INVESTIGATING FACULTY MEMBERS' TECHNOLOGY INTEGRATION INTENTION AND BEHAVIOR: A CASE OF A HIGHER EDUCATION INSTITUTION

A THESIS SUBMITTED TO
THE GRADUATE SCHOOL OF SOCIAL SCIENCES
OF
MIDDLE EAST TECHNICAL UNIVERSITY

BY

HATİCE ÇİLSALAR

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR
THE DEGREE OF DOCTOR OF PHILOSOPHY
IN
THE DEPARTMENT OF EDUCATIONAL SCIENCES

MAY 2017

Approval of the Graduate School of Social Sciences

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ABSTRACT

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May 2017, 233 pages

The technology-rich educational environment in higher education compels faculty members to integrate technology into their classrooms. Developing and supporting their technology integration behavior is needed to perform and maintain its continuity. To understand the factors affecting faculty members' technology integration, mixed method designed was employed in the context of a faculty technology mentoring program at a public university in Turkey. Two main research questions guided this study: (1) How do self-efficacy, subjective norm, facilitative conditions, student influence, and attitude toward technology integration predict faculty members' technology integration intention? (2) How do faculty members perceive their technology integration behavior in the faculty technology mentoring context? Data sources included the survey comprised of the dimensions of the decomposed theory of planned behavior and semi-structured interviews conducted with faculty members who attended to the program. The survey was implemented with 167 faculty members. Semi-structured interviews were conducted with 17 faculty members who participated to the program. The multiple linear regression analysis revealed that attitude, self-efficacy, and student influence were predicting factors of the behavioral intention The qualitative analysis of the semi-structured interviews revealed relations of all dimensions of the theory during their exploration process and the challenges faculty members faced in the FTM program, their potential solutions, perspectives on the contributions of program, and suggestions to improve the FTM. Increase of awareness, more collaboration among peers, and more institutional support as a systematic change to support technology integration in higher education is important critically for dissemination of technology integration behavior.

Keywords: Technology Integration, Faculty Members, Faculty Technology Mentoring, Higher education

ÖZ

ÖĞRETİM ÜYELERİNİN TEKNOLOJİ ENTEGRASYONU NİYET VE DAVRANIŞLARININ İNCELENMESİ: BİR YÜKSEK ÖĞRETİM KURUMU ÖRNEĞİ

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Yüksek öğretimdeki teknoloji ile zenginleştirilmiş eğitim ortamları öğretim üyelerinin sınıflarına teknolojiyi entegre etmelerini zorunlu kılmaktadır. Teknoloji entegrasyonu davranışının geliştirilmesi ve desteklenmesi davranışın gösterilmesi ve devamlılığı için gereklidir. Öğretim üyelerinin teknoloji entegrasyonu davranışına etki eden faktörleri anlamak için, bu çalışma büyük bir devlet üniversitesinde yürütülen fakülte teknoloji mentörlüğü programı dahilinde karma yöntem izlenerek uygulanmıştır. Bu çalışmada iki ana araştırma sorusuna cevap aranmıştır: 1)Fakülte üyelerinin teknoloji entegrayonu niyetini özyeterlilik, subjective norm, kolaylaştırıcı durumlar, öğrenci etkisi ve tutum nasıl yordamaktadır? 2)Fakülte teknoloji mentörlüğü programında öğretim üyeleri teknoloji entegrasyonu davranışlarını nasıl algılamaktadırlar? Veri kaynaklarından biri olan anket ayrıştırılmış planlı davranış teorisinin alt başlıklarından oluşmaktayken, yarı-yapılandırılmış görüşme formu uygulanan programa katılan öğretim üyelerine uygulanmıştır. Geçerlilik ve güvenilirlik çalışmaları yapılan anket, 167 öğretim üyesine uygulanmıştır. Görüşme formu ise programa katılan 17 öğretim üyesine uygulanmıştır. Anket verisine uygulanan çoklu doğrusal regresyon analizi sonuçları onların niyetleriyle, tutumlarıyla, subjektif normlarla, ve algılanan davranış kontrolü tarafından tahmin edildiğini ortaya çıkarmıştır. Görüşmelerin nitel analizi sonucunda teoride belirlenen bütün faktörlerin bir şekilde davranışlar ilişkili olduğunu, ve ayrıca mentörlük programı sürecinde karşılaştıkları teknoloji entegrasyonu zorlukları ve onların bu sorunlara potansiyel çözüm önerileri ile programın katkıları ve geliştirilmesine yönelik önerilerini ortaya çıkarmıştır. Farkındalığın artırılması, iş arkadaşları arasındaki işbirliğinin artırılması ve sistematik bir değişimin parçası olarak kurumsal desteğin çoğaltılması teknoloji entegrasyonun yayınlaştırılması için kritik bir önem taşımaktadır.

Anahtar Kelimeler: Teknoloji Entegrasyonu, Öğretim Üyeleri, Teknoloji Mentörlüğü, Yüksek Öğretim

With all my love and gratitude,

To my awesome family

and

To my miracle

ACKNOWLEDGEMENTS

PhD life is difficulty for me, most of the time. It was in the shade of longing to be with my loved ones. The most important thing that I learned during this process is that I can stand on my feet with the support of precious people in my life, no matter they are close to me or thousand kilometers away from me. First of all, I would like to offer my thanks to my mentor, Assist. Prof. Dr. Evrim Baran, for your support, forthright encouragement, and trust on me anytime. I have learned not only being a good academician but also being an effective instructor in the classroom and thank you for your patience to guide me whenever I need. It is my honor working with such enthusiastic and innovative advisor during this compelling time-span of my life.

I would like to express my thankfulness to examination committee members; Prof. Dr. Soner Yıldırım and Assoc. Prof. Dr. Hanife Akar for their support, feedbacks, and illuminations on my research, and Assist. Prof. Dr. Gülçin Tan-Şişman and Assist. Prof. Dr. Ömer Faruk Islim for their invaluable comments on this study. I should mention about the contributions to my academic life with the experiences gained together with Assoc. Prof. Dr. Chrystalla Mouza and her research team when I was in USA.

I want to express my appreciation to my colleagues and friends particularly for their invaluable encouragement, guidance, comments, criticism, and moral support for completing this dissertation; Soumita Basu, Ayşegül Solar-Şekerci, Yelda Sarıkaya-Erdem, Melek Dönmez-Yapucuoğlu, Sevgi Kaya-Kaşıkçı, Özlem Yıldırım-Taştı, Tamer Kaşıkcı, and Pelin Erdoğan.

I offer many thanks to the faculty members who accepted to participate to this study and spare their valuable time to contribute it. Without their awesome contributions, this study could not be finalized.

Hepsinden de önemlisi, aileme ne kadar teşekkür etsem azdır. Canım annem ve babam, hayatımın iki meleği, sizin sonsuz desteğiniz ve her düştüğümde uzattığınız elleriniz olmadan ben bugünlere gelemezdim. Hayalini kurduğum bu yolda ilerlememde ve hayallerini dahi kuramadığım dünyalara adım atmamdaki desteklerininiz için minnetarım. My lovely brother, Hüseyin, thanks to your joyful and full of information talks on everything whenever I am bored. I have learned too many things from you who is my best gift ever that I have gotten in my life.

The last but not the least, too many thanks to you, Mehmet, who not only always with me whenever I am stuck with trouble but also opened your life and your pure heart to me. Thank you for your endless smiles, support, patience, and love as my miracle.

Finally, I should mention that this study was supported by Scientific and Technological Research Council of Turkey (TUBITAK).

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CHAPTER I

INTRODUCTION

The background of the study is presented in this chapter. It starts with the transformation of the higher education institutions with infusion of educational technologies. Then, the need for development of faculty members on technology integration as behavior and the ways for their development are discussed. Before and during the behavior performance the points considered by faculty members are examined as the factors in higher education context. Finally, technology usage in higher education classroom in Turkey is discussed. Additionally, purpose of the study and the research questions serving to the aims of the study, significance of the study, and definitions of frequently referred terms in the study are included in this chapter.

1.1. Background of the Study

Higher education environments have undergone a serious transformation with "*the implications of new technology and changing modes of course structure, and evolving"* (Nellis, 2017, p. 1) with the needs of the knowledge-based economy and the introduction of diverse informational or educational technologies, etc. (Al-Hattami, Muammer, & Elhamdi, 2013). In order to provide quality education in universities, the role of the teaching effectiveness and quality need to be considered to make the students well prepared for their future professional life. Once this adoption was thought as an institutional change process, faculty members defined as "notorious resisters to innovation" (p. 24) have the main role on it (Garrison & Vaughan, 2013; Hall & Elliott, 2003). As tertiary institutions implement multiple renovation processes higher education, faculty members may have hard time to be aware of all these changes.

The renovation process of teaching in higher education has been mostly shaped by emerging technologies accepted as the force of institutional transition (Porter, Graham, Spring, & Welch, 2014). This renovation can be observed as distance education practices by online learning programs, virtual universities, blended learning implications, massive open online education, cooperation and collaboration tools, flipped classrooms, computer supported collaborative learning strategies, learning management systems, etc. Even if there are such diverse technology integration implications around the faculty members, the faculty members' (63%) technology use with educational purposes is less than ten times in a semester (Britten & Craig, 2006). It is obvious that faculty members' technology integration behaviors are rarely performed, which is leading to a slow adoption to this renovation.

The literature indicates limited research on how faculty members' technology integration intention and behavior are affected and formed by several specific factors in the contextually intense scope of faculty technology mentoring processes (Huang & Chuang, 2007). Although, the behavior of the adjunct faculty members was analyzed by Paver (2012), there is no research on full-time faculty members' technology integration attitudes who are responsible for both research and teaching at dense technology mentoring context. This research objective resonates with Baran (2016a) who suggested expanding the existing literature to a whole university with mentoring opportunities on technology integration.

The limited technology integration performance juxtaposed with a surge in the investment in technology implementation on the administration level of higher education create concerns on quality of teaching and meeting the needs of stakeholders of higher education institutions (Reid, 2014). Accordingly, the institutions focus on the improvement of faculty members' awareness on technology integration and the development of their technology integration skills. Most of the higher education institutions have implemented face-to-face, online, synchronous, asynchronous, one-time, and recurring faculty professional development programs

(PDs), such as self-directed learning experiences, professional meetings, workshops, and conferences to accommodate faculty members' needs for effective technology integration in their classrooms (Johnson, Adams Becker, Estrada, & Freeman, 2015). However, the most commonly used PDs include trainings, workshops, and peer coaching models (Desimone & Garet, 2015). The limitations of trainings or workshops for addressing faculty members' unique and contextual needs have been called into question. Similarly, peer-coaching models require more voluntary effort for proper implementation (Kurtts & Levin, 2000) which is the most drastic part of PDs. Another problematic issue is the lack of time (Donegan, Ostrosky, & Fowler, 2000; Robertson, 2005) for arranging meetings or sharing ideas because of faculty members' workload. Therefore, all established methods of professional development have some limitations on meeting the specific needs of faculty members or reaching effective results at the end of the process.

To avoid the limitations, faculty mentoring programs were suggested as effective models that provide one-to-one working opportunities to faculty members with specific needs of technology integration in their classrooms (Chuang, Thompson, & Schmidt, 2003). Although faculty technology mentoring programs were accepted as pinpointing PDs in different contexts, Ehrich, Hansford, and Tennent (2004) stated that the mentoring activities have been rarely implemented due to some limitations, such as the need for one mentor for each faculty member, the need for time to solve specific problems of faculty members, and extra effort to maintain the continuity of the programs.

The faculty members who have already integrated technology defined themselves the least proficient in newer technologies (Hicks, 2016). Thus, adequate research endeavors are needed to address the existing issues and figure our practical solutions to enhance professional development programs on technology integration. The literature, also, indicates that faculty members' strong technology literacy skills result in familiarity with the usage of emerging educational technologies (Georgina & Olson, 2008). A thorough discussion on the following points are crucial in terms of technology integration practices in higher education: (1) how to develop effective technology integrators, solve their pedagogical problems in innovative and conceptually sophisticated ways by repurposing the current technologies (Mishra & Koehler, 2003), (2) how faculty members' technology integration intention and behavior can be affected by the factors, and (3) how inexperienced faculty member or the ones in the way of being expert on technology integration perceive the factors in the ways they are contributing or inhibiting their practice. The participants of these professional development initiatives are volunteering individuals (Chuang et al., 2003) and, most of the time, they are the unaware or reluctant faculty members who do not benefit from these activities.

Once the technology integration is considered as a behavior, there are several factors affecting the attitude, motivation, belief and intention toward behavior. Oliveira and Martins (2011) defined the factors as perceived benefits, organizational readiness, and external pressure; Ertmer (1999) attributed them as first-order and second-order barriers; and by Ertmer, Ottenbreit-Leftwich, and York (2006) categorized them into intrinsic and extrinsic factors. On the other hand, there are different factors specified as attitude, perceived behavior control, and subjective norm (Teo & Tan, 2012); teacher-technology interface, objective environment for instructional technology (technical support, computer access, and to a limited extent professional development opportunities) (Shiue, 2007); and attitude, subjective norm, perceived behavior control, and risk (Huang & Chuang, 2007).

The pedagogical and technological efficacy developments of the faculty members contribute directly to them and indirectly to their students. Emerging technologies are rapidly replacing traditional teaching practices with a focus on active student participation and constructivist approaches. In this regard, the conventional role of faculty members is shifting from distributor of knowledge to the facilitator of enhanced learning (Shankar, 2017). One of the main pitfalls that faculty members face in the instructional process is the lack of knowledge and experience on undergirding pedagogy with technology (de Hei, Strijbos, Sjoer, & Admirall, 2016). In line with this, examination of inhibiting and enabling factors of faculty members' technology integration behaviors are needed to create appropriate PDs and to address their specific needs for improved their instruction (Gautreau, 2011). Development of the faculty members' technology integration skills alongside the renovation of existing teaching and learning practices play a substantial role on in the renovation of higher education institutions and to arrange the conditions for the improvement of faculty members' technology integration.

In Turkey, educational technology research focused on distance education and learning, multimedia, education and performance, teacher education, research and theory, design and development, systemic change, and administration between 1990 and 2011 (Kucuk et al., 2013). Among these studies, research focusing on technology integration of faculty members are rarely examined when compared to those related to pre-service and in-service teachers. Interestingly, studies conducted on perception of undergraduate students, primary and secondary students were analyzed more than faculty members. Altın (2004) found similar results with the review study conducted at faculty of education of three big universities in Turkey. Similarly, there was limited educational technology research with faculty members according to review study of Simsek et al. (2009).

Most of the studies conducted within the faculty of education concentrating on generally preservice teachers, limitedly the teacher educators at the faculty (Celik, 2011; Gulbahar, 2007, Hismanoglu, 2012; Semiz & Ince, 2012). In their study, Simsek et al. (2013) examined competency level of faculty members on technological pedagogical content knowledge and found that they were at advanced level of competency. On the other hand, university students thought that their faculty members' technology usage was very limited (Cagıltay et al., 2007). Bayır and Ertaş (2010) reflected that technology usage of faculty members based on academic activities not educational ones. Akbaba-Altun, Kalaycı, & Avcı (2011) revealed that the higher education institutions do not have written instructional technology policy, although their main goal was benefitting from educational technologies in the classrooms. This study emphasized that the instruction should be supported beginning from the curriculum design of higher education. Once this process is taken into account, the result of Zayim, Yıldırım, and Saka (2006) indicated that faculty members had their own unique needs during adoption to innovation, which should be met with a unique way, and their self-efficacy for technology use empowers their utilization of technology.

To sum up, the renovation of higher education changed its direction with the emergence of innovative educational technologies. Teaching and learning activities have been considerably modified with the shift from teacher-centered to learner-centered environments and from lecturing to technology-enhanced teaching and learning activities. Along with this change, faculty members, key individuals in this innovative act, need to adapt themselves to changing landscape in educational domain and renovate themselves in terms of technology integration with proper administrative support; therefore, it is highly crucial to enrich their understanding of technology integration and different ways that contribute to their effective improvement.

1.2. Purpose and Research Questions

The study has two main purposes, both of which concentrated on the factors affecting the methods to integrate technology into higher educational institutions from the faculty members' preferences. Firstly, the objective of this study is to determine the relationships among the factors affecting the faculty members' intention for technology integration. By concentrating on these factors, it is possible to derive a reasonable conclusion on the perception of all faculty members with regard to technology integration in higher education. Secondly, this study aims to examine the faculty members' technology integration behavior while they are professionally experiencing it within the faculty technology mentoring program (FTM). By focusing on the change of faculty members' technology integration intention and behavior, this study concentrated on the analyses of the contributions of FTM to the behavior as well as explaining of how it has changed within the FTM program. Additionally, their perspectives on the FTM in terms of its contributions and ways to improve the program are considered within the scope of the study. Finally, the study focused on the challenges that the faculty members faced during the FTM with regard to technology integration coupled with the potential solution for those challenges from the perspective of the faculty members. To reach these aims, the following research questions were investigated.

Table 1.1.

Main and Sub-Research Questions

Research Questions	*Sub-Questions*
1. How do self-efficacy, subjective norm, facilitative conditions, student influence, and attitude toward technology integration predict faculty members' intention toward technology integration behavior?	*1.1.* Is there a relation between faculty members' self-efficacy and their intention toward technology integration behavior? *1.2.* Is there a relation between faculty members' attitude and their intention toward technology integration behavior? *1.3.* Is there a relation between faculty members' subjective norm and their intention toward technology integration behavior? 1.4. Is there a relation between facilitative conditions and faculty members' intention toward technology integration behavior? *1.5.* Is there a relation between student influence and faculty members' intention toward technology integration behavior?
2. How do faculty members perceive their technology integration behavior in the FTM context?	*2.1.* How do faculty members perceive the factors related to their technology integration behavior in the FTM context? 2.2. What are faculty members' perspectives on the effectiveness of FTM? *2.3.* What are the challenges and solutions associated with faculty members' technology integration into higher education classrooms within FTM context?

1.3. Significance of the Study

This study stems from the perceived requirement to determine and contribute to the limited knowledge base of the literature on faculty members' technology integration intention and behavior. It provides an explicit vision and plan to integrate technology in higher education classrooms that should help revise the policies of teaching and enhance the opportunities for technology integration in higher education (Georgina & Hosford, 2009). While a robust body of research work is dedicated to analyzing specific ways to integrate technology, there is a significant gap in the literature related to the factors affecting faculty members' technology integration intention and behavior. Accordingly, this study aimed to contribute to the technology integration literature from different perspectives to: (1) provide clarified factors affecting faculty members' technology integration intention and behavior, (2) reveal inhibiting or enabling factors of the faculty members' technology integration intention and behavior to enrich higher education classrooms with educational technologies, and (3) present recommendations on the design and implementation of FTM programs.

As emphasized by Taylor and Todd (1995), faculty members' technology integration behavior is directly related to intention, and indirectly to attitude, subjective norm, and perceived behavior control. For technology integration in higher education, researchers (Pajo & Wallace, 2001; Beaudin, 2002; Snoeyink & Ertmer, 2001; Bariso, 2003) concentrated on variety of barriers and the ways of elimination of these barriers (Rogers, 2000) through the viewpoint of faculty members on technology integration. However, how these factors affect the intention and behavior have not been examined from the perspectives of the faculty members who have just experienced technology integration (Lim, Lee, & Hung, 2008) within a one-to-one professional development environment. At that point, reaching a deeper understanding of the overall perceptions of technology integration (Kane et al., 2016) behavior from the newly experienced faculty members is one of the unique parts of this study.

Parallel to the aims of the study, the recommendations on the design and implementation of FTM programs are significant to make it powerful for both participants of the program and the decision makers. In a review study by Chuang et al. (2003), FTM programs were implemented in the context of the faculty of education only and these researches typically dealt with the teacher educators who are experts on teaching, learning, and pedagogy. A particular drawback of these studies is their inability to explain technology integration usage intention and behavior of all faculty members from different departments. Baran (2016a) suggested implementing similar programs such as university-wide programs, which contribute the quality of teaching activities over the university. For this reason, it is critical to authorize an effective university-wide FTM program. By focusing on the faculty members' technology integration behavior in the context of mentoring program, this study can empower and inform further professional development practices in higher education institutions as the mentoring activities at university level can be organized by considering the recommendations of the faculty members who participated in this study. Although faculty mentoring activities pose some challenges, their contribution to the participants is significant (Bean, Lucas, & Hyers, 2014). Moreover, with the intention to meet the faculty members' pedagogical needs, the FTM program provides space for engaging in the discourse to admit and disclose the experiential narrative of technology integration (Quintana& Zambrano, 2014) by the faculty members. Finally, it is important to understand why the faculty members do not integrate technology and what the possible ways are to support their technology integration intention and behavior (Buchanan, Sainter, & Saunders, 2013). Although technology integration process being an individual process (Tondeur, van Braak, Ertmer, & Ottenbreit-Leftwich, 2016) and unique to each faculty member, it is important to evaluate and examine the inherent general dimensions of the process. Equally important is to detect the reasons why most of the faculty members abstain from or avoid integrating technology in their classrooms (Hicks, 2016; Watty, McKay, & Nogo, 2016) and to make recommendations for facilitating the performance of those faculty members.

Within this study, examining faculty members' technology integration behavior in both higher education institute and the context of the FTM programs at higher education institutions provides a closer look into their perceptions on technology integration behavior and the factors related to the behavior, emerging challenges and, proposed solutions to integrate technology in higher education. Furthermore, the examination of technology integration behavior is needed to support the creation of facilitative environments for effective amalgamation of technology with content areas and pedagogy in higher education contexts.

1.4. Definitions of the Terms

Technology Integration: *Technology integration* refers to the reliance on computer technology for regular lesson delivery (Bauer & Kenton, 2005). Similarly; Roblyer, Edwards, and Havriluk (2006) claimed that "…integrating educational technology refers to the process of determining which electronic tools and which methods for implementing them are appropriate for given classroom situations and problems" (p. 8). The term generally includes technology usage in the educational settings to enhance solutions for educational challenges. In this study, technology integration refers to using technological tools or resources to solve pedagogical problems or support teaching and/or learning activities within the course in higher education. The tools or resources can be specialized software, online classroom management tools, learning management systems, open/online courses, student response systems, online collaboration and/or communication tools, digital formative and summative assessment tools, blogs, forums, online materials or platforms, mobile devices, mobile apps etc.

