, 2017; Gutierrez-Santiuste, et al., 2015; Kevan et al., 2016) and suggested that satisfaction is a key factor in evaluating the quality of MOOC (e.g. Albelbisi, 2020; Aparicio et al., 2019). Hence, this study examines learner satisfaction as a dependent factor to understand MOOC quality issues.

Quality Antecedents

According to D&M IS Success Model, the independent factors (i.e. SQ, IQ, SRQ) are represented the quality antecedents.

System Quality (SQ)

In this study, system quality refers to the perceived overall quality of MOOCs. It is measured by (1) easiness to use the MOOC; (2) easiness to learn and operate the MOOC; and (3) contains the necessary features and functions. System quality factor is expected to have a positive influence on satisfaction toward MOOC (Albelbisi, 2019; Fianu et al., 2018; Gamage et al., 2015; Yang et al., 2017). Thus, the proposed model tests the research hypothesis ***H1:*** *There is a positive relationship between system quality and learners' satisfaction.*

Information Quality (IQ)

In this study, information quality refers to the ability of MOOC to provide the information that is easy to understand, up to date, meets learners' needs, relevant, and always available. Information quality is proposed to be a significant factor that demonstrates learner satisfaction toward MOOC (Drake et al., 2015; Gamage et al., 015; Yepes-Baldo et al., 2016). Thus, the proposed model tests the research hypothesis ***H2:*** *There is a positive relationship between information quality and learners' satisfaction.*

Service Quality (SRQ)

In this study, service quality can be described as the guidelines or the support documents delivered by MOOCs. Service quality can be measured by aspects such as the technical staff support (e.g. the staff knowledge, understanding, and response) and the IT resources (e.g. server availability). Service quality is expected to impact satisfaction positively (Albelbisi & Yusop, 2019; Nagashima, 2014; Yang et al., 2017). Thus, the proposed model tests the research hypothesis ***H3:*** *There is a positive relationship between service quality and learners' satisfaction.*

METHODOLOGY

Research Design and Instrument

This research is mainly quantitative, conducted using cross-sectional research. The quantitative approach is an efficient method that tries to test the theory and explore the factors that impact the study results (Creswell, 2012). Thus, this method has been chosen as its suitable for examining the relationships between the quality antecedents (SQ, IQ, SRQ) and satisfaction toward MOOC.

The questionnaires used in this study were established by combining several validated instruments from e-learning system success literature. System quality and information quality factors were measured with scales developed by (Alsabawy, Cater-Steel, & Soar, 2012). Service quality was measured by scale adapted from Ozkan, Koseler, and Baykal (2009) while the satisfaction factor was measured by a scale for Sun, Tasi, Finger, and Chen (2008).

The initial version of the instrument was reviewed by five faculty members to ensure that the questionnaire design, wording, and measurement scales were appropriate and to confirm that the instrument is suitable for this research that examining the effect of the quality antecedents on satisfaction toward MOOC.

Besides, pre-tested with ten graduate students was conducted. The participants were asked to take the survey online and provide comments about the content of questions and format to ensure the clarity and appropriateness of the items. This evaluation was conducted to check whether all instructions and questions were understood as we intended.

Some amendments were made to the phrasing to outfit the context of MOOC. For example, the original item for system quality "The e-learning system is easy for me to learn" has been modified to "For me, the MOOC system is easy to learn". The original item for information quality "The LMS provides sufficient information" has been changed to "I believe that MOOC provides sufficient information", and the original item for service quality "Instructor's attitudes are friendly to learners." has been revised to "In learning through MOOC, I think that instructor's attitudes are friendly to learners". The final version of the instrument included a 21-item survey scored based on a 5-point Likert scale (strongly agree (5) to strongly disagree (1)).

Participants

The population of this study was undergraduate students from five public universities in Malaysia: UKM, UiTM, UNIMAS, UPM, and UTeM universities. A total of 1000 students engaged in MOOC via OpenLearning platform, yet, six hundred and twenty-two surveys were returned for a response rate of 62.2%. The target population in the study consisted of students who have ever taken at least one MOOC course in the OpenLearning platform.

Data Collection

This study has employed an online survey method to collect data from the study sample. The initial request for accessing the online survey was sent to the participants through the Chat feature in the MOOC platform "OpenLearning". After two weeks, a reminder letter with the link of the questionnaire has been sent to the MOOC participants to encourage them to answer the survey.

Pilot Test

A small pilot test was conducted involving 52 students from University Malaya (UM) who have enrolled in UM's MOOC course titled "Malaysian Taxation" through "OpenLearning" the MOOC platform in Malaysia. The result indicated that Cronbach alpha value (α) was $0.81 > 0.7$; hence, the result of the pilot study verified good reliability (George & Mallery, 2012).

FINDINGS

In this study, the PLS-SEM analysis method via the measurement and the structural model used to examine the proposed model. PLS-SEM method enables the researcher to study how well the predicting variables (independent/exogenous) explain the dependent variable (endogenous) (Hair, Hult, Ringle, & Sarstedt, 2014).

Reliability

The reliability had been verified via Cronbach's alpha (α). The finding revealed that α value (0.87 > 0.70) is showing sufficient reliability (George & Mallery, 2012).

Examination of the Measurement Model

In the first stage, the analysis of the measurement model was conducted by gauging the convergent and discriminant validity.

The convergent validity has been evaluated through (1) factor loading, each item should be > 0.50 (Henseler, Ringle, & Sarstedt, 2015). (2), the Average Variance Extracted (AVE) should be greater than 0.50. (3) Composite reliability (CR) that should be exceeded 0.7 (Hair et al., 2014). Table 1 shows the findings of convergent validity.

Table 1. The convergent validity analysis

Construct	Code	Loadings	CR	AVE
Information quality	IQ1	0.78	0.88	0.65
	IQ2	0.82		
	IQ3	0.81		
	IQ4	0.81		
Satisfaction	SAT1	0.80	0.93	0.62
	SAT2	0.82		
	SAT3	0.82		
	SAT4	0.81		
	SAT5	0.81		
	SAT6	0.74		
	SAT7	0.79		
	SAT8	0.72		
System quality	SQ1	0.80	0.89	0.63
	SQ2	0.81		
	SQ3	0.84		
	SQ4	0.81		
	SQ5	0.70		
Service quality	SRQ1	0.84	0.88	0.64
	SRQ2	0.84		
	SRQ3	0.81		
	SRQ4	0.70		

Table 1 shows that the factor loadings for all items were ≥ 0.7, the AVE values exceeded 0.5, and CR values were above 0.8, indicating sufficient convergent validity.

Next, the discriminant validity of the model factors was tested by the new Heterotrait-Monotrait (HTMT) criteria using PLS (Henseler et al., 2015). Discriminant validity is used to confirm that the measurement items of a particular factor are represented that factor (Hair et al., 2014). The HTMT analysis is shown in Table 2.

Table 2. The HTMT analysis

	IQ	SA	SRQ	SQ
IQ				
SA	0.745 CI.90 (0.68, 0.80)			
SRQ	0.746 CI.90 (0.68, 0.81)	0.618 CI.90 (0.54, 0.69)		
SQ	0.874 CI.90 (0.82, 0.92)	0.824 CI.90 (0.78, 0.87)	0.719 CI.90 (0.65, 0.78)	

Note: SA: satisfaction; SQ: system quality; IQ: information quality; SRQ: service quality

The findings of the HTMT analysis exposed that the HTMT 0.90 values were less than 0.90. This result, therefore, shows that all values passed the value of 0.90 tests and the discriminant validity has been achieved (Henseler et al., 2015).

Examination of the Structural Model

The structural model was evaluated according to the following measures:

Path Coefficients

Path coefficients used to examine the significance of the study hypotheses and to show the strength of a relationship between two variables (Illowsky, & Dean, 2013). Bootstrapping technique with 5,000 resamples via PLS was used to obtain beta (β) value and t-values. Table 3 displays the bootstrapping results.

Table 3. Bootstrapping results and hypotheses testing

Hypotheses	Relationship	Std Beta	Std Error	T-value	P-value	Supported
H1	SQ -> SAT	0.38	0.05	7.48**	000	**Yes**
H2	IQ -> SAT	0.07	0.05	1.38	0.17	No
H3	SRQ -> SAT	0.02	0.04	0.59	0.56	No

Note. (t-values > 1.645* where $p < 0.05$), (t-values > 2.33** where $p < 0.01$);

Referring to Table 3, SQ ($\beta = 0.38$, $p < 0.01$) was found to have a strong influence on satisfaction toward MOOC, thus H1 is supported. While IQ ($\beta = 0.07$) and SRQ ($\beta = 0.02$) were not significant to satisfaction toward MOOC ($p > 0.05$). This showed that SQ and IQ factors were not influencing satisfaction toward MOOC, hence, H2 and H3 were not supported.

Effect Sizes (f 2)

The effect size (f^2) has small effect when $f^2 = 0.02$, medium effect when $f^2 = 0.15$, and large effect when $f^2 = 0.35$ (Illowsky, & Dean, 2013; Henseler et al., 2015). The results for f^2 are shown in Table 4.

Table 4. The results of the f 2 effect sizes

Hypotheses	Relationship	Effect Size (f^2)	Effect Size
H1	SQ -> SAT	0.152	Medium
H2	IQ -> SAT	0.005	No effect
H3	SRQ -> SAT	0.001	No effect

Table 4 shows that the effect size of H1 ($f^2 = 0.152$) had a medium relationship. This indicated that the system quality factor best predicts satisfaction toward MOOC. While H2: (Information quality -> Satisfaction), H3: (Service quality -> Satisfaction) had no effect sizes.

DISCUSSION

The Relationship between System Quality and Satisfaction toward MOOC

System quality in this study is defined as desirable performance characteristics of a MOOC, it is measured by aspects such as easy to use, flexibility, and functionality of MOOC (Albelbisi, 2019). The finding of this hypothesis indicated that perceived system quality positively influenced learner satisfaction toward MOOC thus, the hypothesis (H1) is supported. In other words, the features and functions of MOOC had met students' expectations and generated a high satisfaction toward using MOOC.

If learners find that they can access the MOOC contents easily, that the platform is well structured, and that they can easily navigate in MOOCs, then learner's satisfaction toward using MOOCs will be improved. This finding supported by Azevedo and Marques (2017); Fianu et al. (2018); Gamage et al. (2015); Yang et al. (2017), all of these studies emphasized that system quality is a crucial factor impacting the MOOC environment.

This result suggested that MOOC designers have to confirm that MOOC is of good quality to improve learners' satisfaction toward learning via MOOC. This can be achieved by ensuring the MOOC platform is fixable, easy to use, easy to navigate, and visually attractive (Albelbisi & Yusop, 2019).

The Relationship between Information Quality and Satisfaction toward MOOC

Analyses indicated that the hypothesis (H2) was not significant. This means that information quality aspects such as understandability, usability, and availability of the information had not affected satisfaction toward MOOC.

MOOC is a learning method that offers several multimedia tools and materials to massive learners (Liyanagunawardena et al., 2019). These resources and information should be clear, available, and relevant to the learning objectives, and should be presented in a detailed format to allow the learners to accept the MOOC information easily (Albelbisi et al., 2018). Thus, any complexity, ambiguity, or conflict in the MOOC information may require learners to spend more time and extra effort to understand and review the information, which might be causing the information overload (Rai & Chunrao, 2016).

The insignificant relation between MOOC information quality and satisfaction is unexpected and contrary to prior MOOC studies by Drake et al., (2015); Gamage et al. (2015); Yepes-Baldo et al. (2016). All of these MOOC studies indicated that information quality influencing the MOOC environment positively.

Thus, it is important for academic staff to offer students with clear, sufficient, updated, and relevant information to the learning purposes and avoid the complexity and mystery of the MOOC information in order to improve satisfaction toward MOOC (Albelbisi, 2020).

The Relationship between Service Quality and Satisfaction toward MOOC

The survey findings indicated that service quality factor was not considered as a key factor in assessing satisfaction toward MOOC. Thus, the hypothesis (H3) was not supported. In other words, students in this

study perceived that the quality of MOOC services such as the availability of academic staff support and IT resources did not affect their satisfaction toward MOOC.

The possible clarification for this result may be related to the participants were beginner users to MOOC environments. The demographic data revealed that the majority of the participants (41 %) were novice learners to use MOOC and their experience is limited to participation in one MOOC course only. The participants of this study may have a lack of confidence to use and manage this novel technology and may not yet have been trained enough to use the full facilities of the MOOC. Thus, it is suggested that the administrators and academic staff train students obtain the necessary skills to use services provided by MOOC effectively. Training provides the essential skills that enable learners to use MOOCs for better learning results (Albelbisi et al., 2018).

Regarding the instructor interaction, educational institutions need to make sure that instructors teaching MOOCs are support and guidance learners in the learning process and provide feedback immediately via a variety of methods (Albelbisi et al., 2018).

The finding of H3 is not consistent with previous MOOC research, such as Yang et al. (2017); Nagashima (2014) found that the instructor support and the IT resources are key factors that impact the MOOC environment. Thus, it is worth conducting longitudinal studies to gain more understanding of this relationship.

IMPLICATIONS

The findings of this study may help to formulate strategies and methods that could improve the implementation of MOOCs. System quality is an important predictor of satisfaction toward MOOC as revealed from this empirical testing, thus, IT developers should confirm that MOOC is easy to use, easy to learn, and reliable to help students in the learning process via MOOC. Administrators also should arrange training sessions that develop instructors' skills to design effective MOOC structure and content to increase learner participation in MOOC and improve learning outcomes. Administrators should also provide workshops for students to support them to acquire the necessary skills they need to use MOOC efficiently and improve the acceptance and adoption of MOOC by the students.

LIMITATION AND RECOMMENDATIONS FOR FUTURE RESEARCH

This study is mainly used quantitative method, conducted using an online survey for gathering data. Thus, recommendations for future research include the need for qualitative data. Interviewing of the learners would provide in-depth data that will give a better understanding of the study findings and it could give a greater insight into the effect of quality antecedents on learners' satisfaction in MOOC.

The study used a part of the D&M IS Success Model (2003) and omitted some constructs such as (intention to use and net benefit) which would have been adapted to understand the advantages of MOOCs to the learners. Future works should be considered the inclusion of these significant factors to expand the view about MOOC success. Future study is also hoped to measure the influence of other factors, especially the factors that influence instructors' satisfaction toward using MOOCs for better understanding the quality antecedents of satisfaction in MOOCs.

CONCLUSION

This study investigated the effect of quality antecedents on learners' satisfaction toward MOOC based on the D&M IS Success Model (2003). This study demonstrated the key role of satisfaction in the MOOC context by examining the relationships between quality antecedents (i.e., SQ, IQ, SRQ) and satisfaction.

The study exposed that system quality has a significant influence on satisfaction, indicating that the higher the system quality of MOOC regarding easy to use the MOOC; easiness to learn and operate MOOC; and flexibility of MOOC; the more likely the learners satisfied with using MOOC. However, the findings of this study noted that information quality and service quality factors were not supported satisfaction toward MOOC.

The results of this study may give empirical evidence that should be useful to formulate effective strategies and methods for improving the implementation of MOOCs. By understanding the quality antecedents of satisfaction toward MOOCs; proper procedures can be adopted to enhance the implementation of MOOCs in educational institutions.

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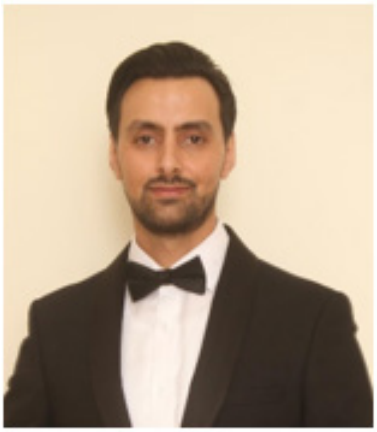

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MEDICATION OR BAND-AID? REVISITING UNIVERSITY STUDENTS' READINESS FOR ONLINE EDUCATION

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ABSTRACT

In the pandemic period we are currently in, online education has replaced face-to-face learning activities on a global scale. Institutions that pursue online education programs commonly assume that online learners are ready for this mode of learning. However, online education programs attract attention due to their remarkably high drop-out rates. This begs the question as to why some students are more able to benefit from online education, and demands to reveal the underlying reasons for such a situation. In this regard, the present study explores students' e-readiness for the changeover phase to online education, and how this differs in terms of a range of variables. 428 volunteer undergraduate students from 59 departments across 33 universities in Turkey were recruited to the study. The data collection tools consist of a personal information form and an online education readiness scale. The results indicate that university students' readiness levels for online education were above medium level of the scale. As for the factors which determine online education readiness, it was found that university students have a high level of internet self-efficacy, yet their motivation towards online education is considerably low. In addition, their online education readiness differs significantly in terms of personal computer ownership, internet connection at home, major, and daily internet usage duration, gender, and online education experience, whereas no statistically significant difference was identified in terms of grade year at the university. A significant interaction between gender and online education experience was ascertained as well.

Keywords: Distance education, online education, readiness, undergraduate students, COVID-19 pandemic.

INTRODUCTION

Online education is a form of education delivery in which learning activities are carried out mostly through technology with the educators and learners being in different locations. Distance education, the predecessor of online education, has a history of more than 200 years, starting with the postal service and continuing mostly through the use of web technologies at the present time. The realization of distance education via the web has led to the emergence of terminological inconsistencies, e.g. web-based learning/instruction, online

education/learning, e-learning, virtual learning, and so on (Moore, Dickson-Deane, & Galyen, 2011). Nevertheless, the concept referred to as distance education currently consists mostly of web-based learning activities. Consequently, these terms may be used interchangeably. Online education, which offers distance and lifelong learning by making use of Information and Communication Technology (ICT) opportunities, has become the new paradigm of education (Bilgic & Tuzun, 2020; Chen, 2007; Mayer, 2017; Sun, Tsai, Finger, Chen, & Yeh, 2008). In this study, the term 'online education' is preferred throughout because the educational activities in the Turkish higher education process during the pandemic-period were totally online.

Nowadays, commercial initiatives with regard to online education have gained momentum in line with increasingly competitive global market conditions (Chang, 2016). A great number of commercial and public institutions have started to provide their in-service training on the web. This is also the case for Turkey. As of 2020, more than half the 207 higher education institutions in Turkey contain a center for distance education. In many higher education institutions, common compulsory courses such as information technology, history, Turkish and foreign languages for freshmen are already taught fully online with mass-participation sessions. Therefore, to some extend, most university students have online education experience.

The underlying rationale of online education is to eliminate the physical obstacles in accessing education, such as time, place, cost, etc. This also constitutes an opportunity for testing pedagogical affordances of technology (Bates, 2005). Since the COVID-19 pandemic has recently made face-to-face interaction in education quite unfeasible, online education has been the only remedy for maintaining educational activities on a global scale. Based on the infographic information published by the United Nations Educational Scientific and Cultural Organization (UNESCO) (2020), the majority of students worldwide (at least 90%) have had to interrupt their in-class learning. Due to the announcement of COVID-19 as a pandemic on 12 March 2020, and following the first cases, Turkey temporarily suspended school activities at all levels in line with risk assessments. In response to the request by the Turkish Council of Higher Education, universities with essential infrastructure started to conduct their education activities entirely through the Internet as of 23 March 2020. From this date, the national open courseware platform also made a wide range of learning resources available to students in order to compensate for learning shortcomings, even if not for all courses. Beyond the inevitable transition to online education, this process brings to mind once again the factors that drive a successful online education process. Whether with regard to face-to-face or distance learning activities, the classical instructional design process is realized following the determination of needs. The design of online education in the pandemic period has been a sudden transformation initiative that bypasses most of the conventional instructional design stages. Rather, the transition to online education seems to be closely related to a rapid instructional design process involving carrying out instructional stages with minimum planning from a pragmatic perspective (Batane, 2010). However, access to technologies does not guarantee their effective use. Therefore, a rapid transition to online education is likely to cause pedagogical and technological tensions. Online education includes a number of components that are also included in face-to-face instruction, but not limited to this. It also brings a range of new challenges, as well as opportunities, inherent in the online environment (Boling, Hough, Krinsky, Saleem, & Stevens, 2012; Tuzun & Cinar, 2016).

The number of students enrolled in online higher education programs is expected to rise in the future, especially with the driving force of online education awareness that possibly occurred throughout the community during the pandemic period. However, future demand for online education is largely shaped by pioneering experiences. From an evolutionary perspective, exposing students to online learning environments and waiting for them to succeed does not go beyond causing them to undergo natural selection. A body of research on how online learning can be more effective points out learner characteristics and readiness levels. Readiness is one of the most prominent components directly influencing learning outcomes in online education (Joosten & Cusatis, 2020). The current study explores students' preparedness for online education, and how this differs in terms of learner characteristics. The reason for the study being conducted with regard to undergraduate students is that higher education contains the most online learning initiatives among all education levels. In addition, higher education instructional activities were carried out solely online during the pandemic period, unlike with regard to the K-12 level, where online education applications were supported with asynchronous TV broadcasts.

ONLINE EDUCATION READINESS

The research initiatives on online education readiness can be characterized in terms of sectoral domains (educational and non-educational institutions such as public and private/commercial organizations), stakeholders (students, faculty/teachers, institutions, parents), school or grade level (pre K to K-12, undergraduate, post-graduate education), disciplines/major areas, contexts (theoretical/conceptual and practical). Here, the studies carried out specifically in the context of undergraduate education were examined. In literature, online education readiness was studied at the undergraduate level under a wide variety of theoretical components (See. Table 1).

Table 1. Examination of survey studies in the literature with regard to undergraduate students' online education readiness in terms of theoretical components

Authors	Online education readiness factors
Hung, Chou, Chen, and Own (2010)	Self-directed learning, motivation, computer and internet self-efficacy, learner control, online communication self-efficacy
Unal, Alir, and Soydal (2014)	Technology availability, technology use, self-confidence, acceptance, training needs
Smith, Murphy, and Mahoney (2003)	Comfort, self-management
Tubaishat and Lansari (2011)	ICT infrastructure, Internet use, technical skills (computer use skills), confidence, communication mode preference, perception towards e-learning (perceived learning outcomes)
Bernard, Brauer, Abrami, and Surkes (2004)	Confidence in skills, general beliefs towards e-learning, Self-direction and initiative (self-management), willingness to interact with others
Dray, Lowenthal, Miszkiewicz, Ruiz-Primo, and Marczynski (2011)	-Learner characteristics (belief in their ability, responsibility in problem solving, self-efficacy in writing and expression, time orientation and management, behavior regulation for goal attainment) -Technology capabilities (basic technology skills/material access to technology, nature/frequency of technology use)
Joosten and Cusatis (2020)	Online work skills (proficiency in access and use of technology), social technology familiarity, organization skills (approaches to task in organized and goal-oriented manner), online learning efficacy (efficacy beliefs), self-directedness, socialization
Yurdugul and Demir (2017)	Computer self-efficacy, internet self-efficacy, online communication self-efficacy, self-directed learning, learner control, motivation towards e-learning

There are also studies in the literature that approach online education from a more holistic perspective (Darab & Montazer, 2011; Demir & Yurdugul, 2015; Omoda-Onyait & Lubega, 2011). The technology acceptance model (Davis, 1989) formed the basis for several studies that provide a model or systemic point of view with regard to online education preparation (Akaslan & Law, 2011a, 2011b; Asaari & Karia, 2005). Asaari and Karia (2005) suggested that ICT availability (PC ownership and Internet access) affect users' perceptions of usefulness and ease of use with regard to online education systems, and consequently their online education readiness levels. Akaslan and Law (2011a, 2011b) stated that the preparation for online education should be measured in three-stages - readiness, acceptance and training. The components associated with the readiness stage are technology, people, content, and institution. The human factor includes experience, confidence, and attitude in addition to traditional skills. The acceptance stage is based on the technology acceptance model. The last stage is the development of the student, teacher and personnel training, and the enhancement of facilities. It can be said that the competencies depicted in the model with regard to the human factor are narrow in scope. The conceptual model rather resembles an implementation plan overall. In many studies, this framework was used to evaluate the readiness of students as well as that of teachers (Akaslan & Law, 2011a, 2011b; Soydal, Alir, & Unal, 2011; Unal et al., 2014).

As can also be seen in Table 1, there is no consensus in the literature with regard to online education components (Demir & Yurdugul, 2015). The existing instruments are commonly based on learner characteristics, ICT access, and technology self-efficacy (Dray et al., 2011). A considerable number of the available online education readiness tools are based on pioneering research such as that of McVay (2000) and Hung et al. (2010). Considering the evolving nature of online education technologies and learning environments, it should be noted that a theoretical framework dating back to the 2000s may be insufficient to portray today's online education conditions. In this study, the instrument developed by Yurdugul and Demir (2017) based on the work of Hung et al. (2010), was used to determine the online education readiness of the students. Unlike Hung et al. (2010), Yurdugul and Demir (2017) considered the computer and internet self-efficacy separately, and consequently proposed a six-factor scale, involving motivation towards online education, learner control, self-directed learning, online communication self-efficacy, Internet usage self-efficacy, and ICT usage self-efficacy. The researchers revealed second-order patterns among the factors by drawing on the inter-factor relationships. According to hierarchical confirmatory factor analysis, motivation, learner control, and self-directed learning factors are grouped under the autonomous learning construct. On the other hand, computer, internet, and online communication self-efficacies are collected under the technology usage self-efficacy construct.

Online education is a self-initiative effort and online learners attend and progress their effort in pursuit of self-determined learning goals. This requires learner motivation in order to maintain learning efforts in the online environment. Both self-directed learning and learner control represent the metacognitive dimension of online education. Online education competence is closely related to self-directed and independent learning skills (Zhu, Bonk, & Doo, 2020). In terms of the most inclusive definition, self-directed learning is the ability to learn with little or no dependence on others (Demir & Yurdugul, 2013; Garrison, 1997; Knowles, 1975). In traditional instructional settings, the control and management of learning tasks is often exogenous. Online education promotes student autonomy. This aspect passes responsibility and control of learning from teachers to students. Briefly, it is reasonable to suggest that all these skills (also called autonomous learning) can be used as important indicators for predicting online education readiness.

Technology usage competencies as well as learner characteristics are frequently emphasized in online education (Dray et al., 2011). Today, digital inequality has shifted to differences in the use of technology rather than differences in accessing it. Computer use and activities in online environments for learning purposes require different competencies. In this sense, learners should both use computer technologies and direct online activities appropriately to ensure fruitful online educational experiences. Regardless of the delivery modality (face-to-face or distance), social interactions contribute to human thinking/intellectual development in a unique way, and enable learners to establish common knowledge in educational settings (Vygotsky, 1978). The dialogues of learners with their peers and with teachers pave the way not only for their learning, but also for self-monitoring and regulation processes (Mercer & Howe, 2012). In order to perform their online education tasks, it is a prerequisite skill set for learners to have confidence in using computer and online technologies, being able to express themselves and to interact with others in the online environment (Joosten & Cusatis, 2020). Therefore, the fact that learners benefit from online education processes does not solely depend on computer and internet competencies, but also on online communication skills.

READINESS AND ONLINE EDUCATION: GAPS IN THE LITERATURE

The demand for wholly online education programs, as well as the number and variety of programs delivered through online education, is gradually increasing worldwide. On the other hand, despite the gradually expanding proportion of online education in the education system, high dropout rates following the first experiences deserve more focus on the learner perspective. This begs the question as to why some students are more prone to benefit from online education and requires researchers to reveal the underlying reasons for such a situation. On the other hand, learner readiness is not adequately addressed in studies conducted with regard to online education, which is more common in higher education settings than in K-12 ones (Darab & Montazer, 2011; Ilgaz & Gulbahar, 2015; Parkes, Stein, & Reading, 2015). Online education provides learners with greater flexibility when it comes to organizing and managing their learning activities (e.g. assignments, working on course content) beyond simply choosing the learning time and place. Institutions

that pursue online education programs generally assume that online learners are ready for this new type of learning. Unlike face-to-face education, online education entails new competences in addition to offering new opportunities and revealing limitations. In the literature, some studies are based on a mere comparison of distance/blended learning education with face-to-face equivalents in higher education (McCutcheon, Lohan, Traynor, & Martin, 2015; Simonson, Schlosser, & Orellana, 2011). In addition, most studies on online education practices generally focus on learning outcomes, mostly in the form of achievement scores that are commonly obtained from tests involving closed and multiple-choice questions (Stodberg, 2012). The evaluation of online education initiatives without considering learner characteristics and preparedness does not go beyond simple tunnel vision. Therefore, it is crucial to determine the online education readiness levels of learners before implementing online education programs. In addition, the determination of other external variables that have an impact on the online education readiness of students can also guide preparatory training with regard to online education. However, when online education readiness studies are examined, it can be seen that the research efforts are generally conducted in the context of a specific higher education program or institution. Moreover, the participants are mostly teacher candidates. Thus, there is a lack of studies that represent more diverse participants. In this regard, the present study examines the online education readiness status of students from a wide variety of departments and universities. To this end, the following research questions were formulated.

1. What are the factor-wise online education readiness levels of undergraduate students?
2. Do online education readiness levels of university students differ by (a) personal computer ownership, (b) internet access at home, (c) grade year at the university, (d) major, (e) daily internet usage, (f) gender and online education experience?

METHODOLOGY

This is a survey study. It is the quantitative research procedure used to describe tendencies or patterns in attitudes, intentions, opinions, behavior patterns, or characteristics of a particular or target population (Creswell, 2012). This study took a snapshot of university students' online education readiness levels shortly before the compulsory transition of residential courses to online.

Participants

428 volunteer university students from 59 different departments of 33 universities in Turkey were recruited to the study based on the convenience sampling method. As a result of the closure of universities due to the COVID-19 pandemic, it was not possible to use a random sampling method. 37.6% of the participants were male (n = 161) and 62.4% were female (n = 267). The research sample mainly comprises students at the 4th grade level and above (40.7%, n = 174). Most of the participants are from non-computing majors (87.4 %, n = 374). Nearly two out of three of the participants (63.3%, n = 271) had personal computers. In addition, 76.9% (n = 329) had internet access at their home. Approximately half of them use Internet between 4-7 hours (48.8%, n = 209). Half of the participants (50%, n = 214) had not taken any online courses before. Further details in relation to participants' characteristics are also given in Table 2.

Table 2. Participants' characteristics regarding independent variables of the study

Variable	Category	Frequency (*f*)	Percentage (%)
Gender	Male	161	37.6
	Female	267	62.4
Grade level	1	46	10.7
	2	110	25.7
	3	98	22.9
	4 and above	174	40.7

Major	Computing	53	12.4
	Non-computing	374	87.4
	N/A	1	0.2
Personal computer ownership	Yes	271	63.3
	No	157	36.7
Internet access at home	Yes	329	76.9
	No	99	23.1
Daily Internet usage	Less than 1 hour	42	9.8
	1-3 hours	89	20.8
	4-5 hours	107	25.0
	6-7 hours	102	23.8
	8 hours and above	88	20.5
Online education experience	No	214	50.0
	Low (1-3 courses)	158	36.9
	High (More than 3 courses)	56	13.1
	Total	428	100.0

Data Collection Tools

Two data collection tools were used in this study. The first was a personal information form. It included eight pieces of information - gender, grade, department, university, the number of online courses taken, the ownership of a personal computer, the availability of an internet connection at home and lastly duration of daily internet usage average. The second tool was an online education readiness scale for university students developed by Yurdugul and Demir (2017). This scale is composed of 33 items and six factors. These factors are computer self-efficacy (five items), internet self-efficacy (four items), online communication self-efficacy (five items), self-directed learning (eight items), learner control (four items) and lastly motivation towards online education (seven items). Cronbach alpha reliability coefficients of the factors of the original scale were reported as .84, .85, .84, .88, .91, .95, respectively. The overall reliability of the online education readiness scale was reported as .93. In the current study, Cronbach alpha reliability coefficients of the factors were re-calculated as .934, .904, .915, .937, .952 and .956, respectively, while the reliability of the overall scale was found out to be .970. It is a 7-likert type scale with alternative 1 corresponding to "it is not suitable for me at all" and 7 to "it is totally suitable for me". The higher the scores the university students get from the scale of online education readiness, the more they are ready for online education.

Data Collection Process

All necessary ethical permissions for the study were obtained from Usak University Ethics Commission before the data collection phase. The online education readiness scale and personal information form were combined prior to data collection, and then administered to participants as a uniform instrument through an online link. The online link was distributed through the social media platforms; mainly online communities (sites, groups, etc.) of which undergraduate students were members. The data were collected in an early phase of compulsory transition to online education at the nation-wide level. The link was in circulation on the web for nearly two weeks (12 days). As of mid-April, the data collection process was terminated as the researchers were of the opinion that the data were saturated enough.

Data Analysis

First, five observations were discarded from the dataset owing to inappropriateness for the study. And then, linear interpolation method was used to replace missing values. After that, factor scores were obtained by averaging relevant items. The online education readiness levels of the students were then analyzed in terms

of subscales and overall scale scores by using item mean and standard deviation values. The effects of the independent variables, which are ICT access, school year, major, daily Internet usage, gender and online education experiences on the overall online education readiness level were analyzed using independent samples t-test or variance analysis. The online education readiness was accepted as a dependent variable. With respect to the assumptions, the data were accepted as normally distributed as per central limit theorem (Kwak & Kim, 2017). Following variance analysis, the Bonferroni or the Games-Howell post-hoc comparisons depending on the result of Levene's test was used to determine the differences within groups. Cohen's d values for independent samples t-test and eta-square (η^2) values for ANOVA were used for reporting effect sizes to interpret pratical meaning of statistically significant results. The Cohen's *d* values were calculated based on mean, standard deviation and sample size (Cohen, 1988). The statistical significance threshold value was accepted as .05.

FINDINGS

The findings are presented in order of the research questions (RQ). Factor-wise findings could not be reported due to word limitations except for the first research question.

Online Education Readiness Levels of University Students (RQ 1)

The findings in relation to the first research questions are given in Figure 1.

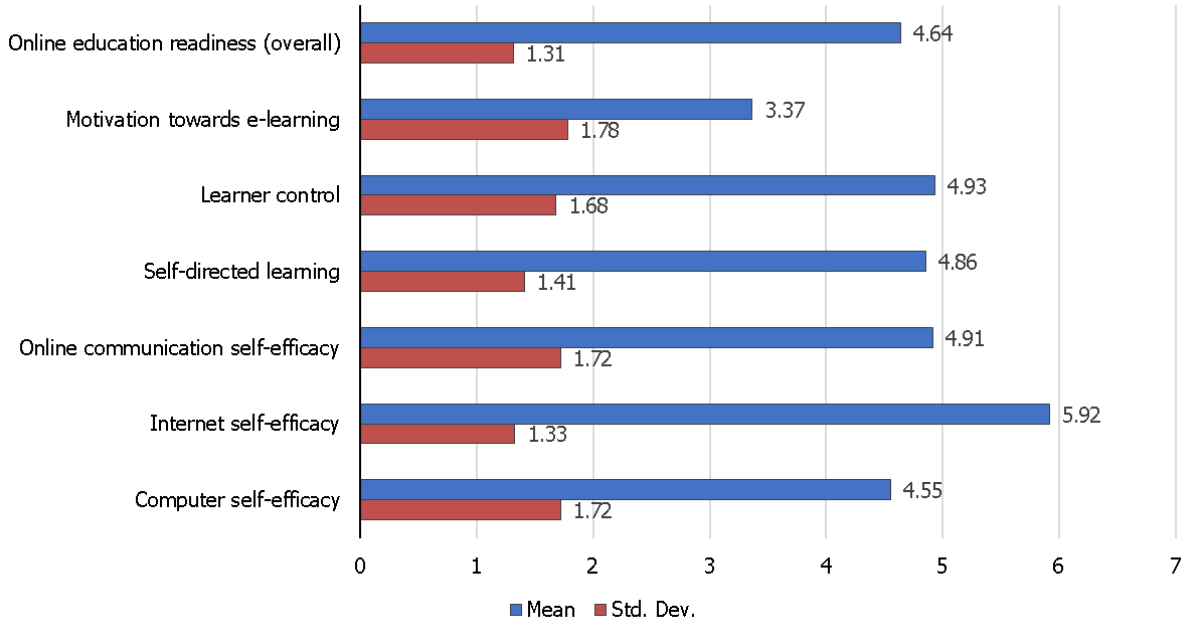

Figure 1. The status of participants' factor-wise online education readiness levels

As seen in Figure 1, students' motivation towards online education (M = 3.37, SD = 1.78) is comparatively low, whereas their internet self-efficacy (M = 5.92, SD = 1.33) is comparatively high. The means of other factors range between 4.55 and 4.93. Overall online education readiness is above the mid-level of the scale (M = 4.64, SD = 1.31).