Faculty Technology Mentoring (FTM): It can be defined as creating a relationship between the faculty member or mentee, and an expert on technology integration or mentor, to meet the needs of faculty members to integrate technology into education. The mentor can have different educational background as McLaughlin (2010) states "there are three levels at which mentoring takes place in the academic environment: between faculty and students, usually graduate students; between faculty and postdoctoral fellows; and between senior faculty and junior faculty" (p. 873). In this study, mentoring indicates relationship and activities between faculty members and graduate students from faculty of education.

Mentor: The term "mentor" refers to an experienced person who possesses the knowledge and skills desired by the novice one (Ambrosetti & Dekkers, 2010). In the context of this study, the mentor is used to imply an experienced and knowledgeable person on technology integration, who trains or guides faculty members who are novice on technology integration in higher education.

Mentee: It is defined as a person who receives mentoring and is less knowledgeable and less experienced. In this process, s/he may contribute simultaneously to the mentor's development (Pamuk, 2008). In other words, it refers to the broad range of individuals who may be in the role of "learner" in mentoring relationships, regardless of the age or position. In this study, the mentee is used as the person who receives support and information to integrate technology into his/her classrooms from a mentor. Although there are different terms to imply these two terms, "mentor" and "mentee" are chosen because they are clearly understood by everyone and commonly used terms in mentoring literature.

Intention: Intention toward technology integration behavior can be defined as "perceived likelihood of performing the behavior" (Montano & Kasprzyk, 2015, p. 101) in educational contexts. Parallel to DTPB, intention toward the behavior is accepted in this study as the acceptance to get positive outcomes by performing the behavior.

Self-efficacy: Faculty members' self-efficacy on technology integration is accepted as reflection of the "personal comfort with performing" (Bandura, 1982) the behavior. Similarly, Ajzen (2002) explained self-efficacy as "to ease or difficulty of performing a behavior, or confidence in one's ability to perform it". In this study self-efficacy refers "the belief that one has the capability to perform a particular behavior" (Compeau & Higgins, 1995, p.189).

Attitude: The definition of attitude made by Fishbein and Aizen (1975) as "a learned predisposition to respond in a consistently favorable or unfavorable manner with respect to a given object" (*p*. 6) which is accepted within the study parallel to individuals' positive feelings about using technology.

Subjective Norm: Subjective norm comprise of belief related to the performance about the thoughts on the performance of the people around the performer who are important. Ajzen (1991) defined it as social pressure making the individual perform a particular behavior. This social pressure can be from different groups of people such as, peers, colleagues, student, administrators, superiors, and support personnel (Taylor & Todd, 1995). For this study, subjective norm comprised of student, peer, and administrator as the social groups affecting technology integration behavior of faculty members.

Facilitative Conditions: Availability of the resources or technologies around the individuals who intent to integrate technology is specified as facilitative conditions, in this study. These conditions were listed as time, money, infrastructure, training, prior experiences, other resources needed to use the technology, and the online and offline technological devices and tool as laptop, tablet, PC, smart phones, headphones, speaker, projectors, online platforms, etc. needed to integrate it (Triandis, 1979).

CHAPTER II

LITERATURE REVIEW

This chapter describes, firstly, theoretical bases of factors related to technology integration behavior in which sub-dimensions and antecedents of the behavior are discussed in detailed. Secondly, the ways of professional development of faculty members on technology integration into their classrooms, particularly their development within the faculty technology mentoring (FTM) programs are examined.

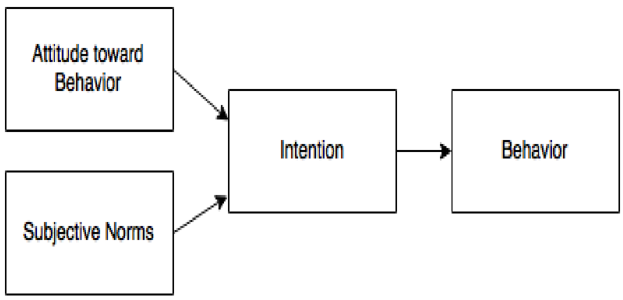
At first, higher education institutions got computers, which were primarily used for administrative tasks, after 1950's with the support of some big foundations (Saettler, 2004). In time, educators began using technologies for educational purposes in universities. For example, effectiveness of the instruction is reconsidered with the infusion of World Wide Web that created more efficient and less costly teaching and learning environments (Bhagat, Wu, & Chang, 2016). With these changes in instruction in higher education, technology integration has become common day-by-day. The adaptation of higher education to 21st century is mostly based on the evolution of teaching activities in the classrooms. While designing technology enhanced teaching activities, five main attributes of learning activities in classrooms need to be considered, a) active (exploratory/observations), b) authentic (contextual/complex), c) constructive (reflective/articulation), d) cooperative (collaboration/conversational), and e) intentional (reflective/regulatory) (Russell, 2016). Creating meaningful learning activities and meeting the requirements of 21st century is possible by enriching the teaching-learning process with effective technology integration in classrooms (International Society for Technology in Education, 2002). Hence teaching and learning activities are needed to be planned with these considerations in mind.

The most problematic point in technology integration is how to orchestrate it with the framework of teaching and learning scheme in an effective way (Semiz & Ince, 2012). Faculty members were suggested to revise their instruction to meet the needs of 21st century by spending more time and energy (Massey & Zemsky, 1995). While the faculty members are expected to use technology for educational purposes in their classrooms, they need a pathway to integrate it in a way to support student learning and solve pedagogical problems easily and practically. Institutions and researchers have been organizing some workshops, trainings, etc. to disseminate their technology knowledge and skills, which are crucial for implementing technology-enhanced learning environment in higher education (Wedman & Diggs, 2001). Additionally, the development on technology knowledge of faculty members has become important to support them. On the other hand, having technology knowledge does not mean effective technology integration into instruction since there are several factors affecting the intention and behavior in the context of faculty members, including time, infrastructure, technological and pedagogical support, available technological tools and their compatibility with the context and content of the course, rewards and incentives, motivation and self-efficacy, expectations, etc. (Ocak, 2011; Wedman & Diggs, 2001). Promoting technology integration intention and behavior requires through exploration of all relevant factors to aid competency and self-efficacy of faculty members, thereby facilitating smooth integration of technology in their curricula and to enhance teaching and learning activities. Within this frame, decomposed theory of planned behavior (DTPB) is the comprehensive theory that helps understand the inhibiting or enabling factors on faculty members' technology integration intention and behavior.

2. 1. Theory of Planned Behavior and Technology Integration

A behavior is mainly directed by intentions (Diatmika, Irianto, & Baridwan, 2016; Teo, Zhou, & Noyes, 2016). DTPB proposed that the intention toward the behavior is directly related to attitude, subjective norms, perceived behavior control, which are the antecedents, and indirectly related to sub-dimensions of these antecedents. Additional support for this argument can be found in several theoretical studies. For instance, Theory of Reasoned Action (TRA) (Fishbein, 1967), Theory of Planned Behavior (TPB) (Ajzen, 1985), and DTPB (Taylor & Todd, 1995), which are groundbreaking studies on understanding of a behavior, are commonly applied theories in both psychological and educational studies. These theories are rooted in earlier studies on psychological areas and later transferred to educational research.

By providing a basis for TPB and the decomposed version of it, the assumption behind TRA is that individuals have rationale behind their actions and they have the tendency to use information available around them systematically. In order to understand individuals' intention and behavior, a key factor is to determine behavior with the help of two determinants of intention such as personal and social influence. In brief, the main focus of the theory is that behavior can be directly influenced by intention to behave which is directly affected by the determinants.



Note. Retrieved from Fishbein (1967)

Figure 2.1: Theory of Reasoned Action

Individuals' evaluation of performing behavior is the personal factor named as attitude toward the behavior (Ajzen, 1985). Attitudes are functions of beliefs and the person who intends to perform the behavior has beliefs about getting positive outcomes and indicates a favorable attitude toward performing the behavior. Behavioral beliefs have the function to define the beliefs underlying individuals' attitudes toward behavior (Ajzen & Fishbein, 1980; Montano & Kasprzyk, 2015). The other determinant is the perception of social pressures on her/him to perform or not to perform behavior named as ‘subjective norm’ (Ajzen, 2015). Subjective norms have roots in beliefs about others’ thoughts on whether s/he should or should not perform the behavior. The thoughts of people around the individual about performing or not performing the behavior creates social pressure on his/her behavior (Manning, 2009), that are named as ‘normative beliefs’ (Ajzen & Fishbein, 1980). Attitude toward the behavior and social norms affecting behavioral intention could make prediction of behavior more transparent. The theory expounds that behavior has a strong relation to the intention that has its roots on the attitude toward behavior and subjective norms. Behavioral and normative beliefs indirectly contribute to the understanding of the intention and behavior.

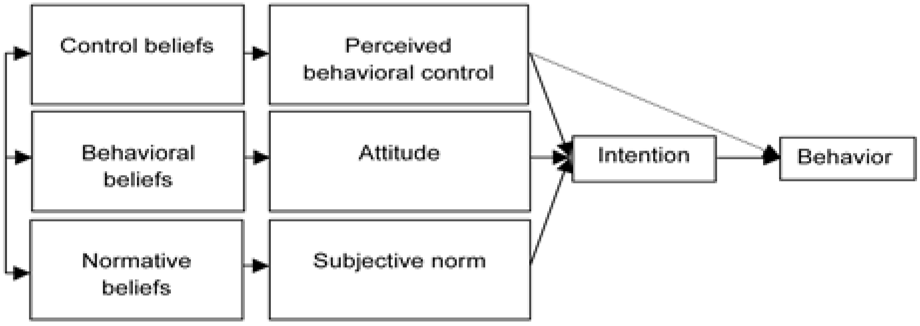
In summary of TRA, behavioral intention is caused by attitude toward behavioral performance and subjective norm. Intention to use instructional technology is a volitional decision depending on expected rewards and required effort. The explanation of behavioral intention in TRA is based on the attitude toward the act shaped by beliefs and evaluation of the behavior. Similarly, the correlation between subjective norm and the behavioral intention has roots in normative beliefs and motivation.

After the emergence of TRA, analysis related to the theoretical explanation of intention and behavior, done by social and behavioral scientists, showed that there are various other factors apart from attitudes toward actions. Ajzen and Fishbein (1980) defined these factors as personality characteristics, demographic variables, social role, status, socialization, intelligence, and kinship patterns, which may bring out a certain behavior. All these factors are defined as *external variables*. TRA, which identifies small set of concepts (see Figure 2.1.) to explain behavior, has dismissed these external variables.

Having two dimensions, which refers intention and the factors as intention antecedents, is considered as a limiting factor for explanation of the behavior. Non-motivational factors, such as external variables, have influence on performance of the behavior to some degree. These factors represent a person’s behavioral control. Intention to perform the behavior, some applications and resources are needed to successfully perform the behavior. However, intentions toward the behavior affect performance of behavior adversely to the extent of the person's control on behavior increases with motivation (Ajzen, 2015). Measuring not only intentions but also some estimation of the tendency to control performance is the standpoint for assuring a definite prediction of the behavior. Thus, Ajzen (2015) proposed that perceived behavior control influences individuals' intentions toward the behavior after reviewing TRA.

Theory of Planned Behavior (TPB) is situated on both TRA and perceived behavior control with its direct and indirect relationships with the behavior. Under conditions where volitional control is low or where behavioral intention alone accounts for small amount of variance in behavior, perceived behavioral control is the independent predictor of behavior (Armitage & Conner, 2001). On the other hand, the effect of perceived behavior control could be on intention rather than directly on behavior performance when volitional control is high. Before all of these, the definition of perceived behavior control requires the understanding of the exact relations of the factors affecting the exercise of the behavior. By altering cross actions and circumstances, perceived behavior control can be defined as "people's perception of the ease or difficulty of performing the behavior of interest" (Ajzen, 1991, p. 183). The confidence on mastering the behavior, the effort to bring it to success, and the acceptance of perceived behavior control as a substitute for measure of actual behavior pave the way to direct measure of actual success of behavioral performance. Individual's perception of control on behavior performance is accepted as a factor directly related with both intention and behavior.

TPB presupposes that specific beliefs play important role in carrying out the behavior. Attitudes, subjective norm, and perceived behavior control as factors lie on these beliefs. The following are defined as latent beliefs; behavioral beliefs are preconditions for attitudes towards behavior, normative beliefs are the determiners of subjective norms, and control beliefs create basis for perceived behavioral control. Diagram of the theory is represented in Figure 2.2.



Note. Retrieved from Ajzen (1985, p. 182)

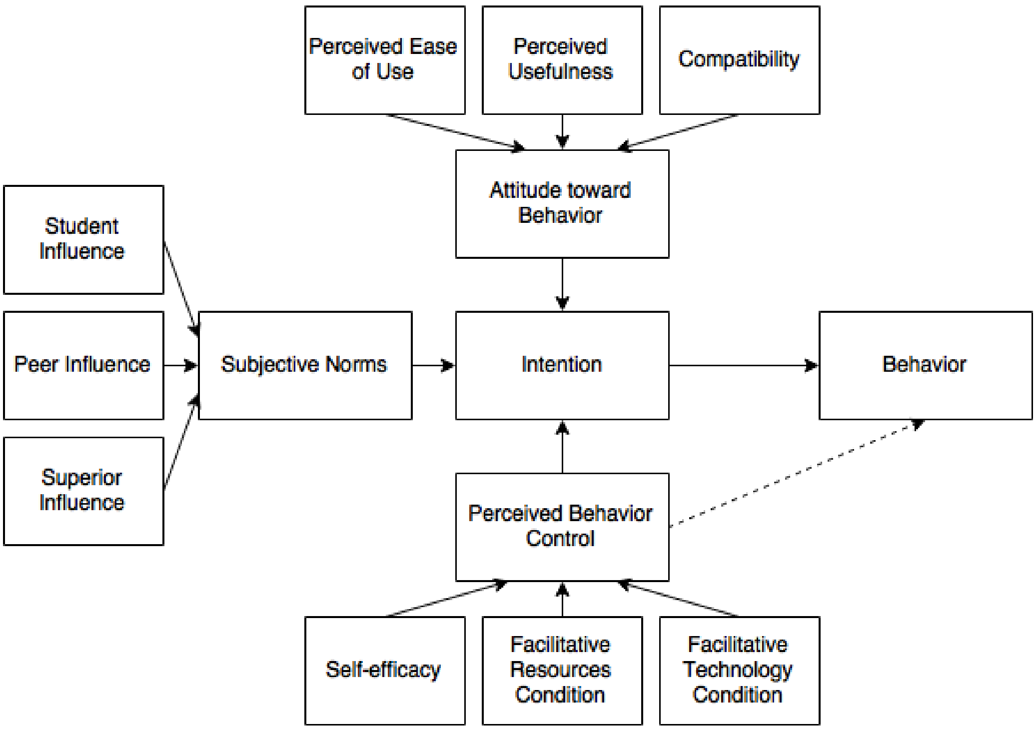
Figure 2.2: The Theory of Planned Behavior

Salient beliefs underlying behavioral intention and its antecedents have different meanings in the process of behavior performance (Salleh, 2016). In brief, behavioral beliefs establish connections between the behavior of interest and awaited outcomes of performing the behavior. Also, normative beliefs indicate that individuals or groups, seen as important or referent, have perceived expectations that indirectly contribute to the individual's behavior. These referent groups who can be a person's spouse, family, friends, supervisors, students, colleagues, peers, etc. promote or hinder performance of the behavior (Salleh, 2016). On the other hand, control beliefs are directly related to the existence of factors facilitating or inhibiting occurrence of the behavior (Kim, Kim, Lee, Spector, & DeMeester, 2013). To sum up, behavioral beliefs contribute to attitude, normative beliefs form a basis to subjective norms, and control beliefs form perceived behavior control on behavior.

As for theory of Planned Behavior (TPB) is the extension of Fishbein and Ajzen's TRA. To predict behaviors and various intentions, researchers have used TPB over the past 30 years. Arising from psychology, Theory of Planned Behavior (TBP) has applications in a wide range of contexts including technology, health care, agriculture, and advertising (e.g., Cheon, Lee, Crooks, & Song, 2012; Pavlou & Figenson, 2006; Song & Zahedi, 2005). These studies analyzed behavior and behavioral intention of participants with the main purpose of determining the factors affecting the specific behavior. Specifically, for technology integration in an educational context, researchers used TPB to understand details of the intention and behavior. Different teaching levels or participant groups were chosen for these studies. For example, both student perspective (Al-Otaibi, & Houghton, 2015) and teacher perspective (Pierce & Ball, 2009) toward technology integration helped researchers to understand perceptions of different stakeholders' technology integration intention and behavior. Similarly, the studies from K-12 level (Sadaf, Newby & Ertmer, 2012a, etc.) to higher education level (Paver, Walker, & Hung, 2014, etc.) were conducted to understand technology integration behavior in different contexts because TBP promotes the development of technology integration behavior by increasing the contribution of the factors related to intention and behavior.

As commonly argued in the studies, TPB carries some obtrusive problems, and the most common of argument is about measuring beliefs to explain sub-constructs of intention. As a result, the relationship between belief structures and antecedents of intention is not well understood (Ajzen, 2015). One-dimensional characteristic of TPB relies on unclear relation of beliefs and attitude. Perceived behavior control and measuring attitude with beliefs is idiosyncratic which makes it difficult to put into operation (Taylor & Todd, 1995). These two points related to the characteristics of the theory create the need of ameliorating of TPB.

Concerning technology integration into education, the unique study of Taylor and Todd (1995) brought forward a new version of TPB. This theory contends "a better understanding of the relationships between the belief structures and antecedents of intention requires the decomposition of attitudinal beliefs" (p. 147) underlying antecedents of theory of planned behavior. Cognitive components of belief cannot be degraded into a single concept or a unit (Shimp & Kavas, 1984). Parallel to this, Roger's (1995) Technology Acceptance Model indicates that three different features of technology; compatibility, relative advantage, and complexity; are required to measure attitudinal belief. To get rid of these limitations, enhancement of TRA and TPB is required. Accordingly, Taylor and Todd (1995) proposed DTPB represented in Figure 2.3.



Note. Retrieved from Taylor and Todd (1995, p. 146)

Figure 2.3: Decomposed Theory of Planned Behavior

In DTPB; attitude, subjective norms, and perceived behavior control have multidimensional belief constructs. This multidimensionality has some advantages on explanation of a behavior (1) representing a variety of dimensions related to the antecedents of intention, (2) understandable and clearer relationships, (3) providing stable set of beliefs which are applicable across a variety of settings, and (4) managerially relevant, pointing to specific factors influencing adoption and usage (Taylor & Todd, 1995). Having such advantages makes DTPB more favorable by offering oodles of factors contributing to the explanation of technology integration intention and behavior.

As Figure 2.3 represents, all antecedents of the behavioral intention have some antecedents. Having antecedents reflects a variation intensifying relationship with intention. Attitude toward behavior has the dimensions of perceived ease of use, perceived usefulness, and compatibility. The second antecedent of intention, subjective norms, has the sub-dimensions of peer influence, student influence, and superior influence. Sub-dimensions of the third antecedent, perceived behavior control, are self-efficacy, facilitative technological conditions, and facilitative resource conditions.

Three sub-dimensions of attitude are given in detail in following paragraphs. Perceived ease of use, the first sub dimension, is defined as “the degree to which an innovation is perceived as relatively difficult to understand and use” (Tornatzky & Klein, 1982, p. 154). As the analogous to complexity, perceived ease of use described by Davis (1989) as “the degree to which a person believes that using a particular system would enhance his or her job performance” (p. 320). There is evidence that usability of innovations is the contributing factor on its use (Young, 2014). The perceptions on the user-friendliness of technology have a potential to change usage intention and behavior of technology in instruction. Ease of use is the key determinant of usage behavior (Adams, Nelson, & Todd, 1992), which is significant for early stages of technology usage, however, it is non-significant at later stages of the usage (Davis, 1989).

Similar to perceived ease of use, perceived usefulness, second sub-dimension, has an analogous term called relative advantage in technology acceptance model (TAM). Davis (1989) defined it as “the degree to which a person believes that using a particular system would enhance his or her job performance” (p. 320). Individual’s expectations on performance enhancement or contribution to his/her life promote intention to perform the behavior more than the attitude toward the behavior. Ease of use has the influence on perceived usefulness (Amoako-Gyampah, 2007). Additionally, ease of use and perceived usefulness have a significant correlation with self-reported usage. Briefly stated, the greater expected benefits from a behavior are, the easier is to perform the behavior.

The third sub-dimension of attitude is compatibility which is defined by Roger (1995) within TAM as “the extent to which [an] innovation is perceived as consistent with existing values, past experiences, and needs of potential users” (p. 224). Values, demands, and previous experiences related to the behavior are the components of compatibility. This helps individuals be familiar with the innovation. Compatibility has a significant correlation with its adoption (Rogers, 1995).

Similarly, results of studies done by Vijayasarathy (2004) and Lin (2006) indicated the impact of compatibility on attitude. As one of the characteristics of innovation, compatibility has its importance on the actualization of technology integration behavior in educational settings.

The second sub-dimension of DTPB is the subjective norm. Subjective norm is defined as how the individual's behavior relies on the opinion about the particular behavior held by the people who are around and important for the individual. In his theory development study, Latane (1981) clarified foundation of social influence on intention and behavior as following;

> People affect each other in many different ways. As social animals, we are drawn by the attractiveness of others and aroused by their mere presence, stimulated by their activity and embarrassed by their attention. We are influenced by the actions of others, entertained by their performances, and sometimes persuaded by their arguments. We are inhibited by the surveillance of others and made less guilty by their complicity. We are threatened by the power of others and angered by their attack. Fortunately, we are also comforted by the support of others and sustained by their love (p. 343).

As social beings, individuals are capable of drawing others' attention and can put some fingerprints on other's intention and behavior. Subjective norm describes how the individual's intention and behavior depends on the opinion about the particular behavior held by relevant people. Different social groups or systems might have different opinions regarding a specific behavior. Consequently, subjective norm refers to the social pressures and influences that make an individual perform a particular behavior (Chung & Rimal, 2016). Salient beliefs of social support and pressure, that is the reason behind the strength of beliefs on motivation to perform the behavior, construct a foundation to subjective norms. According to Ma, Anderson, and Streith (2005) who worked on educational environment, teacher decisions on technology integration may be fulfilled by thoughts, suggestions, and reactions of other people that are significant for them. Similarly, Sadaf (2014) revealed that pre-service teachers' motivation correlates with the strength of their belief on prescriptions of significant others.

The influential people are generally those who are given importance by the performer of the behavior. Taylor and Todd (1995) specified these different groups of people, such as peers, students, colleagues, superiors, administrators, etc. Generally, only three main common groups of individuals are considered for faculty members' technology integration: superior, peer, and student. Ajzen and Harsthone (2008) implied that administrators and colleagues feel that adoption of technology integration contributes students' final grades. One of the other sources for increasing teacher openness to integrate technology can be the support of administrators. Similarly, Fishbein and Ajzen (1977) indicated that social norms or organizational culture could affect the degree of performance of the behavior. Furthermore, school environment, institutional culture, and collegial interaction may change the effectiveness of technology integration (Mouza, 2002). In addition to this, students may contribute to technology integration intention and behavior because being familiar with technology may create a heightened expectation to integrate technology into classrooms (Sadaf et al., 2012b). Accroding to Prensky (2001), students might be more productive with the introduction of technology integration since they are more comfortable with handling technology is more than the educators.

Third and final sub-dimension of DTPB is perceived behavior control, directly contributes to the performance and prediction of the behavior. Elaboration of control beliefs of TPB brings about three categories in DTPB: self-efficacy and facilitative conditions that are technology and resources. As previously defined component in psychology, self-efficacy refers to being confident of the ability to behave successfully in a special situation (Bandura, 1977, 1982). In their comparative study, Taylor and Todd (1995) refer to it marking that the prediction of technology usage behavior is directly related to the perceived behavioral control. Moreover, self-efficacy has a considerable contribution to behavioral intention via perceived behavior control. Schwarzer (2014) declares that the important determinant of intention and behavior could be self-efficacy. Lucidly, the belief on the capability to perform the behavior, entitled as self-efficacy, has an influence on the individual's ability to perform a behavior, the degree of effort used, and the persistence of that effort (Teo, 2011), that indirectly and significantly contribute to the performance of the behavior. Atsoglou and Jimoyiannis (2012) state that when the higher perception level on how well one performs the behavior correlates to the higher reliance on performing the behavior and the higher proportion of actualization of the behavior.

Second and third sub-dimensions of perceived behavior control are technology and resources as facilitating conditions, defined as are the factors in the behavioral context which influence performer's eagerness and in which the conditions are critical on preventing behavioral performance (Brock & Holtschneider, 2015). Thompson, Higgins, and Howell (1991) defined facilitative conditions as the extent to which a teacher believes the factor in the environment that influences his or her decision to use technology. For example, facilitating conditions, such as training on skill development, available materials, administrative or technical support, dramatically increase instructional technology usage (Groves & Zemel, 2000). Sadaf et al. (2012a) found that facilitating resources conditions and facilitating technology conditions significantly contribute to preservice teachers' intention to use technology. Available technologies and resources, such as time, money, and cooperation with others, computer, the Internet, technical and personal support, professional development opportunities, and technology skills also facilitate the technology integration intention to perform behavior.

To sum up, behavior theories have undergone detailed changes over the years from TRA to DTPB. Most recent and detailed version of the theory indicates that behavior is directly controlled by intention and by somehow perceived behavior control. Parallel to this, the intention is under the control of attitude, subjective norms, and perceived behavior control. These antecedents of intention have their own subcomponents. While attitude is related to compatibility with technology, perceived usefulness, and perceived ease of use; subjective norms are highly related to student's influence, peer influence, and superior influence; and finally, perceived behavior control comprises of self-efficacy, resources as facilitative conditions, and technology as facilitative conditions. For technology integration, all these antecedents and sub-dimensions contribute to the performance of the behavior.

2.1.1. Relationship among the Factors Related to Technology Integration Intention and Behavior

Technology integration as a behavior has become a critical issue after the evidences related to positive outcomes of technology integration to classroom surfaced. Previous studies showed that performing behavior was found to have a strong relation with behavioral intention. As indicated in the literature, statistical analysis of this relation returned positive and significant results. Although behavior is directly related to intention, few studies examined this relationship (Chan, 2014; Paver et al., 2014; Pynoo et al., 2012; Sadaf et al., 2012a; Salleh & Laxman, 2014). It is interesting that most of the technology integration behavior studies did not concentrate on the relation of behavior and intention directly. The reason behind this can be that it is hard to measure the behavior reliably and objectively, except self-reported behavior measures (Yzer, 2013) On the other hand, the relationships of attitude, subjective norms, and perceived behavior control with intention were analyzed in a large extent of the literature which are represented in the following paragraphs.

Many hypotheses on relation between behavior and intention appear to check the significance and direction of the relation. Most of the technology integration behavior research studied this relation and found that the strongest correlation when compared to other relations with behavior. Controversially, Findik-Coskuncay and Ozkan (2013) found no significant relation between behavior and intention on their study in faculty members' technology integration behavior. Surprisingly, the direction of the relationship was found to be negative by Pynoo et al. (2012) while the majority of attitude and behavior studies found a positive relationship with intention.

Many experts revealed that perceived usefulness in terms of the technology integration, as the first sub-dimension, had a positive relation with attitude (Ajjan & Hartshorne, 2008; Buchanan et al., 2013; Sadaf et al. 2012a; Smarkola, 2008; Shiue, 2007; Teo, 2012b). Astonishingly, Cigdem and Topcu (2015) stressed that this relationship is the strongest one among the other sub-dimensions of attitude.

Additionally, in the study of Sadaf et al. (2012b), the positive relation was released qualitatively and quantitatively. As the second sub-dimension of the attitude, perceived ease of use had a positive relation with the attitude similar to perceived usefulness. Interestingly, Paver et al. (2014) and Terzis and Economides (2011) found no significant relation between them. Finally, the literature revealed that third sub-dimension of attitude, compatibility, had a positive relation with attitude (Cigdem & Topcu, 2015; Findik-Coskuncay & Ozkan, 2013; Hartshorne & Ajjan, 2009; Kilinc et al., 2006). Contrary to the other sub-dimensions, no study found a negative or non-significant relation between them.

Subjective norm, as second antecedent, is the most analyzed one among the other categories implied by DTPB. Considerable amount of the planned technology integration intention and behavior studies concentrated on the relationship between subjective norm and intention that is easier to observe compared to other sub-dimensions. While some of the researchers found no significant relation (Cheon et al., 2012; Salleh & Laxman, 2015; Shiue, 2007; Teo, 2012a; Sugar, Crawley, & Fine, 2004), a lot of studies conducted on subjective norms indicated that there is a significant positive relation between them. Only Chan (2014) and Teo (2012b) stressed that this relation is less significant one when compared to other antecedents. The technology integration intention and behavior was affected by student thoughts, reactions, and acquaintance with technology (Atsoglou & Jimoyiannis, 2012; Cullen & Greene, 2011; Cheon, Coward, Song, & Lim, 2012; Sadaf et al., 2012b). The studies analyzing the relation between student influence and subjective norms revealed that it is positively significant relation. It is clear that this type of relation evidences students' contributions to subjective norms. Peer influence, as the second sub dimension, has a positive relation with subjective norm according to literature (Al-Otaibi & Houghton, 2015; Chiang, Wuttke, Knauf, Sun, & Tso, 2011; Cigdem & Topcu, 2015; Weng & Tsai, 2014). Only Atsoglou and Jimoyiannis (2012) revealed a non-significant relation. Similarly, superior influence analyzed by Ajjan and Hartshone (2008), Cullen and Greene (2011), and Hartshone and Ajjan (2009) are indicative of positive relation with the subjective norm, except the study of Atsoglou and Jimoyiannis (2012). It is interesting that only one study indicated there is no significant relation with two of the sub-dimensions while the other has a significant relation.

Among the subjective norms, the second antecedent of behavioral intention, students have significant positive impact on subjective norm while peers and superiors do not have significant relation with subjective norms. These confounding results indicated that having participants from different majors, that is the main characteristic of the studies, can cause conflict among the results of the studies separately concentrating on the DTPB's components.

Perceived behavior control is the final antecedent of intention toward behavior. Additionally, it can have a direct relation in some cases, as stated by DTPB (Ajjan & Hartshone, 2008; Atsoglou & Jimoyiannis, 2012; Teo & Tan, 2012). This relation is the least analyzed one when compared to all antecedents of behavior. Sadaf et al. (2012a) indicated that there is a non-significant relation between them while another study of Salleh and Laxman (2014) reveals that this is the strongest one compared to other analyzed relations.

In the literature, most of the research on technology integration intention and behavior analyzed the relation between perceived behavior control with intention (Chan, 2014; Czerniak, Lumpe, Haney & Beck, 1999; Kurubacak, 2006; Lee, Cerreto, & Lee, 2010; Mak & Ross, 2003; Paver et al., 2014; Pynoo et al., 2012; Salleh & Laxman, 2014; Shiue, 2007). It is clear that there is a positive relationship between them while on the other hand, some studies reported non-significant relationship (Hung & Jeng, 2013; Paver et al., 2014; Sugar et al., 2004, Teo, 2012a, 2012b). Among the studies, Chiang et al. (2011) indicated that students' intention toward technology integration was strongly predicted by their perceived behavior control. Contradictorily, Hartshorne and Ajjan (2009) stated that this was the smallest relation compared to others. Although both of these studies concentrated on student's technology integration behavior, contradictory results surfaced on perceived behavior control.

The relation between facilitative resource conditions and perceived behavior control investigated by some researchers indicated positive relationship with perceived behavior control (Cullen & Greene, 2011; Harsthorne & Ajjan, 2009; Lee et al., 2010; Sadaf et al., 2012b). Similarly, facilitative technology conditions (FTC) were also analyzed by some research studies (Atsoglou & Jimoyiannis, 2012; Buchanan et al., 2013; Smarkola, 2008; Kilinc et al., 2016; Sugar et al., 2004) that found a significant positive relationship with perceived behavior control. On the other hand, some of the studies (Ajjan & Hartshorne, 2008; Al-Otaibi & Houghton, 2015; Hartshorne & Ajjan, 2009; Teo, 2012a) found no significant or negative significant relation. When compared to the results on the relations, same three studies found no significant relations of resources and technologies with perceived behavior control. The mixed method study conducted by Sadaf et al. (2012b) revealed that it was a negative relationship. The final subcategory of perceived behavior control is self-efficacy that has a positive significant relation with perceived behavior control according to literature (Ajjan & Hartshorne, 2008; Cheon et al., 2012; Lee et al., 2010; Teo, 2012a, 2012b). It is clear that the relationship between self-efficacy and perceived behavior control is approved by almost all of the researches conducted on technology integration intention and behavior.

In brief, DTPB represents relations with behavior, intention, antecedents, and sub-dimensions of the antecedents. The pathway of structure suggested by DTPB is confirmed by the researches that were conducted on technology integration behavior, as mentioned previously. The direct main contributor to behavior is the intention, whereas attitude, subjective norm, and perceived behavior control are antecedents of behavioral intention. DTPB is figured out by attitude with perceived usefulness, perceived ease of use and compatibility; subjective norms with student influence, peer influence, and superior influence; and perceived behavior control with facilitative resource conditions, facilitative technology conditions, and self-efficacy. The antecedents of intention could have both positive significant and non-significant relations with intention. The relationships among compatibility-attitude, student influence-subjective norms, perceived behavior control-behavior, and attitude-intention have received less attention in the research field. The commonly examined relationships are, relatively, subjective norm-intention and perceived behavior control-intention.

As DTPB suggested, almost all antecedents and their sub-dimensions are positively correlated with their upper-strata (Chan, 2014; Chiang et al., 2011; Hartshorne & Ajjan, 2009; Yusop, 2014). There is a considerable amount of literature on the relations among behavioral intention and its antecedents. Results of Zhao et al.'s (2002) study indicate that innovation adoption is deviating from prevailing values, pedagogical beliefs and practices of teacher and administrators, which implies reduced interaction with context. Moreover, Hew and Brush (2007) concentrated on overcoming the barriers to technology integration and it is interesting that three of strategies out of five are related to context itself including having a shared vision and technology integration plan, overcoming the scarcity of resources, and conducting professional development. The studies, which concentrated on technology integration intention and behavior, are focused on different contexts and they have different participants although their theoretical base is DTPB.

In considering the results of the intention and behavior studies, there are some points that raise questions, as well. The theory is commonly used to analyze the individuals intentional and planned behavior, however, there is no agreement among technology integration behavior studies. While some studies indicate positive relations some imply negative or no relations. At that point, rigorous analysis of the problematic constructs can be helpful for further researchers studying the context of DTPB. Moreover, there are limited studies on faculty members' technology integration intention and behavior. It is highly critical to inform existing research by speculating on these points related to enriching the understanding of faculty members' technology integration intention and behavior as well as reaching a clear picture of the relations among the components of DTPB in higher education context, there is a critical need for considerable research both for enriching the understanding of faculty members' technology integration intention and behavior and achieving a clearer picture of the relations among the components of DTPB in higher education context.

2.2. Faculty Members' Professional Development with Technology Mentoring

The mentoring programs are implemented to ensure that faculty members receive training on time and individual support when needed, in addition to the scholarly approach on professional development to scaffold their development on technology integration (Kirkwood & Price, 2013) because of their potential to provide extended and long-term engagement in learning how to integrate technology (Larson, 2009). FTM programs vary by their structure and implementation methodologies. The reason behind this variance is due to the composition the programs. Design of FTM programs contains the elements; such as objectives, roles, cardinality tie strength, relative seniority, selection, matching, time, activities, training, resources, tools, role of technology, rewards, policy, monitoring, and termination (Dawson, 2014). Different mentoring programs for specific faculties were designed to meet their specific needs.

Faculty members, participating in the mentoring programs, are exposed to the technological and pedagogical practices with their mentors. Mentoring activities contribute to the development of faculty members' specific strategies, including: (a) determining needs, (b) exploring technologies' affordances and limitations, (c) scaffolding, (d) sharing feedback, (e) connecting technology, pedagogy, and content, and (f) evaluation (Baran, 2016a; p. 56). Addition to technology integration expertise, mentoring programs may strengthen faculty members' awareness on pedagogical issues concerning educational technologies, support professional aspects of them, and help diffusion of the learning in FTM among peers or colleagues.

As the most common and recent way of professional development, mentoring programs general structure has two main groups of individuals: mentees and mentors. Generally, graduate students from the same institutions in the one-to-one mentoring process were chosen as mentors. The exemplary implications of this FTM programs are represented by Baran (2016a) and Thompson, Chuang, and Sahin (2007) in which the mentors were chosen from among the graduate students who were enrolled in a specific graduate course concentrating on technology integration, or technological pedagogical content knowledge, or emerging technologies in education, yielded significant results. Graduate students as mentors were already extrinsically motivated for mentorship in the program because of meeting the requirements of the course. Additionally, the students, who were selected among students of faculty of education, are already knowledgeable on the theoretical and practical grounding of teaching and learning (Chuang et al., 2003). Moreover, these students are considered to be technology native as a younger generation compared to most of the faculty members. On the other hand, Sprague, Cooper, and Pixley (2004) chose in-service teachers as mentors for supporting faculties' technological development while Pamuk and Thompson (2009) sought informal mentors such as friends and colleagues who, unlike other mentor, were not constant in one-to-one environment. Different mentor groups were formed to help and contribute to faculty members' intention and behavior on technology integration.

Expert faculty members can also be mentors in the program. They can guide the mentees with their expertise on teaching in higher education and their technology integration knowledge (Admiraal et al., 2017). Thus, technology integration expertise of mentors plays crucial role in the mentor selection process. To meet the needs of mentees, compatibility issues are substantial. Additionally, to create common language between the mentor and mentees, and their being from the same department contributes the effectiveness of mentoring relation. The key challenge of selecting faculty members as mentor is the motivation and engagement (Bland, Taylor, Shollen, Weber-Main, & Mulcahy, 2009). Keyser et al. (2008) indicated that owing to heavy workload and lack of time, faculty members do not prefer to be mentors, they do not spend time on mentoring activities, are not extrinsically motivated as much as graduate students, therefore; to overcome this challenge, financial support or rewards could be a solution.

The most common structure is one-to-one mentoring approach in higher education contexts. In this mentoring program, mentors and mentees were matched as pairs and they worked together through the program together. In this type of mentoring, mentor has the opportunity to focus on one mentee's need, classroom contexts and personal struggles. Hence, there is ample chance to engage in productive mentoring activities, direct the mentee and solve mentee's problems. The mentoring program is conducted with a one-to-one structure while some researchers conducted it on group basis with one mentor and two mentees (Silva, Correia, & Ballester, 2010). In the group mentoring, one mentor matches with more than one mentee. In the group mentoring activities, individuals can experience interpersonal mentoring within the group dynamics (Johnson, 2015). On the flipside from the mentor side, having more than one mentee may generate stress to address all mentees' needs. When the number of mentees increases the mentor's time and energy allocated for a mentee decreases which could be directly influential in the quality of mentoring activities.

In the literature, mentees can be from the same department (Thompson et al., 2007), or from different departments (Baran, 2016b). Mentees from different departments may make more effort owing to the difficulty in addressing the specialized needs of mentees and specific subject area. Similarly, FTM programs can concentrate on the same or different technologies to develop mentees' technology integration ability. For example, Gabriel and Kaufield (2008) concentrated on the preparation of faculty members for online teaching activities. Mentors in this study, who are also expert faculty members, helped faculty members to design their online courses with the help of mentors' already developed and implemented online courses. Institutional policy change sometimes requires such mentoring activities because the faculty members were expecting to integrate the same technology. Some mentoring programs (Baran, 2016a, Thompson, 2006) concentrated on mentees' individual needs on technology integration, so mentors needed to consider different technologies. Researches note that FTM includes different types of technological tools. For instance, virtual environments such as Half Life or Chrystal Island, web page development tools such as Netscape Design or Google Sites, online learning management systems such as BlackBoard or Canvas, video editing software such as iMovie or KidPix, graphical mapping tool such as Inspiration, multimedia applications such as PowerPoint, Prezi and online course preparations. In general, faculty members' syllabus adaptation to technology is the primary focus of the mentoring activities (Sprague et al., 2004). Faculties had different demands from mentorship; therefore, technological content has a huge range, from software to hardware and mentors' responsibilities change dramatically from one study to the next.

Studies of FTM give important insights to how faculties can be supported during technology integration and in what ways they can gain growth with these mentoring programs. FTM often addresses to the special needs in a specific context that is limited to some faculties who participated in the program. This means that FTM programs are highly customizable and can be implemented in different contexts (Beyene, Anglin, Sanchez, & Ballou, 2002; Patton et. al, 2005). Moreover, FTM programs have increased sharply in the last twenty years, which is parallel to the widespread diffusion of technology use in educational settings.

Parallel to the context of program implemented in, mentor and mentee selection processes and mentoring type results in the change of program structure of because this selection and mentoring type (one-to-one or group mentoring) are the main steps to constitute an FTM. Additionally, focus of the program and preferred technologies, etc. have considerable influence on the program structure. Each type of FTM program structure makes own unique contributions to the participants and the institutions. The context and the aim of the program are the main determinants of the structure of FTM programs, in addition to mentor-mentee selection, mentoring type, and mentoring focus.

2.2.2. Advantages of the FTM Programs

An FTM program has the opportunities of creating a facilitative environment, productive mentoring relationship, different communication channels, and adequate support. FTM programs help transform faculty members' technology integration behavior strategically, since they have the potential to meet the wide range of needs and improve the skills of faculty members (Leh, 2005). This behavioral transition in mentoring program can be understood and improved by examining various associated factors, such as self-efficacy, tool efficiency, students, colleagues, and friends (Buabeng-Andoh, 2012; Inan & Lowther, 2010). Moreover, technical support, peer or student impact, administrative pressure, required time, and technical inadequacy are other enabling or inhibiting factors that influence faculty members' technology integration behavior in classrooms (Natividad, Mayes, & Spector, 2015). It is, therefore, imperative to identify and discern enabling factors as well as eliminate inhibitors to enhance faculty members' behavioral performance on adopting technology integration practices. One-to-one mentoring programs enable faculty members to develop positive attitudes toward educational technologies and represent opportunities to integrate the technologies in their instruction with an individual support. As seen in the study of Gariel and Kaufield (2008), at the end of the process, they become a model on technology integration for other faculty members.

For faculty members' professional development on technology, such kind of mentoring exerts meaningful and positive effects, changing from context to context. One of them is that the promise of a supportive mentor in a structured mentoring program attracts individuals by increasing their motivation for their teaching practice and by providing insights for research studies through problem-solving and troubleshooting (Orpen, 1997). Also, it develops faculty members' skills and qualities that remain valuable beyond the duration of the mentoring partnership. By mentoring, each of faculty members could reach their full potential in their areas (Jourdan, 2008). Professional abilities of mentees can develop and support a creative knowledge base (Thompson et al., 2007). Mentoring partnerships provide direct opportunities for knowledge sharing, enhancing, and creating new knowledge for both mentors and mentees. As mentoring is a two-way or reciprocal process, it also provides benefits for the mentee and mentor to develop both their personal and professional aspects in the process (Ehrich et al., 2004). Mentoring programs have the potential to impact faculty members' careers in terms of both teaching and research domains while also contributing to the mentors on their professional, personal, academic, and technological aspects.

Research on FTM show that technology training was delivered in multiple ways: (a) large group workshops (Leh, 2005), (b) small group meetings (Leh, 2005; Silva et al., 2010), (c) individualized mentoring (Baran, 2016a), and (d) just-in-time training (Leh, 2005). Among these activities, individualized learning and just in time training techniques were the most commonly utilized ones in FTM-based research studies. Different terms were used to address the mentor-mentee meetings in the researches. Some of them used the term of workshop (Boulay & Fulford, 2009; Butler & Chao, 2001; Grove, Strudler, & Odell, 2007; Koehler et al., 2004), while there are also terms of groups of workshops (Leh, 2005), project development (Larson, 2009), multiple project development (Boulay & Fulford, 2009), and development of more than two projects (Denton et al., 2004). Depending on the mentoring type, mentor-mentee selection, and FTM structure; technology training within the FTM programs varies because of the context and the need for specific mentoring programs. This diversity factor in FTM programs is greatly advantageous that appeals to all the needs and demands of the participants and the institutions in which FTM programs are implemented.