Students' Online Education Readiness Levels According to Their Characteristics (RQ 2)

The results of research question 2a, 2b, and 2d are summarized in Table 3.

Table 3. Independent samples t-test results by personal computer ownership, internet access at home, and major

Research question	Variable	Group	n	M	SD	t	df	p	Cohen's d	[a]Effect size Interpretation
2a	Personal computer ownership	Yes	271	5.01	1.13	7.66	276.82	.000***	.810	Large
		No	157	4.01	1.38					
2b	Internet access at home	Yes	329	4.88	1.18	6.69	141.29	.000***	.846	Large
		No	99	3.84	1.42					
2d	Major	Computing	53	5.69	.77	9.55	101.60	.000***	.952	Large
		Non-computing	374	4.49	1.31					

*[a]Interpreted in accordance with the Cohen's (1988) suggestion. *** Significant at the level of .001.*

Students' Online Education Readiness Levels According to Personal Computer Ownership (RQ 2a)

An independent samples t-test was conducted to evaluate the effect of personal computer ownership on online education readiness. There was a statistically significant difference in comparisons between owner and non-owner students (t (276.82) = 7.66, p = .000, d = .810). Owners had higher scores (M = 5.01, SD = 1.13) than non-owners (M = 4.01, SD = 1.38).

Students' Online Education Readiness Levels According to Internet Access at Home (RQ 2b)

An independent samples t-test was conducted to evaluate the effect of having internet access at home on online education readiness and there was a statistically significant difference in comparisons between students with access and without access (t (141.29) = 6.69, p = .000, d =. 846). Students with internet access had higher scores (M = 4.88, SD = 1.18) than those without internet access (M = 3.84, SD = 1.42).

Students' Online Education Readiness Levels According to Grade Year at the University (RQ 2c)

A one-way analysis of variance showed that the effect of grade year at the university on online education readiness was not statistically significant (F (3, 424) = 1.489, p = .217).

Students' Online Education Readiness Levels According to Major (RQ 2d)

An independent samples t-test was conducted to evaluate the effect of major on online education readiness. The results showed that there was a statistically significant difference in comparisons between computing and non-computing major students (t (101.60) = 9.55, p = .000, d = .952). Students with computing majors had higher scores (M = 5.69, SD = .77) than non-computing ones (M = 4.49, SD = 1.31).

Students' Online Education Readiness Levels Accorting to Daily Internet Usage Level (RQ 2e)

An analysis of variance showed that the effect of the amount of time spent online on online education readiness was statistically significant (F (4, 423) = 25.62, p = .000). Post-hoc comparisons using the Games-

Howell test indicated that the mean score of less than one hour users group (M = 3.12, SD = 1.44) was significantly lower than that of the others. The mean score of 1-3 hours users group (M = 4.32, SD = 1.36) was significantly lower than that of both 6-7 hours group (M = 4.96, SD = 1.13) and the 8 hours and above group (M = 5.19, SD = 1.02). Lastly, the mean score of 4-5 hours group (M = 4.75, SD = 1.10) was found significantly lower than that of the 8 hours and above group. Post-hoc comparisons are given in Table 4.

Table 4. Post-hoc comparisons using the Games-Howell test of time spent online by students

	<1 hour (1) n = 42		1-3 hours (2) n = 89		4-5 hours (3) n = 107		6-7 hours (4) n = 102		≥ 8 hours (5) n = 88		
	M	SD	M	SD	M	SD	M	SD	M	SD	Post-hoc
Online education readiness	3.12	1.44	4.32	1.36	4.75	1.10	4.96	1.13	5.19	1.02	1<2,3,4,5 2<4,5 3<5

Students' Online Education Readiness Levels According to Gender and Online Education Experience (RQ 2f)

A two-way ANOVA was conducted on a sample of 428 university students to examine the main interaction effects of gender and online education experience as well as their interaction effects on online education readiness. The main effect of gender on online education readiness was statistically significant (F (1, 422) = 41.368, p = .000, η^2 = .089). Males had higher scores (M = 5.31, SD = 1.48) than females (M = 4.36, SD = 1.47) had. The main effect of online education experience on online education readiness yielded a statistically significant result (F (2, 422) = 4.147, p = .016, η^2 = .019). Post-hoc results using the Bonferroni test showed that university students with high online education experience (M = 5.14, SD = 1.30) is readier for online education than those with no experience (M = 4.59, SD = 1.27). There was a statistically significant interaction between the effects of gender and online education experience (F (2, 422) = 5.064, p = .007, η^2 = .023). Simple main effects analysis revealed that males were significantly readier for online education than females when they have no (p = .010), low (p = .002), and high online education experience (p = .000).

DISCUSSION

In the present study, undergraduate students were found to be above-average level ready for online education in terms of the overall scale (M = 4.64). As far as factors are concerned, internet usage self-efficacy is the highest (M = 5.92), while motivation towards online education is the lowest (M = 3.37). Nevertheless, the online education readiness levels noted in the current study is quite low compared to that in Yurdugul and Demir's (2017) study, who found overall online education readiness, internet usage self-efficacy, and motivation towards online education means as being 5.56, 6.33, and 4.59, respectively. This indicates that there is almost a one-point difference in overall online education readiness, and more than a one-point difference in terms of the motivation factor. Yet, their findings as to which factor of online education readiness is the highest and the lowest concur with the present study. In support of these, the findings of Coskun, Ozeke, Budakoglu, and Kula (2018) suggested internet self-efficacy as the highest (M = 5.84), while motivation towards online education as the lowest factor (M = 4.11). This pattern did not change in the study by Yilmaz, Sezer, and Yurdugul (2019). They reported overall online education readiness as being 5.20, which is slightly higher than the result obtained in the current study. To sum up, regarding Yurdugul and Demir's (2017) study, the difference might be attributed to the fact that the current study collected data from various universities irrespective of their faculty and department, whereas Yurdugul and Demir (2017) collected data only from pre-service teachers at a university. As for the internet self-efficacy factor, it was found in the current study that the internet penetration rate among university students in Turkey (76.9%) is relatively high. Indeed, even if students do not have access to the internet at home, they can still connect

to it at universities or through mobile devices. This prevalence of internet access appears to have promoted university students' internet self-efficacy factor in terms of online education readiness. Another interesting finding of the present study, which agrees with the literature, is the critical low level of motivation towards online education. This lowness might stem from the lack of hardware as well as interaction during online courses. In addition, the use of inappropriate instructional methods by faculty members when it comes to online education, which can lead to adverse online education experiences for undergraduate students, is fairly likely to cause this low level. Motivation arises from a context that involves versatile interaction between learners and online education environments, rather than intrinsic characteristics (Hartnett, St George, & Dron, 2011). Therefore, effective and well-planned online education processes enhance learner motivation (Law, Lee, & Yu, 2010). It is also possible that a sense of isolation deriving from the pandemic-related lockdown might have contributed to the decrease in motivation towards online education.

In this study, computer ownership was revealed to be a variable that affect online education readiness. This finding is supported by Yilmaz et al. (2019) who revealed that personal computer ownership positively affects online education readiness levels. Kabatas's (2019) findings also concur with this paper. In addition, the study conducted with tourism students by Pala (2018) echoed the finding of the current study. On the other hand, Basol, Cigdem, and Unver (2018) came to the conclusion that computer ownership does not predict online education readiness. As for the effect of internet access at home on online education readiness, it was revealed in the current study that university students having internet access at home are readier than those not having such access. A study carried out by Yilmaz et al. (2019) might support the finding of this study. They reported that university students having "a smart phone with internet connection" are readier for online education. On the other hand, it was found by Pala (2018) that having access to the internet and "a smart phone with internet connection" has no influence on online education readiness. In general, the online education readiness literature seems to support the present study concerning computer ownership and internet access findings, despite support for the latter being less strong. To interpret the results, there are some prerequisites for online education that need to be met before embarking on it. As found in the present study, ownership of a personal computer and an internet connection at home are clearly two of them.

In this study, it was revealed that computer major university students are readier to online education compared to non-computer major students. Students with computing majors were predominantly comprised of CEIT (Computer Education and Instructional Technology) students in the current study. It is interesting to compare the results of this study with Yurdugul and Demir's (2017) results. Unlike this study, they recruited prospective teachers only. Likewise, they concluded as a result of a cluster analysis, that students majoring at the department of CEIT are readier than those in other departments. Similarly, Alsancak-Sirakaya and Yurdugul (2016) concluded that students in the department of CEIT are better than those from the other departments of the Faculty of Education only in terms of the computer/internet self-efficacy level. In contrast, Adnan and Boz-Yaman (2017) reported in the case of engineering students, that computer engineering students were not readier in terms of online education compared to students of other departments of the Faculty of Engineering. In conclusion, students of the CEIT department are found to be ready for online education (Cobanoglu, Uzunboylar, & Altun, 2017) because the curriculum of the CEIT department includes many technical and pedagogical courses that contain theories and practices about programming as well as online learning. These courses might increase CEIT students' computer and internet self-efficacy levels, which are factors of online education readiness.

The results showed that the grade year at the university does not affect online education readiness levels. The finding of Pala (2018) is in line with those of the current study. In contrast, Yurdugul and Demir (2017) reported that senior university students are readier for online education compared to freshmen. Yilmaz et al. (2019) reached the same conclusion. Likewise, it was revealed by Hung et al. (2010) that seniors are readier for online education than the other grade students, while juniors are readier than sophomores and freshmen. Moreover, Alsancak-Sirakaya and Yurdugul (2016) concluded that only the computer/internet self-efficacy factor of online education readiness is higher in senior students. To sum up, the majority of studies in the literature indicate that the higher the grade year, the readier students are for online education. The related literature diverges from the findings of the present study, possibly due to the fact that the present study collected data from a wide variety of universities and departments. In fact, other studies in the literature collected data from either only Faculties of Education or just a few departments/universities, limiting the

generalization of their findings substantially. To speculate about the findings of the current study, the year difference between grade levels appears to be too small for a significant difference to occur. Indeed, there is only a three-year difference in the case of comparing freshmen with seniors, without even mentioning the only one-year difference between successive grade years.

It was found in the current study that as daily internet usage increases; the online education readiness of university students also increases. Coskun et al. (2018) reached a similar conclusion. However, they measured "internet usage for academic purposes". Moreover, Alsancak-Sirakaya and Yurdugul (2016) found that pre-service students whose daily internet usage level is higher, are readier for online education compared to those students using the internet less, only in terms of the computer/internet self-efficacy factor of online education readiness. This is actually an expected result simply because students are likely to learn about basic online tools, services, operations, etc. while using the internet, substantially enhancing their computer and internet self-efficacy levels.

Another finding of this study is that male students are readier than female students. This finding is in line with the findings of online education readiness studies in the literature conducted with students in a Faculty of Medicine (Coskun et al., 2018), Tourism-related department students with no prior online education experience (Olcay, Dos, Surme, & Duzgun, 2018), and an entire sample of university students (Yilmaz et al., 2019). In contrast, there are many studies in the literature revealing that gender has no effect on online education readiness (Adnan & Boz-Yaman, 2017; Hung et al., 2010; Pala, 2018). Besides, Sakal (2017) reported no gender-wise difference in three online education readiness factors out of four, except for the online communication self-efficacy factor which was found to be higher in the case of male students. In addition, Alsancak-Sirakaya and Yurdugul (2016) found that two online education readiness factors differed by gender, while the remaining three factors were found not to differ. They found that male students show higher levels of computer/internet self-efficacy, whereas females show higher levels of self-directed learning. In brief, findings as to whether gender has an impact on the online education readiness of university students seems to be far from being clear. These conflicting results are likely to stem from the use of quite different study groups. As another independent variable of the present study, the amount of online education experience was found to affect the online education readiness in favor of experienced university students. However, a study conducted with engineering students by Adnan and Boz-Yaman (2017) yielded a dissimilar result. To interpret the result of the present study, it seems to matter how many online courses students have taken. In fact, students might be getting used to online education process by gaining experience. It was determined in the present study that male university students are readier for online education than females in all levels of online education experience. In the same manner, Basol et al. (2018) reported as a result of hierarchical linear regression analysis that "previous web-based course familiarity" predicted online education readiness of male military vocational college students.

CONCLUSION AND IMPLICATIONS

This study aimed to address the online education readiness of university students in order to come up with ways of increasing their online education readiness levels, which, in turn, would enhance the quality of their acquisition of learning from the online education experience. This is significant because they are forced by the COVID-19 pandemic to participate in online courses, irrespective of their being ready for them. A survey involving 428 undergraduate students from various universities and departments was carried out with this purpose.

This study highlights the crucial importance of infrastructure such as computer ownership, internet access at home, etc. for the success of online education. The digital gap between undergraduate students can cause serious problems such as inequality of opportunity, thereby severely decreasing the effectiveness and feasibility of online education. To illustrate the point, as many students do not have a personal computer (36.7%), but nearly all have a smartphone, they use their smartphones for online education activities, making the line between online and mobile learning vague. This high rate of smartphone usage in online education dramatically hampers interaction possibilities during synchronous online lectures and assignment preparation owing to its limited functionality. These adverse aspects of using smartphones appear to be even more serious when the fact that most university students cannot afford to purchase sufficient mobile internet

packages necessary for the online education process. Since students have a limited amount of mobile internet package, faculty members might feel an obligation to shorten lesson times so as not to cause students to run out of internet packages, if not completely abandon synchronous lessons. In addition, some of them might allow students to turn their cameras off during synchronous lessons. More importantly, they might prefer not to use educational videos or other interactive materials in order to preserve mobile data packages. In summary, interaction, which is one of the most serious concerns in online education, seems to be the very first thing to be detrimentally affected by the lack of infrastructure, substantially hampering the quality of the online education process.

Based on the current study's findings, some suggestions could be made for researchers planning to conduct further studies into online education readiness. First of all, as motivation towards online education was the lowest factor of all (M = 3.37), it is recommended that in future studies, researchers should focus on the reason for this low level, as well as the ways to increase this aspect. Furthermore, the mobile learning readiness of university students might be studied in future owing to the fact that a considerable number of university students do not have personal computers, so they try to continue online education using their smartphones (Ekici, 2018). Besides, online education readiness is not just a phenomenon that can be examined exclusively in terms of the learner, so the possibilities of organization, teacher, learner, technological infrastructure, and other factors (peer and family support) should also be taken into consideration in further studies. In addition, the pandemic period, in which individuals' average daily time spent in the online environment increases, might alter students' online communication skills. Therefore, it is highly recommended that researchers examine any differences that might occur in terms of the readiness structures for online education after this transition process. Finally, it is seen that studies on the components of online education readiness have been mostly developed based on the literature. This may make them obsolete due to rapidly-changing online education needs and technologies. Therefore, authentic online education studies focusing on course design, enhancement of interaction, and e-content development can contribute to up-to-date developments and fostering the quality of the online education processes.

Policymakers can also benefit from the findings of the current study. Online education was seen as a band-aid process in dealing with the pandemic, but has the potential to be a medication in terms of some serious educational problems such as cost, inaccessibility, etc. Since it seems that online learning will gain even more importance in the education system, students should be well prepared for it beforehand to get the best out of it. This can be achieved with a selective (preferably mandatory) online learning course taught in every undergraduate program. In this way, higher education institutions and their students might be more prepared to face an imminent second rush to online education. In fact, such a course already exists in the curriculum of the department of CEIT. This course can set an example for possible similar courses in the other departments. As for the lack of computer and internet connection, higher education institutions should provide computer laboratories equipped with fundamental hardware, software, services, etc. required for the online education process, available to those students without access to ICT tools and services. Regarding suggestions for educators, it is strongly advised that they focus on instructional design processes in the web environment, adapt their content to online environments, and reorganize their pedagogy by considering the opportunities and limitations associated with online education technologies.

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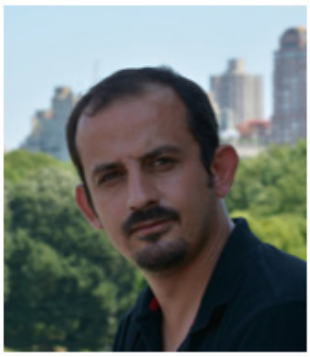

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USING REFLECTIVE PRACTICES TO EXPLORE POSTGRADUATE STUDENTS SELF-DIRECTED LEARNING READINESS IN MOBILE LEARNING PLATFORM AND TASK-CENTERED ACTIVITY

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ABSTRACT

The purpose of this study is to explore postgraduate students' self-directed learning (SDL) readiness using Mobile learning (M-learning) in Massive Open Online Courses (MOOCs) as a platform and task-centred activity. Reflective practice is used to measure students SDL readiness. This study is qualitative in nature. The research employed thematic analysis method, which involved systematic coding processes, entailing coding, finding categories and themes. Hence, 34 postgraduate students from a public university were selected via a purposive sampling method. They were initially introduced to M-learning course content in FutureLearn (MOOCs) platform, followed by reflective practices. Pre-reflective practices happened before students were enlisted into the M-learning process, During-reflective process in FutureLearn platform and Post-reflective upon completion of the task-centered activity. The findings revealed that most of these students were not sure of their own readiness to take on SDL in the M-learning platform during the pre-reflective stage. However, most of them were able to monitor their own readiness at the During-reflective process. Subsequently, they made progress in adopting and self-evaluating their own performance by completing the task-centered activity successfully. Therefore, the contribution of this study is on constructing reflective practices based on three different stages. Hence, the reflective approach practice has given students insight on their own learning capabilities and readiness for SDL in the mobile platform.

Keywords: Self-directed Learning (SDL), readiness, FutureLearn (MOOCs) platform, Reflective practice, Task centered activity.

INTRODUCTION

"We can only have citizens who can live constructively in this kaleidoscopically changing world if we are willing to become self-starting and self-initiating learners", said Carl Rogers' in 1968. In alignment with Rogers' statement, to be effective in the 21st century, learners are required to be self-initiative in creating, evaluating and effectively utilizing easily accessible information. Thus, the 21st-century learners or digital learners are expected to be connected, self-directed, mobile (Tulagan, 2013; Rashid & Asghar, 2016; Jaleel & Anuroofa, 2017) and able to access more information than the previous generation (Fahnoe & Mishra, 2013).

Self-directed learning (SDL) readiness provides a more direct route into understanding the actual dynamics of mobile learning (M-learning) by examining the degree at which the self-directed learner takes personal control and acknowledges freedom (Fisher, King, & Tague, 2001). The author also added that freedom is closely associated with learning what the students' consider as important. Self-directed learners can be likened to active learners as they are able to establish their own knowledge by planning, monitoring, managing the learning materials as well as the learning process, reflect on their learning and evaluate it individually (McLoughlin & Lee, 2010; Lee, Tsai, Chai & Koh, 2014). The immediate access to modern educational technologies and M-learning resources strengthened and broadened the capacity for self-directed learners to enhance their own knowledge autonomously by taking control over the learning process.

Self-directed learning empowers students' to take control over their own learning by accepting the freedom to learn what they consider important for themselves. Yet, SDL is changing the way students think about work. The M-learning platform for SDL learners has its' pros and cons. Therefore, students should have the cognitive ability to diagnose and analyse the pros and cons of mobile devices for learning rather than not falling aside due to mobile distraction. Therefore, reflection is an essential practice for students to encourage thinking about one's own learning. In addition, Diaz (2015) investigates the effects of reflection to help beginning young learners in the learning process.

However, there has been little discussion on postgraduate students reflective practices as regarding the use of SDL readiness (Toh & Kirschner, 2020; Camargo, Bary, Boly, Rees, & Smith, 2011; Kek, & Huijser, 2011) in the M-learning platform. Therefore, the **research question** of this study is to explore the postgraduate students SDL readiness using reflective practices on task-centred activities based on the FutureLearn (MOOCs) platform. Thus, reflective practices (pre-, during-, and post-reflective) has been employed to explore the postgraduate students readiness towards SDL in the M-learning platform. The rationale behind employing these reflective practices is based on Schon's (1983) ideas in his writing *"The reflective practitioner"*. Schon identified these reflective practices as a vital element which enables students to be aware of ones' implicit knowledge and comprehend the experience of learning.

LITERATURE REVIEW

Self-directed Learning Readiness in Mobile Learning Platform

In this digital age, the learner needs to be more alert and aware of receiving any kind of information which is easily available in the online learning platform. This is because the learner has control over their own learning and they also have immediate and quick access to all kinds of information without any filtration. Zimmerman (2008) argued that online learning platform has the potential to improve the learning process, and at the same time require skills like goal setting, monitoring, controlling cognition and motivation. Moreover, he argued that the improvement of the M-learning environment can assist the students in using a self-regulated learning model as guidance (Zimmerman, 2008).

García Botero, Questier, and Zhu (2019) examined on the mobile assisted language learning foster self-directed learning outside the classroom among 118 postgraduate students. The findings reveal a lack of sustained motivation, self-monitoring and self-management reflected in the low usage of the mobile application.

Song, Bonk, and Whiting (2012) stressed that a huge number of learners prefer to use open and free online learning resources during personal learning experiences like MOOCs. Learners have the freedom to learn at their own pace from these online learning resources as this gives a crucial impact on the learners attitudes and beliefs regarding learning. Besides that, Sridharan, Deng, Kirk, and Corbitt (2010) mentioned that technological facets, management of the technology, and learning resources as well as material organizations are the main factors which influence the effectiveness of learning through online resources.

McLoughlin and Lee (2010) stated that self-directed learners establish their own knowledge by examining, managing, reflecting and evaluating their learning materials as well as the learning process. The easy access to modern educational technologies and M-learning strengthened and broadened the capacity for self-directed learners. Dunlap and Lowenthal (2011) supported by adding that recent technologies can help students to enhance their problem-solving skills and reflective practices.

Lai, Li, and Wang's (2017) conducted a research on pre and post survey analyses focused on language learners' self-direction and technology use. The finding proved the importance of learners' positivism on technology and developed beliefs on technology use. Another study was conducted by Sirakaya, Ozdemir and Selcuk (2018) on the effect of flipped classroom and self-directed learning readiness by comparing with blended learning method. The findings of this study shows significant difference between both groups.

García Botero et al. (2019) investigated factors influencing students' self-directed learning with technology. A questionnaire was employed to obtain data from 153 students on their self-directed learning readiness with the use of Web 2.0 tools for learning. The findings revealed that the students' self-directed learning readiness and the Web 2.0 tools for learning, had a statistically significant direct contribution to SDL with technology.

Lee, Yeung, and Ip (2017) investigated university students in Hong Kong and found a positive correlation between self-directed learning construct and technology. The constructs include learning desire, learning management, and learning control. Among this construct, the learning desire was strongly influenced by technology usage. In another study, Hsu (2017) developed and compared self-directed learning and task-centered learning. The author revealed that the potential of self-directed learning and task-centered learning aid in developing effective learning.

Reflective Practices

John Dewey (1933) introduced about the concept of "reflective thinking" in his book "*How We Think*" to represent "active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusion to which it tends" (Dewey, 1933, p.9). In his book, reflection involves the learner as the object of reflection.

In 1987, Donald Schon in his book of "*The Reflective Practitioner: how professionals think in action*" stated that a learner who practices reflective thinking is aware of own cognition and the constant cognition enabled the learner to have a solution which is out of the box thinking. Meaning, the learner recognizes that every given problem or interpretation of a circumstance may have more than one solution if the learner practices and continues thinking. Schon (1987) created the first term of "reflection-in-action as a thought that a learner takes while involved in a circumstance, during which the learner become aware of what one is thinking, feeling and doing and the second term of reflection-on-action takes place sometime later, when the learners consider the events that took place, and recall what the learners were thinking, feeling and doing" (Hickson, 2011, p.831). Later, Thompson (2008) added another dimension to this practice called reflection-for-action, which is planning ahead and reflecting on what may happen, allowing for preparation and anticipation of a situation. Therefore, this study has employed the same process of the three phases (pre, during and post-reflective) as what Schon (1987) and Thompson, (2008) mentioned in their studies. Substantively, this study used Gibbs' reflective cycle as a guide in designing the three reflective questions.

There are several reflections models in the literature (Gibb's reflective cycle, Atkins & Murphy, 1994; Bass, Fenwick, & Sidebotham, 2017), hence this study chose Gibbs' reflective cycle as it helps the postgraduate students to think systematically about the different stages of their learning experience (Helyer, 2015). A study conducted by Ahmed (2019) employed Gibbs' reflective cycle to develop a reflective journal to help students at Qatar University to reflect on the instructional practices. Thus, this study is used a case study methodology and the data analysed using content analysis. The findings of the study revealed that students preferred teaching strategies such as gradual teaching, exemplification, discussion, comprehension checking, cooperative learning, and graphic organizers. In another study conducted by Mohamed Abdullah Turky (2016) aimed to investigate web 2.0 application usages in promoting reflective thinking skills for higher education students in the faculty of education. Thus, this study is used Gibbs' reflective cycle to foster reflective thinking skills. The findings of this study provided the students skills throughout the learning process. Another findings is a professionally reputable and methodologically rigorous evidence base for learning and teaching innovation.

The researcher explored the use of reflective practices in identifying postgraduate students SDL readiness in M-learning platform. Substantially, these students have been evaluated used task-centered activity to

determine their readiness level in SDL. These students were introduced to FutureLearn (MOOCs) platform which is one of the M-learning platforms and the reflective practices (pre-, during-, and post-reflective) take place throughout the M-learning process. To strengthen this study, the researcher used a self-regulatory learning model (Zimmerman, 2002) as a theoretical framework. Using these three reflective practices, this study explores the students SDL readiness in M-learning.

Self-regulated Learning Model

The self-regulated learning (SRL) model and cycle incorporated certain cognitive strategies like planning, monitoring and evaluating (Zepeda, Richey, Ronevich, & Nokes-Malach, 2015). This model categorizes the three phases as forethought, performance, and self-reflection (Zimmerman, 2002; Zimmerman & Schunk, 2011). Each phase includes several important sub-processes (Zimmerman, 2002). To strengthen this study, the researcher has used the self-regulated learning model where the pre-reflective stage is used as a forethought phase, during the reflective stage, it is regarded as performance phase and the post-reflective stage as a self-reflective phase which incorporates with cognitive strategies like planning, monitoring and evaluating. The reason for employing this model is to understand the students readiness towards SDL at every stages (Pre-, During- and Post-reflective) during the online learning process (Figure 1).

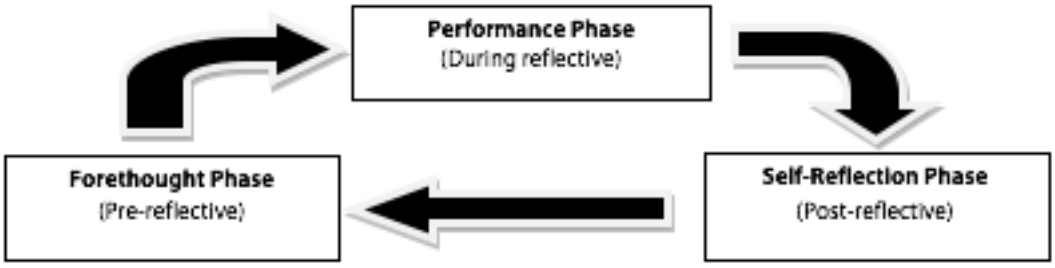

Figure 1. Phases and sub-processes of self-regulated learning (SRL), adapted by Zepeda, Richey, Ronevich, & Nokes-Malach, (2015).

The Role of Instructor as Facilitator

The role of the instructor has transformed from being 'the source of knowledge' to a facilitator and role model in the process of acquiring knowledge and skills (Moodleroom, 2012). Therefore, "instructors need to provide learners with learning experiences that foster self-directed learning, get learners actively involved in one's own learning process, and explicitly teach learners how to learn while guiding the learning process" (Francom, 2010, p.29). In addition, Rico and Ertmer (2015) examined the role of the instructor employing student-centered approaches, specifically those that are problem-centered, result in outlining effective strategies that are valuable for facilitating discussions. Therefore, the instructor role in this study would facilitate regulations of cognitions in an interaction between the content (The FutureLearn course design) and the learner as a teaching presence. The interaction between instructor and learner are assumed to foster readiness towards self-directed learning in the M-learning (Garrison, 2015).

METHODOLOGY

This study is qualitative in nature and employed thematic analysis to identify the postgraduate students SDL readiness using reflective practices. This study used purposive sampling in choosing the 34 postgraduate students from Instructional Technology (IT) course in one of the public universities in Malaysia. Furthermore, a self-regulated learning model was used as a theoretical framework, while Gibbs' reflective cycle (1988) was employed to design reflective questions with some guiding questions to probe postgraduate students' reflections at three different stages in the M-learning process. FutureLearn was also employed in the study, as it is one of the M-learning platforms. An online course which is *'Blended Learning: Getting*

Started' from FutureLearn platform was used as well. The whole M-learning process lasted up to 8 weeks and the reflective practices took place before the students enrolled in the M-learning process (pre-reflective), during the FutureLearn platform courses learning (during-reflective) and after completing the task-centered activities (post-reflective).

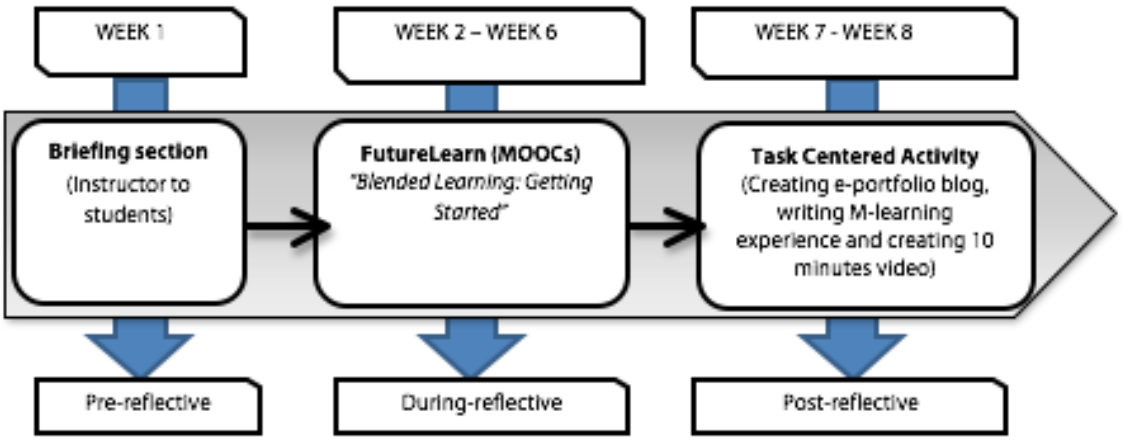

Figure 2. The Reflection Learning Process

Postgraduate Students Background

The total number of Postgraduate students from Instructional Technology (IT) course is 34 individual which comprise of 7 (20.5 %) male and 27 (79.5%) female. This study showed that the frequency of the students year of studies enrolled into IT course is from the first year with 26 (76.6%) students and followed by a second and third year with 4 (11.7%) students. The postgraduate students who enrolled in IT course with different program of studies which is Instructional Technology and Educational Psychology of 9 (26.5%) students, English Language Teaching with 7 (20.6%) students, Curriculum & Instruction with 6 (17.6%) students and Islamic Education with 3 (8.8%) students.

Reflective Questions

This study chose Gibbs' reflective cycle as it helps the postgraduate students to think systematically about the different stages of their learning experience (Helyer, 2015). The Gibbs' model provided a guiding structure and some cue questions to answer which aids the students reflection on the SDL readiness in the M-learning environment. Therefore, this study adapted Gibb's Reflective Cycle (1988) model to construct items for reflective practices. There are six sections in this model and the first two sections (description and feelings) measures pre-reflective with 5 questions. The next two sections (evaluation and analysis) measured during reflective consists of 12 questions. The last two sections (conclusion and action plan) measured the post-reflective phase and consist of 15 questions. Two experts from a public university in IT in the education field reviewed and validated these reflective questions. Besides that, member checking was carried out by permitting the postgraduate students to review the reflective questions for validation purposes. The data from the reflective questions were analysed using the thematic analysis method which involved a systematic coding process which entails coding, finding categories and themes.

Data Collection

The data were collected at three different stages.

Before the M-learning Process (1st Briefing section on Week 1).

In the briefing section which takes part before the postgraduate students enrolled in the M-learning process, the researcher of this study introduced herself and explained the intention and purpose to conduct this study to all the 34 postgraduate students enrolled in the Instructional Technology (IT) course. After the small introduction, the researcher provided the URL of the Google form where the pre-reflective questions were uploaded online and requested the postgraduate students to access the URL using their mobile devices. The rationale behind uploading the reflective questions online is to ease the students learning process as well as to foster online self-report learning experience. Later, the researcher explained the pre-reflective questions precisely and ensured that the postgraduate students understood them. After the brief explanation, the researcher allowed the postgraduate students to answer the pre-reflective questions and 15 minutes time duration was given in order to complete them. After the briefing section, the researcher of this study explained and demonstrated the features and course content on the FutureLearn (MOOCs) platform. The course that the postgraduate students needed to attend is stated thus "Blended learning: Getting started", which runs for five weeks. After the brief explanation, the postgraduate students were allowed to register and enrolled in the FutureLearn (MOOCs) platform at their own pace.

During the M-Learning Process (Week 2 – Week 6).

The postgraduate students started enrolling into the M-learning platform and while engaging, the researcher of this study uploaded the second reflective questions (during-reflective) in the Google form. The researcher personally emailed all the postgraduate students with the second reflective questions. Three weeks duration was given to the postgraduate students to answer the during-reflective questions and the questions were submitted online back to the researcher. The researcher tracked and recorded all the postgraduate students' responses to the reflective questions. A friendly reminder email was sent to those who had not yet responded.

Second Briefing Sections on Week 7.

During the second briefing, the researcher distributed the task-centered activity questions to the postgraduate students. The researcher informed that the postgraduate students had two weeks to complete the activities in the task-centered activity. The task-centered activity consisted of three activities of which the postgraduate students' needed to create an e-portfolio blog, write reflections on M-learning experience and create a 10 minutes video presentation based on M-learning experiences.

During the Task-centered Activity (Week 7 – Week 8).

The postgraduate students started doing the task-centered activity. Two weeks duration was given to do the task-centered activity based on their M-learning experiences. The role of the researcher in this study was to facilitate and provide timely support and guidance to the struggled novice students.

End of the Task-centered Activity (Week 8).

In week eight, the postgraduate students were required to email their blog URLs to the researcher. Every student had their own individual blog URL to exhibit their work. The researcher recorded all the 34 postgraduate students' blog URLs. The postgraduate students' task-centered activity were evaluated based on the rubric. After gathering all these 34 postgraduate students blog URLs, the researcher requested the students to access the online post-reflective questions in Google form. The researcher allocated the students' 15 minutes to answer the post-reflective questions and had them submitted back to the Google form. Upon completion, all the students were dismissed.

Data Analysis

Guided by the research question and Gibbs' reflective cycle, postgraduate students reflective practices were analysed using thematic analysis (Radnor, 2001) which come up with three themes. However, to distinguish the level of SDL readiness, postgraduate students were assessed based on their competency in performing the task-centered activity. The task-centered activity was evaluated based on 100% marks, but this score (100%) is measured using rubric adapted from Harry Walker, Johns Hopkins University (2010). This rubric is based on four levels which are a novice (0-25%), basic (25-50%), proficient (50-75%) and advanced (75-100%).

FINDINGS

From the analysis of the data, three distinct themes were identified. Aligning with a Self-Regulated Learning theory framework (Boekaerts, 1999) each identified theme is discussed thoroughly supported with the related literature.