2.2.3. Challenges in the FTM Programs

Integrating technology in higher education classroom within FTM programs can be challenging sometimes. The problems faced during mentoring programs were classified by Gunuc (2015) as mentee-based, mentor-based, and organization or institution-based problems. Among the mentee-based problems, the most common one is time. According to literature, time constraints of the mentees are due to their other personal and professional responsibilities (Velessianos & Kimmons, 2013). Their heavy workload is the main proponent of this issue (Leh, 2005). Because of this problem, mentoring meetings can be delayed or cancelled which greatly hinder the mentoring process. The planning of the mentoring process is another challenging part that can be attributed to lack of time, motivation, and encouragement of faculty members. Both mentee's and mentor's commitment to the FTM process is determinant of the success of the process (Vance, 2016). Lack of commitment of one side disturbs effectiveness of the program and discourages other participants in the process. Not having clear understanding of the program and misinterpreted expectations may also create some inhibiting situations (Poulsen, 2013). For example, expectation from mentors to assist in teaching the course, to integrate technology on the behalf of the faculty member, to create educational activities for the course/s are not part of the mentor’s responsibility. Personal characteristics of mentee and mentor are directly related to the effectiveness of the mentoring program (Strauss, Johson, Marguez, & Feldman, 2013). In the process, hierarchy between mentor and mentee, lack of communication, or disagreements between mentor and mentee may result in inhibition of the mentoring.

Time and personal characteristics of mentors (Barczyk, Buckenmeyer, & Feldman, 2010) could result in some problematic issues like mentee-based problems. Additionally, the mentor’s experiences on both teaching and technology (Butler & Chao, 2001; Gunuc, 2015) may put mentor in a complex situation to create connections between the content area of mentee and the mentors’ knowledge on pedagogical approaches. Technology expertise directly result in leading the mentoring process and teaching experience helps management of the process to solve mentees’ problems of learning, such as designing with the help of prior experience of the mentee, keeping motivation high, providing feedbacks or incentives to support the learning process.

Alongside organizational problems, pair compatibility, time, infrastructure, and technology (Baran, 2016b) are the most commonly faced problems. Mentoring process starts after the mentor and mentee are matched. For most-suited match, both mentor and mentee’s backgrounds, interest, and expertise are required to be acknowledged. By considering them, there is a chance to reach appropriate matching and initiate a successful mentoring process. Mentorship process goes on between mentors and mentees, generally. By adding another mentors’ contribution within the mentor-to-mentor discussion group, the designated mentor can feel more comfortable concerning applicable support and solve problems easily with help of added suggestions and guidance (Smith & Israel, 2010). During this process, mentor and mentee may require technical supports, and so, technology departments or information technology staff of respective institutions should be a part of the mentoring process. In order to see effects of mentoring at the institutional level, mentoring programs can be implemented with more participants, as an institution-wide mentoring program. In addition, a model for FTM is required to strengthen its theoretical foundations. Overall, FTM researches have defined a lot of benefits for all stakeholders. These researches have followed different ways and approaches. However, they do no address some challenges or fall short in providing a holistic framework.

2.2.4. Summary of the Literature

There has been a growing tendency to integrate technology in higher education classroom in the last decades. This act requires faculty members' development on technology integration not only by concentrating on their knowledge and skills but also their motivation and self-efficacy (Wedman & Diggs, 2001). Moreover, effective technology integration can be related to available infrastructure; technological and technical support; compatibility with the course and context that faculty members are teaching at; students' profile and their expectations and needs related to technology integration; easiness and usefulness of technological tool or devices; faculty members' available time, energy, and effort to integrate technology; and so on. Within this multidimensional context, technology integration intention and behavior can be analyzed in detailed through a comprehensive theory on factors affecting the behavior namely DTPB (Taylor & Todd, 1995). DTPB explains that a behavior is directly related to intention towards the behavior and the intention is directly related to attitude, subjective norm, and perceived behavior control; which are defined as the antecedents of the behavior. All antecedents have their own sub-dimensions affecting intention indirectly. Attitude is defined by ease of use, perceived usefulness, and compatibility, while subjective norm is constituted of student influence, peer influence, and superior influence. Finally, perceived behavior control comprises self-efficacy, facilitative technological conditions, and facilitative resource conditions.

Performing technology integration intention and behavior is related to some factors according to the aforementioned literature. Development of the behavior, therefore, plays an important role in performing the behavior considering these factors. Each faculty member, with different academic and teaching background, has different needs to remediate their teaching activities. Thus, to meet their specific needs, mentoring activities were designed and implemented in different contexts by following different methods (Wang, 2001). Having different contexts and distinct needs to be met requires different mentoring structures. Different mentors, different meeting styles, different aims, different mentoring groups and activities are some of the reasons that facilitate such diversity. Despite this diversity, as Chuang et al. (2003) emphasized, the general aim of these mentoring programs is to develop faculty members' technology integration intention and behavior by meeting their specific technological, pedagogical, and professional needs.

CHAPTER III

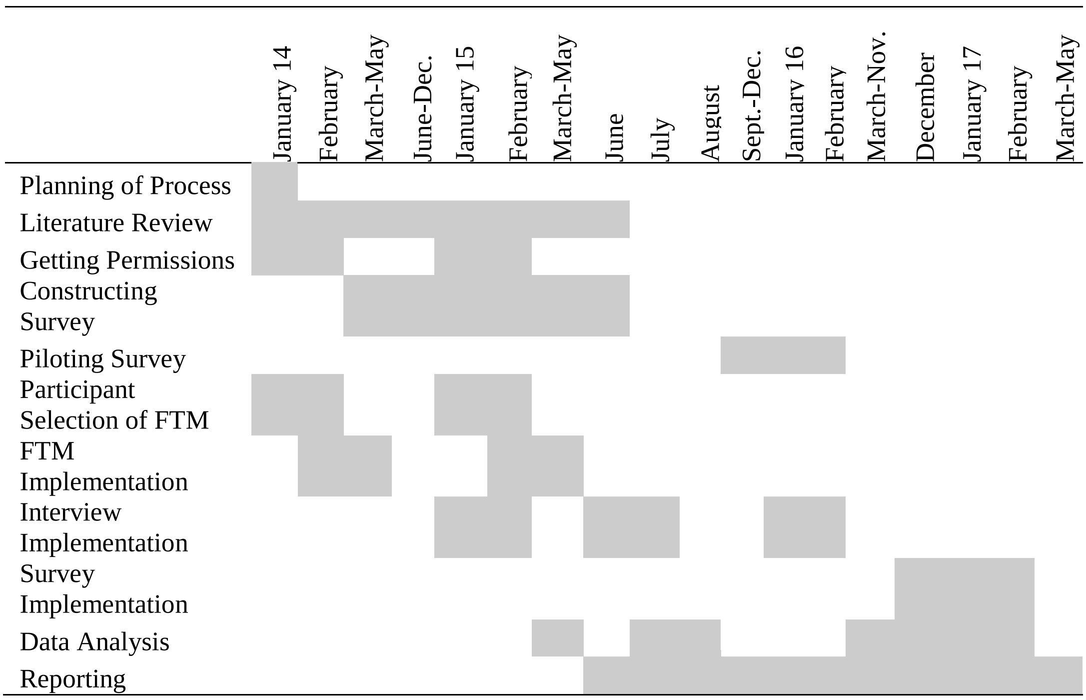
METHOD

In this chapter, overall research design of this study and the phases of the study, in detailes, are presented, seperately. All phases of the study included their own contexts, sampling strategies, data collection and data analysis procedures. Because of this, method section was organized by following the phases of the study. In the phases parts, contexts of the phase, participants of the phase, data collection and data analysis procedures of the phases, and trustworthiness or validity and realibity are reported.

This study followed the mixed method research design that was employed to enrich the understanding of faculty members' technology integration from different angles. By following both qualitative and quantitative data collection procedures, faculty members' technology integration can be examined deeply. Tashakkori and Teddlie (2003) explained mixed method studies as the design used "…to confirm, cross-validate, or corroborate findings within the single study…" (p. 229). Among the types of mixed method research, the multiphase mixed method (Creswell & Plano-Clark, 2011) was utilized in this study. Qualitative and quantitative data were collected separately by following sequential and concurrent strategies. Piloting of the survey (Piloting Phase) was implemented before collecting the data with survey for main part of the study. After this piloting phase 'Qualitative Phase' and 'Quantitative Phase' were implemented concurrently but separately. Survey implementation and interview implementation were conducted at the same time but they were not implemented together. Each data set was converged during data interpretation to provide a complete picture developed by two data sets (Onwuegbuzie & Teddlie, 2003), which refers to partially mixing of the data. In examination of faculty members' technology integration intention and behavior, overall perceptions of faculty members on technology integration intention at a higher education institution was analyzed and the perceptions of faculty members, specific to who experienced technology integration within faculty technology mentoring program (FTM) context were analyzed. Both overall and context specific perceptions on technology integration were gathered with different angles. Timeline of the study is presented in Table 3.1.

Table 3.1.

Timeline of the Study



In a mixed method research design (Creswell et al., 2003), there are two main data sources. In this study, survey and interview were used as data sources. In piloting phase, the survey items and overall factor structure were revised and piloted with the faculty members who were not included in the main part of the study. In survey implementation phase, data were collected through faculty members' technology integration intention survey which was piloted and factor structure was revealed with statistical analysis. Then, faculty members' technology integration intention survey was conducted at a public university to find answers to the first research questions and understand factors related to faculty members' technology integration intention. Through FTM technology integration behavior interview, faculty members' technology integration behavior was examined within the FTM context. The faculty members who participated in FTM were interviewed to get deep understanding on their technology integration intention, behavior, and factors affecting the intention and behavior within their technology integration experiencing process. In total, this study comprised of three main phases as gathering the data; survey construction and testing as "Piloting Phase", survey implementation as "Quantitative Phase", and interview implementation as "Quantitative Phase". Overall research design is illustrated in Figure 3.1.

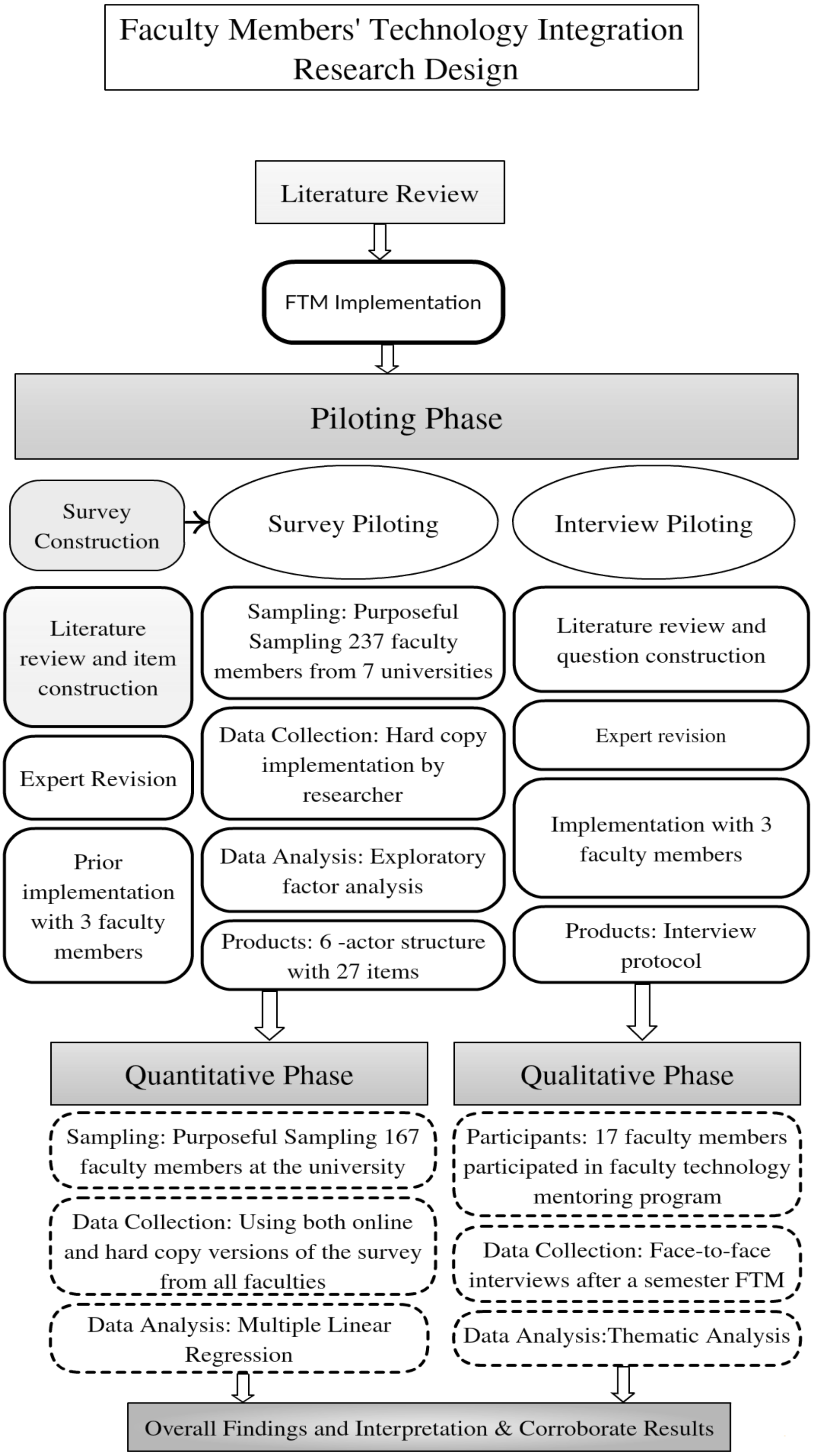


Figure 3.1: Overall Research Design

3.1. Piloting Phase

In this phase, the “Faculty Members’ Technology Integration Intention Survey”, was utilized in order to investigate factors affecting faculty members’ technology integration intention. As initial phase, the structure of the survey was needed to be determined which called for a piloting phase. This initial phase included four steps; survey constitution, expert revision, survey implementation, and data analysis.

3.1.1. Survey Construction

In this step, a survey, founded on Taylor and Todd’s (1995) decomposed theory of planned behavior (DTPB) framework to investigate the factors related to technology integration intention was examined. The faculty members’ technology integration intention survey was grounded on the survey that was developed by Paver et al. (2014). Their study investigated the factors that predict community college adjunct faculty members’ intention to integrate technology into instruction. Some items were removed and some items were added to the original survey to increase reliability scores of the specific constructs. The original survey included 60 items reflecting 13 components of DTPB. Four of the components represented items having low level of Cronbach Alpha. The items of three subcomponents were replaced with five items measuring subjective norm (Alpha = 0.83) from study of Ajjan and Hartshorne (2008), four items on ease of use (Alpha = 0.93) of Venkatesh and Davis (2000), and two items on peer influence (Alpha = 0.92) from Taylor and Todd (1995). In the pilot study, the original items of perceived behavior control (PBC) with low level of Cronbach Alpha were used in this study. Considering the literature, Taylor and Todd (1995), also, included items with lower than desired internal consistency for PBC in their initial study. The Table 3.2 summarized the revision of the factors.

The survey includes four major sections; information about the research as introduction part (1), demographic information (2), open-ended question related to already used technologies in their classes (3), and survey items measuring factors related to technology integration (4). Demographics section included the items about the faculty members' characteristics representing their gender, age, title, academic discipline, currently offered course number, years of teaching experience, and number of participated professional development programs on technology integration. Piloted version of the survey presented in Appendix 1.

Table 3.2.

Original and Revised Item Numbers and Alpha Coefficients of the Survey

Variable	*Original Items*	*Alpha Coefficient*	*Replaced Items*	*Alpha of Replaced Items*
Attitude	3	0.87	-	-
Intention	3	0.87	-	-
Perceived usefulness	5	0.86	-	-
Self-efficacy	5	0.85	-	-
Facilitating resource conditions	5	0.83	-	-
Student influence	5	0.81	-	-
Superior influence	5	0.80	-	-
Compatibility	5	0.76	-	-
Usage behavior	5	0.75	-	-
Facilitating technology conditions	5	0.73	-	-
Subjective norm	3	0.70	5	0.84
Peer influence	4	0.56	2	0.92
Ease of use	4	0.47	4	0.93
Perceived behavioral control	3	0.07	-	-

The survey items related to the factors in piloted version of the survey were indented to measure the factors related to technology integration behavior with a 7-point scale ranging from "Strongly Disagree" to "Strongly Agree", suggested by Ajzen (1991). Only the first (1-representing strongly disagree) and the final options (7- representing strongly agree) were named not to confuse the faculty members with too many details on the options. At the end of the survey, there were open-ended questions related to active use of technologies with educational purposes.

3.1.2. Revision of the Survey

In this step, the advice of experts for the completeness and content validity of the instrument was obtained. Four technology integration experts who are getting their PhD on technology integration from Computer Education and Instructional Technologies Department and two language experts examined the initial version of the survey for the pilot study. Each items represented two extra columns. In the first column, experts indicated problems or concerns with the individual items. This was to indicate ambiguous or poorly worded items or the items that generally did not make sense. In the first column, experts represented their suggestions with the problematic items that they evaluated in the first column. Their suggestions were concentrated on the basis of the questionnaire, the idea and the level of examining the factors as meaningful and feasible. According to the reviews of the experts, suitable revisions in the survey items were made. Especially, the introduction part and a few items in demographics part were revised. Instead of “age”, “year of birth” was used to make participant internalize the survey with the suggestion of one of the experts. “Years of teaching experience” was added to understand faculty members’ background in more detail. “Number of year using computers” was deleted because of not serving to the aim of getting their expertise on technology usage. Additionally, all experts had recommendations about wording of the items. Importantly, the original survey which created basis for this study had some items stated with future tense were revised with present tense not to confuse participants about the behavior. All revisions were made with suggestions of the experts.

Additionally, the survey was implemented in a pilot test with three individuals who were prospective faculty members in educational sciences to examine readability, clarity, and accuracy. Survey items having negative connotations were changed to a more positive version to avoid any confusion and misinterpretations. Exclusively, the terms “superior” in the original survey was highly suggested to change as “administrator” which fits the context of the faculty members and is easier to understand. After revision of faculty members’ technology integration intention survey considering comments of the experts and the faculty members; the approval from the ethical committee of the university was received (See Appendix 6). Required written or oral permissions from the seven universities were obtained, the time for implementations were set with the administrators of the universities, and the pilot data were gathered between December 2015 and February 2016.

3.1.3. Participants of Piloting Phase

In survey implementation step, the data in the pilot were collected at seven universities which have similar technological opportunities to its members and similar profile of faculty members with the university. Purposeful sampling strategy (Patton, 2002) was used for selecting the universities. The main criterion for choosing faculty members of the pilot study was using English as the medium of instruction in their courses. The main data of this study was intended to be collected from universities where English is the primary medium of instruction. Within this, the faculty members, especially English language instructors who teaching in English, had participated in the pilot study from seven different universities. Details on the demographics of the faculty members participating in the pilot study are represented in Table 3.3.

Table 3.3.

Demographics of the Faculty Members Participated in the Pilot Study

	f	%
Gender		
Female	161	67.94
Male	76	32.06
Universities		
A University	41	17.34
B University	35	14.76
C University	34	14.34
D University	33	13.92
E University	33	13.92
F University	28	11.81
G University	18	7.59
H University	15	6.32
Academic Title		
Assistant Professor	23	9.71
Associate Professor	29	12.23
Professor	2	0.84
Instructor	183	77.22
Department		
English Language Education	180	76.59
Education	10	4.25
Architecture	5	2.12
Computer Engineering	6	2.55
Electrical and Electronic Eng.	6	2.55
Business Administration	4	1.75
Modern Languages	3	1.27
Industrial Design	4	1.70
Civil Engineering	3	1.27
Law	2	0.85
Psychology	4	1.70
Other	8	3.40

3.1.3. Data Collection and Analysis of Piloting Phase

In data analysis step of pilot testing, exploratory factor analysis (EFA) was performed to manage data in an easy manner and to reveal the factor structure (Field, 2013). Actually, the purpose of the EFA within this study was to ascertain a survey to measure faculty members' intention to integrate technology in higher education context considering the DTPB. Faculty members' technology integration intention survey was developed considering getting the previous researches as foundational texts (Ajjan & Hartshorne, 2008; Paver et al., 2014; Venkatesh & Davis, 2000; Taylor & Todd, 1995) and feedback from the experts of the field.

Before exploratory factor analysis was employed, it was required to check whether the data was appropriate for the factor analysis. For this reason; missing values, outliers, univariate normality, correlation coefficients, multivariate normality, multicollinearity, sampling adequacy, and sphericity of data were examined. Missing values were controlled and to check the outliers, z-scores were calculated and scores of participants (237 out of 258) between -3.0 and +3.0 were included in EFA. For univariate normality; histograms, p-p plot, and q-q plots were checked. Although histograms showed the non-normal distribution for some items, p-p plots and q-q plots indicated normal distribution.

As assumption check, Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy, Bartlett's test of sphericity, and correlation matrix indicated the appropriateness for performing factor analysis (Field, 2013; Tabachnick & Fidell, 2014). In this study, Bartlett's test of sphericity, which "tests the null hypothesis that the original correlation matrix is an identity matrix" (Field, 2013, p. 695) was significant ($\chi 2$ (df = 378) = 3487.93, $p< .05$). This indicated that the first basis for factor analysis was satisfied. However, Bartlett's test of sphericity was infamously sensitive (Tabachnick & Fidell, 2014), and so, KMO was performed to measure the sampling adequacy. The result was 0.88 that was greater than the criteria of 0.6 determined by Tabachnick and Fidell (2014) which indicated whether sample size was adequate to run a factor analysis. Kaiser (1974) recommended accepting the values greater than 0.5 as acceptable. Additionally, Hutcheson and Sofroniou (1999) specified that the values above 0.9 are superb, values among 0.8 and 0.9 are great, the values between 0.7 and 0.8 are good, and values between 0.5 and 0.7 are mediocre. So the data set of this study was appropriate for the factor analysis because the KMO value was greater than 0.8. To check factorability of R, diagonal coefficients of the anti-image correlation were generated which exceeded the 0.3 criterion suggested by Tabachnick and Fidell (2014) indicating the inclusion of each item in the factor analysis, except one which is “Whether I integrate technology into instruction or not is entirely up to me.” Consequently, the item was ruled out from the survey. Additionally, multicollinearity, as no coefficient was close to one (Tabachnick & Fidell, 2014), was not found as a threat in the data set.

According to MacCallum, Widaman, Zhang, and Hong (1999), the sample size was affected by communalities in which the higher communalities required for lower samples size. From this perspective, if communalities were greater than 0.4, the lower sample size was adequate even with less than 100 participants. Only one item had communality lower than 0.4 which was still acceptable because the sample size was 237 in this study which was adequate. Regarding KMO and Bartlett’s test of sphericity, it was appropriate to use factor analysis for the data of this pilot study. Guilford (1954) suggested that N should be at least 200 cases. Similarly, Lawley (1971) created a formula to decide the sample size for factor analysis as N-n-1>50 in which N was sample size and the number of variables that can be defined as a rule-of-thumb, for this study the formula resulted in 237-12-1> 50, that indicated the appropriateness of 237 as the sample size for this study.

Additionally, as the last step of the assumption check, multivariate normality was checked by Mardia’s test. To conduct Mardia’s test, one of the items related to attitude had to be omitted. The result of Mardia’s test indicated that the normality assumption was violated ($p < .05$). Although there was non-normal distribution, principal axis factoring, which had the tolerance of violation of multivariate normality (Briggs & MacCallum, 2003; Cudeck, 2000; Fabrigar, Wegener, MacCallum, & Strahan, 1999), was employed to extract factors of the structure.

In total, 258 surveys were collected and 21 of them were excluded because they had outliers or missing values. In terms of missing values, one of the participants answered only the half of the survey items. Because of this, this participant was excluded in data analysis phase. For outlier check, descriptive statistics, p-p plots, q-q plots, and z scores were checked for each item. The plots were created and z-scores were calculated. The cases having Z-scores higher than 3 and lower than -3 created concern and the repetitive cases in the plots, which were 20 cases, were excluded after consulting an expert on statistical analysis. Before going on analysis, negatively worded items were recoded as revised items. In order to go on tests of factor analysis, preprocessing, the enabler for detecting problems and addressing them with data cleaning and reduction, was performed prior to the analysis to eliminate potential problems in the analysis (Han, Pei, & Kamber, 2012). The factor analysis was run to reveal exact factor structure of the survey. At first glance, correlation matrix was checked and all items which had no or one correlation with another item with more than 0.4 were removed from the item list. Particularly, items related to compatibility, perceived ease of use, perceived usefulness, and perceived behavior control were problematic in terms of correlation with others. After deleting these items, factor analysis was run again and this time, the pattern matrix was checked and the items with lower factor loadings or cross loadings were reconsidered and their correlation with other items was checked. After data cleaning, 27 items were determined for the final factor analysis.

After checking assumptions, cleaning the data, and deciding the appropriateness of conducting EFA, the correlation matrix was examined to make a preliminary judgment about the factorial structure. According to Hair, Black, Babin, and Anderson (2010), if the correlation value was greater than 0.3, it indicated the correlation among the variables, which was the requirement for conducting factor analysis. Once the table checked, each item was correlated with at least two other items.

Determining the exact number in factor structure was one of the key decisions in an EFA (Tabachnick & Fidell, 2014). The most common criteria for retaining the factors was Eigenvalues greater than 1.0 (Kaiser, 1960). Deciding the factor number by depending on only one criterion may cause to under or overestimate the true latent structure (Velicer, Eaton, & Fava, 2000; Zwick & Velicer, 1986). Zwick and Velicer (1986) reported that the eigenvalues-greater-than-one rule typically overestimates, and sometimes underestimates. Addition to the criteria, scree plot (Cattell, 1966) was another common rule to reveal exact structure, hence these two different criteria were used to decide the factor number of the survey. While the rule of Eigenvalue referred six factors (Table 3.8) and scree plot indicated six factors (Figure 3.2), the factor analysis resulted in a clear 6-factor structure of faculty members' technology integration intention survey. Some of the components of DTPB, which are compatibility, perceived ease of use, perceived usefulness, peer influence, administrator influence, and perceived behavior control; were not included in the factor structure of the survey.

Table 3.4.

Eigenvalue Result for the Survey

Factor	Total	% of Variance	Cumulative %
1	8,933	31,904	31,904
2	2,668	9,529	41,432
3	2,175	7,769	49,201
4	1,717	6,133	55,334
5	1,282	4,577	59,911
6	1,129	4,034	63,945

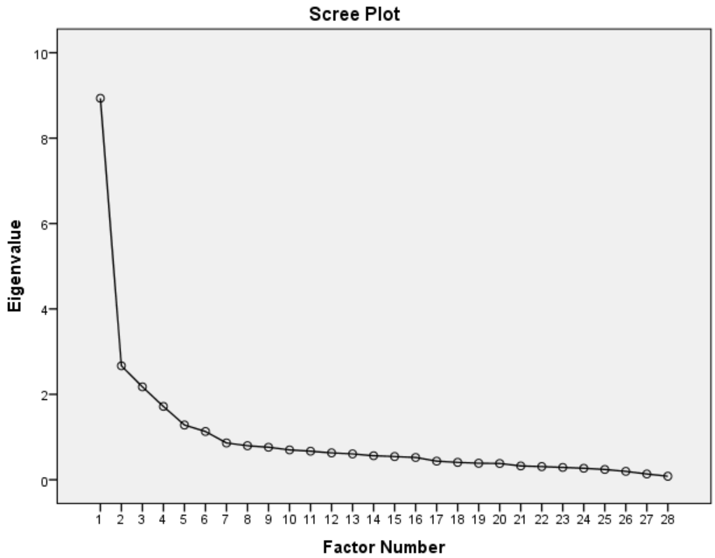


Figure 3.2: Scree Plot

Principle axis factoring analysis (See Table 3.5) was applied as extraction method with oblique rotation because it assumed that the factors were correlated (Brown, 2009; Osborne & Costello, 2009), which was common in educational studies. After determining the factor number, factor analysis was run several times by checking factor loadings of each item. The criterion for factor loading was being higher than 0.3 (Hair et al., 2010). Choosing a cut-off point for factor loading was a researcher preference for Tabachnick and Fidell (2014) and stated that 0.32 was acceptable for determination of factor loadings of the items. For this study, the criterion was 0.3 that was closer to 0.32 and Hair et al. (2010) suggested choosing 0.3 as a cut point for determination on which the items would be loaded to the specific factors. (See Appendix 2. for finalized version of Faculty Members' Technology Integration Intention Survey).

Table 3.9 represents the factor loadings of items after rotation. The items were loaded on the same factors indicated that factor 1 represented intention with three items, factor 2-self-efficacy with six items, factor 3-attitude with three items, factor 4- facilitative conditions with five items, factor 5-subjective norm with five items, and factor 6-student influence with five items.

Table 3.5.

Factor Loadings of the Items

		1	2	3	4	5	6
Intention	I intend to integrate technology into instruction in the next semester.	.822					
	My expectation is to integrate technology into instruction in the next semester.	.768					
	I want to integrate technology into instruction in the next semester.	.757					
Self-efficacy	If I want to, I could easily integrate technology into instruction on my own.		-.734				
	I can integrate technology into instruction using any technological tools (computer, mobile phones, tablets, etc.).		-.701				
	I find it easy to get technology integration to do what I want to do with it.		-.698				
	I do not know enough to integrate technology into instruction.		-.660				
	I can easily integrate technology into instruction on my own.		-.630				
	I am be able to integrate technology into instruction even if there is no one around to help me overcome problems in using it.		-.586				
Attitude	Integrating technology into instruction is beneficial.			.841			
	Integrating technology into instruction is useful.			.689			
	Integrating technology into instruction is good.			.666			
Facilitative Conditions	I could easily get access to the resources that are needed to integrate technology into instruction.				.770		
	I do not have sufficient resources to integrate technology into instruction.				.604		

Table 3.9. (cont’d)

		1	2	3	4	5	6
	The setup of technology at the faculty is compatible with the way I work.				.549		
	I do not use technology for instruction because the computers at the college are outdated and slow.				.532		
	The technology at the faculty is compatible with technologies I already use for teaching.				.496		
Subjective Norm	My administrator thinks it is important that I integrate technology into instruction.					.673	
	My administrator, who influences my behavior think that I should integrate technology into instruction.					.641	
	My administrator confirms my ability and knowledge to integrate technology into instruction.					.609	
	I have to integrate technology into instruction because my faculty requires it.					.524	
	My colleagues think I benefit from integrating technology into instruction.					.448	
Student Influence	I have to integrate technology into instruction because my students require it.						.586
	Students who influence my behavior think that I should integrate technology into instruction.						.573
	My students think it is important that I integrate technology into instruction.						.507
	Student performance is important to me so I should integrate technology into instruction.						.462
	I feel that integrating technology into instruction improve students’ learning.						.394

3.2. Quantitative Phase

In this phase, the survey tested in piloting phase was utilized at a university to reveal factors affecting faculty members' technology integration intention. In the quantitative phase, the overall picture on technology integration at a higher education institution was examined. The context of the university, participants of the survey, data collection, data analysis, and validity and reliability checks were described below.

3.2.1. Context of the Study

This study was conducted at a public university in Turkey. The university had five faculties; Faculty of Engineering, Arts and Science, Architecture, Economics and Administrative Sciences, Education, and some departments and institutes directly connected to Director's office. Since this university was equipped with educational technology opportunities for the faculty members, such as a computer center, instructional technology support office, learning and student development office, computer and projector in almost all classes, wireless networks, and computer labs for both students and faculty members, this specific university was selected to conduct the study.

Computer center serves as the office that carries out all technical tasks in the university with the help of computer engineering department. The university had an instructional technology support office (ITS) that aimed to help faculty members to integrate technology and deal with any issues the faculty members faced during technology integration. To encourage faculty members, the office organized some workshops on selected technologies that can be used for both instructional and personal purposes. Besides, they aimed for enhancing the classroom learning experiences with innovative approaches to education and research. The office provided extended support and relevant resources to faculty members to integrate technology in their classrooms, such as support for Open CourseWare and distance education; and offering seminars on LMS usage; advance webpage preparation and sharing teaching materials on a webpage and e-portfolio development; LATEX usage, effective presentation techniques and methods; educational technology opportunities in the university, teaching material preparation with video creation tools, platforms to detect plagiarism including Turnitin, introduction to Adobe Photoshop, effective usage of Microsoft Office, Web 3.0 tools and available educational technology opportunities in the university for daily and educational usage. The office was supported by the university administration to encourage and motivate the faculty members by assisting them on technology usage in the university.

Another support system, the learning and student development office (LSD) intended to assist both students and faculty members. While they aimed to help students develop academically, socially, personally, and professionally; they were interested in the needs of the faculty members to provide potential solutions and enrich teaching and learning activities at the university. The office offered orientation program for newcomer faculty members to make them familiar with the research, teaching, and social opportunities that the university provides for them.

In addition to these opportunities, the university was in a transformation process, which all content of courses was moved to a learning management system (LMS), for first time. All faculty members were in the exploration process of the LMS, an effective method to engage with technology integration, while this study was being conducted. This act required all faculty members to use Moodle based LMS as a course delivery and assessment platform that alleviates workload and greatly enhances teaching practices. This platform was credited and advised to integrate into the courses in whole university by the administration. In each semester, the university-wide platform contains the online version of all courses in which all enrolled students were automatically registered in this online version of the course. As an e-learning tool, Moodle, an abbreviation of Modular Object Oriented Dynamic Learning Environment, was designed based on the philosophy of social constructivism, a learner-centered philosophy, by using the collaborative possibilities that the Internet offers (Al-Ajlan & Zedan, 2008). This platform allowed educators to create efficient groups for online learning by integrating technology into the traditional courses. Moodle supported educators by providing documents or course materials share, making quizzes, creating online discussion forums, distributing assignments, announcing grades, and associated course activities, empowering educators easily manage their courses online. Likewise, the university gave faculty members opportunities to integrate technology into their course, such as (1) having instructional technology support office for the whole university as well as for individual faculty, (2) presenting professional development trainings or workshops to introduce new academic or educational technologies via these offices, library, and learning and student development office, (3) most of the classes equipped with technology with campus-wide wireless connection.

3.2.2. The Participants of Qualitative Phase

The university was chosen purposefully because of its context, which was explained in context part. As the university had a medium sized population of faculty members (*N* = 894), convenience sampling strategy (Fraenkel, Wallen, & Hyun 2002) was chosen as a data collection method for this phase of the study. For the participation, all faculty members from the university were invited to participate in the implementation of faculty members' technology integration intention survey, only the volunteer ones (*n* = 167) took part in the study. The focus of the survey implementation was full-time faculty members who were currently teaching in the university, which was important to have faculty members with teaching experience at higher education without considering their technology integration expertise. In the university, there were faculty members with different academic positions: assistant professor (*N* = 234), associate professor (*N* = 179) professor (*N* = 356), and instructor (*N* = 125).

Table 3.6.

Demographics of the Survey Participants

	Min	*Max*	*M*	*SD*
Age	27	78	47.39	11.36
Course Number (total offered in the semester)	0	8	2.10	0.89
Student Number (total enrolled in the course/s)	0	380	96.34	45.30
Years of Teaching Experience	1	55	17.46	11.94

The aim was to collect data from a large variety of faculty members who were familiar and unfamiliar with technology integration in the classrooms in order to draw a large picture of the university having considerable technology integration opportunity. Four different groups of faculty members participated in this study when their academic titles were considered, while the faculty members were teaching in different areas of expertise. Table 3.6 and 3.7 represents the descriptive statistics of faculty members' demographics.

When considered the population of the university, the faculty of engineering has the largest population of faculty members that was why there were more faculty members from the faculty in this study. The faculty members were asked about attendance to professional development programs on technology integration. More than half of the faculty members (53%) did not attend a professional development program on technology integration, which characterized their non-familiarity with technology integration. Eight of them participated three times to professional development programs.

Table 3.7.

Gender, Academic Title, Academic Discipline, and PD Participation of the Survey Participants (n = 167)

	n	*%*
Gender		
Female	69	41.3
Male	97	58.1
Academic Title		
Assistant Professor	28	16.8
Associate Professor	39	23.4
Professor	69	41.3
Instructor	31	18.6
Academic Discipline		
Faculty of Engineering	88	52.7
Faculty of Architecture	22	13.2
Department of Modern Languages	21	14.7
Faculty of Arts and Sciences	16	9.6
Faculty of Economics and Administrative Sciences	10	6.0
Faculty of Education	8	4.8
Informatics Institute	2	1.2
PD Participation		
None	89	53,3
1 time	26	15,6
2 times	21	12,6
3 times	8	4,8

The faculty members integrated different technological devices, tools, programs, and applications. The most common technological tool among the faculty members was learning management system (LMS), which was recently provided, and recommended to use in all classrooms. The university faculty members had started interacting with the LMS and all courses' contents were being transferred to this platform. That was why 84 faculty members referred the use of LMS as a technology integration implication. Package programs (*n* = 93) were second most common technologies among faculty members. The engineering based programs were commonly preferred among faculty members because most of them were from engineering faculty. In addition, Matlab, reputed coding software, which could be used for different purposes of different faculties. Some details of the technologies used with educational purposes by the faculty members were represented in Table 3.3.

Table 3.8.

The Technologies Used by the Faculty Members

Technology	*n*
LMS	84
Package programs	93
Matlab	18
Mathematica	5
AutoCAD	1
Other software	11
Presentation tools	86
PowerPoint	83
Prezi	3
Online videos or movies	23
YouTube	9
TEDTalks	2
File Sharing	21
Dropbox	15
Google utilities	6
Web Pages	18
Social Media	8
Facebook	5
Professional networks	3
Twitter	1
WhatsApp	1
Simulation programs	8
Student response system	7
Turnitin	5

Lastly, 27 of the faculty members highlighted the technological devices that they already used in their classrooms, as the practice of technology integration. Computer and projector (n = 21) were frequently used devices among faculty members while smartphone (n = 6), laptop (n = 5), tablet (n = 4), and smartboard (n = 3) were rarely mentioned when compared to computers. One possible reason behind this could be that most of the classrooms in the campus had a computer and a projector.

3.2.3. Data Collection with the Survey

After revising and piloting of faculty members' technology integration intention survey, the finalized survey was used as the data collection tool to answer first research question with the purpose to reveal factors affecting technology integration intention of faculty members all over the university. With this aim, there would be an opportunity to draw a clear picture of technology integration intention and behavior in the university.

Data collection with the survey comprised the quantitative data collection phase of the study. To reach all population easily, therefore, the finalized version of faculty members' technology integration intention survey was entered to Google Forms. Instructional Technology Support Office (ITS) provided an e-mail list of all faculty members teaching in the university. An email body, including a brief introduction to research and its purposes, was formed inviting the faculty members to participate in the study. All faculty members teaching in the university were invited to participate in the survey through the link of the online survey in this invitation e-mail. The online survey platform allowed sending customized email to respondents and included and "opt-out" link of the survey. After getting the invitation e-mail, faculty members were expected to fill the survey within a week ($n = 43$). To those who did not fill the survey, a reminder was sent after two weeks and 63 faculty members filled the online form of the survey, in total. Once the online implication of the survey was finalized, all faculty members' offices at the campus were visited to conduct the survey on paper to reach as many faculty members as possible and 104 of them completed the paper-based survey.

3.2.4. Quantitative Data Analysis

For analysis of quantitative data, multiple linear regression was performed to model the relationship between faculty members' technology integration behavior and subjective norm, attitude, self-efficacy, student influence, and facilitative conditions. Multiple linear regression gives researchers a chance to examine the influence of several predictors in a specific order (Mertler & Vannatta, 2005). In multiple linear regression, researcher enters variables at the same time because statistical regression can be very misleading unless based on samples that are large and highly representative of the population of interest (Tabachnick & Fidell, 2007). Additionally, the faculty members in the study were coming from the census method, which contributed its representativeness of population. Thus, multiple linear regression was the appropriate method in the context of the study. This analysis technique was performed on data coming from 167 faculty members using Statistical Package for Social Sciences (SPSS) version 24.0. The significance level was set as 0.05 for analyses of the study.

For this study, faculty members' behavioral intention to integrate technology in their classrooms was criterion (dependent) variable because of predicting faculty members' technology integration behavior and it also was quantitative, continuous, and unbounded (Field, 2013). This study included five predictor variables. Subjective norm, attitude, self-efficacy, student influence, and facilitative conditions were the predictors of the analysis.

Four steps were followed during multiple regression analysis: (1) examining descriptive statistics of the faculty members (2) checking assumptions for multiple regression analysis which are multicollinearity, homoscedasticity, normality, and independence of errors and influential observations, (3) conducting correlation analysis to reveal the relationship between predictors and the criterion, and (4) testing model significance and how much variance could be explained by the overall model and individual predictors.

3.2.5. Validity and Reliability of the Survey

Validity of a measurement tool is defined as the degree of representativeness of the concept by the measure (Zeller & Carmines, 1980). Nunnaly (1978) categorized the validity types into three; content validity, construct validity, and criterion validity. Although content validity is comprised of the items representing the concept, which was aimed to measured, there was no agreed criteria for reaching content validity (Haynes, Richard, & Kubany, 1995). The factor analysis results enabled to get evidence on the content validity (Nunnally, 1978). The item correlation results approved that each items were correlated at least two of others, which made the understanding the content validity easily. Moreover, expert revisions helped to get valid results in terms of content of the survey. Secondly, to ensure about the content validity, factor analysis was performed as initial phase of the study, because factor analysis or convergence was declared as the ways for checking construct validity by Anastasi (1982). With the help of factor analysis, large number of items were reduced to smaller factors to measure the meaningful concepts and constructs. Criterion-related validation was used to enhance effectiveness of the instrument on predicting actual measure of the behavior, which required another test score compared the measured one. In this study, this was not possible because of the limited measurement of the faculty members' technology integration behavior. To increase validity of the study, survey was pre-piloted with the faculty members to ensure its face validity in terms of readability, clarity, and accuracy of the survey.

Reliability was defined as the degree of stability, dependability, and predictability of the measurement (Kerlinger, 1973). Commonly preferred type of the reliability is internal consistency (Zeller & Carmines, 1980) explained by answering the following question "If we measure the same set of objects again and again with the same or comparable measuring instrument, will we get the same or comparable results?" (Kerlinger, 1973, p. 443). If the survey items were parallel, alpha is accepted as accurate indicator of internal consistency. The alpha scores of the reliability for each factor was presented in the Table 3.9. The results showed that alpha coefficients of the factors in the survey ranges from 0.771 to 0.937. According to Hair et al. (2010), accepted value for reliability is 0.7 or above. Parallel to this, Nunnally (1978) recommended the reliability level as 0.5-0.6 for preliminary research and 0.8 for basic research. When these criteria were considered, the reliability scores of each factor were acceptable.

Table 3.9.

Reliability Results of Each Factor

Factors	*Number of items*	*r*
Intention	3	.937
Self-efficacy	6	.861
Attitude	3	.937
Facilitative Conditions	5	.771
Subjective Norm	5	.817
Students Influence	5	.776

3.3. Qualitative Phase

In this phase, the survey tested in piloting phase was utilized at a university to reveal factors effecting faculty members' technology integration intention. At quantitative phase, the overall picture on technology integration at a higher education institution was ascertained. Context of the university, participants of the survey, data collection, data analysis, and validity and reliability checks were presented below.

3.3.1. Context of Faculty Technology Mentoring Program

The FTM program was implemented at the university. There were two groups of people participating in the FTM program: mentors and mentees. Although the main focus of the study was the faculty members, some details about graduate students who were mentors were represented to explain the mentoring context in detail. Then, faculty technology mentoring program was explained in details.

3.3.1.1. The Mentors in the FTM Program

There were 24 mentors in the program. 17 of them worked with the faculty members participated in to this study. All mentors had background related to teaching or education and 12 of them had expertise on teaching at least one year. 4 of them were teaching at undergraduate level while they were mentors in the program. The mentors who were from computer education and instructional technologies department were had expertise on technology, itself. Details about the mentors were given in Table 3.10.