Pre-reflective Activity on Students SDL Readiness

At the beginning stage, most of the postgraduate students mentioned that they were "unsure of SDL readiness in M-learning". This showed that the students were not sure of their readiness on SDL in the FutureLearn platform and unable to plan any strategy as they lacked prior knowledge. These students were affirming that they do not have prior knowledge or experience of doing tasks independently or with less supervision in the online learning platform. Thus, these students were not ready to do the activity or task without the instructor's supervision. Besides that, several students who are aware of SDL mentioned that it is a process in which an individual takes the initiative in diagnosing the learning needs with or without the help of others on a daily life basis. Other than that, the students also agreed that M-learning increased readiness towards SDL as technology makes their life easier and increased the interest to learn more. Therefore, these students mentioned that they are ready to embrace the online learning platform as they can perform the task and direct their learning with the fast-evolvement of M-learning. The pre-reflective practice permitted the students to brainstorm on this new learning endeavor and prepared them to get familiarized with the FutureLearn platform employing mobile devices. However, few students claimed that they will be able to direct their learning if the activities or task instructions are clear and easy to understand. They also highlighted their willingness to do the task if proper guidance from the instructors were provided. The guidance from an instructor is important when the students are faced with difficult activities or tasks.

"No as I have no experience in doing task assigned independently" (S3).

"Individuals take the responsibility to learn on their own" (S2).

"Yes, because everything is easy at the current situation as we get more guidance with the technology" (S18).

"Yes, anything is possible with the Internet and YouTube which helps in self-learning which help me to build better understanding of what we are learning" (S22).

"I am not familiar doing online learning platform before without instructor guidance" (S25).

"Yes, but anyhow guidance needed for complicated questions or tasks" (S1).

During-reflective Activity on SDL Readiness

At this stage, the students started to monitor their own readiness as a self-directed learner in the FutureLearn platform, employing their own mobile devices. The students reported that they are able to monitor themselves to be more independent, self-confident and self-disciplined while developing love towards learning and the ability of time management and self-management. Proficient students conceded that they are punctual, self-motivated, well-organized, self-learning future-oriented, and creative. There were some students who mentioned that they learned to find solution for the obstacles faced during this M-learning process. Hence, these students described that they were able to monitor their learning progress and adapt their search strategies during this M-learning process. Through monitoring, students can control and direct

their learning and ensure if a selective strategy is working or not or is needed to make adjustment. This stage reflected on the students' self-awareness of their learning and this can improve their understanding of content concept and problem-solving skills.

"I learned to motivate myself and gained more self-confident and self-discipline" (S5).

"I am well disciplined and was able to progress with blended learning" (S22).

"Sometimes i can manage to complete a task that i couldn't believe i can do it" (S35).

"Need to be more focused and able managed time" (S13).

"I was to be punctual and well organized". (S18)

"Time management and self-management are very important for a part-time learner" (S11).

"There are many more creative and innovative ways in delivering an effective class" (S8).

"I learned to manage myself to find solution when faced any obstacles in order to complete the task" (S19).

However, there are few students who reported that they are less likely to be self-directed learners in the M-learning platform. These students reported that they have less confidence when engaging in the M-learning platform. Lack of confidence demotivated the students to engage more in M-learning and condensed their interest to explore more in this FutureLearn platform. Few students admitted themselves as slow learners and technologically not fit to engage in the FutureLearn platform. Therefore, these students felt that the FutureLearn platform sounds very challenging and needed constant instructor guidance throughout the M-learning process.

"I am feeling less self-confident and not independent" (S33).

"Need more hardworking and I often give up" (S15).

"It very difficult and challenging but i needs more guidance" (S9).

"I am a slow learner actually and need more guidance" (S19).

Post-reflective Activity on SDL Readiness

At this final stage, the students' ability to evaluate their effort and strategies in completing this FutureLearn platform and task-centered activity successfully was examined. Thus, most of the students reported that they have more confidence in a positive outcome resulting from independent learning in the FutureLearn platform and task-centered activity. These activities permitted the students to face challenges, especially when they have to accomplish the lesson on a given timeframe and task with less supervision from their instructors and away from the classroom boundaries. Some students responded that they develop more love for challenges and enhance self-discipline. Several students expressed that this FutureLearn platform and task-centered activity enabled them to learn new knowledge as well as increased creativity, ability to use problem-solving skill and self-assessment. Hence, at this stage, these students managed to complete the task-centered activity based on their autonomous learning in the FutureLearn platform. These students felt overwhelmed with the effort invested in the M-learning as they felt appreciative on gaining new knowledge and exposure.

"I will make sure I put a full effort to complete it as I did for before" (S19).

"I am feeling enjoyed and i also complete the FutureLearn and Activities" (S25).

"This platform increases my self-confident and love challenging" (S13).

Nevertheless, some students reported that they felt insecure when required to do the task without their instructor's physical supervision. Thus, the student felt that they lack self-confidence and self-discipline. Few students mentioned that they felt lost during learning when there is a lack of proper guidance or prior knowledge. Therefore, these students mentioned that they need the guidance of an instructor. However, meaningful learning experience has shifted the students to be proficient in mobile technology. Despite, the

lack of confidence and feeling of insecurity without instructor supports, the students managed to complete the task-centered activity.

"I felt insecure as I am not good in technology and without instructor physically make me feel inconvenient to learn more" (S25).

"I felt lack of self-confident as I am not good in technology" (S13).

"I am not good in this FutureLearn and I can't discipline myself well" (S16).

"I need guidance from instructors as I am not confident to do alone" (S26).

"I able to complete the task even without the instructor support" (S15).

Assessment on Task-centered Activity

Students' task-centered activity performance has been assessed using rubric which measured by four levels such as novice, basic, proficient and advanced. Therefore, no novice level students have been recorded meanwhile six students have obtained a score between 25 to 50% which belongs to a basic level. Continuing in the same vein, 18 students have obtained a score of about 50 to 75% which is proficient level followed by 10 students have obtained score about 75 to 100% which is an advanced level. Therefore, most of the students entailed into proficient and advance level while six students entailed into basic level (Table 1).

Table 1. Students Score in Task-centered Activity

Score	Performance Indicator	Student achieved
0 – 25	Novice (1)	0
25 – 50	Basic (2)	6
50 – 75	Proficient (3)	18
75 – 100	Advanced (4)	10
TOTAL		34

DISCUSSION

The first main finding of the pre-reflective stage is that, majority of the students were unsure of their SDL readiness in the M-learning platform. These students reported that the lack of exposure in the FutureLearn platform to work autonomously is indeed challenging when it comes to real-time experience. These students came clueless in handling the FutureLearn platform as they had no idea of what to do at this initial phase. They also were unaware of developing any strategy or transferring the prior knowledge. Although students were unsure of transferring prior knowledge, they were able to regulate their cognition on preparing themselves to direct the learning. Therefore, students slowly self-orientated and got themselves familiarized with this M-learning platform. Despite that, some students mentioned that lack of readiness towards SDL does not stop them from embracing the M-learning independently if the activity or task is easy to understand. Thus, the finding is consistent with findings from Zimmerman (2008), who mentioned that online learning platform has the potential to improve the learning process and require skills like goal setting, planning, controlling cognition and motivation. He argued that the improvement of a high-tech learning environment can assist the students' in using self-regulated learning strategies.

The second main finding during the reflective stage was that, the students adopted the M-learning and gradually got used to the FutureLearn platform, as they developed their own strategy based on their learning experiences. The students did not only monitor the action but also kept track of the progress towards their goal settings. The students reflective practices empowered them to self-instruct, self-monitor and make decision on their learning. Moreover, most of the students became more independent, self-confident and self-disciplined while developing love towards new learning experiences as they started to enjoy this M-learning platform. Additionally, the students developed the ability of time management and self-management despite their hectic schedule and

family commitment. Therefore, these findings are in line with García Botero et al. (2019). The students' self-directed learning with Web 2.0 tools had a statistical significance direct contribution to SDL with technology. The learners' attitude, abilities, and personality traits which is needed for SDL is more likely to influence the use of technology as they get benefit for it. However, there are several students who encountered difficulties to monitor their own cognition, as they were not ready to be self-directed and were technological illiterates in M-learning. Quite common, less self-confidence and feeling of fear demotivates and lower the interest of the students to get engaged in the M-learning platform. Due to a lack of self-confidence, some of the students claimed themselves as slow learners and found M-learning to be difficult and challenging. These students also mentioned that they need constant instructor guidance throughout the M-learning process. Therefore, these findings are consistent with findings from Fournier, Kop, and Durand (2014), who stated that students with a lack of personal attributes will reflect on low self-direction and self-interest in one's learning and not all students have the ability to regulate cognition skills. Also, Azevedo and Cromley (2004) stated that the students reported with only basic technology knowledge are inadequate to do the online courses.

The third main finding of the post-reflective stage is the students' ability to adopt and evaluate their effort and strategies in completing the FutureLearn platform and task-centered activity successfully. Thus, these students developed more self-confidence in working independently to gain meaningful learning experiences. These activities permitted the students to face challenges, especially when they have to accomplish lessons and task with less supervision from their instructors and away from the classroom boundaries. Apparently, students were provoke to be self-directed learners as they set in positions to figure out solutions for the obstacles faced during learning in the M-learning platform and task-centered activity. Students evaluated that the M-learning empowered them to be self-directed learners as they gained more confidence out of this learning experience. At the end of this learning process, students developed self-confidence, self-discipline, love challenges, freedom for making their own decision, increased creativity and ability to use basic skills and problem-solving skills. These findings complement Rivenburg (2015) findings, which stated that learners' learning strategies in setting and attaining goal are essential in self-regulation of learning. When the learner become familiar with their own learning strategies, then they are more likely to apply the favored skills and strategies to the learning process. Also according to Rashid and Asghar (2016), the use of technology has a direct positive relationship with students' engagement and self-directed learning. Nevertheless, some students reported that they felt insecure and less confident when required to do the task without their instructor's physical supervision. Therefore, these students found that the role of the instructor as a facilitator smoothens the learning process, which is in line with what Rico and Ertmer (2015) mentioned about the role of the instructor as a facilitator in the M-learning platform. Hence, these reflective practices have pushed the students to think and comprehend the benefit of M-learning as well as increased SDL readiness. Despite, the lack of confidence and feeling of insecurity without instructor's support, the students managed to complete the task-centered activity successfully. This finding is consistent with Hsu (2017) on revealing the potential for self-directed learning and task-centered learning in developing effective learning. Besides that, this study corroborated with Ahmed (2019) study by employing Gibbs' reflective cycle to develop a reflective journal to help students reflect on the instructional practices. The findings of the study revealed that students preferred teaching strategies such as gradual teaching, exemplification, discussion, comprehension checking, cooperative learning, and graphic organization.

LIMITATION AND FUTURE STUDY

The present reflective practice has many limitations. It is also important to note that about half of the samples of this study were from a particular Higher Educational Institution (HIE). This results may not be generalizable to students at other HEIs or other contexts of learning. Regardless, one outcome that can be generalized is the fact that the students who participated in this study were adult learners. Furthermore, SDL readiness and Gibbs' reflective cycle were self-reported reflective practice writing, which may vary based on subjective bias. However, this study recommend determining the teaching needs and readiness among IT postgraduate students towards SDL in the M-learning environment. Further, since student's M-learning platform is a construct that can be improved, it is suggested that instructors should take into consideration other sources of M-learning and thus try to implement among students in real-time experiences. Moreover, the outcome from this study may help instructors focus on interventions that can foster the development of the cognitive skills of students which accommodate students' strengths and ability level.

CONCLUSION

The reflective practice at three different stages has given students' the insight to think about one's learning capabilities, thus gradually improving the SDL readiness in the M-learning platform. This study has found that reflective practice has a significant impact on increasing the postgraduate students' SDL readiness in M-learning platform and subsequently to perform any task-centered activity. Thus, it is an essential practice which allows the students to think about their own cognitive load. Hence, there are strong arguments for paying more attention to the adoption of SDL in higher education institutions to encourage lifelong learning. The SDL empowers the students to develop an ability to apply and acquire knowledge, recognize the problem and develop an appropriate solution using mobile tools for effective M-learning.

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CONTENT ANALYSIS ON THE GRADUATE THESES DONE ABOUT FLIPPED CLASSROOM MODEL IN TURKEY

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ABSTRACT

In this research, it is aimed to examine the graduate theses done about flipped classroom model in Turkey according to some variables. The data of this descriptive study which was conducted by a qualitative research approach was obtained from 105 master's and doctoral theses accessed from CoHE National Thesis Center database. The data were collected through document analysis and the data were analyzed by content analysis technique. According to the findings, it is determined that the theses were mostly done in 2019, most of the theses were made at Gazi University, the number of master's theses was more numerous, the studies conducted to examine the effect of flipped classroom model applications on various variables predominate, the model is mostly called as "Flipped classroom model" as in this study and mostly preferred in foreign language education, and in the part where the model is applied at home the most preferred online software is Edmodo. In addition, it was determined that mostly mixed methods were preferred as the research method, university students as sample group, interview form/questions as data collection tool, and "t test" in data analysis. At the end of the research, suggestions were made for researchers and for practitioners.

Keywords: Flipped classroom model, graduate thesis, content analysis.

INTRODUCTION

Today, there is a rapid change and transformation process in information and communication technologies. In this context, many components belonging to the social structure are affected by this process. It can be said that the individual comes first among these components. It is usual to have some expectations from the individual due to his/her social role. One of these expectations is to direct the public in line with the requirements along with keeping pace with the social structure. The individual who is expected to fulfill this duty should have a number of individual and social competencies. Accordingly, the quality of the education received by the individual comes into prominence as an important element.

Innovation efforts in education should also be individual and community oriented and respond to their needs. In this context, the rapid transformation experienced in technology has also reflections on education. Especially in curriculums, development and updating activities within the framework are experienced. The starting point of the mentioned studies has been what kind of an individual, and therefore what kind of a society. Accordingly, one of the questions that arise as a priority is the question of "what should we teach" In this context, the content of the "target" element which is one of the basic elements of the curriculum changes, accordingly the content, the teaching-learning process, and assessment-evaluation which are the other elements of the curriculum also change (Demirel, 2012). Along with the question "what should we teach", an answer was sought to the question "how should we teach".

In this regard, it is seen that technology-oriented practices, tools and materials are becoming widespread in the teaching-learning process. For example; e-learning, game-based learning, augmented reality, blended learning are some of them. In addition, one of the tendencies coming forward and being subject to many studies today is the Flipped Classroom Model (FCM) (Du, 2020; Subramaniam & Muniandy, 2019; Jdaitawi, 2019; Webb & Doman, 2020).

FCM is named as "Flipped Instruction" as well as "Flipped Classroom" in the literature (Seaman & Gaines, 2013, p.25). The concept also takes place in international literature as "Inverted Classroom, Reverse Teaching, Backwards Classroom (Baker, 2000; Brown, 2012; Lage, Platt & Treglia, 2000). Inverted is used in the meaning of "to reverse, to turn upside down, to flip" as a concept (Warren, 1999, p. 247). It is also used as "donusturulmus sinif (converted classroom)" and "tersine cevrilmis sinif (reversed classroom)" in Turkish (Demiralay & Karatas, 2014, p.337). In addition, it can be said that it is also expressed in various ways. However, it can be said that they are essentially the same.

As a concept, FCM is a blended learning model in which the aspect of transferring and discussing the content shared in the classroom is brought to the online environment and the activities expected to be carried out in the home environment are carried out to the classroom under the guidance of a teacher (Demiralay & Karatas, 2014, p.336). In the literature, it has been subject to many researches both experimentally and conceptually and its effectiveness has been started to be tested for different disciplines (Bursa & Cengelci Kose, 2020; Leo & Puzio, 2016; Ritzhaupt, & Sommer, 2018).

By the information and communication technologies becoming widespread in our lives, many new studies on FCM have been conducted in our country even in the last years (Akdeniz, 2019; Aydemir, 2019; Bolatli & Korucu, 2020; Calici, 2019; Demir, 2020; Dincer, 2020; Gokdemir & Gazel, 2019; Kaman, 2020; Nacaroglu, 2020; Ozaras Oz, 2019; Ozdemir, 2019; Secilmisoglu, 2019; Sogut, 2019; Sogut and Polat, 2020; Sik, 2019; Tekin, 2020; Tulay, 2019). When the literature is analysed, it was seen that especially the impact of FCM on various learning outcomes was focused in the studies (Bursa, 2019; Cakir & Yaman, 2018; Karagoz, 2019; Kocak, 2019; Sahin, 2019; Topan, 2019). In addition, some studies aiming to describe the situation related to the practices of the model also attract the attention (Cevikbas, 2018; Demiralay Yigit, 2014; Nacaroglu, 2020). Besides, there are studies examining the effectiveness of FCM practices integrated with different variables such as game, discussion etc. (Bolatli & Korucu, 2020; Cukurbasi, 2016; Fidan, 2019; Yilmaz, 2019). Along with these studies, it was also seen that there are some studies making design, practice and evaluation regarding FCM (Donmez, 2017; Ekmekci, 2014; Okmen, 2020).

In addition, there are studies examining the studies on FCM under a single roof (Aydin & Demirer, 2017; Cakiroglu & Ozturk, 2016; Kokoc & Altun, 2014; Ozbay & Sarica, 2019; Yildiz, Sarsar & Ates Cobanoglu, 2017), but it is considered that there is a need also for a study on the graduate theses carried out on FCM. As a matter of fact, graduate theses shed light on many future scientific studies to be conducted thematically and methodologically. From this point of view, it was aimed to determine the tendencies by examining the graduate theses done in Turkey about FCM according to some variables in this research.

When the graduate theses prepared in Turkey are evaluated; it was observed that besides the studies in question not having a standard conceptualization status related to the model, also a common practising process was not followed in many studies that were examined. Therefore, it is important to discuss and analyse the studies conducted in the literature as a whole in terms of establishing a standard which is both conceptual and regarding implementation process of the model. In addition, it has been tried to determine the tendencies in terms of the distribution of the tendencies related to the model by years, the university in which the study was conducted, the type of publication, the denomination of the study as concept, the purpose of the studies, the fields of study, the implications applied in the practising process, the study groups, the research methods applied, the data collection and the analysis of the data. Thus it was considered that the study will be a guide for those who are interested in the model and those who want to work on this subject in the issues such as the subject of study, the implementation form of the model and scientific research processes they will use. In this direction, in the study in which it is aimed to examine the graduate theses done about the flipped classroom model in Turkey according to certain variables, answers for the following questions were sought: accordingly as for the graduate theses done about FCM in Turkey;

1. How is their distribution according to years?
2. How is their distribution according to the universities in which they were conducted?
3. How is their distribution according to the type of publication?
4. How is their distribution according to the denomination of the FCM?
5. How is their distribution according to their objectives?

6. How is their distribution according to the field of study in which the FCM is used?
7. How is their distribution according to the monitoring/managing/interaction tools which are used in out-of-class digital environments for practical studies related to FCM?
8. How is their distribution according to the sample group?
9. How is their distribution according to the research method?
10. How is their distribution according to the data collection tools?
11. How is their distribution according to the data analysis techniques?

METHOD

Research Model

This study is a descriptive content analysis study, because of aiming to examine graduate theses done between 2014 and 2020 in line with the determined criteria and to specify the tendency in this subject. Descriptive content analysis is the systematic studies that include the discussion of studies conducted on a particular subject and evaluation of their tendencies and research results in a descriptive dimension (Calik & Sozbilir, 2014). In addition, the method of document analysis was applied in the collection of the data obtained in this study. Document analysis involves the analysis of written materials that contain information about the phenomenon or facts intended to be examined (Yildirim & Simsek, 2013).

Population and Sample

The population of the study is the graduate theses done about FCM in Turkey between 2014 and April 2020. Criterion sampling which is a purposeful sampling method was used as the sample in the selection of theses. Purposeful sampling allows for in-depth research by selecting information rich situations depending on the purpose of the study (Buyukozturk, Kilic Cakmak, Akgun, Karadeniz & Demirel, 2009, p.88). Criterion sampling method is the study of situations that meet a predetermined set of criteria (Yildirim & Simsek, 2013). Accordingly the literature was scanned for the graduate theses done about FCM in Turkey up to the present according to certain keywords within the scope of the research and the suitable theses were included in the research.

Collection of Data

The data of the study were obtained from master's and doctoral theses (graduate theses) accessed from CoHE National Thesis Center (YOK Ulusal Tez Merkezi) database in April 2020. While determining the theses, "ters", "tersine", "yuz", "duz", "ogrenme", "sinif", "cevrilmis", "donusturulmus", "model" words and their English meanings were used in the advanced search section of the CoHE National Thesis Center database, 110 theses which are suitable for the purpose of the study were listed, and among the listed theses 5 theses were not included in the study since being unavailable for access. Finally, 105 theses were included within the scope of the research.

Analysis of Data

The data obtained were analysed by content analysis technique. The basic process in content analysis is to combine similar data within the framework of certain themes and concepts and interpret them by organizing them in a way that the reader can understand (Yildirim & Simsek, 2013, p.259). For the analysis of the data, a graduate theses about FCM analysis form was created by the researchers. The content analysis directive used by Saban (2009) in the study was taken as a criterion in the mentioned form. For the purpose of the research, certain questions in the mentioned directive were changed. The examination form was put into its final form accordingly and the theses included in the study were analysed accordingly. The titles of the year, university, type of publication, name of the publication, purpose, field of study, monitoring/management/interaction tools used, target group, research method, data collection tool and data analysis technique with regards to the determined criteria took place in the form.

The analysis of the data was done according to the steps of the content analysis. These stages are coding data, finding themes, editing codes and themes, defining and interpreting the findings (Yildirim & Simsek, 2013). Graduate theses were analysed according to these steps. Before starting the coding process, some randomly selected theses were coded with the other two encoders according to the directive in terms of the consistency of the data encoded by the first researcher.

FINDINGS

In this section, findings reached as a result of the analysis of data obtained from graduate theses done about FCM in Turkey were given place. The data are presented in graphics.

Findings Regarding the Distribution of Graduate Theses according to Publication Year

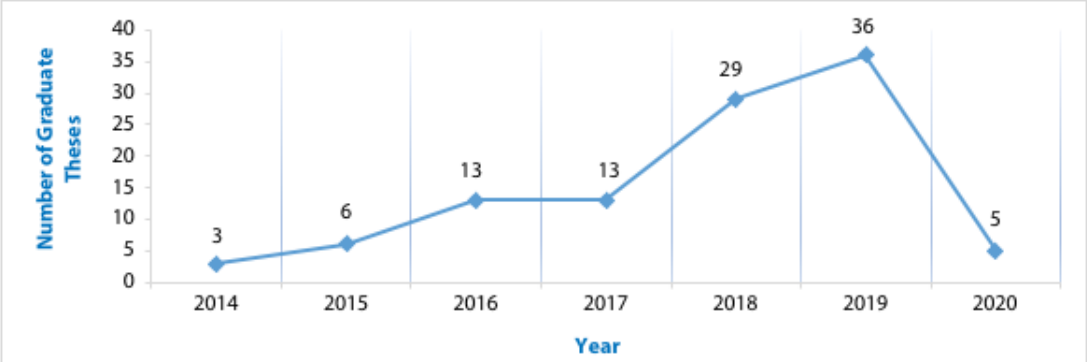

Figure 1. The distribution of graduate theses according to publication year

According to Figure 1 it is seen that the graduate thesis about FCM in Turkey started to be done in 2014, the studies on this subject has increased rapidly until today and in 2019 the number of theses has reached the highest level.

Findings Regarding the Distribution of Graduate Theses according to the Universities in Which They Were Done

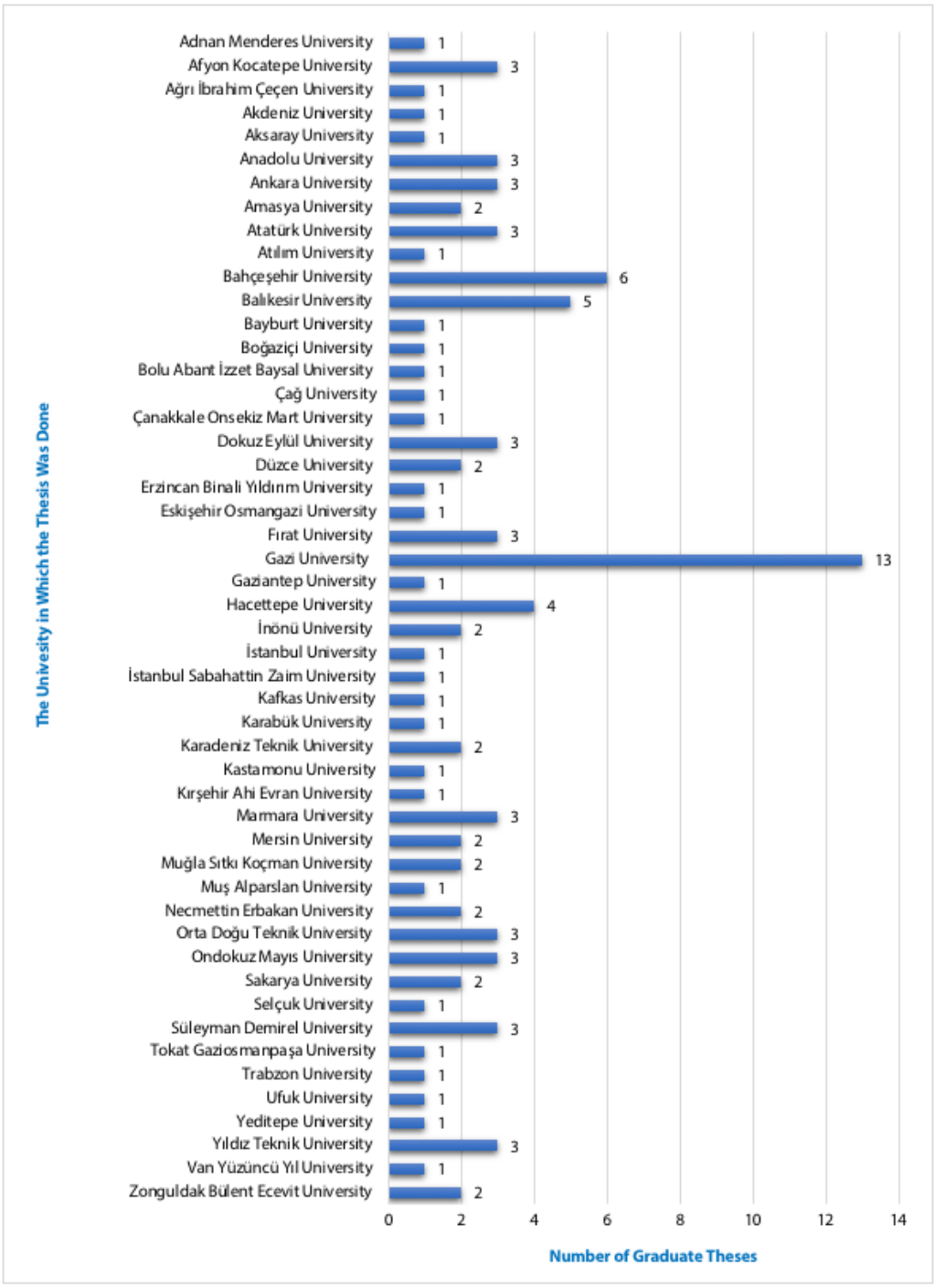

Figure 2. The distribution of graduate theses according to the universities in which they were done

When Figure 2 is examined; it is seen that graduate theses regarding FCM in Turkey was done mostly at Gazi University (f=13). This is followed by Bahcesehir University (f=6), Balikesir University (f=5) and Hacettepe University (f=4) respectively.

Findings Regarding the Distribution of Graduate Theses according to Publication Type

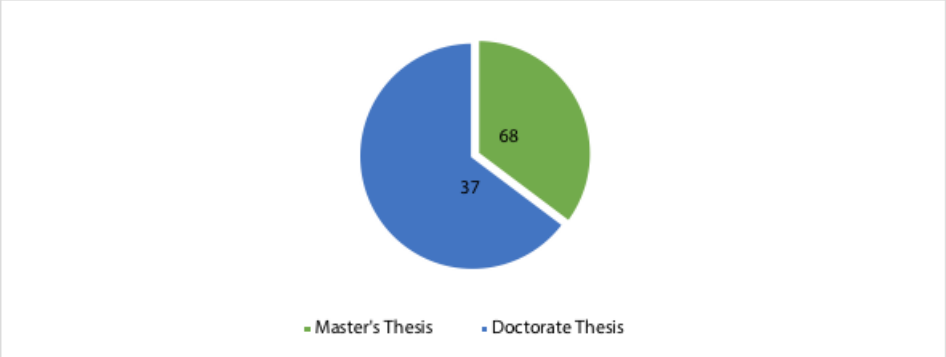

Figure 3. The distribution of graduate theses according to publication type

When the distribution of graduate theses according to publication type is examined; it is seen that 68 of the completed studies about FCM in Turkey is the master's thesis and 37 of them is doctoral thesis.

Findings Regarding the Distribution of Graduate Theses according to the Denomination of the Model

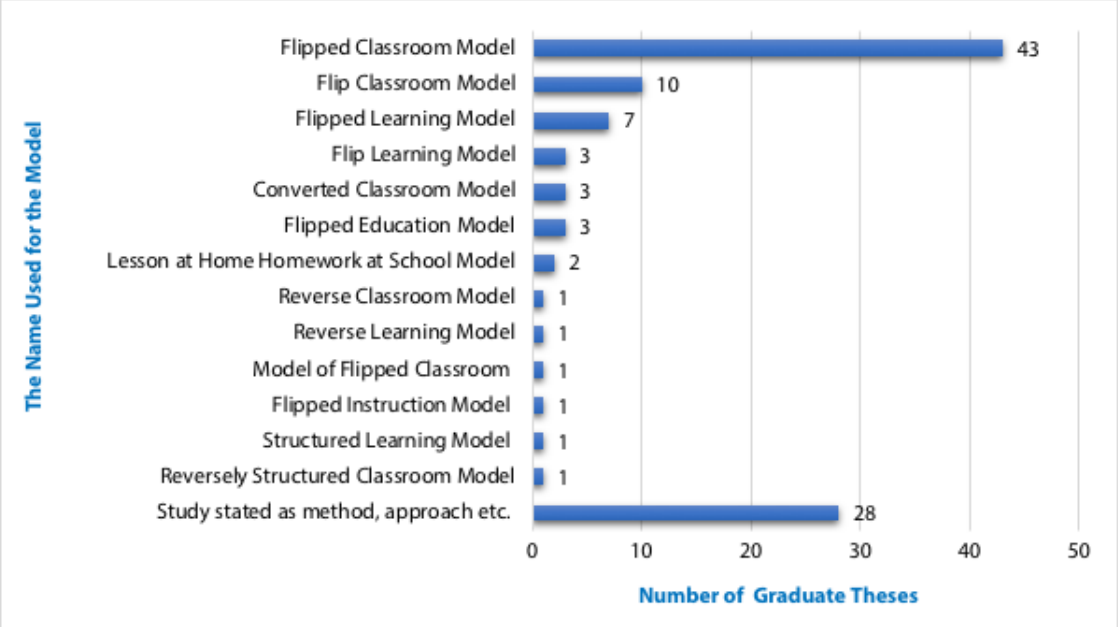

Figure 4. The distribution of graduate theses according to the denomination of the model

When Figure 4 is examined; it is seen that in the theses done about FCM in Turkey, this model is named in many different ways. While this model is mostly named as the "flipped classroom model" (f=43), it is also seen that expressions such as "flip classroom model" (f=10) and "flipped learning model" (f=7) are also used. In twenty-eight studies, the mentioned model was stated as method, approach, etc. It is expressed in figures.

Findings Regarding the Distribution of Graduate Theses according to Their Purposes

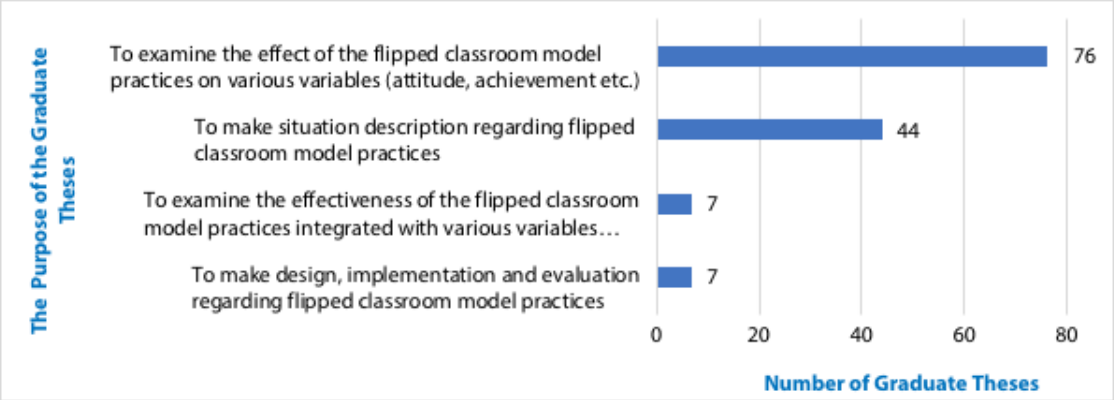

Figure 5. The distribution of graduate theses according to their purposes

When Figure 5 is examined; it is seen that most of the studies conducted about FCM in Turkey is aimed at the examination of the effect of FCM practices on various variables (f=76). It is seen that these are followed by the studies (f=44) aiming to make situation description related to FCM applications. It is also observed that studies examining FCM practices integrated with various variables (f=7) and studies making design, implementation and evaluation (f=7) regarding FCM practices are conducted as well.

Findings Regarding the Distribution of Graduate Theses according to the Field of Study in Which the FCM is Used

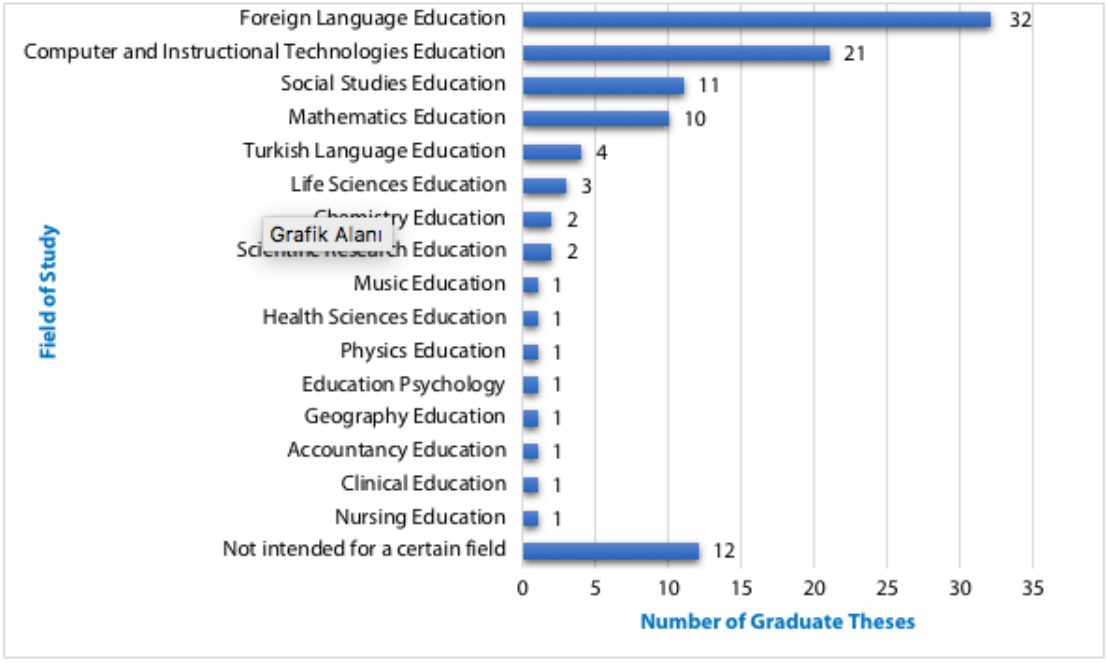

Figure 6. The distribution of graduate theses according to the field of study in which the fcm is used

When Figure 6 is examined, it is seen that the postgraduate theses (f=32) made for the use of FCM in foreign language education are the most in number. This is followed by computer and instructional technology education (f=21), social studies education (f=11), and mathematics education (f=10). In addition, it has been determined that there are also studies (f=12) which do not integrate FCM with a certain field.

Findings Regarding the Distribution of Graduate Theses according to the Monitoring/ Management/Interaction Tools Used in Out-of-Class Digital Environments

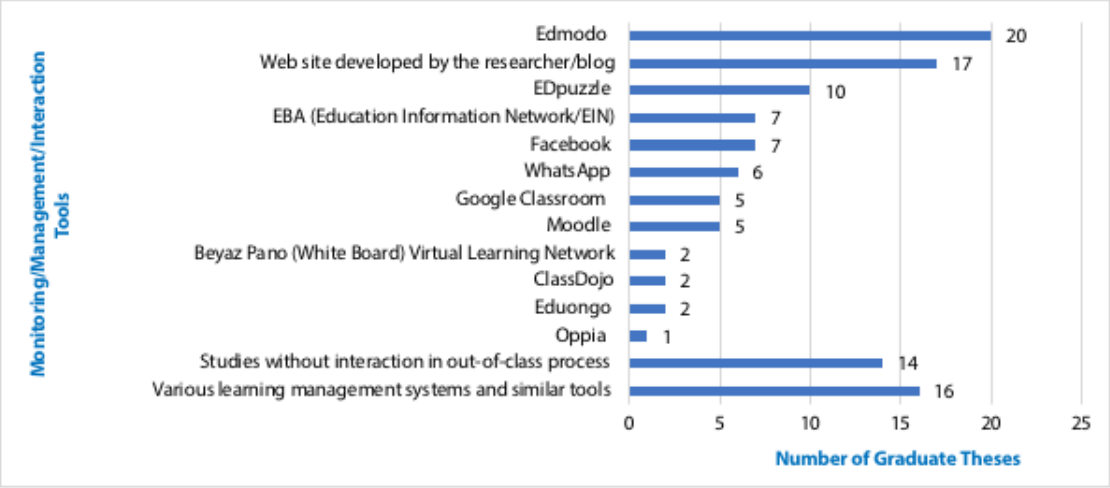

Figure 7. The distribution of graduate theses according to the monitoring/management/interaction tools used in out-of-class digital environments

When Figure 7 is examined; it is seen that Edmodo (f=20) is the most preffered tool as monitoring/ management/interaction tool in out-of-class digital environments used in applied studies conducted about FCM in Turkey. This is followed by tools such as the website/blog (f=17) which the researcher developed. Apart from this, besides various learning systems and other tools (f=16), there are studies without interaction in the out-of-class process (f=14), in other words, studies that do not include learner-instructor interaction in out-of-class learning activities. These studies are the studies in which the out-of-class process is the recording of the lecture part to any tool and the learners complete the out-of-class process from this record. Along with these, EDpuzzle (f=10), EBA (f=7), Facebook (f=7), WhatsApp (f=6), Google Classroom (f=5), Moodle (f=5) and other tools were also used respectively.

Findings Regarding the Distribution of Graduate Theses according to Sample Group

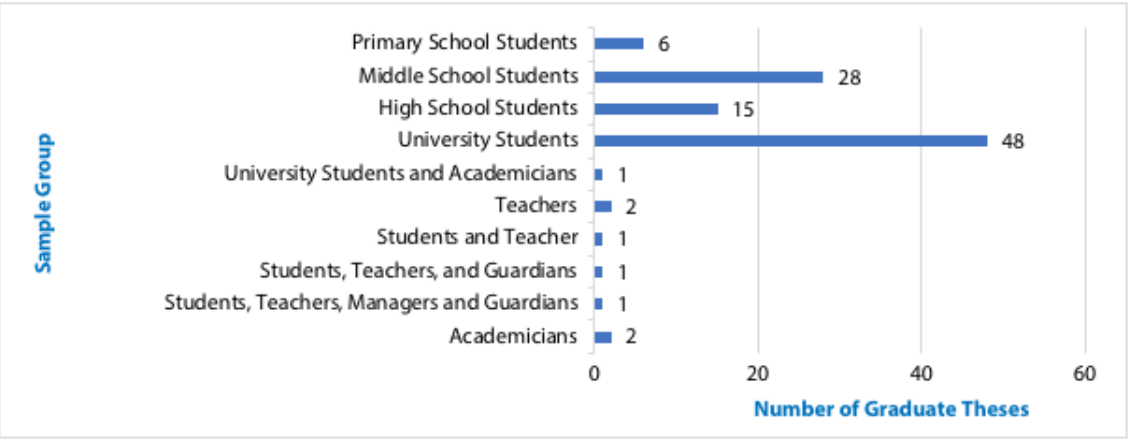

Figure 8. The distribution of graduate theses according to sample group

When Figure 8 is examined, it is seen that mostly university students (f=48) are preferred as the sample group according to graduate theses done about FCM. This is followed by middle school students (f=28) and high school students (f=15), respectively. It is also noteworthy that very few studies including teachers and academicians were conducted.

Findings Regarding the Distribution of Graduate Theses according to Research Method

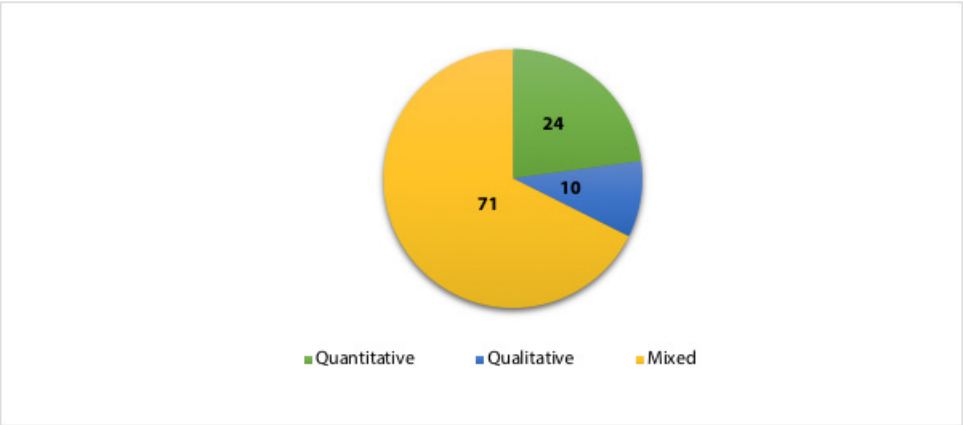

Figure 9. The distribution of graduate theses according to research method

When Figure 9 is examined; it is seen that mixed methods (f=71) were preferred the most as research method in graduate theses done about FCM in Turkey. This is followed by studies that prefer quantitative (f = 24) and qualitative (f = 10) methods respectively.

Findings Regarding the Distribution of Graduate Theses according to Data Collection Tools

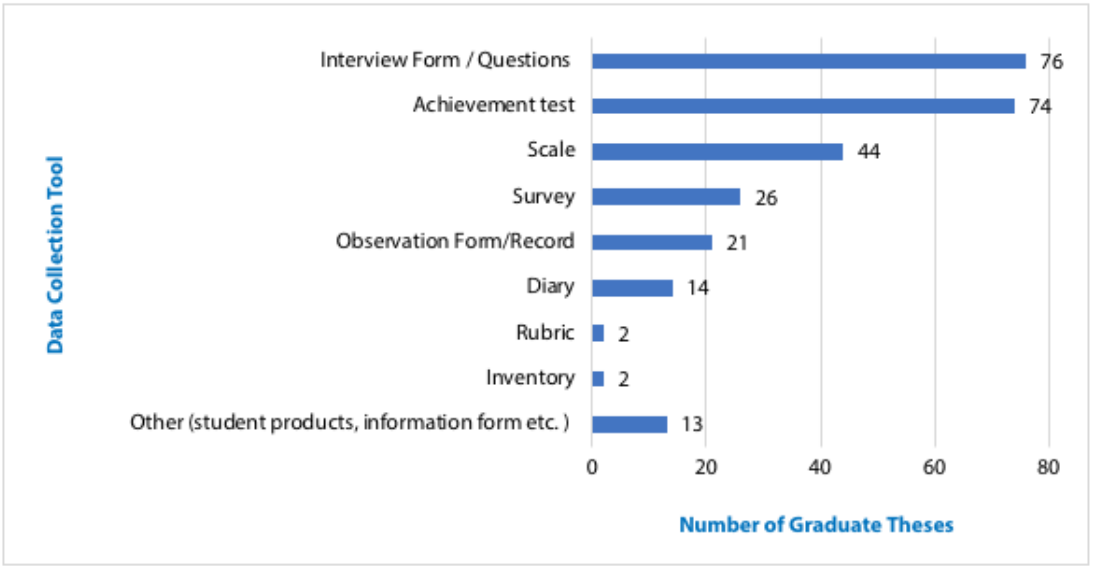

Figure 10. The distribution of graduate theses according to data collection tools

When Figure 10 is examined; it is seen that interview form/questions (f=76) are used the most as data collection tool in the studies related to FCM. Then, success test (f=74), scale (f=44), questionnaire (f=26), observation form/record (f=21), diary (f=14), rubric (f=2) and inventory (f=2) are preferred the most as the data collection tool in the studies on this subject.

Findings Regarding the Distribution of Graduate Theses according to Data Analysis Technique

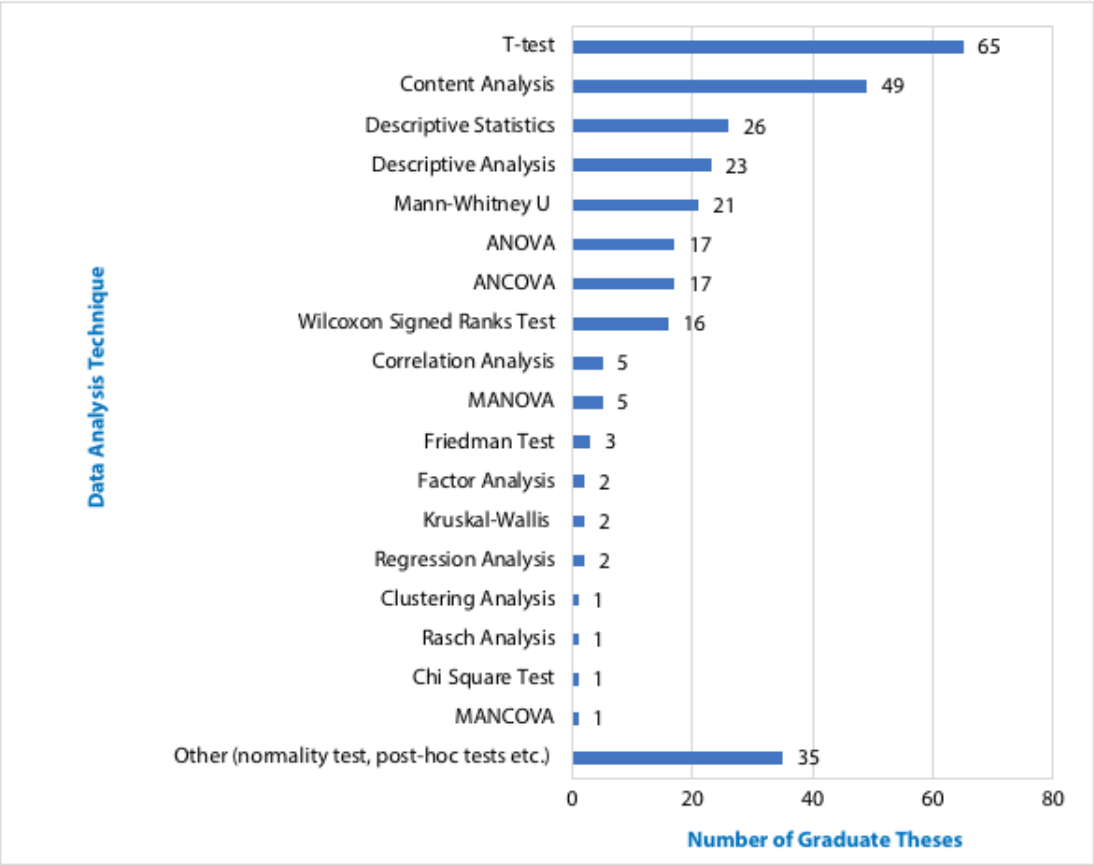

Figure 11. The distribution of graduate theses according to data analysis technique

When Figure 11 is examined, it is seen that "t-test" (f=65) is used the most as the data analysis technique in graduate theses done about FCM. This is followed by content analysis (f=49), descriptive statistics (f=26), descriptive analysis (f=23), Mann Whitney U (f=21), ANOVA (f=17), ANCOVA (f=17), Wilcoxon signed ranks test (f=16) and other tests.

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

When the findings obtained from the study in which graduate thesis done about FCM in Turkey were examined according to certain variables and the tendencies regarding the model were tried to be specified, are evaluated; it has been observed that the distribution of graduate theses made between 2014-2020 according to the publication year differentiates. Accordingly, the theses related to the model started in 2014, while a big increase is not observed until 2017, the biggest increase was observed between 2017-2018 that followed. The year 2019 has been the year with the highest number of theses among the years included in the research. It can be said that the spread of computer-aided applications in the context of technology integration in education as in every field in recent years has an effect on the formation of a tendency related to the model.

It has been observed that the graduate theses about FCM are done predominantly in Gazi, Bahcesehir, Balikesir and Hacettepe universities. It is considered that the reason for Gazi University being the university where the most studies on the model were conducted is because of the fact that FCM is implemented under the umbrella of computer and instructional technology education due to its subject field and the university has been conducting studies in this field for many years. In addition, when the distribution of graduate theses by type of publication is examined, it is seen that there are 68 studies at master level and 37 studies at doctorate level.

When the literature is examined, it is seen that FCM is mentioned by various names. It can be said that a standard has not yet been formed in terms of naming the model. When the distribution of the denomination of the model in graduate theses is examined; it was observed that it was mostly named as "flipped classroom model". This was followed by "flip classroom model" and "flipped learning model", respectively. Apart from this, when the Turkish literature is examined; it is seen that it was the subject of different studies with various names such as "Flipped Classroom System" (Gencer, Gurbulak & Adiguzel, 2014), "Inverted Learning Model" (Sever, 2014), "Lesson at Home Homework at School" (Demiralay, 2014), "Flipped Classroom Method" (Turan & Goktas, 2015), and "Reverse Education Practice" (Boyraz, 2014). As one of the reasons for the mentioned difference in the denomination of the model, it is considered that the model has not been fully clarified by the researchers in the context of the theoretical framework.

When the distribution of graduate theses related to FCM according to their purposes is examined; it has been seen that mostly there are studies examining the effect of practices related to FCM on various variables (attitude, achievement etc.). The reason for this was considered to be the fact that FCM being a new practice in the literature, eliminating the question marks regarding whether it has an effect especially on the academic achievement and attitudes of the learners is a priority. This was followed by studies in which situation descriptions related to the implementation of the model were. As for this, it can be said that besides a number of outputs of the model in terms of quantity, the views of different study groups regarding the implementation process are also considered important. Thus, a great majority of the studies was done by mixed pattern. Apart from these, there are also studies conducted for the effectiveness of FCM applications integrated with variables such as games, discussions, etc. In addition, there are studies conducted for the design, implementation and evaluation related to the implementation of the model as well. In this type of studies, it was tried to be evaluated especially how the model should be practiced in other words; which in-class and out-of-class components should be used in what way and what may their results be. Accordingly, in the study conducted by Cakiroglu and Ozturk (2016), it was specified that while "Academic Achievement" is the variable which was studied the most, "Perception, FCM Design and Implementation Principles" are frequently studied variables In addition, "Learning styles, Cognitive load, Attitude" were the least studied variables. Here, a different result has been observed in this research, especially in the context of "attitude". One of the main reasons for this is that Cakiroglu and Ozturk (2016) included theses mostly from foreign literature to their studies. Similarly, in the study conducted by Aydin and Demirer (2017), academic achievement was found to be the most examined variable.

When the distribution of graduate theses according to the field of study in which FCM was used is examined; it was seen that the model was implemented mostly in the field of foreign language education. This was followed by computer and instructional technology education. In the study of Ozbay and Sarica, (2019), it has been determined that FCM is mostly used in the field of foreign language education, supporting this finding. As it is known, the model is designed in two different ways: in-class implementations and out-of-class online components (Baker, 2000). In addition, FCM is formed from the combination of processes that require individual interaction and out-of-class implementations that involve a computer-aided teaching-learning process (Bishop & Verleger 2013). It is considered that the reason for studies being conducted predominantly related to this two disciplines is the curriculums of the mentioned courses being more appropriate for being taught by FCM within the context of both in-class implementations and out-of-class components of the model. Particularly, the need for computer-aided applications in the teaching-learning processes of the mentioned courses coinciding with the design and implementation processes of the model may be effective in the tendency to these disciplines. Apart from these two disciplines, it has been observed that the model is frequently used in social studies and mathematics education. In the study conducted by Aydin and Demirer (2017), it was observed that the studies were mostly in the field of mathematics and

then in the field of foreign language education. It can be said that in both studies, the disciplines which were studied the most are common in terms of two disciplines. On the other hand, Kokoc and Altun (2014) determined in their research that studies related to the Flipped learning method are intensified in the field of health sciences.

When the distribution of the applied studies on FCM according to the monitoring/management/interaction tools used in out-of-class digital environments is examined; it was seen that the application named Edmodo was preferred the most. Edmodo which is a learning management system, meeting the requirements within the context of out-of-class online components can be shown among the reasons for it being preferred. Besides, along with sharing the content related to the subject through the mentioned application, it is possible to carry out activities such as discussion and question-answer online together with the learners by homework and file sharing. In addition to all these, both the cost and the availability of the application can be counted among the reasons for the preference of the application by the researchers. It is seen that after Edmodo, the website / blog developed by the researcher and EDpuzzle are the other preferred software or applications respectively. Ozbay and Sarica (2019) revealed that researchers mostly preferred the Moddle environments in presenting the content. Kokoc and Altun (2014), on the other hand, found in the studies they examined that there is a tendency to utilize existing technologies instead of developing environment, tools and software to be used in the learning process, supporting these findings. One of the remarkable results obtained from the research data is that in some studies there is no learner-teacher interaction in out-of-class learning activities except from the mentioned tools. In other words, in some studies, out-of-class process of the learners was only in the form of conducting the study by benefiting from the record. It can be said this does not coincide with the essence of the model in the context of in-class practices (explain, expand, apply, practice) and out-of-class online components (lessons, subject discussion, quizzes) that Baker (2000) suggested related to the model. Hence, contrary to a model that has only one of the in-class or out-of-class components, this model will be fully benefited by using both implementation processes together at the same time in the context of their own subcomponents.

When the distribution of the graduate theses examined within the scope of the research according to the sample group is examined; it was seen that university students were preferred more in terms of sampling. In the study conducted by Aydin and Demirer (2017), it was seen that more studies were conducted with that group in the study in which graduate theses abroad were examined. Similarly, Ozbay and Sarica (2019) found that undergraduate students were preferred more in studies related to FCM. In their study, Kokoc and Altun (2014) determined that the majority of the studies were carried out at higher education level and mostly student performance and student perceptions were examined in order to decide on effectiveness. It is considered that these results areoriginated from the mentioned sample group; university students acting more consciously, especially in the use of the model's out-of-class online components in terms of both accessing the tools and equipments in the field of information and communication technologies and fulfilling the responsibilities expected of them.

It was seen that mixed method was preferred the most as the research method in the graduate theses done about FCM in Turkey. This was followed by qualitative and then quantitative research methods respectively. Due to the fact that the model has more than one component and implementation process, not only obtaining the data related to the variables such as academic achievement, attitude, but also obtaining the opinions of the study group regarding the model is quite important with regards to the evaluation of the model as a whole. Thus, it can be said that it is to the purpose to choose mixed methods in the research process. However, in certain studies similar to this in the literature, quantitative research methods were used more (Aydin & Demirer, 2017; Kokoc & Altun, 2014; Ozbay & Sarica, 2019). In addition, in the study conducted by Cakiroglu and Ozturk (2016), it was observed that experimental researches were preferred more and mixed method researches followed. Therefore, it is concluded that the researches that examine the researches abroad and the results obtained from these researches do not coincide with each other in terms of the preferred research method. Yildiz, Sarsar and Ates Cobanoglu (2017), on the other hand, revealed that qualitative methods were preferred the most in the studies related to the converted classroom.

When the distribution of graduate theses according to data collection tools is examined; it was seen that interview form and achievement test were preferred the most as the data collection tool. It can be said that this corresponds to the nature of the research methods used in theses. It can be stated that mentioned two

data collection tools were used in the studies in which both academic achievement and participants' opinions regarding the model should be obtained. Hence, it is thought that these data collection tools are used more. Other frequently used data collection tools were found to be scale, survey and observation form/record.

When the data analysis techniques used in graduate theses are examined; "t test" and "content analysis" were the most used analysis techniques. It can be said that "t test" was preferred because of being one of the most suitable techniques for testing academic achievement. In addition, in studies where both mixed and qualitative research methods are used, content analysis which is frequently used in the analysis of the qualitative data related to the model and one of the most appropriate analysis techniques is expected to be preferred. Besides, it is seen that the most frequently applied data analysis types were descriptive statistics, descriptive analysis and Mann-Whitney U.

Consequently, when the graduate theses done about FCM are examined; it can be said that FCM is started to be the subject of many researches depending on the rapid change and transformation process in the information and communication technologies. Since it is a current issue, it has been seen that there is no standardization in the conceptual dimension of the model. It can be said that the studies on the model in question mostly focus on academic achievement and attitude. And this is important in terms of the popularization and acceptability of the model in the literature. Through such studies, in addition to measuring the effect of the model on the teaching-learning process, a unity in the implementation can also be achieved by various and rich technology-based tools in terms of the model. Although its impact has been measured in terms of some disciplines and fields in the literature on FCM, there are many disciplines and areas whose impact has not yet been measured. Therefore, this deficiency should also be eliminated in terms of this model being widespread and acceptable. Conducting similar studies in this process can be a guide for future studies and can contribute to the conduct of studies with improved standards in this regard. With this study, it is tried to establish the general framework and contribute to the creation of tendency to the variables that are less studied.

Based on the results of the research; the following recommendations can be made to the researchers who will study on the model;

- This study is limited to the graduate thesis made about FCM in Turkey between 2014-2020. In future studies, graduate theses made nationally and internationally can be researched comparatively. Thus, by comparing different and similar phenomena, it can be contributed to the formation of standards in terms of different dimensions related to the model.
- By conducting research on both the conceptual and theoretical dimensions of the model, the formation of standards can be ensured in terms of both denomination and implementation dimension.
- Less studied subjects and disciplines can be studied contrary to the similar researches to previous researches.
- The reasons for preferring the monitoring/management/interaction tools used in out-of-class digital environments of the conducted studies and the ideal tools for the model can be researched.
- In order to spread the model and prove its feasibility, studies can be conducted on the problem and solution suggestions by working with the least studied sample groups.

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TURKISH ADAPTATION OF THE TRANSACTIONAL PRESENCE SCALE AND AN EXAMINATION OF ITS RELATIONSHIP WITH PERCEIVED LEARNING

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ABSTRACT

The main purpose of this study is to establish a valid and reliable Turkish version of the Transactional Presence Scale. The study also aims to determine whether learners' personality structures, age, sex, previous experiences of distance education and perceptions of transactional presence are significant predictors of their perceived learning. The study sample consisted of 467 students who received pedagogical formation training at Sakarya University and agreed to participate in the study. The study used the relational survey model, a general survey model based on the quantitative research paradigm. Data were collected using the Transactional Presence Scale, the Perceived Learning Scale and TIPI-Ten Item Personality Inventory. First, the transactional presence scale was adapted for use in Turkish. Following the validity and reliability tests of the Turkish version of the transactional presence scale, a multiple linear regression analysis was performed to determine whether learners' personality traits, age, sex, previous experience of distance education and perceptions of transactional presence were significant predictors of their perceived learning. The results showed that only institutional transactional presence was a significant predictor of perceived learning. Transactional presence perceptions of the learners in the study explained 29% of the total variance of their perceived learning.

Keywords: transactional presence, the transactional presence scale, big five personality traits, perceived learning, distance education.

INTRODUCTION

Communication and interaction are central factors in distance learning environments. Moore (1997) called the potential psychological distance that may occur between the learner and the teacher in distance education as transactional distance and listed the components that affect transactional distance as dialogue and structure. Therefore, in these learning environments, the learner does not only have a process of communication and interaction with the teacher. The learner may also have an internal process of communication and interaction with other peer learners, the content, the interface in which the course is delivered, the institution, and even themselves. The perceptions that will occur due to these processes may affect learning outcomes.

In the literature, depending on communication and interaction processes, learner perception is often associated with the concept of presence. In order to produce effective and efficient learning outcomes in a distance education system, internal factors such as learners' perceived learning, including learners' assessment of their own learning, and learners' personality traits can be effective as well as external factors such as learning environments and resources and student support services design. Accordingly, in order to better design distance learning environments and to construct meaningful, efficient and effective learning outcomes by better structuring educational processes, perceived learning, which is an important variable in the field of distance education (Albayrak, Gungoren and Horzum, 2014), and its variables should be examined in addition to the concept of presence.

According to the distance education literature on presences, the concepts of teaching presence, cognitive presence and social presence are the components of community of inquiry (Garrison, Anderson and Archer, 2000). Following the presences in the community of inquiry framework, Shin proposed the concept of transactional presence (TP) in 2001. TP is composed of teacher, peer student and institution TP components, and it is briefly described as distant learners' perceptions of connectedness and availability of these three components within a distance learning system.

In 2001, Shin developed a scale called "the Transactional Presence" to measure TP and its components. Shin (2001) associated TP with the components of learning achievement, satisfaction and intent-to-persist, which are outcomes of distance learning. In Turkey, there are currently no studies about TP. In this respect, it is crucial to adapt the TP scale for use in Turkish and to examine its relationship with perceived learning, which is an important component in distance education. Therefore, the primary aim of this study was to generate a valid and reliable Turkish version of the TP scale. The study also examined whether perceived learning, which is one of the important variables of distance education, is predicted by TP and whether learners' personality traits, age, sex, distance education experiences and perceptions of TP are significant predictors of their perceived learning.

LITERATURE REVIEW

Transactional Presence Theory

TP theory was developed by Namin Shin in 2001. TP is "the degree to which a distance student perceives the availability of, and connectedness with, teachers, peer students, and institution" (Shin, 2001, p. 124). TP theory consists of three main components: teacher, peer and institution TP. Each component has two sub-dimensions: availability and connectedness. Availability means that interpersonal relationships are responsive and that what is needed or desired is available on demand. In other words, it can be expressed as the availability/accessibility of teachers, other peer learners, the institution or the resources and services provided by these components for learners. Connectedness is the belief or feeling that a reciprocal relationship exists between two or more parties (Shin, 2003, p. 71).

Teachers' TP can be expressed as perceived supporters for cognitive learning, peer students' TP can be expressed as perceived supporters for affective learning, and institution's TP can be expressed as perceived interface with support services (Shin, 2001). Institutional TP plays a key role in distance learning. It is also essential that distance learners feel connected to the institution as well as having access to support services. If distance learners do not know about the types of services they can access, they will not be able to utilize these services, which makes it difficult for them to feel connected to the institution, and will be reluctant to express the support they need despite an important task/assignment (Shin, 2001, p. 160). In addition, institution's TP is related to students' expectations from the institution, interaction with the institution or perceptions of the staff working in the institution (Shin, 2001).

Starr-Glass (2013) stated that TP differs from social presence since social presence focuses on social interaction, collaboration and community building while TP focuses only on the concepts of availability and access (p. 124). Perceptual behaviors in an educational environment involve more than the closeness one feels to others and sharing time and space. In this sense, Shin's work brought together the existing perceptions of learners in learning and teaching transactions in an inclusive manner and revealed its sub-dimensions.

Big Five Personality Traits

The big five personality model is considered to be a comprehensive measure by experts to determine personality traits (Horzum, Ayas and Padır, 2017). The big five model consist of extraversion, agreeableness, conscientiousness, neuroticism and openness to experience personality traits. *Extraversion* refers to a person's demonstration of sociable, assertive, talkative, active personality characteristics, in other words, not being shy or reserved (Gosling, Rentfrow and Swann Jr, 2003). *Agreeableness* is about interpersonal relationships and refers to the individual's participation in interpersonal cooperation and the degree to which he or she approves this cooperation (Horzum et al., 2017). *Conscientiousness* refers to not being careless or impulsive,

and being hardworking, responsible and self-disciplined (Gosling et al., 2003). *Neuroticism* refers to emotional instability. *Openness to experience* indicates the tendency to participate in intellectual activities and to be open to new feelings and thoughts. Openness to experience is, in a way, related to intellectual interest, aesthetic sensitivity, imagination, flexibility and non-traditional attitudes (Horzum et al., 2017).

Perceived Learning

While actual learning reflects the exchange of information defined by a meticulously prepared learning measurement tool, perceived learning refers to self-reporting, in other words self-reporting based on some internal observations and reflections of the student (Bacon, 2016). Caspi and Blau (2008) defined perceived learning as set of beliefs and feelings one has regarding the learning that has occurred. Perceived learning derives from two sources: *cognitive* source and *socio-emotional* source. The cognitive source reflects new knowledge acquired (even if knowledge and meaning are inaccurate), a new meaning acquired, and a perception of other cognitive processes. The socio-emotional source refers to experiences and feelings (e.g. having difficulty or enjoying), interacting (e.g. talking with other students or a teacher), or a sense of innovation/discovery related to the course of study (Caspi and Blau, 2008). Briefly, perceived learning can be defined as one's beliefs about his or her learning based on self-evaluation.

Relevant Studies

A review of the literature suggests that there are many studies on social, teaching and cognitive presence in relation to the community of inquiry theoretical framework, whereas there are only few studies on TP. In her study of distance education students' perceived learning achievement, satisfaction and intent-to-persist about their courses of study, Shin (2003) stated that distance learners' institution TP predicted all the variables specified for distance learning achievement. She further discussed that peer TP was significantly correlated with satisfaction and intent-to-persist about the course of study variables, and that teacher TP was only associated with the students' perceived learning. In their study of the TP perceptions of two separate groups, Naylor and Wilson (2009) found no differences between online and traditional teaching environments/tools with respect to student perceptions. The authors also argued that ethnic identity or sex did not play a central role on the students' satisfaction about their communication with peers or faculty. Shin and Chan (2004) investigated the direct and indirect effects of online learning on distance education, and they found a significant relationship between the students' perceptions of institutional presence and satisfaction, persistence in the program, and learning outcomes. In the light of these points, we could suggest that if students feel stronger availability of and connectedness to the agents/institution delivering the course of study, the learning outcomes will be more positive, they will be more satisfied with their learning experiences and they will be more willing to persist in distance learning than those with low institutional presence. In this respect, courses should be tailored to the needs of students, and a distance education program or institution should be in constant communication with its students. Samuel (2015) stated that flexibility, responding to student needs, being available and approachable to students were important factors, and that students needed a variety of types of support, such as direct answers to their questions, as well as linking to content resources and support services, tutorials. Samuel (2015) also found that the faculty participants felt disengaged due to their lack of immediate feedback from their students, lack of physical clues was a major problem for them and this affected their emotional connections with their classes. Poellhuber, Racette and Chirchi (2012) examined students' interests in lessons and their perceptions of teacher and peer TP in videoconference courses offered in three different distance education institutions. The authors found that the videoconference lessons improved perceptions of teacher TP in all the aspects considered in the study, but there were some differences between the institutions regarding teacher and peer students TP. In addition to the effects of the differences in the way teachers conduct their lessons in videoconferencing environments, the difference in interaction needs of the students in these three institutions could have caused the difference among these three institutions. According to Samuel (2015), students need to get feedback from the teacher in order for them to feel connected to the teacher and the lack of feedback also affects their sense of connectedness with the class. Belaja, Boon Sai, and Wei Lin (2012) investigated the relationship between distance learners' perceptions of teacher TP and motivations for learning English through distance education

and found that distance learners' high levels perceptions of teacher TP were associated with higher levels of intrinsic motivation. Belaja, Boon Sai, and Wei Lin (2012) further argued that teachers needed to recognize learners' needs and expectations regarding the teacher availability and connectedness, which directly affects learners' perceptions of teacher TP. Therefore, according to Belaja, Boon Sai, and Wei Lin (2012), teachers should respond to the e-mails and questions from learners immediately and actively participate in student blogs, chat rooms and discussion forums, and this could increase learners' intrinsic motivation to learn English through distance education.

A review of the literature suggests that there are only few studies on TP perceptions in distance learning environments. Also, these studies mostly address teacher TP. According to the findings obtained from Shin's studies, institutional TP is considered as the most effective factor in these studies. In the relevant literature in Turkish, there is currently no measure for TP and there are currently not any studies to correlate TP with learning outcomes.

METHODS

Research Model

Two separate models were used in the study: a scale adaptation model and a relational survey model. The scale adaptation model involved the language translation and equivalence work and validity and reliability tests of the scale. The relational survey model is a research model that aims to determine the presence and/or degree of changes that occur at the same time between two or more variables (Karasar, 2010. p. 81). The relational survey model was used in this study to examine whether personality structures, age, sex and distance education experiences as well as TP perceptions are predictors of perceived learning, which is an important variable in distance education.

Population and Sample

The target population of the study was composed of 2.200 students who received pedagogical formation training at Sakarya University Faculty of Education in 2014-2015 spring semester. The study sample initially consisted of 530 students who received pedagogical formation training at the faculty of education for the departments of Turkish Language and Literature, Sociology, Philosophy, Theology and History and who voluntarily completed the scale. The final sample was selected using maximum variation sampling, which is a non-probability sampling technique, to ensure a wide variety of participants. Because 61 participants submitted incomplete scale forms, their forms were not analyzed and the study was finally conducted with 467 participants. The characteristics of the participants are given in Table 1.

Table 1. Demographic characteristics of participants

		n	%	Min-Max
Sex	Female	312	67.83	
	Male	148	32.17	
Age	21-23	110	30.90	21-40
	≥ 24	246	69.10	
Distance education experience	Yes	174	39.37	
	No	268	60.63	

Data Collection Tools

Data were collected using a 56-item instrument consisting of three measures: the 37-item TP scale developed by Shin (2001) and adapted for use in Turkish by the researcher, the nine-item perceived learning scale developed by Rovai, Wighting, Baker and Grooms (2009) and adapted for use in Turkish by Albayrak, Gungoren and Horzum (2014), and the Ten Item Personality Inventory (TIPI), which is a 10-item scale of

the big five personality traits scale developed by Rammstedt and John (2007) and adapted for use in Turkish by Horzum, Ayas and Padır (2017). The data collection tool also collected data about the participants' sex, age and previous experiences of distance education.

Perceived Learning Scale

The Perceived Learning Scale developed by Rovai et al. (2009) and adapted for use in Turkish by Albayrak et al. (2014) was used in the study. The scale is a nine-item scale that consists of three factors for measuring cognitive, affective and psychomotor learning. Items 2 and 7 in the scale are inversely scored. In the original version of the scale, respondents indicate their agreement with each of the statements among the options ranging from "Not at all" (1) to "Very much so" (7). As a result of the confirmatory factor analysis (CFA) conducted by Albayrak et al. (2014), the three-factor structure of the scale was confirmed by the fit values χ^2/sd=1.43, GFI=0.94, CFI=0.96 and RMSEA=0.059. The item load values of the scale ranged from 0.62 to 0.86. As a result of the reliability analyzes, the Cronbach's alpha internal consistency coefficient was found to be 0.83 for all the items of the scale, 0.65 for the cognitive learning, 0.66 for the affective learning and 0.72 for the psychomotor learning. These results indicated that the scale could be used as a valid and reliable measure for use in Turkish (Albayrak et al., 2014).

Ten-Item Personality Inventory

The study also employed the TIPI, which is a 10-item version of the big five personality traits scale developed by Rammstedt and John (2007) and adapted for use in Turkish by Horzum et al. (2017). The scale consists of five dimensions each of which has two items: extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience. As a result of the CFA conducted by Horzum et al. (2017), the validity of the factor structure of the scale was confirmed by the fit values χ^2=46.139, RMSEA=0.062, GFI=0.96, AGFI=0.91, CFI=0.98, NFI=0.97 and SRMR=0.035. The item load values of the scale ranged from 0.706 to 0.946. As a result of the reliability analyzes, the internal consistency and composite reliability values of the scale were found to be 0.88 and 0.83 respectively for extraversion, 0.81 and 0.73 respectively for agreeableness, 0.90 and 0.85 respectively for conscientiousness, 0.85 and 0.79 respectively for neuroticism, and 0.84 and 0.78 respectively for openness to experience. These results showed that the scale could be used as a valid and reliable measure for use in Turkish culture (Horzum et al., 2017).