Table 3.10.

Mentors' Profile

	Gender	Department	Status	Teaching Exp. (years)
Mehmet	Male	CEIT	Master Student	1 to 3
Sevgi*	Female	ESE	PhD Student	4 to 6
Melis	Female	CEIT	Master Student	1 to 3
Tugba	Female	ESE	PhD Student	7 to 9
Oykü	Female	CI	Master Student	1 to 3
Derya	Female	CEIT	PhD Student	1 to 3
Hadi	Male	CI	Master Student	1 to 3
Betül	Female	CI	Master Student	None
Oguz*	Male	CEIT	PhD Student	10 or more
Serra	Female	CI	Master Student	None
Selen	Female	CEIT	PhD Student	1 to 3
Ozge	Female	CI	Master Student	None
Miray*	Female	CI	Master Student	1 to 3
Tugce	Female	CI	Master Student	None
Hayri	Male	CI	PhD Student	1 to 3
Ilay*	Female	EME	Master Student	10 or more
Aycan	Female	Industrial design	PhD Student	None

*Teaching at undergraduate level

The mentors were the graduate students from faculty of education enrolled in the course titled as "Research and Practice on Technology in Teacher Education" offered by the Department of Educational Sciences. In mentor selection process, it was important to consider whether a graduate student's prior teaching experience was situated within higher education setting as K-12 classrooms. The reason behind this selection was that they had practical experiences in solving pedagogical problems. Participating in FTM enabled them to practice what they learned from their classes or student-teacher field trainings because mentors were asked to guide faculty members in developing not only their technology integration intention and behavior but also their pedagogical views. Pierson (2001) found out that exemplary technology integrators use distinctive planning habits when planning technology inclusion, strategies for teaching with technology that matches teacher's strategies, management of student technology use, and altered perspectives on assessment as a part of pedagogical knowledge. So, this program focused on not only technology usage but also intercept of technology and pedagogical knowledge of faculty members in practice. Parallel to this, the mentors who were skilled individuals in technology integration, pedagogical implications and planning were needed for this mentoring program.

The course was designed to develop understanding of Technological Pedagogical Content Knowledge (TPACK) of graduate students theoretically and practically while it concentrated on development of the faculty members' technology integration knowledge in practice in FTM context. In other words, it was aimed to improve faculty members' technology integration skills and to create awareness on technology integration itself and its affordances for their teaching and the student learning.

Before enrolling in the course, the students were interviewed in order to determine their technology abilities and their interest in technology and mentoring. The faculty members were also informally interviewed in order to assess their willingness to partake in the FTM program and specific technology skills they were interested in developing. The efforts were made to pair graduate students' technology abilities and their educational background with the faculty members' desired skills in order to get most suited counterparts. At the beginning of the semester, the students were presented with the FTM guideline to make them clear about what they were expected to do during the FTM program. In FTM guideline, their responsibilities were listed as;

1) Working with the faculty members in pairs to help them in technology integration activities that can be implemented in their courses.

2) Keeping mentoring blogs about what they did with their mentees weekly.

3) Writing a case study report about their mentoring experiences by considering an appropriate theory.

4) Presenting the mentoring process and results as a case study.

5) Publishing mentoring case page on the FTM website (http://ftm.eds.metu.edu.tr) for introducing and summarizing the mentoring process and the outcomes at the end of the program.

3.3.1.2. Faculty Technology Mentoring Program

The faculty members and graduate students were matched as pairs; one graduate student being the mentor and one faculty member being the mentee, except two teams. For one of these teams, one graduate student worked with two instructors offering the same course with the same syllabus and the other graduate student guided a teaching team with four instructors. Each mentoring group met as much as possible, preferably once every week. At these meetings, they were expected to define needs of the faculty member(s) and to search the ways to meet them. The most important reference guide for meeting these needs was mentoring debriefings. All mentors met and discussed together about their concerns coming from their mentee meetings. The debriefing meetings were conducted weekly for 20-30 minutes during the course hours. All mentors, following the mentoring guides, tried to produce solutions for problems which occurring during the mentoring process. Among the artifacts of the FTM, the mentoring case page was designed as the representation of the students' mentoring case studies. In addition to FTM webpage, the students and faculty members of the program were enrolled in the FTM Facebook group page to be connected through and after the program. On this page, the mentors and mentees shared some specific technologies they used or planned to use in their classroom to solve specific problems and they reflected experiences.

FTM program was implemented in the spring semesters of 2014 and 2015. In the first semester, the faculty members, who were in the e-mail list of the orientation program implemented by Learning and Student Development (LSD) office and those who were in the e-mail list of Instructional Technology Support Office, were invited to participate in the program through e-mail invitations. These specific mail lists were chosen intentionally because of their previous contact with these offices that gives technology integration opportunities to the faculty members. For the second semester, in addition to the same invitation to the program was followed, even more faculty members were recruited applied for the participation with the suggestion and encouragement from the faculty members who had participated in the year before. Based on to their responses, the mentee group was formed. The faculty members who were from different areas of expertise were welcomed to participate in the study because this mentoring program was designed as the university-wide program (Baran, 2016a). This was the criterion for selection of mentees were defined as willingness for participation, eager to solve their pedagogical problems; and openness to learn new technologies. In total, 28 faculty members participated in the program.

The faculty members had different academic background and teaching expertise in higher education. Most of the faculty members who were mentees had at least one degree from the university and all of them had studied abroad at least one year. 16 of the faculty members completed their PhD studies in USA and one of them got his PhD from a European country. The mentees' teaching experiences were changing from 1 to 10 years, and 10 of the mentees had been working at the university less than five years. This indicated that the results of the quantitative part of the study had the opportunity to represent different point of views on technology integration behavior. They defined themselves somehow enthusiastic to learn technology integration.

Within the mentoring program, some steps had to be followed by the mentors that made mentoring process somehow structured while they had opportunity to make their own decisions. The steps were defined by Baran (2016a);

1) Conduct needs analysis to determine mentees' needs at the beginning of the semester,
2) Engage in technology integration activities with their mentees throughout the semester by holding weekly or bi-weekly meetings and observing the mentees' classes,
3) Present technological and pedagogical solutions to problems laid out by mentees,
4) Explore solutions through a collaborative discourse with mentees and other mentors,
5) Evaluate the results of implemented solutions, and
6) Present and share the process and results with the community to disseminate the knowledge of innovations within the course and the campus (p. 52).

Each mentoring groups had their own schedule and program plan in their hands which were prepared by mentors and mentees based on faculty members' specific needs. The needs were determined by a needs assessments conducted by mentors at the beginning of the program. According to the results of needs assessments, each mentor came up with suggestions to their mentees and planned their mentoring process based on these suggestions and needs. The mentoring groups followed their unique plans and did some activities. Details of these activities were presented in Table 3.11. Nicknames for each individual in the study were assigned and used throughout the study.

Table 3.11.

FTM Activities and Technologies Explored During the Program

Mentee	Mentor	FTM Activities and Technologies
Ali	Hadi	Already integrating technology what he needs. Developing mentee’s pedagogical aspects
Banu	Derya	Formal Needs assessment, Used-Student response systems
Baki	Serra	Informal Needs assessment, Socrative, Kahoot, LMS
Cansu	Ilay	Informal Needs assessment, Used-Diigo, Kahoot, Socrative
Deva	Aycan	Informal Needs assessment, Used-LMS, Wordpress, Facebook
Didem	Tugce	Informal Needs assessment, Used-Kahoot, Socrative
Ela	Tugba	Formal Needs Assessment, Used-LMS, Turnitin, Diigo, Pinterest, Infogram
Figen	Betül	Pre-survey to students, Used-Prezi, e-choice, LMS.
Gamze	Miray	Formal Needs assessment, Used-Kahoot, Google Communities, LMS
Onur	Hayri	Pre and post survey for student satisfaction, Used-Socrative, Open Education Sources
Olcay	Selen	Formal Needs assessment, Used-Socrative, Blog
Pelin	Sevgi	Formal Needs assessment, Syllabus revision, Used-LMS, Explore-Diigo, Letsfeedback
Sadi	Ozge	Informal Needs assessment, Used-Diigo and Socrative, Explore-Blog
Suat	Oguz	Informal Needs assessment, Used- Student response system with sms/e-choice, Prezi, LMS
Seda	Mehmet	Formal Needs assessment, Used-Blog, Open courseware
Serkan	Melis	Formal Needs assessment, Pre and post survey on students’ perceptions, Used-Socrative, Kahoot, Lets Feedback, Trello, Google Drive
Yaren	Oykü	Informal Needs assessment, Used-LMS and Diigo; Explored-Prezi, Camtasia, Captivate, Camstudio, Facebook, Twitter, Socrative, E-Choice, Letsfeedback

During these meetings, they were in pairs and mostly in the faculty member’s office. First two weeks of these meetings mostly covered the understanding of each other, the context of the faculty members in which they were teaching, and the implications of faculty technology mentoring program. In the following two or three weeks, mentors explored the technologies which could help the faculty members before the meeting and they experienced technologies during the meetings. Mostly within these weeks, mentors' meetings covered by the problems that mentors could not solve alone and all mentors tried to create solutions or find an appropriate technology for specific problems. Last two or three week mostly included the practice of technology integration as a part of the program. The planned and explored technologies were implemented and evaluated by both mentees and mentors. Among the mentoring groups, only one of them could not have the chance to implement the technologies which were explored due to lack of time and late start to the mentoring program. At the end of the program, mentors evaluated their process and created a case study paper representing the whole process, published a blog on the webpage of the mentoring program, and present this process as a journey at the closure party of the program in which mentors and mentees were met.

3.3.2. The Participants of FTM Technology Integration Behavior Interview

For participant selection, the method of the study indicates qualitative sampling strategies, as a nature of this type of studies. The features of this type of samplings are being purposive, small, and information-rich (Patton, 2002). For this reason, criterion referenced sampling strategy was chosen for the FTM who were the potential participants of the qualitative phase. Among the faculty members participated in FTM program, 17 faculty members out of 28 participated in to this research. Their general characteristics were represented in Table 3.4. Although they had different backgrounds, their demographics represented that their ages ranging from 31 to 49 with the mean of 38.3. During the program, their offered course numbers varied as two courses (n = 9), three courses (n = 6), and four courses (n = 2). The average enrolled total student number to their all courses was 102. The faculty members were teaching the students with numbers ranging from 30 to 230 in the semester. The average years of teaching experience in higher education was eight. Within this study, assigned pseudonyms were used to represent the participants.

All of the faculty members had already participated in at least one professional development program on technology integration, which meant that all of the faculty members were aware of technology integration before participating in FTM. According to their self-report on technology expertise, they identified themselves being on the intermediate level of technology integration. Their educational technology usage level depended on the type of technology. They were mostly familiar with the technologies that were easily accessible at the campus or free to use, such as computer projection systems, learning management system, file sharing platforms, student response systems, and social media. On the other hand, they rarely used online community of practice opportunities, flipped classrooms, virtual learning environments, podcasting, social bookmarking, and educational games. The faculty members were needed to be experienced or at least joined a training on usage of some of these technologies such as; virtual reality, simulations. On the other hand, the others were not common on the campus. The summary of their profile was presented in Table 3.12.

Table 3.12.

Mentee Profiles

Mentee (Gender) (Age)	Title-Department	Teaching Activity	Teaching Training	Technology Expertise ***	Technology Integration Experiences
Ali (M) (40) *	Professor-Physics	2 courses with 160 students	2	4	2 PDs 3-year expertise
Banu (F) (37) *	Assistant Professor-Psychology	2 courses with 180 students	1	2	2 PDs 4-year expertise
Baki (M) (38) **	Assistant Professor-Sociology	3 courses with 230 students	1	4	No PDs 3-year expertise
Cansu (F) (40) **	Associate Professor - Elementary Education	3 courses with 36 students	1	3	2 PDs 9-year expertise
Deva (F) (36) **	Dr. Instructor - Industrial Material Design	2 courses with 94 students	3	3	2 PDs 3-year expertise
Didem (F) (36) **	Assistant Professor-Educational Sciences	3 courses with 120 students	-	1	2 PDs No expertise
Ela (F) (45) *	Associate Professor-Business Administration	4 courses with 200 students	-	3	No PDs 10-year expertise
Figen (F) (31)*	Assistant Professor-Mechanical Eng.	2 courses with 65 students	1	3	No PDs 2-year expertise
Gamze (F) (42) **	Assistant Professor - Educational Sciences	4 courses with 48 students	1	3	1 PD 10-year expertise
Onur (M) (33) **	Assistant Professor - Electrical Eng.	2 courses with 90 students	1	5	2 PDs 2-year expertise

Table 3.12. (cont'd)

Mentee (Gender) (Age)	Title-Department	Teaching Activity	Teaching Training	Technology Expertise ***	Technology Integration Experiences
Olcay (F) (49) **	Professor - Educational Sciences	3 courses with 43 students	-	4	2 PDs 17-year expertise
Pelin (F) (37)*	Assistant Professor – Economics	2 courses with 100 students	3	3	1 PD 2-year expertise
Sadi (M) (36) **	Assistant Professor – Chemistry	3 courses with 120 students	1	5	1 PD 4-year expertise
Suat (M) (35) *	Assistant Professor - Electrical Eng.	2 courses with 30 students	2	3	2 PDs No expertise
Seda (F) (37) *	Assistant Professor – Economics	2 courses with 130 students	2	3	2 PDs 3-year expertise
Serkan (M) (39) **	Associate Professor - Industrial Eng.	2 courses with 50 students	1	3	1 PD 2-year expertise
Yaren (F) (40) *	Associate Professor - Health Informatics	3 courses with 40 students	2	4	15-year expertise

* represents FTM participation in 2014
** represents FTM participation in 2015
*** 1-Novice, 2-Talented 3-Skillful 4-Proficient 5-Advanced 6-Expert (based on their self-report)
Note: All names were revised with nicknames

3.3.3. Data Collection Tool and Procedure

In order to answer second research questions, the data obtained with a "FTM Technology Integration Behavior Interviews" of 17 faculty members were the core of data collection with interview phase of the study. Semi-structured interview was preferred for this phase of the study since this type of interview attempts to understand the world from the subjects' point of view (Kvale, 2008). This type of interview was conducted by following a guideline and constituted by a list of questions covering a certain topic (Kvale, 2008). Accordingly, a detailed interview protocol was developed. Data collection through interviews in this study included other set of activities and steps, which were; developing the interview guide (1), getting expert reviews (2), checking language (3), piloting the interview (4), conducting the interviews (5), transcribing and coding the interviews (6), and analyzing the results (7).

Since the aim was to collect information to understand the contributions of the FTM program, initial interview questions and focused themes were defined as similar to the factors consisted of DTPB dimensions. Four experienced researchers evaluated the questions in the interview protocol and gave suggestions about the style and wording of them. All protocols were carefully revised and finalized after implementing changes by following suggestions of the experts that involved clarification and simplification of the questions. In addition to recommended revisions, FTM technology integration behavior interview protocol was conducted with one faculty member and two research assistants who are familiar with the mentoring process to reveal clarity and clearness of the protocol. The interview protocol was presented in Appendix 3. Interview protocol had four sections, warm-up questions (1), initial background questions (2), grand questions (3), and closure (4). For sample questions, see Table 3.13. FTM technology integration behavior interview started with an introduction part including information about the research and researcher in addition to the research question. The second section gave information about confidentiality and approximate duration of the interview. Three warm-up questions and initial questions about their background were listed before main interview questions or grand questions to prepare the participant psychologically for the interview. After grand questions, FTM technology integration behavior interview ended with a closure question about their additional thoughts on the study.

Table 3.13.

Example Questions of the Interview

Section	Example Question
Warm-up	Do you mind to fill in this demographics questionnaire? [*Give "Demographic questionnaire" to fill in.]*
Initial Background	Could you give me some information on your educational and academic background?
Grand	How does your attitude/opinions on technology effect your technology integration?
Closure	Do you want to add anything that you think it will contribute to this study?

The demographics form was prepared to gather basic information about the faculty members. The form had questions related to; gender, year of birth, year of mentoring program participation, number of offered course in the semester, enrolled student number in the courses, year of teaching experience, etc. In the warm-up part, faculty members signed the consent form (see Appendix 7) and filled the demographics form (see Appendix 5). After this brief introduction, the permissions from the faculty members to record the interviews was retrieved and instructions were provided to not miss any part of the interview were gotten.

Following guidelines of DTPB and the factors addressed in faculty members' technology integration intention survey, FTM technology integration behavior interview protocol was prepared. Main interview questions were designed by following the structure of DTPB. This interview had semi-structured questions on technology integration behavior during FTM that focused on the following categories: behavior, intention, attitude, subjective norm, and perceived behavior control. The questions representing antecedents of the theory had prompts that were correlated with their sub-categories. Last two questions were about their suggestions on ways to increase technology integration among faculty members and ways to develop FTM. Sample questions were presented in Table 3.14.

Table 3.14.

Interview Questions on the components of DTPB

Component of DTPB	Interview Questions
Behavior	Could you describe any activity that you have enjoyed during your faculty technology mentoring program?
Intention	How did your courses change after faculty technology mentoring program?
Attitude	How does your attitude/opinions toward technology integration affect your technology integration?
Subjective norm	What are supports or challenges of individuals around you on technology integration into your courses?
Perceived behavior control	How does your confidence/belief in success influence you while learning technology integration?

To collect data via interview, an invitation mail to participate in the interview and a request to arrange a meeting for the interview was sent to all the faculty members who participated in FTM (n = 28). However, only 17 of them accepted to participate in the study. According to their time schedule, the meetings with each of them were arranged, separately. Interview protocol was shared via email prior to the interview to allow them to have greater time to be familiar with the study and think about their technology integration practices and FTM activities. All interviews were conducted between December 2015 and February 2016. Each interview took place in the faculty members' offices and lasted between 16 minutes to 40 minutes. The interviews were tape-recorded and transcribed for data analysis. Independent transcriber, who was not familiar with the topic and the context, completed the transcription of all interviews.

3.3.4. Qualitative Data Analysis

Data collected via interviews were analyzed to determine the perception of the faculty members participated in FTM; how the faculty members explored technologies; how their intention changed during the process of FTM; and during the technology integration practice process in FTM how the factors affected their intention and behavior. Different models and classifications of qualitative data analysis process generally rely on three important concepts for researchers; (1) describing, (2) analyzing, and (3) interpretation (Yıldırım & Simsek, 2006). The qualitative data analysis models can concentrate on 'data reduction', 'data display' and 'drawing conclusion and verification' (Miles & Huberman, 1984) or 'describing', 'classifying', and 'connecting' (Dey, 2003). Although these models have different views on data analysis, the data analysis process of this study relied on the mandatory two important steps: clear description of data, and detailed definition of exploration process (Yıldırım & Simsek, 2006). In the data description step, interview questions were modeled to make the audience familiar with the data itself (See Appendix 3 and Appendix 4). In the second step, detailed definition of process contained derivation of hidden concepts and themes, and their relationships. This step helped to answer the research question in detail by allowing understanding "what all these expressed and observed issues mean" (Yıldırım & Simsek, 2006, p. 222). The interpretation of data in this context occurred as a final step of the data analysis.

The interviews were transcribed by an external person and coded by the researcher. All interview questions were organized according to the framework of DTPB and the sub-research questions that helped to code data in a general view. Before starting the coding, all transcriptions were read and some inferences from data were gotten about the codes. These inferences were noted as potential codes. During the initial data coding process, researcher memos and analytical descriptions of the codes were created, that helped main coding process. By following the notes and descriptions, an initial codebook was created mainly based on the components of DTPB to make the coding objective. It included themes, categories, and their explanations with an example quotation of the code.

Analysis of all interviews was performed by using "coding in a general framework" method prescribed by Strauss and Corbin (1990). This type of analysis allowed using a pre-developed conceptual framework that could be revised with new concepts and themes. In the main part of coding, as parallel to the data analysis method of Strauss and Corbin (1990), additional themes and categories emerged from the data to answer sub-research questions. During the first coding process, extra codes emerged from the data. Revision of the codebook was required in order to avoid bias in the interpretation of the results. By following revised codebook, all transcriptions were re-coded in the second coding process. The connections between the codes were used to advance the understanding of FTM program. All the analyses were performed on NVivo 11 software. The software helped to create codes and themes and organizing them during the data analysis process. Additionally, the program helped to create researcher notes and connect these notes to specific code or cases.

The codebook includes 3 main categories related to sub-questions of the second research question. The first category includes five themes parallel to the main dimensions of the DTPB: Behavior, intention, attitude, subjective norm, and perceived behavior control. In behavior theme, the technologies that faculty members explored or integrated into their classrooms were coded. The interview had the question related to reasons for technology usage, therefore these are categorized under the behavior. Among these categories, only the category of reasons to use educational technology has two subcategories as reasons to use technology and reasons not to use technology. Under attitude theme, faculty members' interest, perceived ease of use, perceived usefulness, and compatibility were coded as categories. In the second coding phase, interest as a category was emerged in addition to the dimensions suggested by DTPB. Under subjective norm theme, student influence, peer influence, and administrator influence were coded as categories. Finally, facilitative resources, facilitative technologies, and self-efficacy were coded as categories of perceived behavior control theme. In the second category; additional themes were emerged that involved contribution of the FTM program and the suggestions for development of the FTM program. In the third category, the challenges confronted during the experience of technology integration amid and after the FTM program were coded. This theme included three categories including context-related, instructor-related, and student-related challenges.

Definitions and sample quotations were represented in the codebook. Terms related to the codes and definitions were presented in the Appendix 8.

An independent researcher who was familiar with technology integration into educational settings and experienced in qualitative data analysis coded the data coming from randomly selected two interviews separately to confirm reliability. During that process, the coders' agreements and disagreements were counted to check inter-coder reliability that indicated 81% agreement indicating acceptable level at first step. After discussion on the codes, 97% agreement of the coders was reached. Although there is no consensus on the standard for inter-coder reliability, 67-79% range was considered acceptable in the field (Krippendorff, 2004) and used in this study as a criterion for this type of reliability. 3 % the disagreement was caused on the intention part.