Transactional Presence Scale

The TP scale developed by Shin (2001) was adapted for use in Turkish in this study. Based on the concepts of availability and connectedness, Shin (2001) developed a 64-item TP scale in order to determine the perceptions of distance learners about TP of teacher, other peer learners and the institution as well as their satisfaction and intent-to-persist about the course studied. The original version of the scale included five scales for distance learners' perceptions of teacher, peer and institution presences and their satisfaction and intent-to-persist about the course of study as well as demographic questions. The scale items included expressions such as "I believe" and "I feel" so that respondents' subjective thoughts could be reflected. Responses to the scale items were given on a five-point Likert scale: (1) Strongly Disagree, (2) Disagree, (3) Neutral, (4) Agree, and (5) Strongly Agree. The validity and reliability tests of the scale were conducted with 506 distance learners enrolled at the National Open University of Korea.

Shin (2001) first published the TP scale with a total of 71 items. Among the items, 15 were about learners' perceptions of institution TP of Korea National Open University, 15 were about their perceptions of teacher TP and 15 were about their perceptions of peer students TP. The scale also had eight items about students' experiences with the university to determine their satisfactions and six items were about students' future studies at the university to determine their intent-to-persist in their courses of study. The remaining 12 items were about students' demographic characteristics. Validity and reliability analyzes were performed on 59 items except the last 12 items. First, 59 items were evaluated by experts in the field of distance education. After this step, in order to determine whether each item in the scale reflected the definitions given for the purposes of the study, the items were grouped under relevant themes and evaluated by a total of 10 subject

experts at different universities, and if all the expert evaluations of an item were 80% or above, those items were included in the scale. Following all the evaluations and exclusions, a 51-item TP scale was generated for measuring teacher, peer and institution TP and satisfaction and intent-to-persist about the course of study. A pilot study was conducted for the generated scale and, during the pilot study, the scale items were firstly translated from English to Korean and then back to English. For the validity test, exploratory factor analysis (EFA) and varimax rotation were performed. According to the results for the teacher, peer and institution TP scales, the teacher TP scale consisted of three factors. The six items representing Factor 1 represented teacher availability, and Factor 2 and Factor 3 constituted teacher connectedness dimension. A total of three factors were found to explain 60.8% of the total variance of the teacher TP scale. The peer TP scale had a two-factor structure. Factor 1 represented peer connectedness and Factor 2 represented peer availability, and these two factors accounted for 69.6% of the total variance in the peer TP scale. The institution TP scale had a three-factor structure like the teacher TP scale. Factor 1 represented institution availability, Factor 2 and Factor 3 represented institution connectedness and explained 65.4% of the total variance. To summarize, the factor structures of the TP scale developed by Shin (2001) are as follows:

Table 2. Distribution of the sub-dimensions and factors of the TP scale

	Availability	Connectedness
Teacher TP	Factor 1	Factor 2 + Factor 3
Peer TP	Factor 2	Factor 1
Institution TP	Factor 1	Factor 2 + Factor 3

According to the reliability analysis results, the reliability coefficients of the five scales in the TP scale were 0.83 for intent-to-persist/persistence in the course of study, 0.85 for institution TP, 0.88 for teacher TP, 0.94 for peer TP, and 0.94 for satisfaction.

Once the validity and reliability of the 51-item scale were ensured, by adding 13 more items about respondents' demographic characteristics in accordance with the purposes of her study, Shin (2001) developed a 64-item measure called "the Transactional Presence Questionnaire". The first part of the instrument consisted of 13 items about students' experiences with teachers to determine their perceptions of teacher TP at Korean National Open University. In the second part, there were 13 items about students' experiences with their peers at the university to determine their perceptions of peer TP. Eleven items in the third part were about students' experiences with the institution to determine their perceptions of institution TP. In the fourth part, there were 8 items about students' perceptions of satisfaction and all their experiences at the university. In the fifth section, there were six items about students' future plans at the university in order to determine their intent-to-persist in their courses of study. The last part included 13 items about respondents' demographic characteristics. In line with the purposes of the current study, the first 37 items (items of the first three parts of the scale about teacher, peer and institution TP) of the 64-item TP scale developed by Shin (2001) were selected for use in this study. Items 46 and 47, the last two items of the scale used in the study for institution TP, are reverse items, so they were included in analyzes after they were reverse coded.

Procedures

The procedures followed for adapting the TP scale for use in Turkish were performed in two stages. The first stage included English-to-Turkish translation, expert opinions about the face validity and content validity, and linguistic equivalence work. In the second stage, the scale was administered to 467 students, and construct validity, criterion validity and reliability analyzes were performed.

In line with the purposes of this study, the first 37 items of the original version of the TP scale were selected and translated into Turkish by the researcher. The researcher also prepared a form with enough space for each of the original items, the translated items and suggestions for possible revisions. This form also provided "Acceptable", "Unacceptable" and "Acceptable after revision" options and was sent to five faculty members with expertise in educational technology for their comments. The minimum level of agreement adopted was

80% in order for each of the translated items to be accepted. Items under this level were revised in line with the suggestions received. Following the revisions, the scale was sent to the same experts again and, this time, all the items were found to be acceptable.

After ensuring the face validity and content validity of the scale based on expert opinions, the next step was linguistic equivalence work to determine whether the translated version was equivalent to the original scale. For the linguistic equivalence work, both the original scale and the Turkish translated version of the scale were administered 15 days apart to 32 students of Sakarya University Faculty of Education who were fluent in both languages. After that, the correlation between the scores obtained from the two forms was examined. The correlation value between the total scores obtained from the Turkish and English forms of the scale was found to be 0.68. The correlation coefficients of each item and three factors of the scale are given in Table 3.

Table 3. Correlation coefficients of the items and sub-factors of the scale

Item	r	Item	r	Item	r
m1	0.798	m14	0.629	m27	0.867
m2	0.813	m15	0.793	m28	0.702
m3	0.707	m16	0.675	m29	0.712
m4	0.756	m17	0.512	m30	0.648
m5	0.708	m18	0.724	m31	0.471
m6	0.768	m19	0.854	m32	0.695
m7	0.718	m20	0.614	m33	0.605
m8	0.727	m21	0.656	m34	0.811
m9	0.714	m22	0.665	m35	0.873
m10	0.500	m23	0.628	m36	0.672
m11	0.771	m24	0.584	m37	0.672
m12	0.833	m25	0.739		
m13	0.706	m26	0.910		
Teacher TP	0.731	Peer TP	0.790	Institution TP	0.600

As can be seen in Table 3, there was a medium-to-high significant relationship between the items and sub-factors of the original and Turkish-translated versions of the TP scale. As a result, we concluded that the Turkish adapted version of the scale was linguistically equivalent to the original version.

For the construct validity, criterion validity and reliability analyzes in the second stage, the translated version of the scale was voluntarily completed by 467 students who received pedagogical formation training at Sakarya University Faculty of Education for the departments of Turkish Language and Literature, Sociology, Philosophy, Theology and History. In order to examine the construct validity of the scale, the scale structure was examined using EFA. Next, CFA was performed to confirm this structure. For the criterion validity, the relationship between the scores of the TIPI and the scores obtained from the TP scale was examined with Pearson's correlation test. In order to determine the reliability of the scale, Cronbach's alpha internal consistency coefficient was calculated for the three factors in the TP scale. EFA, Pearson's correlation test and reliability analysis were performed using SPSS version 22 and CFA was performed using AMOS version 22.

Also in this study, whether students' personality structure, age, sex, distance education experiences and perceptions of TP were significant predictors of perceived learning were examined using the data collected with the Turkish version of the TP scale, which was already tested for validity and reliability. Multiple linear regression analysis was performed using SPSS version 22.

In this study, assumptions that should be met for multiple linear regression analysis were tested first. The existence of a linear relationship between the result and the predictor variables was checked and shown with a multiple scatter plot (Figure 1) and single scatter plots (Figures 2-10). In addition, values for the relationships between the variables are given in Table 4.

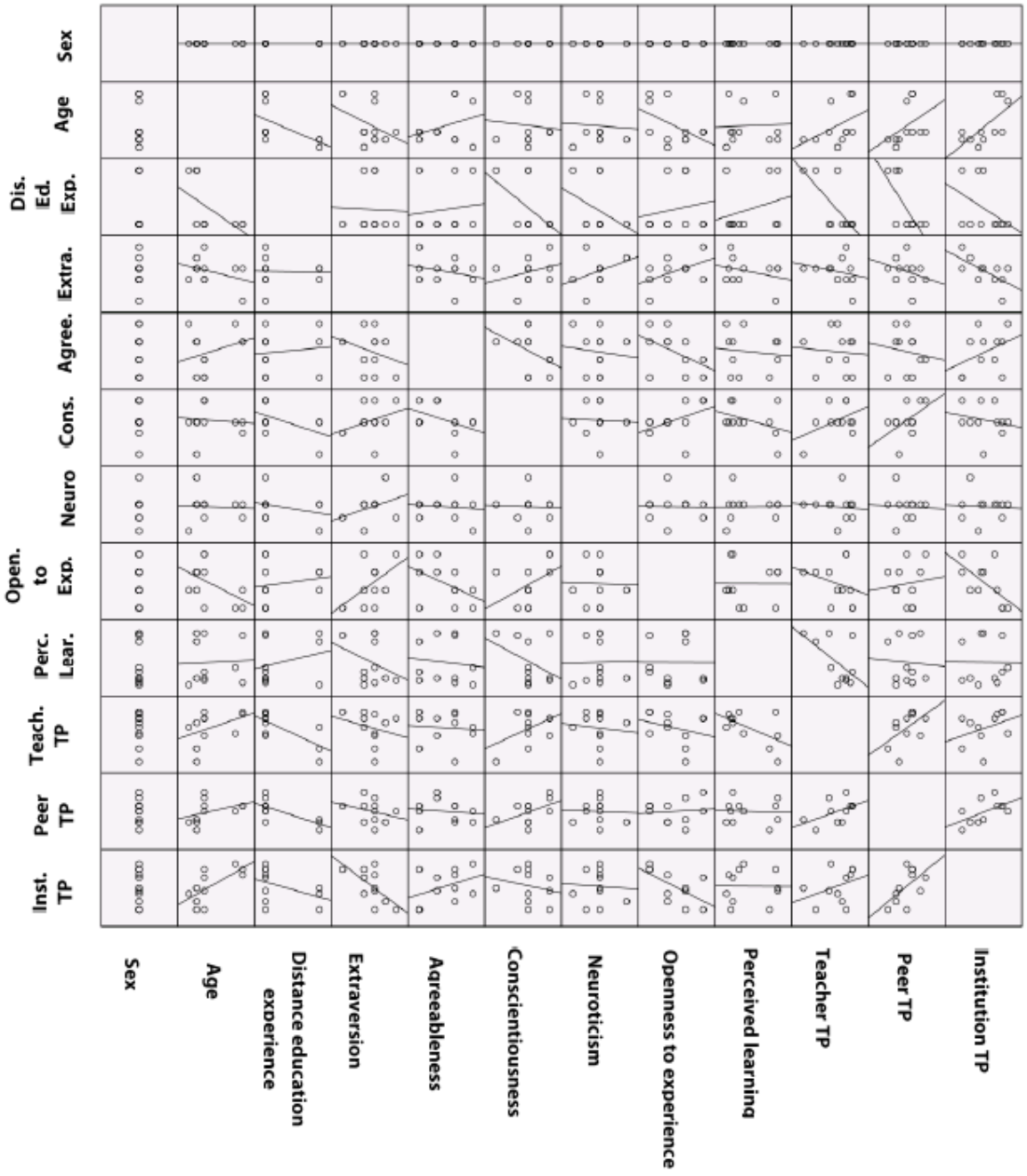

Figure 1. Multiple scatter plot for the variables in the regression model

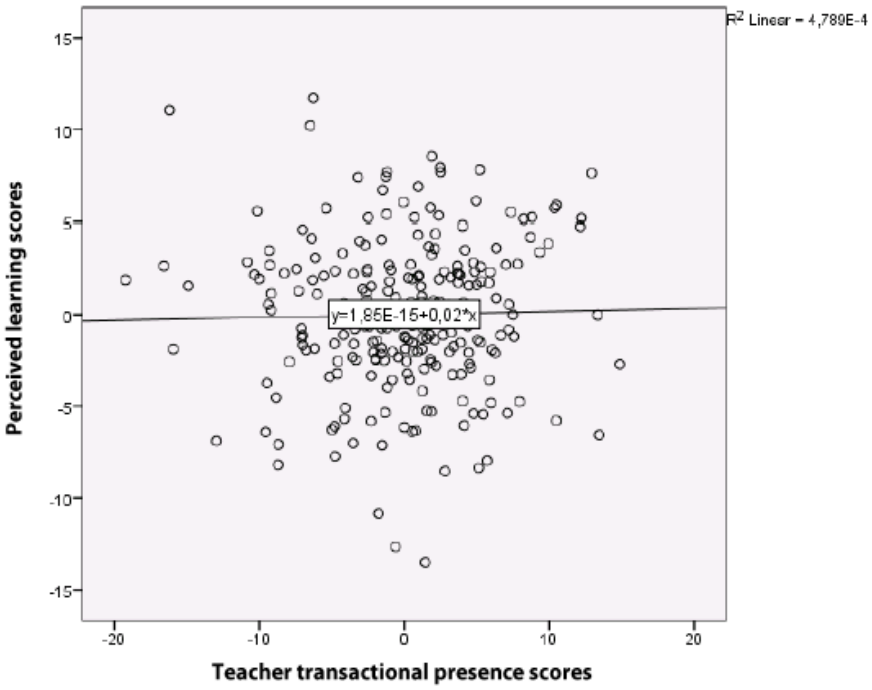

Figure 2. Scatter plot of the relationship between perceived learning and teacher transactional presence

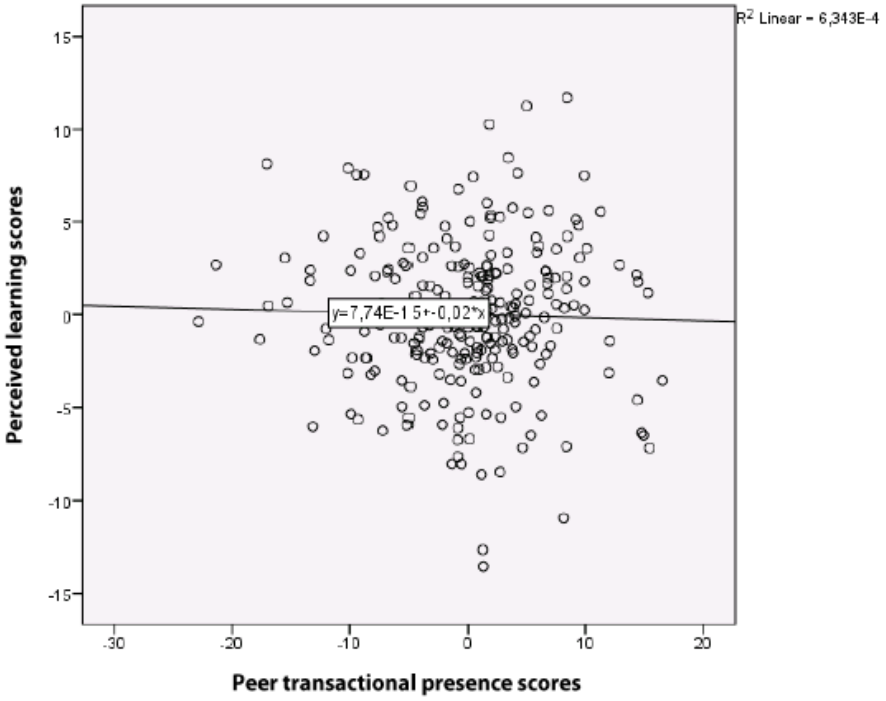

Figure 3. Scatter plot of the relationship between perceived learning and peer transactional presence

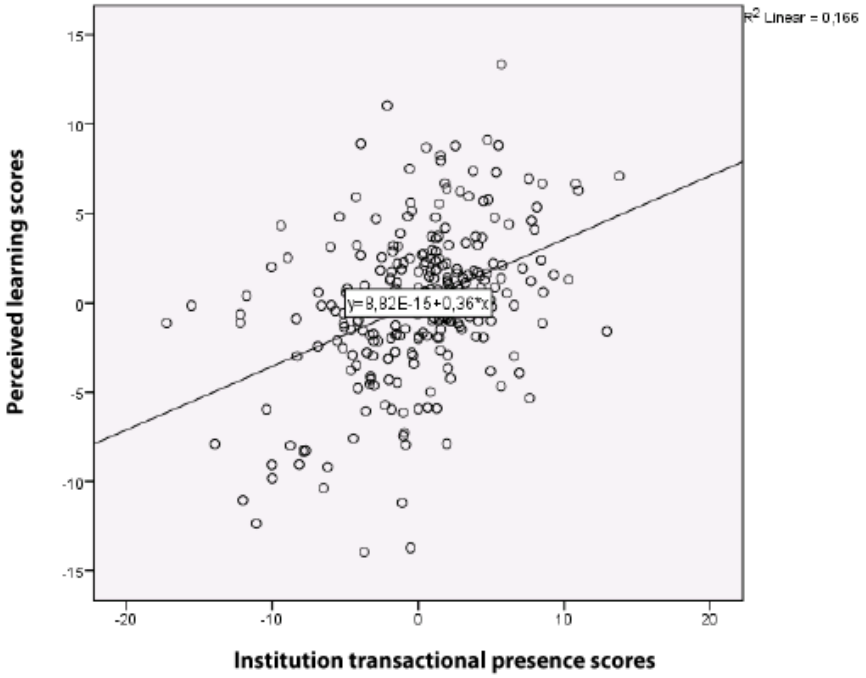

Figure 4. Scatter plot of the relationship between perceived learning and institution transactional presence

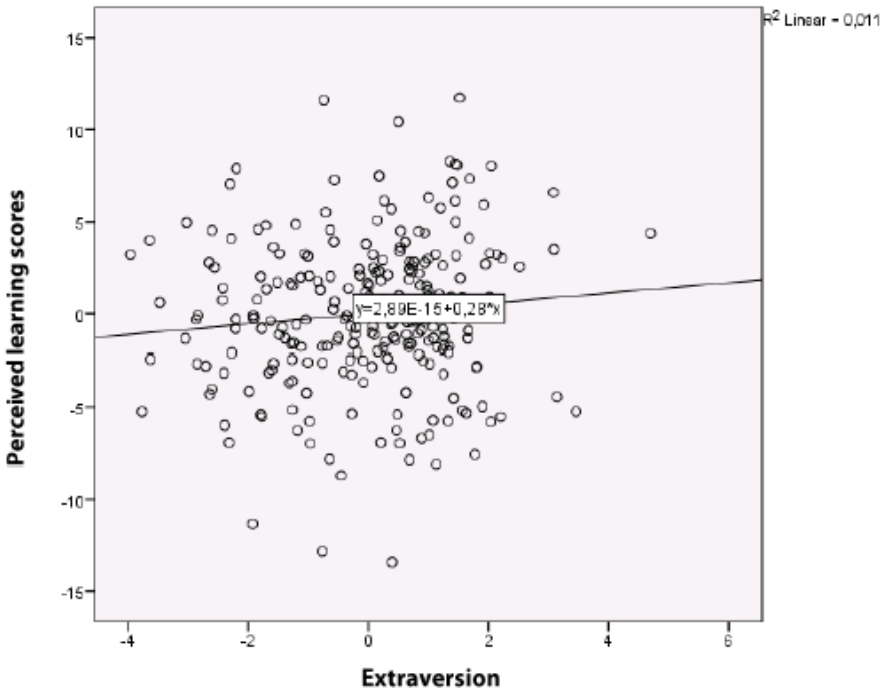

Figure 5. Scatter plot of the relationship between perceived learning and extraversion

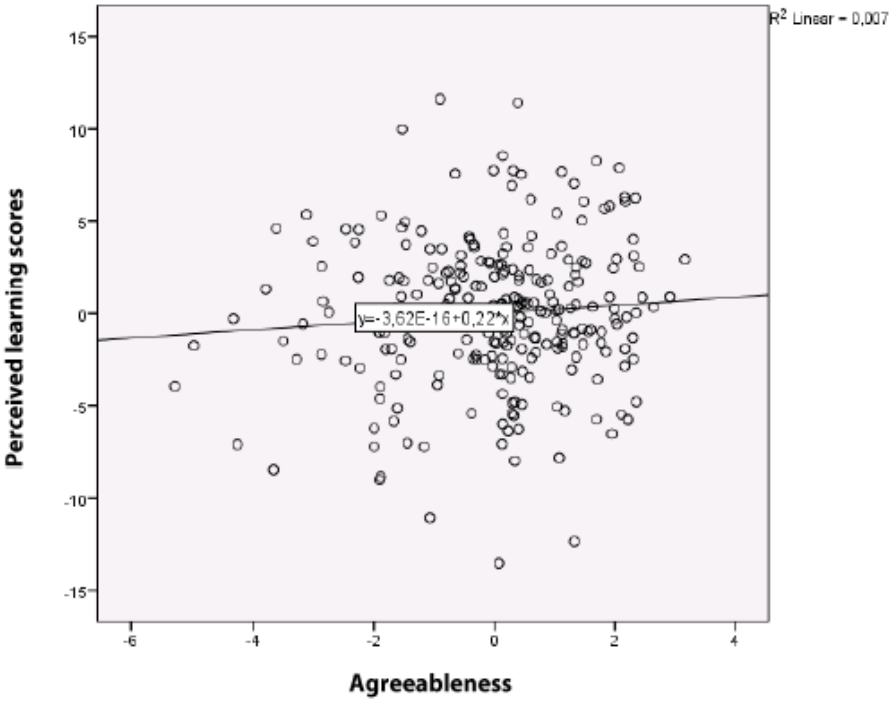

Figure 6. Scatter plot of the relationship between perceived learning and agreeableness

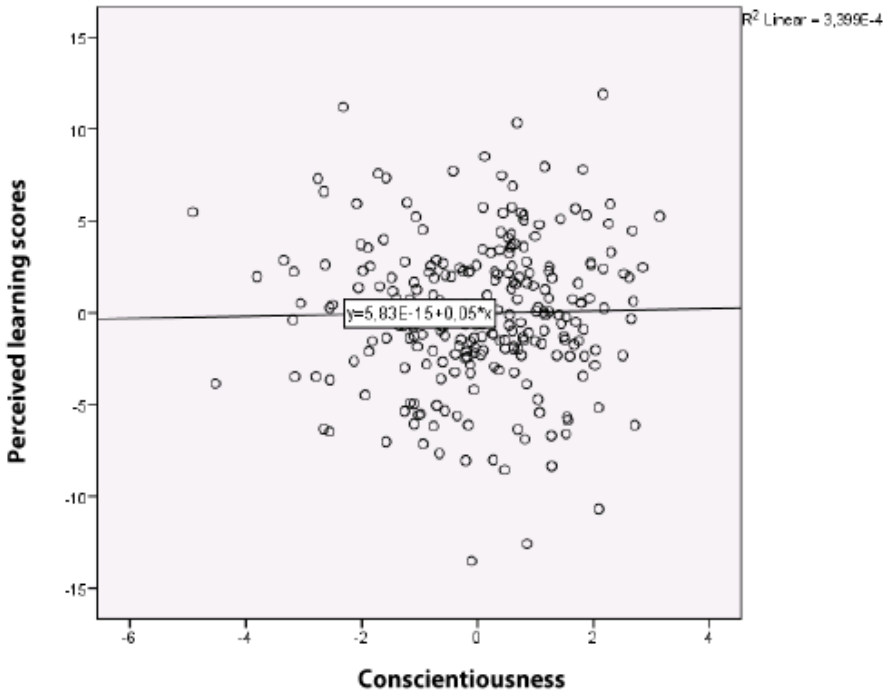

Figure 7. Scatter plot of the relationship between perceived learning and conscientiousness

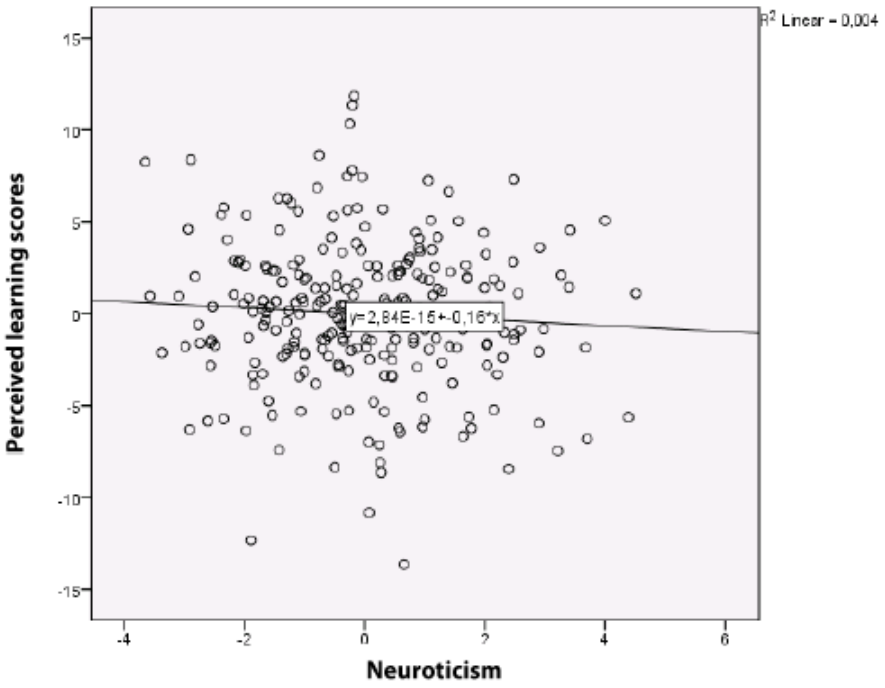

Figure 8. Scatter plot of the relationship between perceived learning and neuroticism

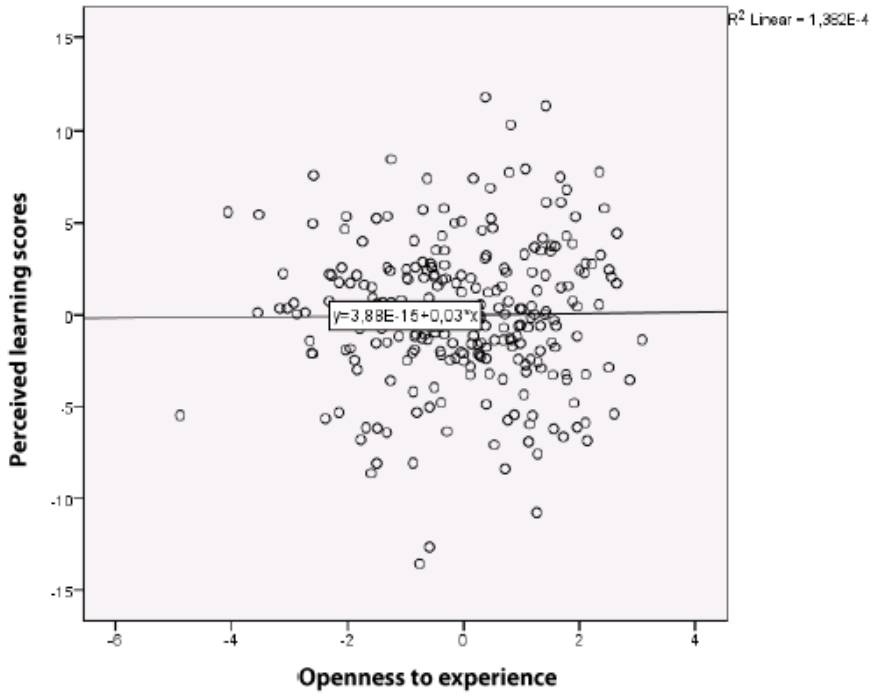

Figure 9. Scatter plot of the relationship between perceived learning and openness to experience

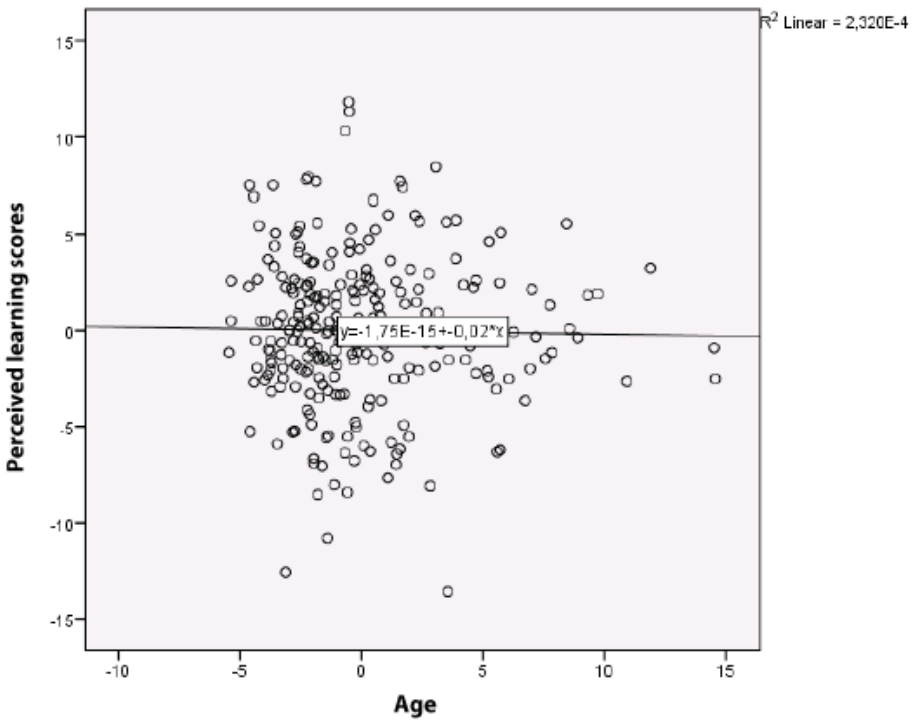

Figure 10. Scatter plot of the relationship between perceived learning and age

Table 4. Pearson's correlation test showing the relationships between the variables in the regression model

n=260	1	2	3	4	5	6	7	8	9	10	11	12
1. Perceived learning	1.000	0.368**	0.269**	0.536**	0.216**	0.156**	0.201**	-0.170**	0.121*	0.095	0.102	0.050
2. Teacher TP		1.000	0.438**	0.625**	0.237**	0.094	0.270**	-0.263**	0.232**	-0.059	0.241**	0.089
3. Peer TP			1.000	0.468**	0.327**	0.085	0.270**	-0.121*	0.101	0.022	0.122*	-0.025
4. Institution TP				1.000	0.177**	0.117*	0.216**	-0.186**	0.137*	-0.021	0.225	0.069
5. Extraversion					1.000	0.078	0.451	-0.196	0.253	0.023	0.050	-0.012
6. Agreeableness						1.000	0.102	-0.052	0.086	0.128*	0.005	-0.045
7. Conscientiousness							1.000	-0.065	0.245**	0.190**	0.064	-0.035
8. Neuroticism								1.000	-0.110*	0.086	-0.140*	-0.061
9. Openness to experience									1.000	-0.019	0.036	-0.015
10. Sex										1.000	-0.153**	-0.070
11. Age											1.000	0.061
12. Distance education experience												1.000

p<0.05, p<0.01***

Also, homoscedasticitiy, normal distribution (randomness) of errors, and perfect multicollinearity between the variables were tested. Findings regarding the relevant tests are shown in Figure 11-12-13 and Table 5.

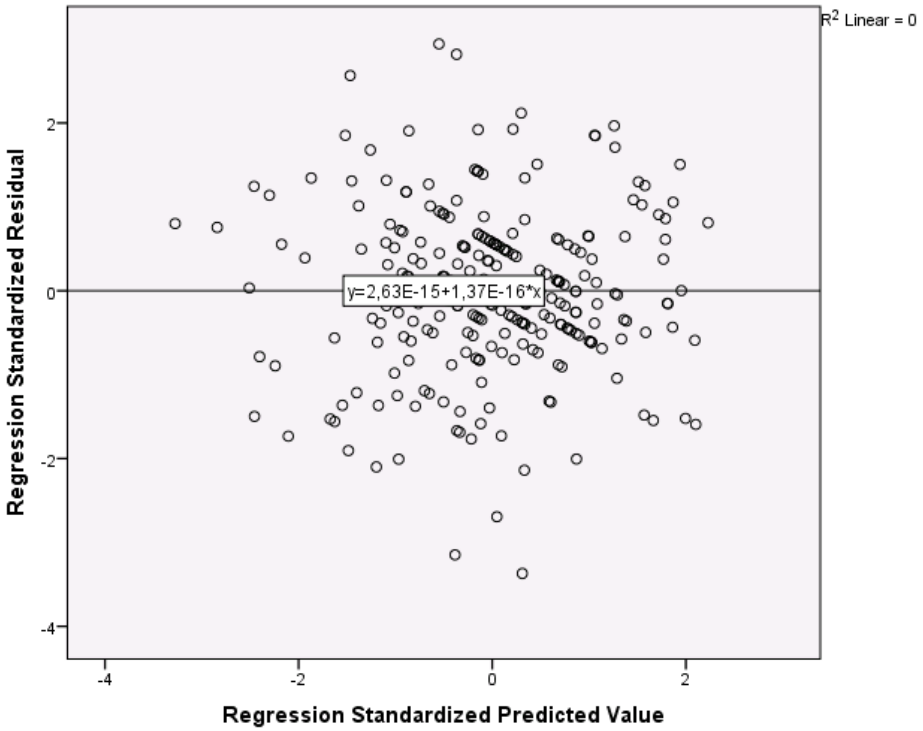

Figure 11. Scatter plot of standardized residual

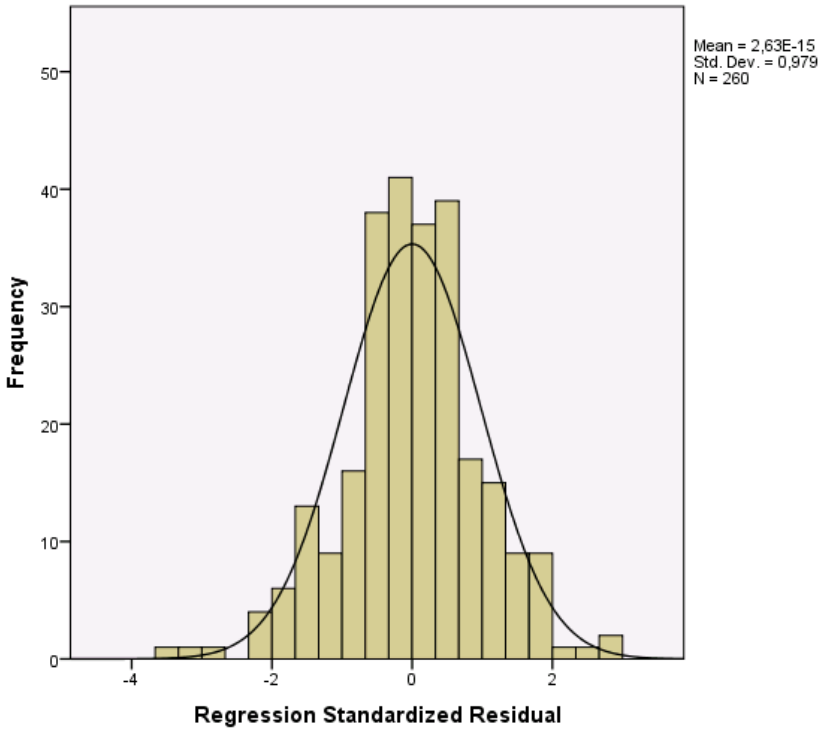

Figure 12. Histogram of standardized residual

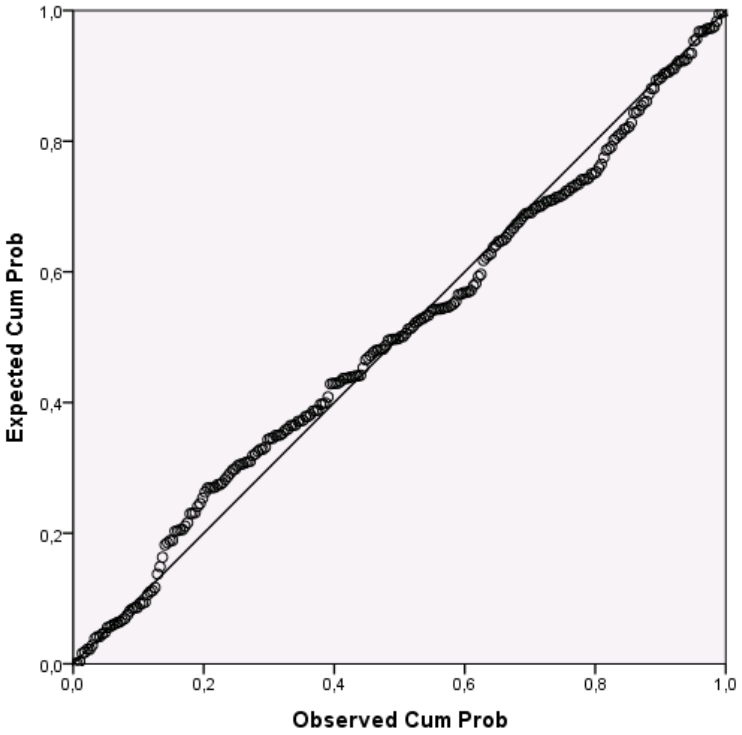

Figure 13. P-P graph of standardized residual

Table 5. Parameters for the regression model

Model		Non-standardized coefficients		Standardized coefficients			95% confidence interval for B		Correlations			Collinearity statistics	
		B	Standard Error	Beta	t	*p*	Lower limit	Upper limit	Zero order	Partial	Segmented	Tolerance	VIF
1	Constant	16.210	3.067		5.285	0.000	10.169	22.251					
	Teacher TP	0.016	0.045	0.025	0.345	0.731	-0.074	0.105	0.368	0.022	0.018	0.527	1.897
	Peer TP	-0.015	0.038	-0.025	-0.397	0.692	-0.090	0.059	0.269	-0.025	-0.021	0.687	1.455
	Institution TP	0.356	0.051	0.493	7.014	0.000	0.256	0.456	0.536	0.407	0.366	0.552	1.810
	Extraversion	0.280	0.171	0.102	1.642	0.102	-0.056	0.616	0.216	0.104	0.086	0.710	1.408
	Agreeableness	0.222	0.163	0.073	1.363	0.174	-0.099	0.542	0.156	0.086	0.071	0.959	1.043
	Conscientiousness	0.050	0.173	0.018	0.290	0.772	-0.291	0.392	0.201	0.018	0.015	0.710	1.409
	Neuroticism	-0.162	0.155	-0.058	-1.050	0.295	-0.467	0.142	-0.170	-0.067	-0.055	0.894	1.118
	Openness to experience	0.031	0.170	0.010	0.185	0.853	-0.303	0.366	0.121	0.012	0.010	0.881	1.135
	Sex	0.993	0.561	0.097	1.769	0.078	-0.112	2.098	0.095	0.112	0.092	0.906	1.104
	Age	-0.017	0.071	-0.013	-0.240	0.811	-0.157	0.123	0.102	-0.015	-0.013	0.906	1.104
	Distance education experience	0.218	0.513	0.022	0.425	0.671	-0.792	1.229	0.050	0.027	0.022	0.976	1.025

a. Dependent variable: perceived learning

Finally, a multiple linear regression analysis was performed based on testing and verifying the assumptions.

RESULTS

In the presentation of the results, mainly the results from the scale adaptation procedure were presented. This part of the study includes the results of EFA performed to determine the structure of the scale in Turkish students and the results of CFA performed to determine whether the scale structure was confirmed in the research sample. This part also presents the reliability test results and the results of the Pearson's correlation analysis performed between TIPI scores and TP perceptions in order to examine the relationship between TP perceptions and personality traits, an important variable in the field of distance education (Busari, 2017; Randler, Horzum & Vollmer, 2014; Siddiquei & Khalid, 2018; Bhagat, Wu & Chang, 2019; Bayram, Deniz & Erdogan, 2008; Bahcekapılı & Karaman, 2015) as they were taken as criteria for TP. This part finally presents the results of the multiple linear regression analysis performed on the data obtained using the Turkish version of the TP scale.

EFA Results

The TP scale consists of three main dimensions: teacher TP, peer TP and institution TP. In other words, the 37-item TP scale consists of three scales: teacher, peer and institution TP scales. For this reason, EFA was conducted for each dimension, and the results were presented below.

EFA Results for the Teacher TP Scale

EFA was performed on the 13 items in the teacher TP scale. Kaiser-Meyer-Olkin (KMO) test was used for sample adequacy and Bartlett's Sphericity value was used to examine the fitness of the data for factor analysis. KMO value was found to be 0.898 in the analysis. Since this value was between 0.8 and 0.9, the sample was found to be adequate (at a good level) for factor analysis (Kaiser, 1974). Bartlett's Sphericity test showed that the relationship between the variables was significantly different from 0. and it was concluded that EFA could be performed with the data (χ^2 =2248.773; p<0.001). In the factor analysis, varimax axis rotation was performed on 13 items and a principal components factor analysis was performed with an eigenvalue of 1. These steps were preferred in factor analysis because it was expected that there would be no relationship between the factors of the scale and varimax rotation had also been performed in the original scale (Shin, 2001). The analysis results showed that the scale consisted of three factors. It was also observed that the eigenvalue-factor number graph confirmed the three-factor structure. Table 6 shows the results of EFA.

Table 6. Principal components and varimax rotation EFA results for the teacher TP scale

Item	Factor variances	Pre-rotation factor load values			Post-rotation factor load values		
		1	2	3	1	2	3
14	0.714	0.766	-0.355		0.810		
15	0.682	0.746	-0.353		0.793		
13	0.666	0.710	-0.375		0.779		
16	0.657	0.781			0.728	0.314	
12	0.589	0.693			0.695	0.319	
11	0.511	0.649			0.684		
18	0.646	0.674	0.347			0.752	
17	0.542	0.559	0.433			0.716	
19	0.547	0.641				0.675	
20	0.452	0.524	0.398			0.644	
21	0.517	0.623	0.359			0.624	
23	0.721	0.402		0.727			0.828
22	0.640	0.486	0.378	0.510		0.339	0.717
Eigenvalue (Total=7.884)					5.398	1.444	1.042
Explained variance (Total=60.642)					41.522	11.107	8.013

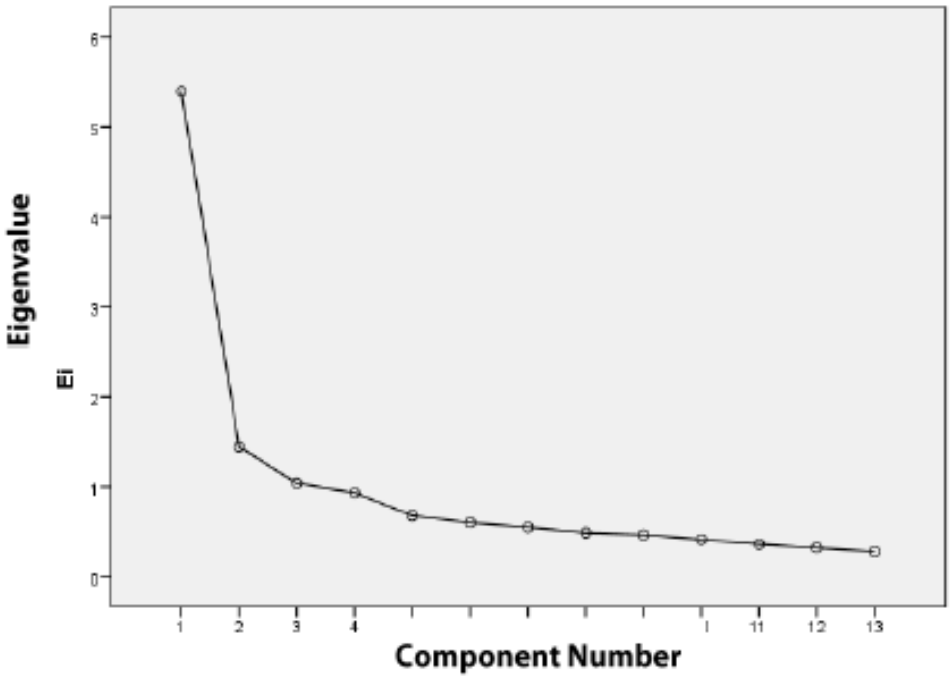

Figure 14. Teacher TP EFA scree plot

The analysis results showed that the eigenvalue of the first factor of the three-factor scale was 5.398 and the variance explained was 41.522%. The eigenvalue of the second factor was 1.444 and the variance explained was 11.107%. The eigenvalue of the third factor was 1.042 and the variance explained was 8.013%. The total eigenvalue of the scale was 7.884 and the total variance explained was 60.642%. This result suggests that the variance explained by the scale adequately explained the quality that was measured. In addition, the factor structure of the original scale exhibited a similar structure among Turkish students. In the original scale, the first factor represented teacher availability, which made up the sub-dimensions of teacher TP, while the second and third factors represented teacher connectedness. All the items in the Turkish version of the TP scale were found to be compatible with the sub-factors of the original scale and were included in the same factor groups within the same cluster. As a result, the 13 items and three sub-factor structure in the Turkish version of the teacher TP scale had similar properties to the original form.

EFA Results for the Peer TP Scale

EFA was performed on the 13 items in the peer TP scale. KMO test was used for sample adequacy and Bartlett's Sphericity value was used to examine the fitness of the data for factor analysis. KMO value was found to be 0.928 in the analysis. Since this value was between 0.8 and 0.9, the sample was found to be adequate (at a good level) for factor analysis (Kaiser, 1974). Bartlett's Sphericity test showed that the relationship between the variables was significantly different from 0. and it was concluded that EFA could be performed with the data (χ^2 =3473.349; $p<0.001$). In the factor analysis, varimax axis rotation was performed on 13 items and a principal components factor analysis was performed with an eigenvalue of 1. These steps were preferred in factor analysis because it was expected that there would be no relationship between the factors of the scale and varimax rotation had also been performed in the original scale (Shin, 2001). As a result of the analysis, it was found that some items had load values on more than one factor after varimax rotation. Table 7 shows the first EFA results. Buyukozturk (2011, p. 125) recommended that the difference between the two high load values should be at least 0.10 when eliminating the items that do not measure the same structure in factor analysis. Therefore, Item 24 was excluded from analysis as it did

not meet the specified criterion and EFA was performed again on the remaining items. The analysis results showed that the scale consisted of two factors. It was also observed that the eigenvalue-factor number graph reflected and confirmed the two-factor structure. Table 8 and Figure 16 show the second EFA results and the eigenvalue-factor number graph.

Table 7. Principal components and varimax rotation EFA results for the peer TP scale-1

Item	Factor variances	Pre-rotation factor load values		Post-rotation factor load values	
		1	2	1	2
35	0.730	0.813		0.762	0.387
27	0.729	0.807		0.378	0.766
26	0.795	0.786	-0.420		0.852
30	0.610	0.773		0.469	0.625
34	0.729	0.762	0.386	0.813	
25	0.760	0.752	-0.441		0.843
32	0.655	0.736	0.337	0.759	
36	0.620	0.730		0.726	0.305
29	0.600	0.708	-0.313		0.721
33	0.706	0.689	0.480	0.828	
31	0.482	0.679		0.583	0.377
28	0.539	0.652	-0.338		0.699
24	0.274	0.522		0.395	0.343
Eigenvalue (Total=8.228)				6.885	1.343
Explained variance (Total=63.287)				52.959	10.328

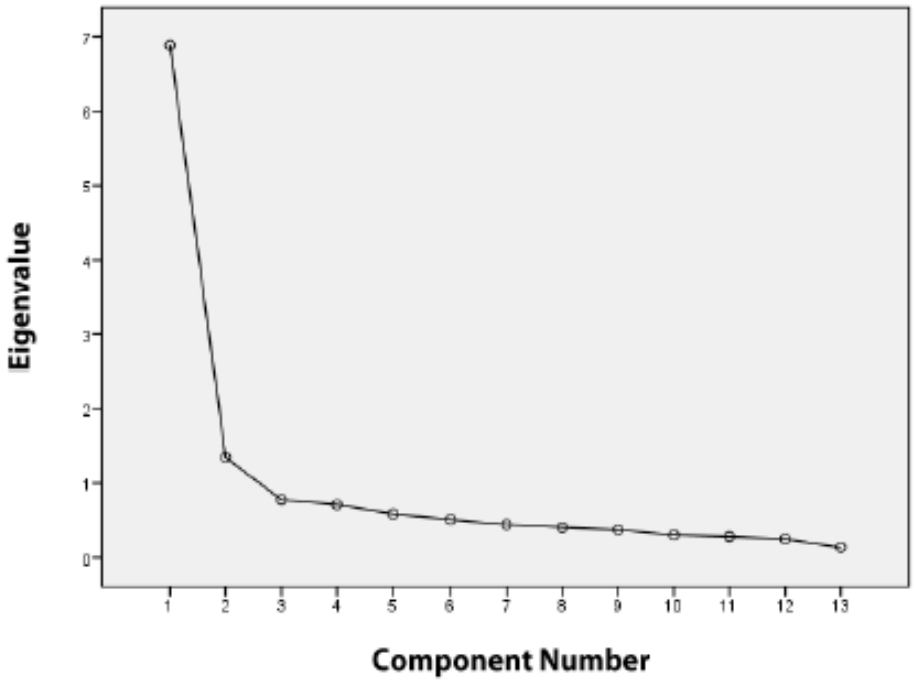

Figure 15. Peer TP first EFA scree plot

Table 8. Principal components and varimax rotation EFA results for the peer TP scale-2

Item	Factor variances	Pre-rotation factor load values		Post-rotation factor load values	
		1	2	1	2
35	0.729	0.811		0.388	0.760
27	0.732	0.809		0.771	0.372
26	0.797	0.790	-0.417	0.854	
30	0.613	0.775		0.629	0.467
34	0.732	0.761	0.391		0.813
25	0.763	0.756	-0.437	0.844	
32	0.655	0.735	0.339		0.758
36	0.626	0.732	0.300	0.308	0.729
29	0.595	0.707	-0.307	0.718	
33	0.716	0.692	0.487		0.833
31	0.474	0.674		0.382	0.573
28	0.543	0.653	-0.341	0.704	
Eigenvalue (Total=7.974)				6.624	1.350
Explained variance (Total=66.45)				55.203	11.247

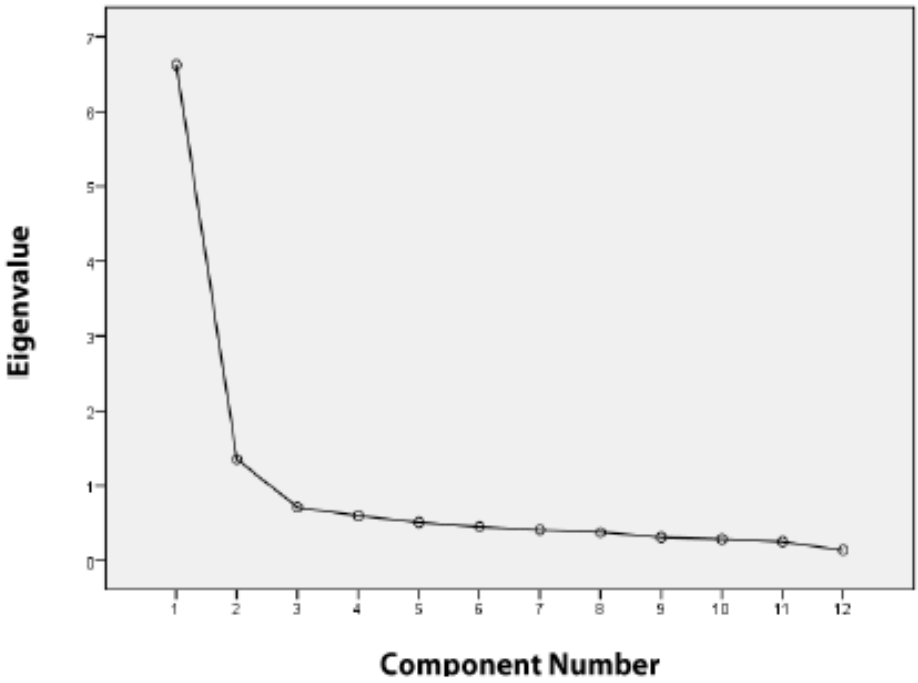

Figure 16. Peer TP second EFA scree plot

The analysis results showed that the eigenvalue of the first factor of the two-factor scale was 6.624 and the variance explained was 55.203% and the eigenvalue of the second factor was 1.350 and the variance explained was 11.247%. The total eigenvalue of the scale was 7.974 and the total variance explained was 66.45%. This result suggests that the variance explained by the scale adequately explained the quality that was measured. Also, the factor structure of the original scale exhibited a similar structure among Turkish

students. All items except three items in the Turkish form (Items 24, 30 and 31) were found to make up the same factors within the same cluster as in the original scale. The first factor represented peer connectedness, which made up the sub-dimensions of peer TP, while the second factor represented peer availability. As a result, the factor structure of the original scale exhibited a similar structure among Turkish students and the 13 items and two sub-factor structure in the Turkish version of the peer TP scale had similar properties to the original scale.

EFA Results for the Institution TP Scale

EFA was performed on the 11 items in the institution TP scale. KMO test was used for sample adequacy and Bartlett's Sphericity value was used to examine the fitness of the data for factor analysis. KMO value was found to be 0.820 in the analysis. Since this value was between 0.8 and 0.9, the sample was found to be adequate (at a good level) for factor analysis (Kaiser, 1974). Bartlett's Sphericity test showed that the relationship between the variables was significantly different from 0. and it was concluded that EFA could be performed with the data (χ^2 =1842.435; p<0.001). In the factor analysis, varimax axis rotation was performed on 11 items and a principal components factor analysis was performed with an eigenvalue of 1. These steps were preferred in factor analysis because it was expected that there would be no relationship between the factors of the scale and varimax rotation had also been performed in the original scale (Shin, 2001). As a result of the analysis, it was found that some items had load values on more than one factor after varimax rotation. Table 9 shows the first EFA results. Buyukozturk (2011, p. 125) recommended that the difference between the two high load values should be at least 0.10 when eliminating the items that do not measure the same structure in factor analysis. Therefore, Item 40 was excluded from analysis because it did not meet the specified criterion and EFA was performed again on the remaining items. The analysis results showed that the scale consisted of three factors. It was also observed that the eigenvalue-factor number graph reflected and confirmed the three-factor structure. Table 10 and Figure 18 show the second EFA results and the eigenvalue-factor number graph.

Table 9. Principal components and varimax rotation EFA results for the institution TP scale-1

Item	Factor variances	Pre-rotation factor load values			Post-rotation factor load values		
		1	2	3	1	2	3
41	0.769	0.794		-0.364	0.853		
42	0.736	0.799			0.823		
44	0.564	0.714			0.699		
45	0.478	0.651			0.645		
43	0.466	0.620			0.623		
40	0.468	0.614			0.509	0.451	
37	0.727	0.627	- 0.465	0.344		0.819	
38	0.719	0.614	- 0.546			0.810	
39	0.505	0.471	-0.421	0.326		0.698	
46_r	0.757	0.436	0.553	0.512			0.853
47_r	0.714	0.489	0.517	0.455			0.809
Eigenvalue (Total=6.905)					4.387	1.457	1.061
Explained variance (Total=62.771)					39.882	13.244	9.645

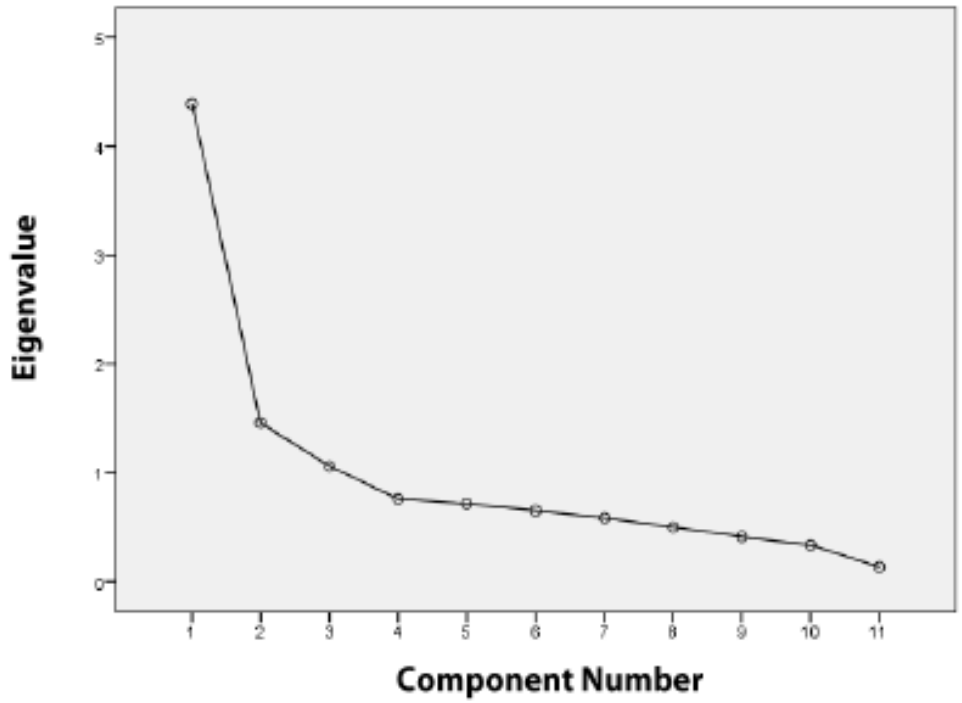

Figure 17. Institution TP first EFA scree plot

Table 10. Principal components and varimax rotation EFA results for the institution TP scale-2

Item	Factor variances	Pre-rotation factor load values			Post-rotation factor load values		
		1	2	3	1	2	3
41	0.798	0.800		-0.395	0.868		
42	0.771	0.811		-0.332	0.843		
44	0.551	0.709			0.687		
45	0.483	0.658			0.651		
43	0.467	0.629			0.625		
37	0.737	0.617	-0.514	0.303		0.824	
38	0.727	0.597	-0.585			0.814	
39	0.519	0.466	-0.474			0.708	
46_r	0.755	0.467	0.507	0.530			0.850
47_r	0.722	0.514	0.479	0.478			0.813
Eigenvalue (Total=6.529)					4.067	1.411	1.051
Explained variance (Total=65.290)					40.668	14.115	10.507

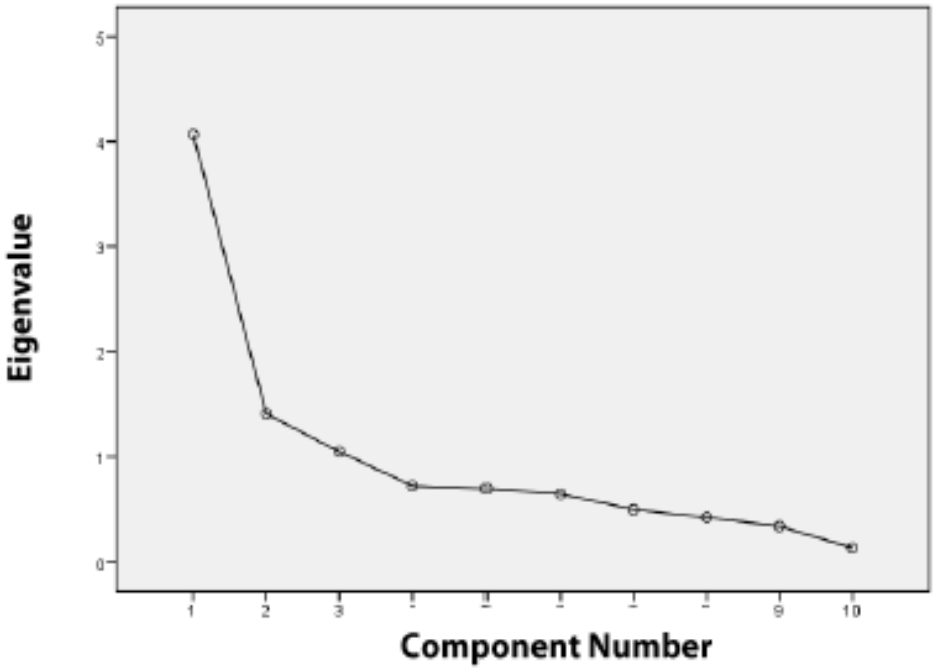

Figure 18. Institution TP second EFA scree plot

The analysis results showed that the eigenvalue of the first factor of the three-factor scale was 4.067 and the variance explained was 40.668%, the eigenvalue of the second factor was 1.411 and the variance explained was 14.115%, and the eigenvalue of the third factor was 1.051 and the variance explained was 10.507%. The total eigenvalue of the scale was 6.529 and the total variance explained was 65.290%. This result suggests that the variance explained by the scale adequately explained the quality that was measured. In addition, the factor structure of the original scale exhibited a similar structure among Turkish students. It was found that all items except Item 40 in the Turkish form constituted the same factors within the same cluster as in the original scale. In the original scale, the first factor and third factors represented institution connectedness, which made up the sub-dimensions of institution TP, while the second factor represented institution availability. The results showed that the factor structure in the original scale showed a similar structure among Turkish students and that the item-factor structure in the Turkish form of the institution TP scale was similar to the original form.

CFA Results

The structure of the TP scale, which consisted of 35 items, 3 factors (teacher, peer and institution TP) and two sub-factors (availability and connectedness) under each factor were tested with CFA. CFA was performed with first and second order analyses. The first order CFA tested the fitness of the model, which consisted of three factors each with two sub-factors, and 35 items associated with these factors. In the CFA, it was found that the error variable of institution TP had negative variance, the relevant variable was removed from the model, and the analysis was performed again. The first order CFA results showed that the five items in the teacher availability sub-factor of the teacher TP factor had a standard solution between 0.65 and 0.82 and the seven items in the teacher connectedness sub-factor had a standard solution between 0.36 and 0.73. Also, the standard solutions of the six items in the peer availability sub-factor of the peer TP factor ranged from 0.62 to 0.81, and the standard solutions of the six items in the peer connectedness sub-factor ranged from 0.62 to 0.90. Finally, the three items in the institution availability sub-factor of the institution TP factor ranged from 0.54 to 0.82, the seven items in the institution connectedness sub-factor were found to range between 0.34 and 0.92, and all load values were statistically significant ($p<0.001$). It was concluded that all the items in the factors were significant for their factors.

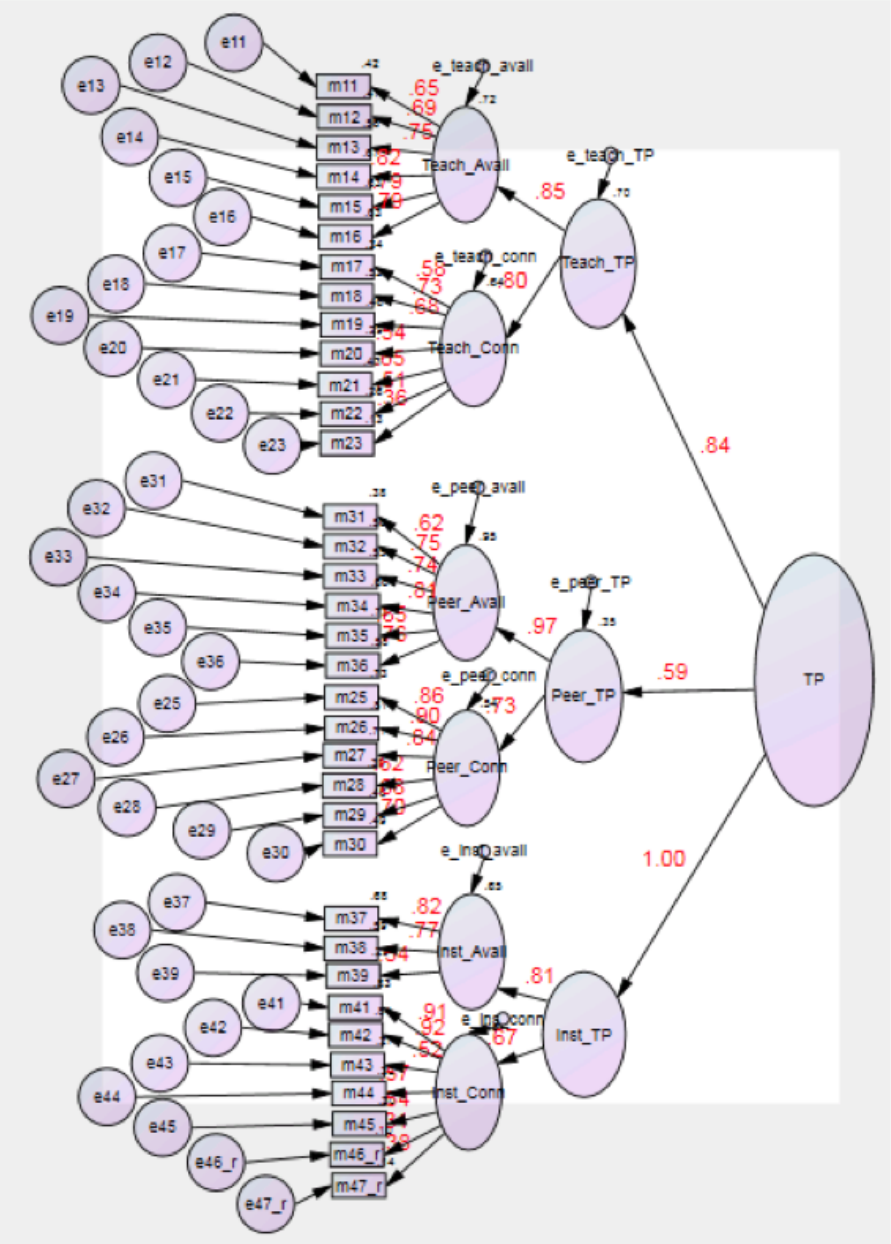

Figure 19. CFA results standard solution after modification

After standard solutions, t values between the factors and items were examined. The t values were found to be between14.691 and 19.099 for the items in the teacher availability sub-factor and between 6.216 and 6.960 for the items in the teacher connectedness sub-factor of the teacher TP factor; between 12.962 and 18.043 for the items in the peer availability sub-factor and between 15.254 and 25.631 for the items in the peer connectedness sub-factor of the peer TP factor; and between 10.407 and 14.565 for the items in the institution availability sub-factor and between 5.269 and 8.189 for the items in the institution connectedness sub-factor of the institution TP factor. Also, R^2 values of the items ranged between 0.099 and 0.950 and these values were significant at the 0.01 level. This standard solution indicated that t and R^2 values were significant for the factors and the scale to which 35 items belonged, and that they were also statistically significant since there were no red arrows for the t values (Joreskog & Sorbom, 1996).

The fit indices of the TP scale were estimated as χ^2 (552, n=467) =1686.527 ($p<0.001$), $\chi^2/sd=3.055$ RMSEA=0.066, CFI=0.863; NFI=0.811, NNFI (TLI)=0.844 and IFI=0.864. When the fit indices of the TP scale were compared with the fit indices recommended by Schermelleh-Engel, Moosbrugger and Muller

(2003), they were considered acceptable for RMSEA and very close to acceptable values (minimum fit) for χ^2/sd. However, the CFI, NFI, NNFI and IFI fit indices were below the acceptable values. As a result, the factor structure presented a minimum fit to the determined model.

Criterion Validity

The relationship between TP perceptions and personality traits, which is a criterion for TP, was examined in order to determine the criterion validity of the Turkish-translated version of the TP scale. First, the TIPI, which was developed by Rammstedt and John (2007) and adapted for use in Turkish by Horzum et al. (2017), was administered to 467 students in the sample simultaneously with the TP scale. After that, Pearson's correlation analysis was performed between the scores obtained from this scale and TP perceptions. The relationship between the variables is presented in Table 11.

Table 11. Pearson's correlation test showing the relationship between personality traits and TP

	1	2	3	4	5	6	7	8
1. Openness to experience	1	-0.103*	0.240**	0.083	0.268**	0.172**	0.097*	0.109*
2. Neuroticism		1	-0.090	-0.121*	-0.224**	-0.172**	-0.121*	-0.112*
3. Conscientiousness			1	0.227**	0.438**	0.250**	0.279**	0.199**
4. Agreeableness				1	0.148**	0.130**	0.201**	0.183**
5. Extraversion					1	0.269**	0.298**	0.207**
6. Teacher TP						1	0.412**	0.621**
7. Peer TP							1	0.476**
8. Institution TP								1

**p< 0.05 ; ** p<0.01*

As can be seen in Table 11, there was a significant and positive correlation between teacher TP and openness to experience (r= 0.172; p<0.01), conscientiousness (r= 0.250; p<0.01), agreeableness (r= 0.130; p<0.01) and extraversion (r= 0.269; p<0.01) personality traits at the 0.01 level. However, teacher TP was significantly and negatively correlated with neuroticism personality trait (r= -0.172; p<0.01) at the 0.01 level. While peer TP was significantly and positively correlated with openness to experience personality trait at the 0.05 level (r= 0.097; p<0.05), it was negatively correlated with neuroticism personality trait at the same level (r= -0.121; p<0.05). Peer TP was also significantly and positively correlated with conscientiousness (r= 0.279; p<0.01), agreeableness (r= 0.201; p<0.01) and extraversion (r= 0.298; p<0.01) personality traits at the 0.01 level. Similar to peer TP, institution TP was significantly and positively correlated with openness to experience personality trait at the 0.05 level (r= 0.109; p<0.05), but it was negatively correlated with neuroticism personality trait at the same level (r= -0.112; p<0.05). In addition, institution TP was significantly and positively correlated with conscientiousness (r= 0.199; p<0.01), agreeableness (r= 0.183; p<0.01) and extraversion (r= 0.207; p<0.01) personality traits at the 0.01 level.

In summary, the results showed that all the personality traits were correlated with perceptions of the three types of TP. Also, as neuroticism personality trait decreased, or in other words, as emotional stability increased and openness to experience, conscientiousness, agreeableness and extraversion increased, there was an increase in perceptions of teacher TP, peer TP and institution TP. These results provided evidence for the criterion validity of the scale.

Results for Reliability

In order to estimate the reliability of the Turkish adapted version of the TP scale, a reliability analysis was performed for the items about the teacher, peer and institution TP. Cronbach's α values obtained for each dimension are given in Table 12.

Table 12. Reliability of the Turkish adapted version of the TP scale

Scale	Number of Items	α value
Teacher TP	13	0.875
Peer TP	13	0.923
Institution TP	11	0.841

Kline (1999, p. 15) states that the acceptable Cronbach's α reliability coefficient should be at least 0.7 for a good test. As can be seen in Table 12 is examined, the teacher, peer and institution TP scales included in the Turkish adapted version of the TP scale had all high reliability (teacher TP Cronbach's α=0.875, peer TP Cronbach's α=0.923 and institution TP Cronbach's α=0.841). The results of the validity and reliability analyzes showed that the TP scale could be used as a valid and reliable instrument for measuring the TP levels of university students.

Multiple Linear Regression Analysis Results

In this study, multiple linear regression analysis was conducted to investigate whether teacher, peer and institution TP, extraversion, agreeableness, conscientiousness, neuroticism and openness to experience personal traits, age, sex and distance learning experience predicted perceived learning. The analysis assumptions were met. Field (2013) noted that when categorical variables are included in the model in regression analysis, all other variables associated with these variables should also be included in analysis by "forced entry" method. For this reason, multiple variables were included in the model by "forced entry" method. Multiple linear regression analysis results are given in Table 13.