3.3.5. Trustworthiness

As part of trustworthiness in the data collection with interview and data analysis; credibility, transferability, dependability, and confirmability terms are used in terms of internal validity, external validity, reliability, and objectivity by Lincoln and Guba (1985). As Yıldırım and Simsek (2006) stated, qualitative research had different methods and techniques on validity and reliability issues from quantitative research.

Reliability of interpretations of the results in the qualitative study is directly related to the credibility. Prolonged engagement, persistent observation, and triangulation of the data result in the likelihood of credible findings (Lincoln & Guba, 1985). For this study, credibility was met by triangulation and prolonged engagement. In this study, triangulation was accomplished by using different data sources for collecting evidence from the sources and using it for building coherent justification for the themes (Yıldırım & Simsek, 2006). To ensure the rigor of the study through methodological triangulation (Denzin, 1978), two different data collection methods across several data points were employed. Similarly, data were gathered from faculty members with surveys, and interviews. Another way of accessing credibility is prolonged engagement that required an investment of sufficient time to learn the culture of the environment, test out misinformation, and build trust with the faculty members in the study (Lincoln & Guba, 1985). To reach prolonged engagement, data collection and data analysis processes were conducted together to understand the need for extra data. In addition, adequate time was spent on step-by-step data analysis and interpretation to recognize a pattern.

Transferability was provided with rich, detailed description of findings using quotations, themes, and concepts by referring to the code list. The sampling procedure helped to ensure transferability with a detailed explanation of both the institution and faculty members. In addition to this, a competent person with technology integration research experience was asked to auditing to meet dependability and confirmability.

Dependability refers to what extent the results would be the same if repeated with a similar sample in a similar context (Campbell, 1996). Dependability was achieved in this study through the description of the larger context for the concepts underlying the investigation. The documentation and accounting of the process of inquiry occurred during the year prior to the data collection to support the dependability of the data. Intercoder-reliability was checked with an experienced researcher.

Confirmability is the degree to which the findings come from the data rather than researcher bias (Creswell, 2008). To support the confirmability of the study, an audit trail was maintained in three ways: First, all raw data were kept as an evidence to support the findings. Second, all the data reduction and analyses products produced in NVivo 11 and SPSS 24 were kept and printed out during the entire data analysis process. Third, the data reconstruction and synthesis products, created in NVivo 11, including the structure of the categories (themes, definitions, and relationships) were printed and maintained. Moreover, reflections on this process were written in a reflective journal that was maintained through the study. These notes were used during the data analyses and the writing process to clarify and support the findings. To increase confirmability and to eliminate researcher bias (Creswell, 2008), this information was discussed with a peer-debriefer.

3.4. Researcher Role

I have had the chance to see technology integration from different angles: as a student, novice teacher, research assistant, and teaching assistant. This experience helped me see how an instructor manages a technology-integrated course, and I started to think about how faculty members' technology integration ability can be developed. Also, I have joined several massive online open courses (MOOC) to be familiar with new technological opportunities that can be integrated into the courses and tried to analyze the features of the course instructors. This gave me a perspective and encouraged me to study on this topic.

For me, technology integration can help instructors to contribute to their teaching on what they cannot achieve without technology. Technology is an opportunity to catch up with the era. It is also the requirement for the teachers. The changing landscape of digital technology in 21st century calls for educational intervention in K-12 and post-secondary curriculum to better equip the future citizens to competently face challenges in a demanding world that is increasingly becoming technology dependent. Hence, I joined some projects with vivid technology integration dimensions. During my studies, I have developed an interest in technology integration and it is increasing day by day.

In the program, I had undertaken the role of facilitator with my advisor who is the instructor and the leader of the program. It was aimed to help mentors and mentee on as-needed basis. As facilitator, I played the role on matching process as collecting information about the mentees informally and conducting a demographic form to mentors to get information about them. Additionally, I provided communication with instructional support office which was authorized to manage LMS in behalf of the mentors and helped mentors during the program to reach some other specific technologies (e-choice, etc.). In addition to being the program facilitator, I was the facilitator for the graduate course, alongside another consultant and instructor. I had the role of teaching assistant in the course in which mentors enrolled, assisted the instructor while designing the course, preparing the syllabus and guidelines for both mentoring program and other responsibilities of the mentors.

Furthermore, mentors had opportunity to communicate with me via e-mail whenever they needed. Sometimes, I tried to solve their problems online, sometimes we met in my office and worked on the problem face-to-face and created solutions. I was a participant-observer researcher in the study and conductor of surveys and interviews. Although I had different roles while FTM program was implementing, I had to be careful not to make these roles intertwined. Because of this, I kept a weekly journal during the program implementation and data collection processes.

3.5. Ethical Issues

Before conducting this study, official permission from Ethical Committee of the university, which examines research procedures in terms of their ethical concerns, was taken (See Appendix 5). In addition to this, the permission from all participants was taken to conduct this study and each participant signed consent forms (See Appendix 6). For the piloting phase, the universities were informed about the study and permission to conduct the survey was requested both via e-mail and face-to-face. After getting oral permissions, their committees were applied for official permissions. Data collection for piloting phase started after getting official permissions. Before data collection of qualitative phase, the faculty members were informed about the purpose of the research and research questions. Also, interview questions were sent to the faculty members via e-mail to make them familiar with the questions and to inform them about the research, a day before the interview implementation.

According to Merriam (1998), data collection and data analysis hold ethical dilemmas in qualitative research because of having a direct relationship between researcher and the faculty members. Triangulation and audit trial were used to ensure that the results reflected actual experiences of the faculty members. Additionally, weekly journal was kept during the program implementation and data collection process to understand the researcher role, clearly. It was made much effort to pursue confidentiality of participants and trustworthiness of results. For example, two universities, in which pilot study was conducted in, requested to share results of the data collection process with them and reports about the results of the data collected from that specific university were shared. Also, the names of interview participants were changed with their pseudonym. Except for the university, where the main study was conducted on any identifiable information of other universities was not represented in the study. The university was the focus of the study and that is why only some details of its context were represented. Finally, each participant of quantitative phase was asked whether they want to be informed about the results of the study or not and e-mail addresses of the ones who requested to be informed noted to share the study with them after the study is finalized.

3.6. Limitations of the Study

This study has three main limitations, one of which is originated from research context, other one of which is based on the participants of the study and another one is sourced on data collection of the study. For pilot testing of the survey, it was implemented at the universities, which were similar with the university selected to implement main study. The only criterion to choose for participants of the pilot study was teaching in English in their classroom. Because of this most of the participants of piloting phase were instructors of English language teaching department. This could be a limitation. Because, in English language context, instructors confronting with some specific technologies while the focus of the study is not only the technologies used in English languages teching context but also in all teaching and learning context at higher education institution context. Additionally, qualitative and quantitative phases of the study were conducted at a specific higher education institution that was chosen because of fixing the aim of the research. As a result of this, the findings may represent limited inferences for all higher education institutions. However, the invitation to survey participation sent to all faculty members to reach an expected level of representativeness of the institution. On the other hand, the study was conducted at a specific context. Thus, context of the study results in being cautious while examining its suggestion to implement another context. Because of the diversity in higher education institutions and the contexts specify of FTM programs requires arrangement on the suggestions of this study. The researchers concentrating on to develop technology integration behavior in higher education could spotlight how to organize an institution to develop teaching and learning activities with the help of technology.

The main data sources of the study survey and interview that are two main self-reported data collection tools. These types of tools are thought as subjected to bias and social desirability, and demand characteristics. On the other hand, while surveys are easy to collect large amount of data quickly and can be self-administered (online surveys), interviews increase allow better understanding from different perspective by increasing response rate. In the survey, having 7-point Likert scale and allowing the participants to skip some of the demographics to make them feel free to eliminate participant bias and social desirability. For demand characteristics, technology integration was not specifically defined beforehand in the survey to limit social desirability. Finally, survey questions were sent in advance interview implementation to make them familiar with the study to increase participant's involvement to the study and increase accuracy of the data coming from the interviews by giving time to think about their potential responses to the questions. Additionally, the interview data was limited to the faculty members who were volunteer participants of the FTM program. Even though all the faculty members, who were interested in technology integration before the study, were invited to participate in FTM program, their dedication to the experiencing technology integration within the FTM context made contribution to effective mentoring relation contributing to the technology integration behavior performance and facilitating getting meaningful insights from them. The program intensively involved faculty members in learning and implementing technology integration.

CHAPTER IV

RESULTS

This chapter presents the results of the study under two main titles parallel to the research questions: The factors related to technology integration intention of faculty members and perceptions on technology integration behavior in faculty technology mentoring program (FTM).

4.1. The Factors Predicting of Faculty Members' Technology Integration Intention

In light with the decomposed theory of planned behavior (DTPB), validated survey with six different constructs of the theory was used as a data collection tool. Five further sub-questions were answered to address the first research question. Regression analysis was conducted to test the relations and to reveal the predictability of faculty members' technology integration intention. In order to analyze data, multiple linear regression method was employed to reveal the predictability of technology integration behavioral intention by subjective norm, student influence, facilitative conditions, attitude, and self-efficacy, data were controlled in terms of missing values and outliers. And the assumptions of regression analysis; univariate normality, normality of residuals, homoscedasticity, independence of residuals, multicollinearity, regression outliers, and influential values, were checked.

Influential observations in terms of outliers were checked. Scatter plots, residual plots, DFBeta values, Cook's Distance, and Standardized residuals were examined and there was no outlier among cases. Standardized residuals were between -3 and +3 that referred no outlier (Field, 2013). Similarly, Cook's distance values of cases were lower than one as suggested by Field (2013). There was only one exceptional case in the sample that did not account as problematic. After controlling missing values and outliers, correlation matrix of variable was analyzed to determine whether there was any pattern among variables and then, assumptions of the analyses were checked. Multicollinearity, homoscedasticity, normality, and independence of errors and influential observations were checked.

Table 4.1 illustrated the correlation matrix for the variables of this study. The dependent variable, which was faculty members' behavioral intention on technology integration into higher education classrooms, had positive correlations with all independent variables ranging from 0.07 to 0.58. Faculty members' intention toward technology integration had the highest positive correlations with attitude toward technology integration (r = 0.58) and student influence (r = 0.57). This correlation indicated that the best predictor of the intention could be faculty members' attitude. On the contrary, dependent variable had the lowest correlation with participation to faculty technology mentoring program (FTM) program (r = 0.07) displaying it to be a weak predictor of the study. The significance of the correlations indicated that all independent variables had significant relationships with each other.

Table 4.1.

Intercorrelations for Faculty Members' Behavioral Intention on Technology Integration and Predictor Variables

Measure	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
Intention (1)	1.00					
Self-Efficacy (2)	0,54*	1.00				
Facilitative Conditions(3)	0,38*	0,58*	1.00			
Subjective Norm (4)	0,34*	0,26*	0,29*	1.00		
Student Influence (5)	0,57*	0,44*	0,33*	0,61*	1.00	
Attitude (6)	0,58*	0,53*	0,46*	0,25*	0,61*	1.00

*p < .05

The correlation matrix indicates that there was no correlation higher than 0.9 ranging from 0.26 to 0.61 (see Table 4.1.) when r was 0.9, standard errors of the regression coefficients were doubled (Berry, 1993, cited in Tabachnick & Fidell, 2007). Similarly, Field (2013) suggested that correlations between variables should be less than 0.8 or 0.9. In addition to checking correlation matrix, Field (2013) offered controlling variance inflation factors (VIF) ranging from 2.54 to 1.64 for the model of regression which was lower than four (Field, 2013) and controlling tolerance values which ranged from 0.39 to 0.61 that were higher than 0.25 (Field, 2013). All of these results indicated that there was no multicollinearity. Another assumption is the homoscedasticity that was checked from scatter plot of standardized residuals and predicted values with dependent variable that is faculty members' behavioral intention on technology integration behavior. There was no pattern in the scatter plot that means homoscedasticity assumption is not violated (See Figure 4.1).

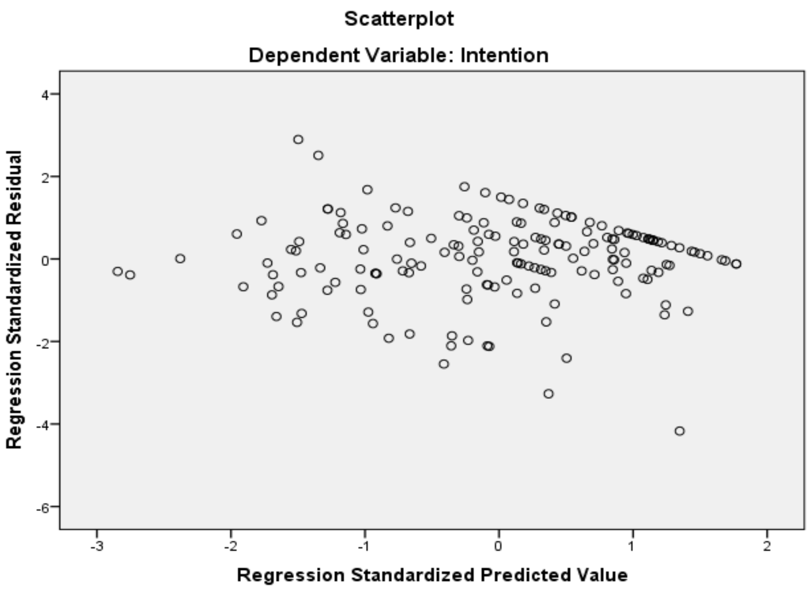


Figure 4.1: Scatterplot of Standardized Residuals and Standardized Predicted Value

For normality assumption, histogram and p-p plot of residuals were analyzed that produced a histogram showing a normal distribution and cases were closely followed diagonally on residual line of p-p plot. Both of them showed that error terms distributed normally (See Figure 4.2).

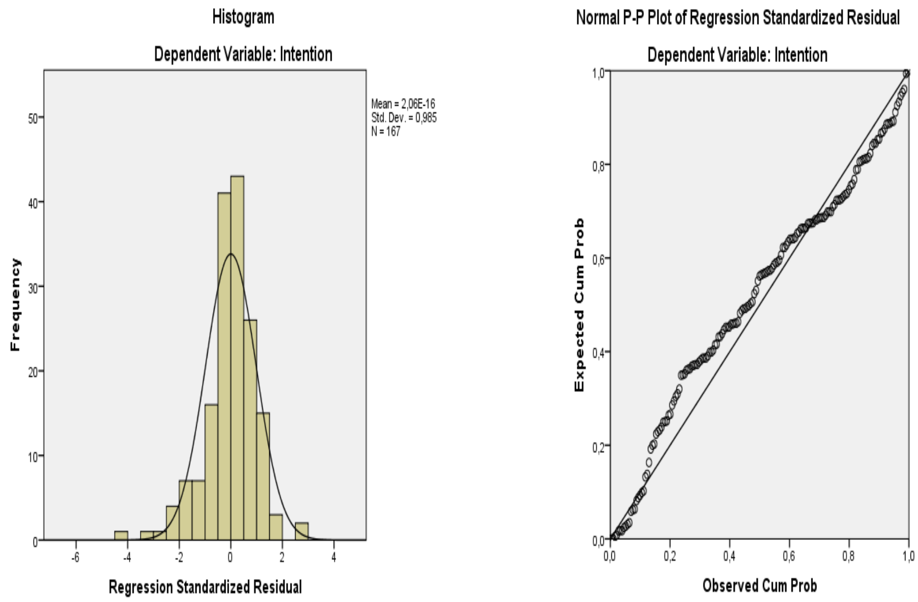


Figure 4.2: Normal Probability Plot and Histogram

Final assumption for this regression analysis was independence of errors. Durbin Watson value was 2.34 that was between 1 to 3 and closer to 2 as suggested by Field (2013) and being closer to 2 meant that residuals were uncorrelated. Overall; multicollinearity, homoscedasticity, normality, and independence of errors were checked as assumptions, which did not cause problem for the multiple regression analysis. In addition to assumptions, the influential observations were controlled via scatter plots, residual plots, Cook's Distance, and standardized residuals. All of them indicated that there was only one outlier, which was not removed. Overall, it was decided that the data set was appropriate to conduct multiple regression analysis for this study.

As preliminary analyses revealed that the data set were appropriate for multiple regression analysis, it was performed for this study which gave the researcher chance to manually examine the influence of several predictors on a dependent variable based on the observed values of the predictors by manually (Allison, 1999). As previously mentioned, faculty members' self-efficacy on technology integration, their attitudes toward technology integration, and facilitative conditions for technology integration, subjective norm as peer and administrator influence, and student influence were defined as independent variables and faculty members' intention to perform technology integration behavior was determined as dependent variable in the regression analysis.

Table 4.2.

Descriptive Statistics of Continuous Variables (n = 167)

Variables	*M*	*SD*
Intention	4.95	1.82
Self-Efficacy	4.92	1.36
Facilitative Conditions	5.32	1.10
Subjective Norm	3.62	1.43
Student Influence	4.58	1.41
Attitude	5.45	1.65

Before the results of the regression analysis, descriptive statistics of variables are represented in Table 4.2. The faculty members scored each items of the survey from 1 (strongly disagree) to 7 (strongly agree). The descriptive statistics indicated that faculty members had intention (M = 4.95, SD = 1.82) toward to integrating technology in their classrooms over the moderate level. According to results of descriptive statistics, the faculty members' attitude (M = 5.45, SD = 1.65) and the facilitative conditions (M = 5.32, SD = 1.10) had the highest two mean scores which may indicate that technology integration intention mostly depends on personal beliefs and existence or availability of the facilitative conditions around. Similarly, the mean of overall their self-efficacy (M = 4.92, SD = 1.36) was more than average, thus, faculty members' self-efficacy on technology integration could be considered as being over moderate level. Finally, students' demands or needs as student influence (M = 4.58, SD = 1.41) and thoughts of individuals around the faculty members as subjective norm (M = 3.62, SD = 1.43) were almost on moderate level and this may indicate that while faculty members were integrating technology in their classrooms, and they may not reflect on students' demand and needs to a degree and do not regard peers or administrators' thoughts on their technology integration implications.

Multiple linear regression analysis was conducted to determine which independent variables were the predictors of faculty members' intention on technology integration in their classrooms. A summary of regression model was presented in Table 4.3. In addition to bivariate correlations, partial correlation coefficients between each predictors and the dependent variable were presented.

Table 4.3.

Summary of Multiple Linear Regression Analysis for the Variables (n = 167)

Variable	*B*	*SE B*	β	*t*	Sr^2	R^2	ΔR^2	ΔF
Model 1						0.46	0.45	28.28
Self-efficacy	0.36	0.10	0.27	3.54*	0.07			
Facilitative Conditions	0.01	0.12	0.01	0.09	0.00			
Subjective Norm	0.04	0.10	0.03	0.45	0.01			
Student Influence	0.35	0.12	0.27	2.99*	0.05			
Attitude	0.28	0.09	0.26	3.12*	0.06			

* $p< .05$

The model which included five variables indicates that significantly predict faculty members' technology integration intention, R^2 = 0.46, ΔF(5, 161) = 28.28, *p*< 0.05. This significant model accounted for overall 45.4% of variance in faculty members' technology integration intention. Three variables had significant contribution to the model, which were self-efficacy (β = 0.36, *t*(167) = 3.54, *p* = 0.001); student influence (β = 0.35, *t*(167) = 2.99, *p* = 0.003); and attitude (β = -0.28, *t*(167) = 3.12, *p* = 0.002); while facilitative conditions (β = 0.01, *t*(167) = 0.09, *p* = 0.92) and subjective norm (β = 0.35, *t*(167) = 0.12, *p* = 0.66) had no significant contributions to the model. This indicated that faculty members' technology integration intention in higher education was not predicted by facilitative conditions and subjective norm.

Self-efficacy, which had positive correlation with faculty members' decisions to perform technology integration behavior (β = 0.27), had a significant contribution to the model. This indicated higher self-efficacy is critically related to heightened intention to integrate technology in their classrooms. Similarly, student influence had significant contribution to the explained variance and had positive correlation with faculty members' technology integration intention (β = 0.27). Faculty members having more students who were interested in technology or demand technology usage in classroom find more motivation in technology integration in their classroom. Finally, faculty members' attitude on technology integration was positively correlated and had significant contribution to explaining faculty members' integration intention (β = 0.26). The results show that faculty members who had positive attitude toward technology integration had more tendencies to integrate technology in their classrooms.

In aggregate, five variables explained 45% of variance in faculty members' technology integration behavior. According to results of quantitative data analysis, relationship with intention revealed that the faculty members' technology integration intention was predicted by attitude, student influence, and self-efficacy positively. On the other hand, subjective norm as peer and superior/administrator influence and facilitative conditions were not predicting the intention toward technology integration.

4.2. Faculty Members' Perceptions on their Technology Integration Behavior in the FTM Context

The primary foci were determined as gaining a deeper understanding of the underlying reasons attributed to factors affecting technology integration behavior identified in DTPB and, extracting the challenges of technology integration in higher education classrooms and the potential solutions for those challenges to promote all faculty members' technology integration behaviors, while simultaneously revealing the opinions of faculty members on the effectiveness of FTM program were the main focus. This section was organized into three sections; factors relate to the behavior, effectiveness of the FTM program, and challenges and solutions; to answer the following sub-research questions.

4.2.1. Factors Related to the Faculty Members' Technology Integration Behavior

The faculty members who participated FTM program were asked the following research question in the interview: How do faculty members perceive the factors related to their technology integration behavior in the FTM context? The faculty members' perceptions about the factors specified in the DTPB were either directly addressed or implied within the interviews. The faculty members referred to all antecedents of DTPB with different proportions. The faculty members also referred additional elements of the factors specified in the theory. (See Table 4.4.)

Table 4.4.

Sources and References of Factors Referred in Interviews

Variable	*n*
Behavior (total)	17
Reasons	12
Reason to Use	9
Reasons not to Use	9
Used Technology	16
Contributions of Technology	17
Contribution to faculty member	15
Contribution to Students	16
Intention	11
Attitude (total)	17
Compatibility	13
Interest	10
Perceived Ease of Use	11
Perceived Usefulness	8
Subjective Norm (total)	17
Peer Influence	15
Student Influence	15
Administrator Influence	16

Variable	*n*
Perceived Behavior Control (total)	17
Facilitative Resources	15
Facilitative Technology	17
Self-Efficacy	13

Table 4.4 presented all referred factors, the number of sources, and references representing frequency of the factors. The behavior and main antecedents of intention, which are attitude, subjective norm, and perceived behavior control were indicated categories by all faculty members. Among the factors, subjective norm was highlighted in the interviews. This demonstrates that faculty members found to support coming from peers, students, or administrators.