Table 13. Results of standard multiple regression analysis for predicting perceived learning

Independent variable	B	SH Beta	β	t	*p*
Model (R= 0.57; R^2=0.32; ΔR^2=0.29; $F_{(11,248)}$ =10.78; p<0.01)					
Constant	16.21 (10.17; 22.25)	3.07		5.29	0.00*
Teacher TP	0.02 (-0.07; 0.11)	0.05	0.03	0.35	0.73
Peer TP	-0.02 (-0.09; 0.06)	0.04	-0.03	-0.40	0.69
Institution TP	0.36 (0.26; 0.46)	0.05	0.49	7.01	0.00*
Extraversion	0.28 (-0.06; 0.62)	0.17	0.10	1.64	0.10
Agreeableness	0.22 (-0.10; 0.54)	0.16	0.07	1.36	0.17
Conscientiousness	0.05 (-0.29; 0.39)	0.17	0.02	0.29	0.77

Neuroticism	-0.16 (-0.47; 0.14)	0.16	-0.06	-1.05	0.30
Openness to experience	0.03 (-0.30; 0.37)	0.17	0.01	0.19	0.85
Age	-0.02 (-0.16; 0.12)	0.07	-0.01	-0.24	0.81
Sex	0.99 (-0.11; 2.10)	0.56	0.10	1.77	0.08
DE experience	0.22 (-0.79; 1.23)	0.51	0.02	0.43	0.67

**p<0.01*

As can be seen in Table 13, the regression analysis results showed that the predictive variables explained 29% of the perceived learning levels of the learners. Institution TP (b=0.36; β=0.49; t= 7.01; p<0.01) was a significant predictor of perceived learning. Beta value indicated that perceived learning increased with increasing institution TP. In other words, it showed that learners' perceived learning levels would increase as their perceptions of school or institution TP increased. However, teacher TP (b=0.02; β=0.03; t= 0.35; p>0.05), peer TP (b= -0.02; β= -0.03; t= -0.40; p>0.05); having personality traits of extraversion (b=0.28; β=0.10; t= 1.64; p>0.05), agreeableness (b=0.22; β=0.07; t= 1.36; p>0.05), conscientiousness (b=0.05; β=0.02; t= 0.29; p>0.05), neuroticism (b= -0.16; β= -0.06; t= -1.05; p>0.05), or openness to experience (b=0.03; β=0.01; t= 0.19; p>0.05); age (b= -0.02; β= -0.01; t= -0.24; p>0.05); sex (b= 0.99; β= 0.10; t= 1.77; p>0.05); and distance education experience (b= 0.22; β= 0.02; t= 0.43; p>0.05) variables were not significant predictors of perceived learning. In addition, when the ANOVA analysis results were examined according to the F statistics findings, it was found that F statistics were significant (=10.78; p<0.01). Therefore, we could suggest that the model is better than using averages as the best estimate.

In summary, the results showed that only institution TP was a significant predictor of perceived learning and none of the other variables (the learners' age; teacher and peer TP, personality traits of extraversion, conscientiousness, neuroticism, openness to experience or agreeableness; sex; or previous experience of distance education) was a significant predictor of perceived learning. Furthermore, there was a high positive correlation (r = 0.536) between perceived learning scores and institution TP scores of the learners in the study. This result showed that perceived learning scores would increase as institution TP increased. The institution TP of the learners in the study explained 29% of the total variance of perceived learning. According to the standardized regression coefficient (β), the relative significance order of predictive variables on perceived learning was institution TP. Finally, the regression formula can be expressed as follows: Perceived learning=16.21 + (0.36 × Institution TP)

DISCUSSIONS AND CONCLUSION

The aim of this study was to establish a valid and reliable Turkish version of the TP scale and to determine whether certain variables such as learners' personality structures, age, sex, distance education experiences and perceptions of TP (i.e. teacher, peer and institution TP) were significant predictors of their perceived learning. For this purpose, first of all, linguistic equivalence, EFA, CFA, validity and reliability analyzes were conducted for the scale adaptation study. EFA was considered important as it would indicate how the original scale structure would change in Turkish students. Since the TP scale consists of three basic dimensions (i.e. teacher, peer and institution TP), EFA was performed for each dimension. EFA results showed that the teacher TP scale had a three-factor structure and Factor 1 represented teacher availability while Factors 2 and 3 represented teacher connectedness. The analysis results also showed that the total eigenvalue of the scale was 7.884, it explained 60.642% of the variance, and factor load values of the items ranged between 0.624 and 0.828. The original version of the scale also had a three-factor structure and the corresponding items constituted the same sub-dimensions. In addition, the total eigenvalue of the original scale was 7.907,

it explained 60.830% of the variance and factor load values of the items were between 0.452 and 0.844 (Shin, 2001). Although there are cultural differences between the expressions in the original version and the Turkish adapted version of the scale, the two versions could be considered equal because of the three-factor structure, total eigenvalue, similarity of the explained variances, and even higher factor loads of the items in the Turkish adapted version than the original scale.

According to EFA results for the Turkish adapted version of the peer TP scale, the scale had two factors, Factor 1 represented peer connectedness and Factor 2 represented peer availability. Item 24 was excluded from the analysis because it had a similar factor load (factor load difference less than 0.10) on both factors and EFA was performed again. According to the results of the second EFA, the total value of the peer TP scale was 7.974, it explained 66.45% of the variance and factor load values of the items ranged between 0.573 and 0.854. The original version of the scale also had a two-factor structure and the corresponding items constituted the same sub-dimensions. In addition, the total eigenvalue of the original scale was 9.048, it explained 69.602% of the variance and factor load values of the items were between 0.564 and 0.846 (Shin, 2001). Both the Turkish adapted and original versions of the scale could be considered equal because they both had a two-factor structure, these factors represented the same sub-dimensions, and the explained variance and factor load values of the items were close to each other although the total eigenvalue was lower in the Turkish adapted version than in the original form. The fact that Item 24 was removed from the scale and EFA was performed for the second time could be the reason why the total eigenvalue was lower and the variance explained was relatively lower than the original form. Moreover, cultural differences need to be taken into account, too.

EFA results for the institution TP scale showed that the scale had a three-factor structure, Factors 1 and 3 represented institution connectedness and Factor 2 represented institution availability. In addition, the total eigenvalue of the scale was 6.905, it explained 62.771% of the variance and factor load values of the items ranged between 0.623 and 0.853. Similarly, the original version of the scale had a three-factor structure, but Factor 1 represented institution availability while Factors 2 and 3 represented institution connectedness. In this respect, the scale had the same structure as the original version, but the sub-dimensions of the corresponding factors differed. Also, the total eigenvalue of the original scale was 7.199, it explained 65.439% of the variance and factor load values of the items ranged from 0.573 to 0.873 (Shin, 2001). Both the Turkish adapted and original versions of the scale could be considered equal because they both had a three-factor structure and the explained variance and factor load values of the items were close to each other. However, the order of the sub-factors differed in the Turkish adapted version. As a result, although there were some differences between the Turkish version and the original version, the scale was still found to have a similar structure to the original scale. The sub-dimensions that Factors 1 and 2 were included in the original form, or in other words, the sub-dimensions that they were thought to measure, worked in a reversed way in Turkish culture. Those items that measured institution connectedness and availability were in different places. This could have been caused by cultural differences.

The fitness of the Turkish version of the scale to the model was checked by CFA. CFA results showed that the t values of the items and factors in the latent variable ranged between 4.561 and 25.639, R^2 values were between 0.099 and 0.950 and they were significant at the 0.01 level. This standard solution suggests that all 35 items were important for their factors and the scale, and they were statistically significant since there were no red arrows in t values (Joreskog & Sorbom, 1996). These results indicated that the indices of the variables in the model could be examined. According to the CFA results, the scale had χ^2 (551, n=467) =1685.608 ($p<0.001$); $\chi^2/sd=3.059$ RMSEA=0.066; CFI=0.863; NFI=0.811; NNFI (TLI)=0.843 and IFI=0.864 fit indices. When the fit indices of the TP scale were compared with the fit indices recommended by Schermelleh-Engel, Moosbrugger and Muller (2003), they were acceptable for RMSEA and very close to acceptable values (minimum fit) for χ^2/sd. However, the CFI, NFI, NNFI and IFI fit indices were below the acceptable values. As a result, the factor structure presented a minimum fit to the determined model.

In order to determine the criterion validity of the Turkish adapted version of the TP scale, the relationship between TP perceptions and personality traits, which is a criterion for TP, was examined. For this purpose, Pearson's correlation analysis was performed between the scores obtained from the TIPI and TP perceptions. According to the results, all personality traits were associated with perceptions about the three types of

TP. In addition, as neurotic personality trait decreased, or in other words, emotional stability, openness to experience, conscientiousness, agreeableness and extraversion increased, perceptions of teacher, peer and institution TP increased. These results provided evidence for the criterion validity of the scale.

Once the linguistic equivalence, face validity, content validity, criterion validity and construct validity of the Turkish adapted version of the TP scale were ensured, a reliability analysis was performed to estimate its reliability. Cronbach's alpha internal consistency coefficients were examined for consistency for the reliability of the scale. The first dimension of the scale, "teacher TP", had a reliability score of 0.875; the second dimension, "peer TP", had a reliability score of 0.923; and the third dimension, "institution TP", had a reliability score of 0.841. We could suggest that these values indicated high internal consistency, in other words, they would produce consistent data. In terms of the internal consistency coefficients of the original version of the scale, the first dimension had a reliability score of 0.88, the second dimension had a reliability score of 0.94, and the third dimension had a reliability score of 0.85 (Shin, 2001). Therefore, it was concluded that the internal consistency coefficients of the Turkish adapted version were close to the values obtained in the original version of the scale.

Based on these findings, the TP scale, developed by Shin (2001) and adapted for use in Turkish, was found to have item-factor fit and a structure similar to the original form. On the other hand, some values were found to be lower than the original form. This result might have been caused by the fact that the original form was administered after it was translated from English to Korean, but in this study it was translated from English to Turkish. Also, another reason could be cultural differences of the respondents and, therefore, differences in their evaluation of the scale items.

In this study, multiple linear regression analysis was conducted to investigate whether certain variables (the learners' personality structures, age, sex, distance education experiences and perceptions of teacher, peer and institution TP) were significant predictors of their perceived learning. The results showed that only institution TP was a significant predictor of perceived learning and none of the other variables (the learners' age; teacher and peer TP, personality traits of extraversion, conscientiousness, neuroticism, openness to experience or agreeableness; sex; or previous experience of distance education) was a significant predictor of perceived learning. The institution TP of the learners in the study explained 29% of the total variance of perceived learning. According to the standardized regression coefficient (β), the relative significance order of predictive variables on perceived learning was institution TP. This indicates that the distance learner's relationship with the institution is important. In her study, Shin (2001) showed that institution TP predicted all the variables (i.e. learning achievement, satisfaction, and intent-to-persist) and, therefore, it was important. Furthermore, Shin and Chan (2004) stated that there was a significant relationship between students' perceptions of institution presence and satisfaction, intent-to-persist in the course of study, and learning outcomes. In this respect, the findings of this study are supported by the findings in the literature. In addition, as Shin (2001) suggested, considering the fact that institution TP is more likely to be perceived in the context of student support services, students' access to the services and information they need (institution availability) and developing a sense of belonging (institution connectedness) by seeing themselves as a part of the institution could increase their level of perceived learning. By its very nature, distance education requires the learner to have the ability to self-manage his or her learning process (learner autonomy). This is also an important component of transactional distance. In distance learning, for students with lower learner autonomy and in need of more support services, the institution could decrease the perception of transactional distance that learners could feel by providing more effective dialogue and communication processes. As this situation increases sense of connectedness to the institution, this could positively affect dropout rates, which is one of the major problems in distance learning, and thus improve students' beliefs and feelings about their learning.

The sample of this study, the pedagogical formation training group, was provided with support via Facebook, with e-mail, on IP phone and face-to-face. The accessibility of the application in this study could be associated with the higher perception of institution TP among the respondents. In fact, the positive effect of this situation on perceived learning is an expected result.

In addition, the results showed that personality structures were not a significant predictor of perceived learning. Since personality structures mostly express the mental and spiritual characteristics of an individual that distinguish him or her from others (Horzum, Ayas & Padır, 2017), these mental and spiritual characteristics are not expected to be directly correlated with perceived learning, whereas they are expected to be correlated with perceptions where psychological factors come into prominence such as TP (Horzum, 2015). Similarly, in this study, personality structures were correlated with TP, where psychological basis was prominent, but they were not significantly correlated with perceived learning, where cognitive processes normally come into prominence. Finally, the results also showed that sex and age, which are demographic characteristics, had no significant effect on perceived learning.

RECOMMENDATIONS

As a result of this study, a valid and reliable Turkish version of the TP scale was generated. The scale was used as an independent variable in the study. In future studies, TP and its dimensions to be measured with this scale could be considered as dependent variables, and demographic characteristics such as age, sex and previous experience of distance education could be examined by variables such as learners' majors, departments, professions or experiences. Similarly, future research could investigate TP and its sub-dimensions in association with different learning outcomes apart from perceived learning such as achievement, satisfaction, motivation, intent-to-persist and willingness.

This study investigated TP perceptions in a hybrid model of synchronous and asynchronous activities in a one-semester distance education application. Future research could investigate learners' TP perceptions in fully distance, fully synchronous, fully asynchronous or hybrid learning models and in different learning environments (e.g. LMS platforms, MOOCs, etc.). In addition, longitudinal studies could also investigate TP.

The results of this study showed that institution TP was the only variable that predicted the perceived learning of the learners. We could suggest that this finding supports the importance of institution TP, which was mentioned previously. Therefore, institutions or service providers offering distance education services should be aware of the impact of institution TP, develop an effective distance education student support service and ensure that services are recognized by their students (Shin, 2003). By working in different contexts and with different samples, future research could examine whether the scale would yield a similar structure under those conditions.

Finally, TP perceptions could be investigated with respect to the student support services of universities. The relationship between the types of support services offered by universities and learners' perceptions of institution TP can be examined. Similarly, the relationship between teachers TP as perceived by learners and their various demographic characteristics and the academic and administrative support provided by the institution to the teacher can be examined. Determining the relationships between the reasons for the results to be obtained in such studies and the variables in consideration could help increase institution TP perceptions of both current and prospective learners, reduce drop-out rates, ensure more effective learning and increase the quality and sustainability of the services offered.

Author's Note: This study was derived from an MSc thesis supervised by Dr. Mehmet Barıs HORZUM in Sakarya University Computer and Instructional Technology Department.

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DESIGNING E-LEARNING IN MEDICAL EDUCATION: TOWARD A COMPREHENSIVE MODEL

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ABSTRACT

This study was conducted to present a comprehensive model for designing e-learning in Medical education. This qualitative study was performed in three stages. First, we used the "critical review" approach proposed by CarnWell to synthesize a conceptual model from studies that employ e-learning in Medical education. In the second stage, using Bereday's comparative method, 30 renowned virtual universities were evaluated. Finally, after aggregating and summarizing the results of the previous stages, the model was presented.

The results of the study showed that designing e-learning in medical education requires making plans on national and international levels. Moreover, for qualitative and quantitative improvement of e-learning, global progress, achievements, and standards should be monitored continuously, and strategic, tactical, and executive aspects should be rigorously addressed. This comprehensive model for the design and development of e-learning in medical education is identified as an area requiring further research.

Keywords: e-Learning, medical education, qualitative method, design, critical review.

INTRODUCTION

E-learning is an essential innovation in medical education which has expanded the boundaries of learning beyond regional and national borders to global frontiers by breaking down the barriers of time and place (Gaupp, Korner, & Fabry, 2016). E-learning can enhance the quality and accessibility of educational opportunities for different people by providing learning conditions that help them overcome traditional time

and place constraints. It enables learners to develop new competencies and to earn valid scientific degrees and certificates. Experts believe that e-learning has become an essential modality in medical education (De Leeuw, Westerman, Nelson, Ket, & Scheele, 2016).

The ever-growing emphasis on the benefits of e-learning in medical education has increased the demands for virtual courses and workshops in universities' curriculums (Aboshady et al., 2015). According to Allen & Seaman (2013), online courses in educational institutions are increasing day by day in the United States. Universities across the world have made considerable efforts to implement e-learning; it is estimated that by 2025, 85% of education will be delivered electronically (Cidral, Oliveira, Di Felice, & Aparicio, 2018). E-learning increases the efficacy and effectiveness of medical education which explains why e-learning is increasingly utilized by medical schools around the world. To develop e-learning programs, it is critical to have a clear theoretical framework for their design, especially in medical education (Frehywot et al., 2013).

Designing e-learning in medical education requires attention and consideration of all the essential aspects of this environment. Thus, a comprehensive model is needed to help stakeholders capture the critical dimensions of this context. Consequently, this study was conducted to develop a comprehensive model for e-learning in medical education.

LITERATURE REVIEW

In the information age, the process of globalization has introduced a new paradigm in human learning, and universities increasingly seek to harness the benefits of emerging technologies in their educational activities (Ruggie, University, USA, University, & USA, 2017). Research has shown that using e-learning in medical education has increased in recent decades (Salimi, Mohammadi, & Hosseini, 2017). There are two major uses of information and communication technology in medical education, one is to improve access to educational resources and the other is to enhance collaboration and communication between teachers and learners (Amin, Joo, & Jamali, 2018). According to some researches, E-learning can help with the personalization of the learning environment, a wide distribution of learning materials and resources, content standardization, improvement of the knowledge acquisition process, and basic and clinical skills. E-learning provides opportunities for flexible learning. It also provides the possibility of self-regulation in the learning process (Bello, Oludele, & Ademiluyi, 2018). Concerning the importance of e-learning in medical sciences, international organizations such as the United Nations and the World Health Organization emphasize that e-learning is a useful way of addressing educational needs in medical education (Ellaway & Masters, 2008).

E-Learning can fill the gap between theory and practice and it can encourage the learner to solve problems and exchange experiences. Having a profound understanding of these developments, medical universities all over the world are seeking to develop optimal methods and models for implementing effective e-Learning(Gaupp et al., 2016). For this reason, several diverse factors may determine the success of an e-learning system. Indeed, for designing any system, moving toward a particular model or framework will lead to systematic work and secure better results. This also applies to designing e-learning systems. Consulting a specifically defined framework can determine e-learning system requirements, and make it easier to design (Aithal & Aithal, 2015).

Numerous studies have been conducted on designing models and frameworks for e-learning in higher education. For example, Namisiko, Munialo, & Nyongesa (2014) concluded that a systematic and comprehensive approach to e-learning depends on at least three fundamental conditions: 1) simultaneous and continuous attention to all educational, technical, and organizational aspects of the learning environment, 2) presence of a systematic viewpoint for designing an educational system, and 3) learner-centeredness of the e-learning system.

Meltzer (2018) also believes that an e-learning framework requires the establishment of at least three necessary conditions; constant attention to all educational, technical, and organizational dimensions of the learning environment, and careful consideration of the pervasive features of an electronic learning system.

Also, in their study Haddad & Draxler (2002) outline seven aspects that are necessary for the success of an e-learning system: educational policy, approach, infrastructure, content ware, committed and trained personnel, financial resources, and integration. This learning environment facilitates interaction and creates

a conceptual framework through the use of multimedia and contributes to active knowledge acquisition by learners.

One of the most crucial prerequisites for the successful implementation of e-Learning is a careful deliberation of the underlying pedagogy, or how learning takes place online. In this regard, Aboumatar et al. (2012)self-efficacy and system thinking. Methods: This study reports on curriculum development and evaluation of a 3-day, clinically oriented patient safety intersession that was implemented at the Johns Hopkins School of Medicine in January 2011. Using simulation, skills demonstrations, small group exercises and case studies, this intersession focuses on improving students' teamwork and communication skills and system-based thinking while teaching on the causes of preventable harm and evidence-based strategies for harm prevention. One hundred and twenty students participated in this intersession as part of their required second year curriculum. A preepost assessment of students' safety knowledge, selfefficacy in safety skills and system-based thinking was conducted. Student satisfaction data were also collected. Results: Students' safety knowledge scores significantly improved (mean +19% points; 95% CI 17.0 to 21.6; p<0.01 proposed a model for designing virtual universities. According to this model, the learning environment should prepare the grounds for genuine learning activities, reinforce the learners' sense of responsibility for learning, encourage participation, and employ authentic assessment strategies.

Garrison (2011), analyzed the theoretical challenges of distance education in the 21st century. He designed a conceptual model for distance education, knows as the "community learning model." According to this model, any effective educational experience requires social, cognitive, and teaching presence. Social presence is defined as the ability of the online teacher to provide a learning environment in which learners communicate with each other openly and securely. Cognitive presence indicates that the online teacher should create an appropriate environment to develop the learners' basic thinking skills. Teaching presence emphasizes the effective design of the learning environment based on technology. As can be seen, the important aspects of the learning environment need to be taken into account when designing appropriate models.

In this respect, globalization and the emergence of information technologies, and contemporary developments have resulted in rapid changes in medical education (Franz, Behrends, Haack, & Marschollek, 2015). There has also been growing interest in the use of e-learning in medical universities. The shift towards e-Learning, the complexity of medical education, and the advances in medicine have all increased the demands for using information and communication technology in medical education(Fernandez-Rodriguez, 2017). Despite the increasing use of e-learning in medical education, research on this topic is in its early stages. Existing research mostly covers the design and implementation of e-learning in different medical disciplines. No studies have yet investigated the design of e-learning models and frameworks in medical education in a systematic fashion(Lewis, Cidon, Seto, Chen, & Mahan, 2014).

The most important challenge in designing and launching e-learning in medical education is to disregard all the important aspects that constitute a learning environment that can take into account the complexities of the clinical and educational environment in design(Ikram, Essink-Bot, & Suurmond, 2015b)care providers tend to underuse professional interpretation. Evidence suggests that students who received training on language barriers and interpreter use are more likely to utilize interpretation services. Aims: We developed an e-learning module for medical students on using professional interpreters during the medical interview, and evaluated its effects on students' knowledge and self-efficacy. Methods: In the e-learning module, three patient-physician-interpreter video vignettes were presented, with three different types of interpreters: a family member, an untrained bilingual staff member, and a professional interpreter. The students answered two questions about each vignette, followed by feedback which compared their responses with expert information. In total, 281 fourth-year medical students took the e-learning module during the academic year 2012-2013. We assessed their knowledge and self-efficacy in interpreter use pre- and post-test on 1 (lowest. One of the essential issues in this regard is the presence of proper patterns or designing models that are consistent with medical education.

Given the conflicting results in previous studies, there is still a need for further research in this field, particularly since facilities and methods are constantly transformed. In designing an appropriate model and framework for e-learning in medical education, all aspects of a medical education environment should be taken into account Therefore, it seems necessary to present a comprehensive model for e-learning in medical

education. Following the above argument, researchers decided to research designing a comprehensive model of e-Learning in medical education.

The specific objectives of this research were as follows:

1. To determine the key design components of e-learning in medical education
2. To identify and compare the components of e-learning programs in renowned universities across the world
3. To present a comprehensive model for e-learning in medical education

METHOD

Study Design

The goal of this study is to achieve some degree of innovation and synthesis. This is a qualitative study; in terms of method it is heuristic, in terms of the period it is cross-sectional, and in terms of purpose it is developmental; a particular approach has been used at each stage.

The First Stage

The first stage was conducted using the critical literature review approach in which the aim and scope of the review were outlined. On this basis, the relevant literature was identified and selected using exclusion and inclusion criteria. The study addresses a focused question: What evidence is available about the main e-learning concepts in medical education?

We critically reviewed selected research reports about the deployment of e-learning models in medical education and their concepts. Our review relies on (Carnwell & Daly, 2001)& Daly's (2001) 'critical review' approach to literature synthesis. A critical review aims to evaluate the relevance and thoroughness of available research in terms of the theoretical framework. The objective of the critical review is to qualitatively summarize research findings and compare the similarities and differences of different studies. Furthermore, the context of the studies is investigated to identify what makes educational interventions work qualitatively. At this stage, we: 1) focused on the main concepts of e-learning in medical education, 2) Identified sources of relevant information, and 3) reviewed the literature and applied findings in drafting the e-learning model.

Samples and setting: We searched multiple databases (Google Scholar, Scirus, ProQuest, Scopus, IEEE, SID, Bio-Medical, PubMed, Medline (EBSCO & Ovid), Eric, Taylor and Francis, and Science Direct) and also examined reference lists of highly cited papers and reviewed articles from 2000 to 2018. The keywords used for the search were (electronic OR virtual OR Online OR Internet-based OR distance OR web-based) AND (medical, health) AND (learning OR instruction OR education) AND design AND Development.

Participant characteristics: To select the documents, the titles found in the search engine were first evaluated for relevance. The retrieved material was divided into three categories of websites, books, and articles. Articles were excluded if they were not written in English or Farsi, or if they did not involve education in health professions. We included a full review of all original research studies involving e-learning in medical education.

Analysis: This approach yielded 142 articles published between 2000 and 2019. On initial assessment, the titles and abstracts were selected by two reviewers, and documents with less relevance to the research topic were excluded. The articles retrieved by the searches were sorted by each of the investigators into two groups: primary publications (reports of studies that produced original data) and secondary publications (those not producing original data, such as literature reviews, editorials, and letters). In the next step, the primary publications about e-learning in the fields of medicine and health were classified by each of the investigators into three types of study, termed observational studies, pragmatic studies, and explanatory studies.

A total of 87 Farsi and English articles, which were more valid and compatible with the general objective of the study, were selected and meticulously evaluated. We extracted information from each paper into a spreadsheet and used the constant comparison method to explore possible topics of e-learning and Medicine. We independently analyzed the definitions and identified recurrent topics using "coding." As described by

Strauss and Corbin, coding is an analytical process through which concepts are identified and dimensions are discovered in data (Willcocks, Sauer, & Lacity, 2016).

The Second Stage

In the second stage, to achieve a more in-depth understanding, the components and the structures of successful e-learning systems in renowned universities across the world were evaluated using Bereday's comparative method. This method is one of the most important classical methods for comparing educational systems. According to the Bereday model, comparative studies should employ well-known and well-studied instructional methods. In this stage, the researchers examined and compared the structure and the components of the e-learning systems at selected universities across the world using Bereday's four-step method, including description, interpretation, juxtaposition, and comparison (Adick, 2018).

At the description stage, information and evidence about the e-Learning systems of the selected universities in three continents were obtained. Thus, sufficient material was available for review and critique in the next stage. Detailed information was gathered according to the following criteria:

1. Availability of e-Learning for students in various degrees and levels of study,
2. Student admission criteria,
3. Teaching-Learning approach,
4. Evaluation methods,
5. E-learning Infrastructures.

In the interpretative phase, the detailed information obtained regarding the e-learning systems of the selected universities was investigated and analyzed. In the juxtaposition phase, the information and analyses collected in the previous stages were categorized and integrated to develop a clear framework for the comparison of their similarities and differences. Finally, at the fourth stage (comparison), details of the similarities and differences of the e-learning systems of the selected universities were compared to address the research questions.

Samples and setting: Purposive sampling was performed according to the classification proposed by Ambient Insight market research firm. It is an international market research firm that uses quantitative predictive analytics to identify revenue opportunities for advanced global learning technology suppliers (Agarwal & Lenka, 2018)garment industry and educational institute. Those virtual universities in North America, Europe, Australia, and Asia that had the highest ranks in the Ambient classification in 2014, and whose information was available on their websites, were included in the study. Accordingly, 30 credible universities were selected, and their e-learning systems were studied.

In North America; University of Pennsylvania, Yale University, The University of Chicago, Johns Hopkins University, Princeton University, University of California, Duke University, Cornell University, University of British Columbia, University of Bristol, McGill University, University of Toronto, and Northwestern University were assessed. In Europe; the e-learning systems of the universities of Austria, King's College, Federal Of Technology, ETH Zurich University, Techniches Universität in Germany; Ecole Normale Superieure in France, the University of Edinburgh in Scotland, Manchester University, Swiss Federal University, Uppsala University of Sweden and Utrecht University in the Netherlands were investigated. In Asia, the e-learning systems of the universities of Nanyang Technological University in Singapore, National University of Singapore, Tsinghua University in China, The University of Hong Kong, Seoul National University in Korea, The University of Tokyo in Japan were studied.

The Third Stage

After summarizing and analyzing the results of the previous stages, the model was refined. At this stage, the researchers categorized different aspects and components of e-learning by summarizing the mutual concepts and related documents. The specific objectives were classified and presented to determine and understand the relevant concepts. Finally, a comprehensive model was presented.

Ethics Approval

This study was approved by the Ethics Committee of the Virtual University of Medical Sciences. In this study, the following ethical issues were considered: This study was based solely on the data provided by specific websites, and the research literature and patients were not involved.

FINDINGS

The first specific objective of the study was to determine the components of the comprehensive model for designing e-learning in medical education. Through an extensive review of essential literature (87 selected papers examined over 7 months), we identified eight themes and 84 critial concepts of e-learning which can be classified as Necessity of reform in the Educational System, Factors contributing to the development of e-learning, The role of information and communication technology in medical education, Objectives of e-Learning, e-Learning Infrastructures, e-Learning barriers and limitations, Determinants of success in an e-learning system, Different forms of virtual institutes (Table 1).

Table.1 Themes and Key concepts of e-learning in medical education

	Them	Key Concepts	Authors, year
1	The necessity of reform in Educational system	The need to join the process of globalization, Expanded educational opportunities and educational justice, developing a new paradigm for learning	(Singh, 2018); (Collins & Halverson, 2018); (Brusamento, Kyaw, Whiting, Li, & Tudor Car, 2019)
2	Factors contributing to the development of e-learning in medical education	Technological advances, Entering the age of information, changes in the demographic pattern, decreased government fund for medical education, competition in the educational market, a growing trend of virtual learning in medical education	(Garg & Jain, 2017); (Bagrova, 2017); (Hurtubise & Roman, 2014); (Brusamento et al., 2019)
3	The role of information and communication technology in medical education	Effect on educational curriculum • Possibility to use an integrated curriculum • Increasing importance and validity of curriculum • Enhancing the accessibility of learners • Imparting knowledge and clinical skills within an appropriate structure • Improving the usefulness of the educational curriculum • Enhancing student learning • Curriculum flexibility Evolution in learning • Increasing learners' motivation • Improving high-level reflection skills • Time management and ability to prioritize basic and clinical skills in an information atmosphere • Creating liveliness • Maintaining order in the class • Improving medical skills and methods • Cultivating learners' talents • Creating a spirit of research • Providing rapid feedback • Decreasing anxiety • Improving continuous professional development	(Barclay, Donalds, & Osei-Bryson, 2018); (Cleveland & Block, 2017); (Al-Emran, Elsherif, & Shaalan, 2016); (Horn & Khalid, n.d.)(Hamidi, Meshkat, Rezaee, & Jafari, 2011); (Bello et al., 2018); (Etzkowitz, Webster, Gebhardt, & Terra, 2000); (Etzkowitz et al., 2000); (Hiltz & Turoff, 2005); (Allen & Seaman, 2013); (A. R. Brown & Voltz, 2005); (Amin et al., 2018); (M. Brown, Anderson, & Murray, 2007); (Marković, 2009); (Salimi et al., 2017); (Talebian, Movahed Mohammadi, & Rezvanfar, 2014); (Whyte & Hennessy, 2017)

4	Objectives of e-Learning	Improving the quality and accessibility of educational opportunities regardless of time and place, acquiring competence, acquiring problem-solving skills, improving critical appraisal skills, improving clinical skills, management and decision-making in complex situations, lifelong learning, negotiating and establishing social relationships, valid scientific degrees	(Aboshady et al., 2015); (Gaupp et al., 2016); (Behnam, 2012); (Ellaway & Masters, 2008); (De Leeuw et al., 2016); (Duncan, Miller, & Jiang, 2012); ("The Priming Effects of Virtual Environments on Interpersonal Perceptions and Behaviors - Peña - 2013 - Journal of Communication - Wiley Online Library," n.d.); (Aithal & Aithal, 2015)
5	e-Learning Infrastructures	• technological infrastructures • human infrastructures • pedagogical infrastructures • cultural-social infrastructures • economic infrastructures • managerial and leadership infrastructures • administrative and support system infrastructures	(Namisiko et al., 2014); (Marfo & Kabutey Okine, n.d.); (Camelia & Silviu, n.d.); (Oye, Salleh, & Iahad, 2011); (Mnyanyi & Bakari, n.d.); (Ismail, Safieddine, & Kulakli, 2018); (Cidral et al., 2018)
6	e-Learning barriers and limitations	Instructors • Limitations related to the competence of faculty members • Lack of knowledge about virtual learning • Lack of incentives • Lack of ICT knowledge • Lack of required educational skills • Lack of innovation and research • Instructors' unwillingness to cooperate in online courses • Negative attitudes to virtual learning Managers • Lack of knowledge and insight among university and medical education officials • Constraints in human resources and time • Budget limitation • Failure in change management • Organizational structures and processes • Managers' attitudes • Educational costs • Funding limitations • Inadequate structural, political, and • organizational support • Inadequate research and findings in this regard Technological infrastructure • Inadequate bandwidth • Inadequate advanced systems for virtual learning • Limitations in IT infrastructures • Quality of online programs Learners • Improper evaluation methods in online education • Lack of credit for virtual learning • Lack of reliability and acceptability • Absence of learning societies • Inadequate student support services • Poor quality of online content and courses • Ambiguities in the roles of students and their capabilities	(Al-Ghaith, Sanzogni, & Sandhu, 2010); (Tsai & Chai, 2012)("Overcoming barriers for eLearning in universities—portfolio models for competency development of faculty - Schneckenberg - 2010 - British Journal of Educational Technology - Wiley Online Library," n.d.); (Assareh & Bidokht, 2011); (Franz et al., 2015); (Quadri et al., n.d.); (Idris & Osman, 2016); (Quadri et al., n.d.); (Alshahrani, n.d.); (Qureshi, Ilyas, Yasmin, & Whitty, n.d.); (Quadri et al., n.d.); (Afshari, Bakar, Luan, Samah, & Fooi, 2009); ("Researching Learning in Virtual Worlds | Anna Peachey | Springer," n.d.)

7	Determinants of success of e-learning system	• Interaction • Learner-centeredness • Attention to individual differences of learners • Flexibility • Encouraging active learning • Use of IT capabilities • Evaluation in all stages of learning • Quality control	(Ikram, Essink-Bot, & Suurmond, 2015a); (Ikram et al., 2015b); (Farajollahi, Zare, & Sarmadi, 2010); (Bhuasiri, Xaymoungkhoun, Zo, Rho, & Ciganek, 2012); (Mosakhani & Jamporazmey, 2010); (Lwoga, 2014); (Ikram et al., 2015a); (Whyte & Hennessy, 2017); (Alhabeeb & Rowley, 2017); (Karanjam, Zarif Sanaiey, & Karanjam, 2017)
8	Different forms of virtual institutes	Independent and joint distance learning centers Virtual learning centers within an institution Exclusive virtual learning centers Corporate universities or private vocational centers Virtual university consortiums	(George et al., 2014); (Wingo, Ivankova, & Moss, 2017); (Ismail et al., 2018); (Fikile & Neil, 2017); (Malatji, 2017); (Ahmed & Elhag, 2017); (Aboshady et al., 2015); (Arndt & Guercio, 2017); (Pettersson & Olofsson, 2015)

Therefore, to design, stabilize, and enhance an e-Learning system, it is essential to consider the objectives, success determinants, barriers and limitations, infrastructures, and different forms of virtual institutes.

The second objective of the study was to determine and compare the structures of e-learning programs in medicine at renowned universities across the world for modeling based on the context of a country. The basics were studied in previous steps, and the objectives and executive strategies were investigated at this stage.

For that reason, the e-learning systems of some renowned universities in North America (13 universities), Europe (11 universities), and Asia (6 universities) were analyzed comparatively. In the first stage of the study, relevant and reliable information regarding the e-Learning systems of selected universities was documented. In the second and third stages, the documented information was critically analyzed and categorized to compare the similarities and differences between e-Learning programs. Finally, in the fourth stage, the best strategies for implementing e-Learning programs in Medical education were determined. Due to the lack of complete data available on university websites as well as overlapping and inadequate findings, some of the indicators were merged into more general categories (Table 2).

Table 2. Determination and comparison of the components of e-learning programs in well-known universities across the world

Index	Comparative analysis of universities	Appropriate strategies for implementing e-Learning in Medical Education
Objective of e-Learning	In North America, the objective is to receive a university degree in medical sciences, especially at the Masters level and sometimes Ph.D. In Europe, virtual courses are offered for empowerment, but equivalent degrees are sometimes granted. A master's degree is offered in some countries. The situation is a little different in Asia. Certificates are provided for primary and competency courses, and few universities admit students for Masters and Doctoral levels.	Designing appropriate e-Learning systems based on the target groups in medical and interdisciplinary courses
Student admission criteria	In all three continents, the applicants are required to have a related degree. A CV in North America and an oral and written examination in Asia are also required.	Determining suitable student admission criteria

Educational approach	The educational approach is mostly blended in North America and Europe, and virtual in Asia. In North America, various methods and tools such as gamification, social networks like Skype and Facebook, simulation and webinar, video conferencing, and forums are used. Social media are less frequently used in Europe. Mobile learning is used in Asia and North America while it is not popular in Europe. In Asia, most presentations are in the form of lectures that are lesson-driven. Lectures are available in electronic format.	Designing blended teaching-learning approach (active and interactive)
Evaluation methods	Although formative and summative assessment methods are used in almost all three continents, these methods are not identical. In North America, projects and peer assessment are of importance, while journal writing, logbook, scientific bulletin, portfolio, and individual and team projects besides mutual assessment methods like oral and written exams indicate the diversity of assessment methods in Europe. Since courses mostly aim at empowerment in Asia, assessment is not usually done. However, for academic majors, formative and summative assessment methods are used.	Designing various methods for evaluating students

Overall, the findings showed that in terms of providing virtual courses, The Australian National University, King's College, and Singapore University, were amongst the pioneers of this field. Given that one of the goals of establishing virtual universities is to create interdisciplinary courses to develop new ideas and identify existing issues, we decided to investigate the frequency of courses within the Medical field.

Amongst the Medical field, basic science, health, and nutrition, pharmacology and dentistry have entered into the area. In terms of developing interdisciplinary courses, mathematics, science, psychology, sociology, and technology have been integrated into the medical field and developed into new courses. Most of the offered courses have been delivered to Master's and in some cases Ph.D. students, indicating that the majority of courses are offered at the graduate level. Their educational strategies mostly comprise active learning approaches using both synchronous and asynchronous methods. Many online communication methods are suitable for developed countries with robust technological infrastructures. The implementation of e-learning in medical education in each of these settings is based on reliable infrastructures as well as executive, tactical, and strategic factors. We integrated the findings of stages 1 and 2 to present the following comprehensive model (Figure 1).

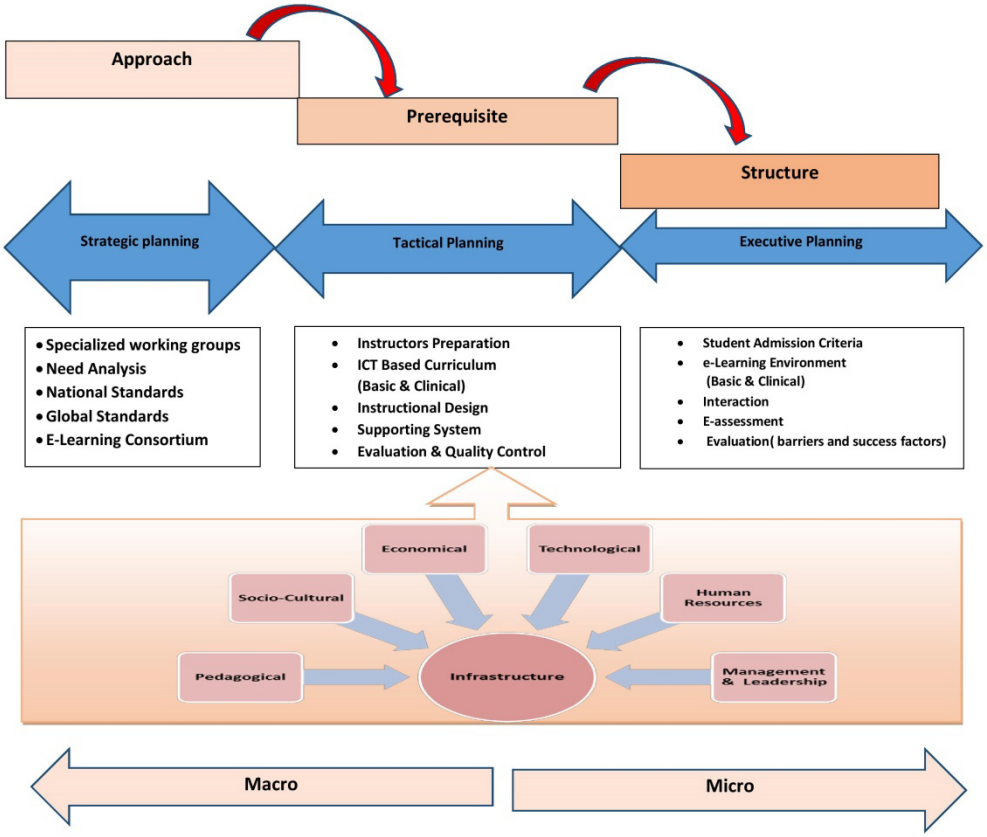

Figure.1 The Characteristics and Features of the comprehensive model for designing e-Learning in medical education

The proposed model is based on studies about different e-learning issues in medical education. It consists of four dimensions (approach, prerequisite, structure, and infrastructure). These dimensions and their fundamental concepts briefly include:

- Approach: In this dimension, strategic planning for achieving long-term goals is carried out. At this level, it is necessary to pass the required laws and determine the direction of managerial decisions in addition to the provision of infrastructures. This level is composed of the following categories; specific working group, need analysis, national standards, global standards, and e-Learning consortium. Therefore, a specialized working team is established to determine national and global standards, and by enforcing these standards in the context and local learning environment, the initial planning is performed. Moreover, an E-learning consortium will be finally formed for collaboration in providing quality e-learning resources and courses for medical education on national and international levels.
- Prerequisite: In this dimension, tactical planning and scheduling of short-term activities are required to achieve the objectives of strategic planning. In the tactical phase, attention should be paid to the preparation of instructors, recruitment of competent professors for curriculum design, integration of new technology infrastructures for the teaching-learning process, designing the supporting systems for learners and instructors, and applying measures for supervising and monitoring the quality of education.
- Structure: At this stage, such procedures as executive planning, student admission criteria, preparation of the proper educational content, application of suitable student assessment methods, adoption of various instructional and learner assessment methods, and evaluation of the programs are essential components of the structural dimension.
- Infrastructure: The model emphasizes the infrastructure of the educational system as a basis for designing medical education. Following this category, we need to establish the necessary infrastructure

that is composed of: technical, pedagogical, sociocultural, and economic factors, along with human resources, management, and leadership.

- The ideal scenario of e-learning is to establish a university that is free from the limitations of traditional universities or regional restrictions. Therefore, the basis for the proposed model rests on the macro (international and national educational setting) and micro (learner, teacher, and teaching and learning processes) levels. While each level is discussed separately, in practice they are intimately connected.

DISCUSSIONS AND CONCLUSION

The present study aimed to develop a comprehensive model for designing e-learning in medical education. The model described here attempts to integrate all components of an educational system. The key dimensions of the model are the approach, prerequisite, structure, and infrastructure.

The Approach dimension is where the educational system determines the long-term goals, and performs strategic planning. In the Prerequisite dimension, tactical planning and scheduling of short-term activities are performed, and in the executive aspect, the teaching-learning process is planned.

We did not find any studies presenting a comprehensive model for e-learning in medical education; therefore, the findings of the following studies were compared with the studies that were somehow related to the main concepts of the present study. For example; Asgarimehr, Shirazi, Eskandari, & Rostami (2012) developed a strategic framework for designing e-learning with a focus on university entrepreneurship. They found that the cooperation among officials in the government, industry, and educational system was essential in creating an entrepreneurial system. The results of these studies partly mirror the results of the present study; e-learning is not only adding a component to the educational system, but it is also an innovation in medical education. This innovation is a comprehensive part of the educational system (Ahmady, Kohan, Bagherzadeh, Rakshhani, & Shahabi, 2018). Therefore in our model, we try to integrate e-learning in all aspects of medical education systems from the macro-level to the micro-level. At the macro-level, the focus is on the national and international settings of medical education and strategic planning, and at the micro-level, the focus is on the learner, design, implementation, and evaluation of learning environments such as medical schools and clinical settings.

Interaction with others is crucial for the gradual development of the learner's understanding. Interaction with human and non-human factors of the environment is an inevitable component of high-quality educational experiences (Aboshady et al., 2015). Some studies also examine the key success factors of an e-learning environment. For example, Basak, Wotto, & Belanger (2016), studied the factors contributing to the success of e-learning from the perspectives of learners and teachers from four universities in the U.S., Mexico, Spain, and China. They concluded that from the learners' and instructors' points of view, essential factors in establishing an effective online program were course design, instruction, learning platform, interaction, learning content, and social presence.

M. Brown et al. (2007) identified critical elements of effective e-learning designs: providing interactive learning activities, creating motivation and enthusiasm in the learner, providing appropriate technologies for presentation, and learning within the social and personal context of the learner.

These studies were consistent with the findings of the present study. The results of our research indicated that e-learning programs at renowned universities applied collaborative methods including synchronous and asynchronous group forums, webinars, and virtual classes, as well as social networks. Moreover, one should consider the infrastructure when designing effective and interactive e-Learning. Thus, in our model, pedagogic, cultural, economic, and technological infrastructures are the basics for moving an active and interactive learning program into the operational stage.

Various factors affect the quality of an educational system. Evaluation of academic achievement is of paramount importance (Costello et al., 2014). The online assessment is rarely used in Summative evaluation, and as indicated by the results of this research, the selected universities used formative assessment methods such as seminar presentation, forum discussion, journal writing, logbook, electronic portfolio, self-assessment, peer reflection, case study, and peer assessment, in addition to summative evaluation, online testing, and in-person testing. The results of a study by Yerushalmy, Nagari-Haddif, & Olsher (2017), showed that

electronic evaluation is rarely used in the summative evaluation due to some obstacles like shortage of specialized facilities and difficulties in ensuring test security. Therefore, the present model covers a variety of assessment methods as an essential part of any educational learning process; assessment feedback should be employed to improve learning.

Also, the results of our study indicate that most countries are moving towards virtualization through the formation of consortiums. An e-Learning Consortium fosters inter-institutional collaboration and cooperation between organizations, institutes, and universities to create a synergistic environment. Establishing e-learning consortiums necessitates collaboration on national and international levels, which should be reflected in strategic planning.

In conclusion, meticulous attention should be paid to all aspects and elements of an e-Learning design before implementing it.

LIMITATIONS AND FUTURE RESEARCH

The main limitation of this study is that its findings cannot be extended to other fields, because the findings of the research are not tested to find out whether they are statistically significant or due to chance. In addition, only the available articles were reviewed and articles other than Farsi and English were excluded. However, there were no prior studies related to e-learning in medical education in the Iranian context. The findings of this study suggest that the criteria for designing E-Learning may not fully resolve the problem of its implementation. Other factors contributing to Structure are human resources and their role in implementing a successful e-Learning program. Additional studies are required to determine the validity of these findings. Using the above-mentioned criteria, researchers can develop a tool to measure the quality of this type of education. It will enable them to access varying levels of quality and determine further indexes.

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EFFECTIVENESS OF VIRTUAL VS. NON-VIRTUAL TEACHING IN IMPROVING READING COMPREHENSION OF IRANIAN UNDERGRADUATE EFL STUDENTS

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ABSTRACT

Virtual learning, in particular, has been defined as any system of education and instruction that brings together participants who are separated by geographical distances or time. Notably, in virtual learning environment interactive telecommunications systems are utilized to connect learners, resources, and instructors. Accordingly, the present study sought to investigate the significant effect of virtual teaching on improving reading comprehension of undergraduate EFL university students. To this end, from the population of students majoring in English translation, at Islamic Azad University, Isfahan, Iran, one control group, one virtual class, and one blended group were selected, each consisting of thirty participants. Subsequently, the virtual group was exposed to web-based technologies throughout the entire term while the students in the control group were taught through traditional method. Moreover, the instructor in the blended group used both traditional and innovative methods. The results of the t- test revealed that the group which was taught through web-based technologies during the term progressed substantially in comparison with the other two groups. Moreover, there appeared to be a significant difference between the pretest and posttest in the virtual group. Evidently, the results of the present study may have practical implications for EFL teachers, online instructors, distance education programmers, materials developers, and syllable designers.

Keywords: Blended learning, geographical distance, reading comprehension, virtual learning, web-based technologies.

INTRODUCTION

The term virtual environment, like online learning and e-learning, is used to describe "distance education, where the learning group is separated and where interactive telecommunications systems are used to connect learners, resources, and instructors" (Marrotte-Newman, 2009). The presence of new technologies in distance learning has altered the ways through which students interact with both their teachers and their classmates (Kaminski, Switzer, & Gloeckner, 2009). One of these new technologies is online learning, which is an educational delivery method that brings together participants who are separated from each other through geographical location and time (Filimban, 2008).

The virtual classroom is becoming more prevalent in all academic settings, particularly in distance education (Archambault and Crippen, 2009). Virtual classes provide students with access to many educational opportunities that might not otherwise exist. Based on current growth trends, more students will continue to take virtual courses in the future (Rice, 2009). He observed that regardless of how virtual schools are operated, the rise in the number of virtual schools has been dramatic.

Virtual learning environment and electronic learning setting have received considerable critical attention in the discipline of language teaching in general and reading comprehension in particular. Developments in the field of distance education have led to a renewed interest in virtual learning studies and electronic-learning environments. Research on this topic has been mostly restricted to limited comparisons of virtual and non-virtual environments in terms of attrition rate, sense of community, grade and satisfaction. Little research has been done on contributory role of virtual teaching in improving reading comprehension of university students.

LITERATURE REVIEW

The theoretical framework for this research study is rooted in the theory of transactional distance as a key variable for eliciting student engagement in the classroom. Transactional distance is defined as "the psychological and communication space that exists between learners and instructors in distance education". The theory asserts that the quality of teaching, learning, and interactions among participants is not affected at the same level by geographical separation as it is by the structure of the course and the quantity and quality of the interactions that happen in that structure (Moore and Kearsley, 1996).

Distance learning can be either synchronous or asynchronous in delivery (Martin, Parker, and Deale, 2012). In distance learning, synchronous delivery involves live interaction between all participants, which may include a traditional classroom, video or audio teleconferencing, a communal whiteboard, and live interactive chat rooms (Filimban, 2008). Asynchronous delivery involves an interaction wherein students and instructors do not participate at the same time and place, such as through e-mail, videotape, and Internet-based platforms. Both synchronous and asynchronous instructional practices have been used at traditional and online schools and universities.

Harvey, Greer, Basham, and Hu, (2014) conducted a study that examined middle school students in the online learning environment. An area of concern that was noted throughout this study was the area of social interaction or lack of social interaction. The study that was conducted compared the experiences of middle school students in the traditional environment to the online environment. Areas that students liked about working in the online environment were primarily in the flexibility that was provided, learning on their own, staying home for school, and working online.

One application of virtual courses is the employment of this system at universities. A virtual university has been founded to be free of traditional systems' limitations and characteristics. Traditional universities should inevitably comply with the course of new changes. In the new environment, the role of instructors and trainers will change. They will more play the role of a facilitator and trainer or of educational designers. In process of dealing with virtual courses and the role of teachers Atai and Dashtestani (2013) claim that online classes should be treated differently. In online courses, teachers may not be able to explain instructions, perceive and mentor the learners as typically practiced in face-to-face classrooms. Therefore, it may be argued that initiation and facilitation of discussions, as well as providing feedback require different approaches.

Wallace (2009) explored the utilization of virtual programs primarily with gifted students at younger age levels. Gifted students utilizing virtual technology showed promising outcomes. Additionally, virtual technology provides more access to classes that students may not have access to otherwise. Students found that their educational experience was much more enriched because of the availability of the virtual platform. Students who participated in this study found that they were very well prepared academically for end-of-course tests that were taken following the virtual class. The researcher found that the research on the effectiveness of the virtual platform for learning, particularly with younger students, was very limited and that much more research was needed because the utilization of the virtual platform for education with younger students was rapidly expanding.

Kerr (2005) conducted a research project on online learning communities. She found the development of a learning community within the virtual education setting was very important for success. Regarding the virtual environment, the researcher found that in order for the learning process to be successful, instructors needed to pay attention to the development of a sense of community within the classroom group. The creation of a learning community that will benefit the students in the virtual setting requires a commitment both from the students and the teacher. Learning has to be an active process in which the teacher and students participate in order to achieve success.

The relationship between technology and EFL learning is a significant area to do research studies and because of students' familiarity with technology devices in everyday life and their improved computer literacy, it is demanding to use technology more effectively. As Chirimbu and Tafazoli (2013) believe, for many language learners around the world, new digital environments create a useful way for learning language and also the main medium in which they will actually use their second language in ever day life. Almost all university students are equipped with functionalities and application on their cell phones, so using these applications to facilitate language learning and communicate with each other is so widespread.

Blended learning can also be defined as integrating face to face learning and electronic learning or distance learning, using different learning theories, methodologies and techniques in the same place and supporting the learning with various online technologies during the learning process in the classroom (Discroll, 2002; Rossett, 2002; Singh, 2003). Throne (2003), on the other hand, defines the blended learning as "an education model which can integrate e-learning which has improved in parallel with new and technologic developments with traditional learning which provides the interaction in classroom".

Jahanbakhsh and Chalak (2018) investigated the contributory role of virtual courses via Skype to control embarrassment of Iranian EFL learners' performance. This study aimed at finding out how presentation in the frame of virtual courses can control embarrassment and shyness of Iranian EFL learners. The practical part concentrated on using Skype for the purpose of presentation in seminar courses. The data collection was based on Revised Cheek and Briggs Shyness Scale (PRSS 14 item) and the target group was selected from three seminar classes during 2016.

Esmaili (2012) conducted a study with 70 participants in Iran and used Kumaravadivelu's framework to use technology in writing classes. The results of his study state that technology is not a beneficial tool per se, and it should be used as a complementary tool for teachers. Nezam Hashemi (2014) stated, in a recent study, that teaching writing in virtual way is not significantly more effective than teaching it in actual conventional classes, and virtual classes turned out to be fruitful if used as an addition to the actual class to boost whatever in the class. Moreover, Khoshsima and Sayadi (2016) conducted research on the effect of virtual language learning method on writing ability of Iranian intermediate EFL learners. They found out that virtual learning environment can have a statistically significant impact on writing capacity of intermediate EFL learners by and large.

There is increasing longing for students who intend to enroll in academic centers that have online specialized courses. Research has consistently shown that undergraduate EFL learners lack involvement in virtual learning environments and settings. Most studies in the field of reading comprehension have only stressed the importance of teaching reading skills in the physical classroom setting. Although extensive research has been conducted in different schools and institutions, few studies have been carried out in the university level in terms of effectiveness of virtual teaching and blended method in enhancing reading comprehension of undergraduate students.

The main objective of this research study was to investigate the contributory role of virtual teaching in improving reading comprehension of Iranian undergraduate EFL students. Moreover, the profound impact of blended learning environment on reading comprehension of undergraduate students will be taken into account. Furthermore, this examination aimed at investigating the significant differences among traditional, virtual, and blended learning environments in terms of English reading comprehension. This study is significant in filling the gap in the literature by determining that synchronous virtual learning environment can have a substantial effect on reading comprehension of Iranian undergraduate EFL learners. Additionally, this research study is going to make a major contribution to comparative studies on traditional, virtual, and blended language learning environments.

In fact, the research questions to be answered in this study look like the following:

1. Does virtual learning environment have a statistically significant effect on reading comprehension of Iranian intermediate undergraduate EFL students?
2. Does blended learning environment have a statistically significant effect on reading comprehension of Iranian intermediate undergraduate EFL students?
3. Are there any significant differences among traditional, virtual and blended groups in terms of reading comprehension competency?

METHODOLOGY

Design

All the data collected in this research study were objective and statistical. It was a quantitative research study that started with a quasi-experimental design in which specific hypotheses precede the quantification of data with follow-up numerical analyses. The investigation compared student test results before and after an instructional treatment in the pretest and posttest respectively. This quantitative research study was confirmatory, verification-oriented, and outcome-oriented in nature.

Participants

From the population of undergraduate translation students majoring in Islamic Azad University, Isfahan Branch, Iran a sample of ninety participants with an intermediate proficiency level was recruited for this research study. They were assigned to one control group and two experimental groups, each made up of thirty students. All participants were aged between 20 and 30 years and they were of both male and female genders. The subjects were selected on the basis of a degree of homogeneity of their English courses and the number of terms attended in the university. All the participants were native speakers of Persian and they were generally studying English as a foreign language.

Instruments

To begin with, three particular instruments including a placement test, a pretest, and a posttest were employed for the purpose of assessment and evaluation. Accordingly, the solution placement test was administered in the beginning of the investigation. The pretest was given to participants prior to the treatment while the posttest was responded by students after the treatment.

In order to determine the homogeneity of the sample classes, subjects were asked to take the Solution Placement Test (Edward, 2007) prior to the study. In a nutshell, this test includes 50 multiple-choice items which assessed students' knowledge of grammar proficiency, vocabulary knowledge, 10 graded reading comprehension questions that evaluated reading comprehension of students, and a writing task which assessed writing ability of students. The whole administration took, approximately, forty minutes and from the entire population, 90 students with an intermediate proficiency level were chosen.

Prior to the study in order to ensure they were homogeneous in reading comprehension, a pretest was administered to find out students' knowledge of English reading comprehension. To this end, a series of thirty multiple-choice reading comprehension tests in five particular tasks was given to the students.

At the end of the semester, the tasks and questions in the pretest were scrambled and employed as the posttest. The posttest consisted of five English reading comprehension tasks including thirty questions and was administered and given to the control group and experimental groups to determine their progress and improvement in terms of reading comprehension skill. Having considered the methods approached in the three classes, the post test was delivered after the treatment. Furthermore, the reliability of both pretest and posttest was 0.84 calculated by KR-21 formula. In order for the researcher to find out the content validity of the tests, five experienced and knowledgeable teachers were consulted.

Data Collection Procedure

The procedures and approaches adopted in the control group and experimental groups were different. To that end, the control group was delivered an alternative treatment in which the reading comprehension strategies were taught through traditional methods whereas the experimental groups were given two treatments in which the reading comprehension tasks were instructed in a virtual learning environment and blended learning situation. The whole experiment was completed during an entire university semester approximately four months and sixteen sessions. The attrition rate was to the minimal level since students proceeded with and stayed on the program until the end of the semester.

Students in the control group were not exposed to any technological approaches at all rather they were put in a face-to-face classroom in which they exchanged ideas lively in an educational brick-and-mortar situation. Although the instructor in the control group did not make use of innovative methods in teaching reading comprehension tasks, he made students take advantage of applying verbal and non-verbal strategies in negotiating the meaning during the class activities. In fact, reading strategies were taught and instructed traditionally in the control group in which no web-based technologies and internet-based tools were utilized. A pretest was given before the experiment to ensure the homogeneity of learners and a posttest was administered at the end of the term to monitor their progress.

In the first experimental class, reading comprehension was taught in an innovative way using virtual learning environment throughout the experimentation. Students attended the number of sixteen sessions, once a week. Learners were engrossed in a live interactive chat room in which they interacted with each other via internet in a virtual learning environment. The instructor stressed the importance of learning comprehension prompts and utilizing them in appropriate places as well.

In the other experimental group, reading comprehension was taught in an innovative way using virtual learning environment mixed with traditional and face-to-face method of teaching. Students met sixteen times, once a week. Learners in the blended learning environment were involved in a situation in which they interacted with each other via internet in a virtual learning environment and took part in a physical class as well. Students were always encouraged to spend more time at home practicing these useful reading strategies and using them in class as well. The instructor focused on learning comprehension prompts and utilizing them not only via the internet but also in the classroom. A pretest is going to be given to them in the very beginning of the treatment to illuminate the homogeneity of the learners and a posttest will be administered to figure out the progress of learners at the end of the semester.

Date Analysis Procedure

The data for this study were elicited and collected from the solution placement test, pretest, and posttest to be analyzed subsequently. The experiments were carried out over a course of the growing period from the beginning to the end of the term. The scores for the placement test, pretest and posttest were recorded and written for later analysis. Moreover, the data analysis and interpretation were followed after the data elicitation and collection. The experiments were run using custom software for English language articles.

All the data and results gained through pretest and posttest were fed into the computer and then analyzed employing SPSS (Statistical Package for Social Science) software program. The data management and analysis were performed using this program. Technically, all numerical and quantitative data were analyzed with the help of SPSS program. The participants received 1 point for each correct answer in reading comprehension items in the pretest and posttest. One-way ANOVA test was employed to determine the homogeneity of learners in terms of their general English proficiency level and another one-way ANOVA was utilized to elucidate their reading comprehension skill in the beginning of the experimentation. In addition, a paired sample t-test was exploited to figure out the difference in the virtual group before and after the semester. In order to understand whether there were significant differences among the three groups on the posttest a one-way ANOVA test was run.

RESULTS

Homogeneity of Learners Concerning Their English Proficiency Level

Then, in order to ascertain the homogeneity of all groups in terms of their English proficiency level, a one-way between-groups analysis of variance (ANOVA) was run to the scores of participants on placement test. Table 1 shows the descriptive statistics for placement test. As represented, the mean, standard deviation, and standard error of measurement based on 95% confidence interval for the three groups are identified. Table 2 shows the results of Levene's Test of Equality of Error Variances for the participants. Accordingly, the significance level is F (2, 87) = 0.955 which is depicted in the last column of the following table. Since the significance level (0.955) is much greater than the cut-off point (0.05), it can be concluded that the difference between groups was not statistically significant in the very beginning of the research study. Therefore, it can be concluded that the all participants were homogeneous in terms of their English proficiency level.

Table 1. Descriptive Statistics for the Placement test

placementtest

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
control	30	57.0000	3.21634	.58722	55.7990	58.2010	52.00	63.00
virtual	30	57.0333	3.25347	.59400	55.8185	58.2482	52.00	63.00
blended	30	56.8667	3.21348	.58670	55.6667	58.0666	52.00	63.00
Total	90	56.9667	3.19216	.33648	56.2981	57.6353	52.00	63.00

Table 2. The Results of Levene's Test of Equality of Error Variances for the placement test

Test of Homogeneity of Variances

placementtest

Levene Statistic	df1	df2	Sig.
.046	2	87	.955

Homogeneity of Learners in Reading Comprehension

In order to ascertain the homogeneity of all groups according to their English reading ability, a one-way between-groups analysis of variance (ANOVA) was run to the scores of participants on pretest. Table 3 depicts the descriptive statistics for the pretest. As represented, the mean, standard deviation, and standard error of measurement based on 95% confidence interval for the three groups are illustrated. Table 4 shows the results of Levene's Test of Equality of Error Variances for the participants. The significance level is 0.959 that is depicted in the last column of the following table. Since the significance level (0.959) is much greater than the cut-off point (0.05), it can be concluded that the difference between groups was not statistically significant. Therefore, it can be concluded that the all participants were homogeneous in terms of their reading comprehension potential.

Table 3. Descriptive Statistics for the Pretest

pretest								
					95% Confidence Interval for Mean			
	N	Mean	Std. Deviation	Std. Error	Lower Bound	Upper Bound	Minimum	Maximum
control	30	20.6667	2.05667	.37549	19.8987	21.4346	17.00	24.00
virtual	30	20.7333	2.21178	.40381	19.9074	21.5592	17.00	25.00
blended	30	20.9000	2.15519	.39348	20.0952	21.7048	17.00	24.00
Total	90	20.7667	2.12026	.22350	20.3226	21.2107	17.00	25.00

Table 4. The Results of Levene's Test of Equality of Error Variances for the pretest

Test of Homogeneity of Variances			
pretest			
Levene Statistic	df1	df2	Sig.
.041	2	87	.959

One-Way ANOVA for the Posttest

In order to illuminate the differences among groups regarding their ability in reading comprehension, a one-way between-groups analysis of variance (ANOVA) was run to the scores of participants on the posttest. The descriptive statistics for the posttest is represented in table 5 below. In this table the mean scores, standard deviation, and standard error of measurement based on 95% confidence interval are represented. Table 6 shows the results of Levene's Test of Equality of Error Variances for the participants. As such, the significance level in the last column is F (2, 87) = 0.013 that is lower than the cut-off point (0.05), it can be concluded that there were differences among the control group, virtual group, and blended class in terms of their potential in reading comprehension.

Table 5. Descriptive Statistics for the posttest

posttest								
					95% Confidence Interval for Mean			
	N	Mean	Std. Deviation	Std. Error	Lower Bound	Upper Bound	Minimum	Maximum
control	30	22.2667	2.04995	.37427	21.5012	23.0321	18.00	25.00
virtual	30	25.0000	3.21634	.58722	23.7990	26.2010	19.00	29.00
blended	30	23.0667	2.18037	.39808	22.2525	23.8808	18.00	26.00
Total	90	23.4444	2.76052	.29098	22.8663	24.0226	18.00	29.00

Table 6. The Results of Levene's Test of Equality of Error Variances for the posttest

Test of Homogeneity of Variances			
posttest			
Levene Statistic	df1	df2	Sig.
4.580	2	87	.013

According to Table 7, Post hoc tests, multiple comparisons using Scheffe tests were carried out in order to locate the exact differences in the performances of the target groups. This test systematically compares each pair of groups, and indicates that there was a significant difference in the means of control, application, and blended groups since the amount of sig. is .000 that is less than cut-off point (0.05).

Table 7. Post Hoc Tests, Multiple Comparisons

posttest						
Scheffe						
		Mean Difference			95% Confidence Interval	
(I) group	(J) group	(I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
control	virtual	-2.73333*	.65492	.000	-4.3644	-1.1023
	blended	-.80000	.65492	.477	-2.4311	.8311
virtual	control	2.73333*	.65492	.000	1.1023	4.3644
	blended	1.93333*	.65492	.016	.3023	3.5644
blended	control	.80000	.65492	.477	-.8311	2.4311
	virtual	-1.93333*	.65492	.016	-3.5644	-.3023

*. The mean difference is significant at the 0.05 level.

The following graph represents the graphical representation of the means for the posttest. Accordingly, the horizontal axis depicts the control, virtual, and blended groups whereas the vertical axis shows the mean of scores ranging from 22 to 25. As depicted, the differences between the three groups were statistically significant. The mean score for the control group is 22.2667 in the figure. Moreover, the mean score for the virtual group is 25 and the mean score for the blended group is 23.0667 as shown in the following figure.

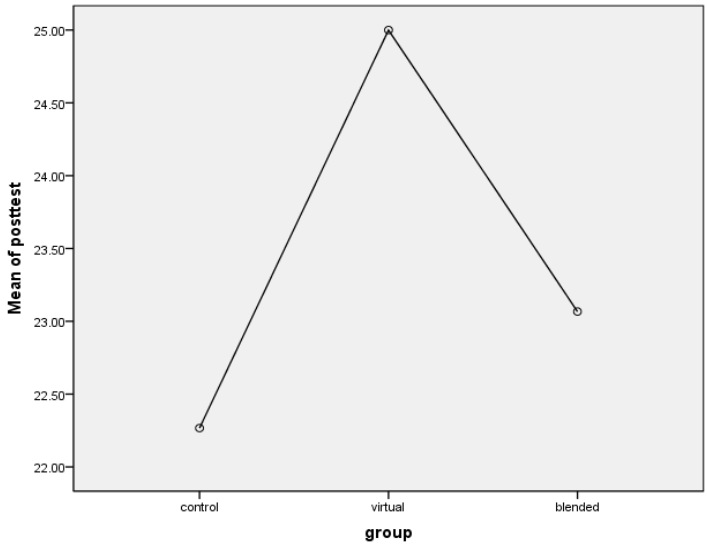

Figure 3. Mean scores for posttest

Paired Samples t-test for the Virtual group

Based on paired sample t-test for the virtual group, Table 8 shows the descriptive statistics for paired samples t-test. The mean scores, the number of students and standard deviation points are identified in this table. As such, the mean score for the pretest is 15.5667 while the mean score for the posttest is 18.4667 which show that there was not as much progress as the one in the TEFL group. In line with that, the progress in the experimental (TEFL) group was much more that the improvement in the control (Linguistic) cohort due to the fact that the experimental group were exposed to a lot of praise expressions.

Table 8. Descriptive Statistics for Paired Samples t-test for virtual group

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	pretest	20.7333	30	2.21178	.40381
	posttest	25.0000	30	3.21634	.58722

Paired samples correlations for the virtual group are shown in the next table. The number of students, the correlation rate, and the significance level are illustrated in the following table. As Table 9 depicts, the significance level in the last column is .00 that is less than cut-off point (.05), as a result, the treatment was effective. Moreover, the significance (2-tailed) in table 10 is zero (less than .05) which shows that the treatment was influential.

Table 9. Paired Samples Correlation for the virtual group

Paired Samples Correlations				
		N	Correlation	Sig.
Pair 1	pretest & posttest	30	.960	.000

Table 10. The Result of Paired Samples t-test for the virtual group

Paired Samples Test									
		Paired Differences							
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
					Lower	Upper			
Pair 1	pretest - posttest	-4.26667	1.25762	.22961	-4.73627	-3.79706	-18.582	29	.000

DISCUSSION

The present research study investigated the instructional efficacy of virtual teaching versus non-virtual teaching in augmenting reading comprehension of Iranian undergraduate EFL students. The main objective of this research study was to examine the profound effect of virtual learning environment on reading comprehension capacity of undergraduate students majoring in translation. In line with Kerr (2005), this study revealed that virtual learning environment can have a positive impact on reading comprehension of students. She found the development of a learning community within the virtual education setting was very important for success. The creation of a learning community that will benefit the students in the virtual setting requires a commitment both from the students and the teacher. Learning has to be an active process in which the teacher and students participate in order to achieve success.

In fact, virtual learning environment can bring together learners who are geographically and temporally separated from each other. Online learning can be helpful for students who are not able to attend classes on a regular basis and who are not able to commute to classes in a specific time. Students who are learning English as a foreign language and are busy doing other activities seek a more flexible way to expose themselves to learning circumstances and situations in one way or another. In agreement with (Filimban, 2008) one of these new technologies is online learning, which is an educational delivery method that brings together participants who are separated from each other through geographical location and time.

Wallace (2009) explored the utilization of virtual programs primarily with gifted students at younger age levels. Gifted students utilizing virtual technology showed promising outcomes. Additionally, virtual technology provides more access to classes that students may not have access to otherwise. Students found that their educational experience was much more enriched because of the availability of the virtual platform. Students who participated in this study found that they were very well prepared academically for end-of-course tests that were taken following the virtual class. The researcher found that the research on the effectiveness of the virtual platform for learning, particularly with younger students, was very limited and that much more research was needed because the utilization of the virtual platform for education with younger students was rapidly expanding. In line with (Wallace, 2009) virtual learning environment can have a substantial effect on the education of young learners in the academic settings.

CONCLUSION

The present study attempted to investigate the contributory role of virtual learning environment in improving reading comprehension of Iranian undergraduate university students majoring in translation. In a sense, this research study proved that virtual learning environment can not only bring together students who are geographically and temporally separated from each other but also lead to better confidence in reading comprehension. Furthermore, integrating virtual learning setting inevitably influences the scores students accomplish in reading comprehension tests.

The results of the t-test revealed that the virtual group achieved better reading comprehension grades as compared to other two groups. What is more, the students in the virtual learning environment cohort took the reading comprehension tasks more confidently and appropriately. In line with this, the mean scores for the control group and blended groups were much lower than the mean score of the virtual cohort. To conclude, utilization of virtual and online learning can flourish the reading comprehension ability of Iranian university students majoring in translation.

Evidently, the results of the present study may have implications for EFL teachers and syllabus designers, and materials developers. Another application to be included is that the lesson planners and school managers can benefit from the role of virtual environment in enhancing English teachers and university instructors to lead the classes more confidently and successfully. In addition, the results of this research study may provide significant help for students who are learning English as a foreign language and seeking ways to improve their reading comprehension potential through distance education and electronic learning.

The present research study was completed in the university level which included students majoring in translational studies and did not encompass TEFL and linguistic students. Furthermore, another limitation of this investigation is that it did not take account school students but university students. The present examination was oriented and manipulated in the Islamic Azad University and was not accounted for in other universities such as the state university, Payam Noor University and etc. This study can be carried out in other educational settings such as high schools, junior high schools, and vocational centers. Moreover, the present study might be replicated in other provinces, cities and ethnics with different English language exposures, language backgrounds, and proficiency levels. Last but not least, it can be conducted in overseas countries with non-native and immigrant students including both males and females and different age groups.

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