4.2.1.1. Behavior

The faculty members were asked about what they were using as instructional technology. The data from demographics form including a list of technologies represented that the faculty members were always using projector systems and learning management systems (LMS, Moodle, Blackboard, etc.) for teaching and learning activities. Additionally, the frequently used technologies were reported as; online presentation tools (Prezi, etc.), student response systems (Socrative, Clicker, etc.), video creation or editing tools (Moviemaker, iMovie, etc.), social media, web blogs, collaborative editing tools (Google Docs, Wikis, etc.), file sharing platforms (Dropbox, Google Drive, etc.), online communication tools (Skype, etc.). On the other hand, the faculty members never used some of the educational technologies in their classrooms, such as online community of practice platforms, virtual learning environments, podcasting, social bookmarking (Diigo, Delicious, etc.), online educational games, and smart boards.

Within the interviews, the faculty members reported details on the forms of educational technologies. For example, the commonly referred student response systems were Socrative (n = 5), e-choice (n = 3), Kahoot (n = 1), and Lets Feedback (n = 1). Moodle was the most frequently used learning management system.

Among the faculty members, five of them indicated that they were using social media (Twitter, Facebook, etc.) with educational purposes. The platforms were used with different aims. For example, Baki, assistant professor at Sociology, used Facebook as a page for his class to continue interaction with his students after class. He explained how he started to use it as; "For example, I am using intensively for each class… I started to use for tentatively and it works, I have been using since then. I created Facebook groups for each class." Suat's students created their own Facebook group page for each of his classes. Because of these pages were student initiated, the faculty member did not prefer to be in this platform. Suat explained as;

> *For example, there were some Facebook group pages in which my all last year students were enrolled. It was founded without letting me know and it was reported that the page worked well. Students stated that there was too much interaction among them but they did not want to me enroll that page. I did not want to participate the group too much. (Suat, assistant professor at Electrical engineering)*

In addition to these technologies, Diigo, blog services, PowerPoint, videos, and online sources as webpages or open courseware sources were preferred by the faculty members to enrich their classrooms. "There was blog of [THE UNIVERSITY], that we explored and started to create a webpage for me (with my mentor). You can share your research interest in it etc." (Olcay, professor at Educational sciences). Similarly, Cansu reported her exploration on the platform as

> *There was a program named as Diigo. We (students, faculty member, and teaching assistant) shared something (some sources or links) related to mathematics and teaching on which we concentrated in class and we wanted to draw students' attention about them.*

17 of the faculty members specified the contributions of technology that were categorized as contribution to faculty members and students. The mostly cited contribution of the technology for faculty members was reaching to all faculty members easily. In order to understand the reason behind choosing to teach technology-enhanced courses (n = 12), the faculty members were asked about why they prefer to integrate technology in their classrooms. Their purposes were categorized into two; making teaching activities easier and augmenting students' learning. Firstly, the faculty members (n = 2) aimed to simplify their teaching

responsibilities by decreasing the time for lesson planning and assessment along with implementing more engaging classroom activities. The faculty members (*n* = 9) integrate technology for sharing, collecting, and announcing the grades of the assignment, sharing course documents (syllabus, project guidelines, PowerPoint used in the class, readings, etc.), communicating with students, and sending notifications. For example; Olcay used the platform to manage her classroom document, communicate with her students and shared some of her teaching responsibilities with her teaching assistant on the platform;

> *I post all readings, presentations, assignments to the platform (LMS), and sending emails via it. My teaching assistant is enrolled in the platform, too. S/he is communicating from there, and announcing the grades (Olcay, professor at Educational Sciences).*

Secondly, the faculty members' aim to integrate technology (*n* = 5) was to contribute to their students' learning. From the perspective of the faculty, technology increased student interaction by eliminating the borders of confined classrooms members (*n* = 5), so technology was thought as a way to establish enhanced connection. "Firstly, I think it (technology integration) gave a novel touch in terms of my course. Secondly, I think it (technology integration) accelerated interaction" (Banu, assistant professor at Psychology). While the faculty members (*n* = 7) were trying to support students' learning via educational technologies, class size can be the limitation to reach each student in the classroom.

> *I started to use it (technology) out of necessity. I started to use it- making connection with my tablet and projector- while I had been searching the ways to do lectures in the class with 150 students to make all of them see what I write down. My classes before that one had been relatively small classes. They were 15-20 student classes. And I had had a chance to interact with students more individually. (Ali, Professor at Physics)*

As seen in Ali's case, faculty members had some pedagogical problems such as reaching all students in a big classroom. They tried to find solutions to the problems with the help of technology. In addition to increasing student interaction and curb the limitations of class size, the faculty members (*n* = 2) chose to integrate technology to create discussion environment in an online platform. Since the students who were self-contained or introvert had chance to actively participate or to raise their voice in the course activities, this system proved to be an effective method of engaging greater number of students. Furthermore, educational activities moved beyond the class walls and after class time, students' interaction in an online platform could continue. Olcay, professor at Educational sciences, implied this, as "…however it is amazingly supportive it overcomes the border and you do not have any border" (Olcay, Professor at Educational sciences). Thus, the students have chance to keep learning after class. "Some parts of discussions were kept on there (the platform)" (Ali, Professor at Physics). Similar thoughts were seen in the following quotation.

> *Before (using LMS) I could not share global matters at hand which are related to the course topic. I had to have hardcopy of documents and distribute current (After starting to use LMS). They (students) started to discuss and make connections between what they learned and what they experienced in real life. (Pelin, assistant Professor at economics)*

Pelin gained opportunity to enrich her teaching activities out of class time with the help of technology. Among the faculty members in the university, there were those who did not prefer to integrate technology. Faculty members who had already experienced technology integration were asked to elaborate possible reasons behind this phenomenon. They specified the reasons from their observations and interactions with other faculty members in the university. Nine of the faculty members listed different reasons as age, awareness, interest, and resistance to technology. Six of the faculty members referred age as the most important factor to perform technology integration behavior. According to most of the faculty members, younger faculty members could easily adjust themselves to integrate technology into teaching and learning activities. For example; "I think, particularly young faculty members can be easily adapting (to integrate technology)" (Ela, associate Professor at business). The faculty members reported that these faculty members were more familiar with technology than the elder ones in their daily life, which makes it was easy to adopt technology integration. For Onur, assistant professor at Electrical engineering, the enthusiasm of the young faculty members was more than the elder faculty members. He explained the effect of teaching years on performance of technology integration behavior instead of the age.

I mean; I do not want to say it is related to their age but the time span of teaching the same course is highly correlated with their resistance to change their behavior toward integrating technology into their courses. You know, it is really hard to say any faculty member who has been teaching the same course for 30 years to change your class notes that you have been using for 30 years, make online presentations, use these applications, and integrate this platform to your class. (Onur, assistant Professor at Electrical engineering)

The performance or openness to technology integration behavior may be related to faculty members' awareness on affordances of the technologies in teaching and learning activities. The faculty members (*n* = 3) had not used the technology because of being unaware of some technologies that they explored in mentoring program. For example, Baki, assistant professor at Sociology, stated, "I did not know about such system (student response system), we put into practice this system. In other words, we examined it. It was an applicable system for my courses and me. And I had not known and learned it"

Faculty members' interest and resistance to use technology were other reasons not to integrate technology, as reported by certain faculty members (*n* = 5). If the technology did not catch the attention of the faculty member, s/he would not integrate it in to the courses. In this case, seeing how it contributes to teaching and learning activities helped to increase its usage of it in class by faculty members. For example; "If technology that has been used by somebody else does not appeal to you, you leave it aside and do not use it" (Yaren, associate professor at health informatics). While analyzing the reasons of not using technology into higher education, the faculty members (*n* = 4) emphasized the resistance to use technology by faculty members as another reason. Previous negative experiences with technology or their prejudices can cause such resistance. Because of believing in the ineffectiveness of technology on learning, faculty members are reluctant to use it due to their beliefs on the ineffectiveness of technology on learning. For example, Yaren, associate professor at health informatics, stated that;

Faculty members, himself or herself, can be the barrier to integrate technology. Because I heard that these faculty members can humiliate to use technology in class as "Aoow are they using PowerPoint, is this class an active one?" I hear that they are using this in a negative way because they are *not get used to having technology enriched classrooms. Maybe they think that*

PowerPoint presentations teach the course by its own and they have nothing to do in the class.

Faculty members were aware that some of the faculty members deem educational technology worthless. They have negative attitude toward technology integration and thought that there is no world in which technology replace with instructor.

4.2.1.2. Intention

The intention of the faculty members to use technology in their future classrooms was clearly indicated. According to the faculty members' perspective, most of the technologies already experienced and be sure about their effectiveness in the classrooms could be continued to use in the classes. For example, Serkan, associate professor at Industrial engineering, indicated that he would continue to integrate technology as demonstrated in the FTM program. Baki, assistant professor at Sociology, similarly, started to integrate Facebook as trial runs to experience how it worked in his classroom and concluded to integrate it in his future classrooms. Cansu, associate professor at elementary education, only learned about the technologies during the FTM and had not had any chance to integrate them. She expressed the intention to experiment with the listed the technologies and consider of new approaches to integrate them into her future classrooms. Faculty members (n = 3) had similar plans for their classrooms to integrate different technologies and enrich their classrooms. The faculty members (n = 12) had their instructional plans in their hands to integrate more technologies by trying new ones in their classrooms which indicated their openness to technology integration and their intention to perform the behavior in the following semesters and even their future academic life to solve their instructional problems.

4.2.1.3. Attitude

Faculty members were asked how their attitude/opinions toward effected their technology integration to understand their attitude toward technology integration. Among the antecedents of the technology integration behavior, the faculty members mostly referred to the attitude toward the behavior (n = 17) as a key determinant of it. Interestingly, practicing technology integration beforehand was rarely stated as a behavior itself. The majority of faculty members (n = 11) indicated their intention to integrate technology in their current and future classes. Although Banu, assistant professor at Psychology, did not use technology in daily life, she had integrated technology in her classes. As she stated that "I think it is a good application… In time I reconciled myself to educational technologies you know I am not the fan of technology in my daily life. I really like it but it has not been a part of my life" (Banu, assistant professor at Psychology).

On the other hand, technology integration is a part of daily life for three of the faculty members, which makes its educational usage necessary. Didem, assistant professor at Educational sciences, stated that "I think there is no way out of technology… I am aware of that is required to use it (educational technology). The current pedagogical approaches require this. I think I have no chance to stand out against technology." Similarly, Olcay, professor at Educational sciences, who had been using educational technologies over 20 years indicated the necessity of technology integration stated that "Technology is in the core of the life and there is no return. Solely, it is essential to find a way to use it effectively not only in daily life but also in educational environments."

The faculty members (n = 16), who have already been using technology in their daily life or have already been familiar with educational technology, thought that they easily integrated technology into their classrooms during and after their mentoring activities. For example, Pelin, assistant professor at economics, implied her personal interest as a starting point to perform the behavior. Similarly, Sadi, assistant professor at Chemistry, indicated that mingling with technology before the mentoring activities and having a positive attitude created a positive environment to integrate technology. Performing technology usage behavior before FTM, which implied their positive attitude, contributed to their technology integration behavior. Once the affordances of technology in daily usage were experienced, technology integration performance can be supported with this previous experience.

The faculty members who were members of faculty of education (*n* = 4) specified their attitudes related to being a role model for the future teachers. For example, using smart boards would be a part of current teacher candidates in their future teaching life because of the government supported technology enhanced classroom projects named as FATIH. By using the smart boards and other potential technologies in higher education classrooms, these faculty members have been trying to equip these teacher candidates in their classrooms for their future classrooms. The faculty members (*n* = 2) were aware that having an open attitude towards educational technology could be instrumental to prepare their students for future professions. One of faculty members at faculty of education stated that;

> *For example, there is effect to use smart boards in my classes. I thought that I have to make smart boards a part of my courses. Because there are smart boards in K-12 schools. If I use it in here (in the university), my students will use in their classrooms. I believe to go on cautiously, although I believe the importance of technology integration. My attitude toward technology integration is like that I concern not about directly usage of the technology, only about how to use technology and to arrange the classroom with the technology. (Cansu, associate professor at elementary education)*

Cansu was a teacher educator and she was curious about her students' preparation for their future career that is why she chose to use smart board in her classroom. The participants mostly preferred the technologies that the students will need in their future life. Among the sub-dimensions of attitude (compatibility, perceived ease of use, perceived usefulness), the faculty members (*n* = 17) mostly cited compatibility. They integrated technology by considering its compatibility in terms of congruence with course (*n* = 6) and congruence with student preparedness to technology integration (*n* = 4). Firstly, the resonance between courses and educational technology was the key point in their decision to integrate technology into that specific course.

The class size was the first determinant to choose whether to integrate technology or to identify which technology was appropriate to incorporate in the classroom for three of the faculty members. Banu, assistant professor at Psychology, indicated, “I do not know whether my courses were appropriate. I had too crowded classroom with more than 170 students. Because of this, I could not do all kinds of activities”.

The course content (n = 6) was another determinant to select and integrate technology into classroom. If the content relied mostly on documents, the faculty members preferred to use LMS to share course materials as in Olcay’s classrooms. If the content depended on mostly images or visuals, the technology, which would be integrated, was needed to support visual content with easily shareable materials and artifacts could be downloaded and downloaded easily as in Deva’s classrooms. She, the instructor art faculty of architecture, indicated, “Previous version of LMS was not for visual content. When the students uploaded anything, I had to separately open and check them. Because of this, we created another system in our department”. In addition to course content, pedagogical needs were another determinant to perform technology integration behavior. Sadi tried to use Socrative –a kind of student response system- in his Chemistry class. He mentioned about the trouble when uploading images of some chemical structure to the platform and get feedback from students during the class. Deva, particularly, preferred specific technology to meet her instructional needs as she expressed that “All I need is to make an interactive communication with students in an online platform” (Deva). Additionally, the technology contributed to the instructions of Gamze (Assistant professor at Educational sciences) by making the course entertaining and reviewing the content easily.

Secondly, all of the faculty members were concerned about student readiness for technology integration as a key determinant in terms of compatibility. To integrate technology in their classrooms, a high-speed the Internet connection was required. Eight of the faculty members conducted needs assessment to analyze what resources they already possessed, collecting information about students’ technological tools and their technology usage in daily life (social media accounts, etc.). Some of the technologies required specific devices to use in or out of class. For example, three (Baki, Banu, and Gamze) of the faculty members stated that most of the student response systems required students to have smart phones to use in class which created concern to integrate it in the classrooms. Banu, assistant professor at Psychology, implied that "I wanted to implement it in my large classroom. However, I am not sure whether everyone in class has smart phones or they have any devices with Internet connection". The interfaces of some of the platforms were not compatible with student's cognitive abilities for two of the faculty members after considering the reactions from the students. For the faculty members, the platform was designed for younger students and not appropriate for higher education students. Baki, assistant professor at Sociology, explained that;

> *There could be awesome usage stories from primary school classrooms. However, our students' profile is not on that level. They respond, as "Are we primary school student? We will do joyful activities as question and answer-like ridiculing. (Baki, assistant professor at Sociology)*

Compatibility with student level was important, too, for faculty members because their students' preparedness or psychological level require some specific technologies, which appeal to the students. Perceived ease of use (n = 11) is another factor related to faculty members' technology integration behavior. For seven of the faculty members, after spending time to get familiar with technology, it made the integration process easier. For example, Serkan, associate professor at Industrial engineering, indicated, "Once you learned it (Socrative, a student response system) you can upload the quizzes from excel. Somehow I understood to write quizzes to students' mails, it was not too difficult for me". Similarly, Suat, assistant professor at Electrical engineering, emphasized easy usage of technology for instruction catalyzed his instruction, "LMS has a list of action to choose what you want to do and the rest is not tiring and there is nothing to think about. There should be such easy system. If learning such systems only takes one hour and if you can modify or arrange the platform after a week, it was beneficial and useful for me". Additionally, the faculty members (n = 5) mentioned about how technology heightens student's learning. For example, Yaren, associate professor at Health informatics, affirmed, "For students, I guess it makes easy to follow the course... Everyone can use the technology that we used within the course". Furthermore, the students easily understood how to enroll or how to use the technologies integrated into courses. For Gamze, assistant professor at Educational sciences, "The usage of Kahoot is easy and I and my students did not have any problem, too. We introduced the platform one time; how to enroll and how to use. Then, they used it easefully". The reason behind such easy adoption by students was specified as that the platforms were user-friendly, designed to cater to individuals of all ages and cognitive skills, and they were not too complex platforms which were preferred by Banu, assistant professor at Psychology. Perceived ease of use was one of the determinants of deciding whether to integrate technology or not and which technology would be most suited to integrate into the course. Such meaningful reflections pave the way for attentive implementation of instructional technology.

While deciding to perform technology integration behavior, perceived usefulness (n = 8) of the technology was referred by more than half of the faculty members since the usefulness of technology has significant effect in performing technology integration. In details, these faculty members needed to see what the platform or technology could do in their classrooms and how it confronts challenges that the faculty member had already faced in their classrooms. Serkan, associate professor at Industrial engineering, stated that "Socrative corresponded to me and I started to use it as a part of my instruction. Although I did not have teaching assistant, doing exercises on Socrative made my job easier". Similarly, if the technology was perceived as impractical to solve an instructional problem, the faculty members did not prefer to integrate that specific technology and then tried to find another platform or tool to solve the problem. According to Gamze's experience, she, faculty member at faculty of education, who did not prefer LMS or Edmodo to create classroom pages and went on with Google Communities. For her, "It was not useful for me. Frankly speaking, not only students but also I did not like it".

Almost half of the faculty members agreed that technology integration was time consuming at the beginning, but it was accepted as time saving after being acquainted with the technology, which increased its usefulness. For example, when discussing about the activity of watching movie, Olcay, professor at Educational sciences, stressed the opportunity to make students watch the movie after class, which saved in-class time to engage in other activities in the class such as in-depth discussions and formative assessments “At least, I shared the link of the movie to make them watch it. Otherwise we could not watch it in class because of time limitation”. Technology changed the flow of instructional activities, such as making explanations about an assignment or any student questions (n = 3). Technology can create interactive environment for learning of student, according to Baki, assistant professor at Sociology; “The student who did not understand any point can write a post under the link shared in the class page and there, also, were other students who did not understand. When their classmates or I made any explanation we could reach 95% of the students at the same time, hence it became more interactive and the information flow accelerated.” For example, Banu, assistant professor at Psychology, was doubtful about the distraction potential of technology, which was explored during FTM - Socrative, in classroom, which cannot be useful in the classroom because of having downloading problems or destructing students’ concentration and motivation. “... On the other side, this is stimulating which can easily direct attention from one point to other one. This can create disconnection in their minds. Indeed, I cannot take that risk”.

Attitude toward the technology integration behavior was sourced by the faculty members’ interest in technology (n = 10). The key element of their interest was that half of the faculty members had been willing to implement LMS during its pilot implementation phase and all of them had participated in least one professional development program on technology integration. Additionally, all faculty members, except Didem, assistant professor at Educational sciences, who has just started teaching in higher education, all faculty members defined themselves as expert on intermediate level based on their self-report that explains their mindset on the practical usability of technology integration. Interestingly, their self-reported data indicated that Onur, assistant professor at Electrical engineering, and Sadi, assistant professor at Chemistry, characterized themselves as technology integration experts who had already been unconsciously integrating technology for a long time unconsciously before FTM program. While one of them, Sadi, assistant professor at Chemistry, had been creating collage videos from TV series or movies to teach Chemistry in popular culture and creating blog for Chemistry students and society; whereas Onur, assistant professor at Electrical engineering, had been using technology for both personal and educational purposes, contributing to the society and his students' professional career by managing a blog about academic career, sharing some software related tips for all, and logging his ideas on basic concepts in engineering on a webpage. Onur stated that "Actually doing similar things before and having such perspective ensure to lean towards technology integration".

The faculty member (n = 2) were aware of the need to integrate technology into instruction and FTM further piqued their curiosity. Similarly, Banu, Pelin, Serkan, Deva, and Yaren, who were teaching for more than 7 years in higher education, specified their enthusiasm as a start-point to integrate technology. Their eagerness was represented in the quotation of Banu, "When I heard about FTM and had a chance to learn technology integration, I was impressed and jumped to it. That was my first semester in the university and helped me a lot in both my courses and my pedagogical implications and helped me to shape my further courses after FTM". The awareness on the need for technology integration in higher education was indicated by one of the faculty members that was remarkable. "Sure enough, I am aware that to use technology is compulsory. The pedagogies of our current time have demand like this" (Didem, assistant professor at Educational sciences). Olcay, professor at Educational sciences, supported the need for technology integration. For her, "…there is no way back from technology not only in education but also in life whether you like it or not". Because of involving technology-enriched educational environment from her early career period, she believed the need for technology integration as a support for in-class instruction. "One of my colleagues does not want technology in his classes. For him it cannot be like face-to-face instruction. But, for me, they are separate and they complete each other…".

4.2.1.4. Subjective Norm

To get clues from faculty members on subjective norm, they were asked as "What are supports or challenges of individuals around you on technology integration into your courses? Students? Friends/Colleagues? Superiors/ Administrators?" Students, peers, and administrators of the faculty members constituted subjective norm (*n* = 17) of the behavior. Except all these sub-dimensions of subjective norm, the faculty members added no support or influence from peers and administrators. Each antecedent has comprised different sub-categories in themselves. As peer influence (*n* = 15), the availability of support through teaching assistants (*n* = 4) and the influence of colleagues (*n* = 13) helped the faculty members to adopt technology integration. Three of the faculty members reported no support from their peers. The colleagues' influences stemmed from close peers in the department or social environment along with individuals who were technology integration experts on the campus and served to support technology integration in the university. For example, Seda mentioned Professor Kaan, the director of instructional support office; Dr. Esra, who has the expertise on technology integration; and the coordinator of FTM as knowledgeable peers who encouraged or supported technology integration in their classroom. Gamze, assistant professor at Educational sciences, stated, "Meeting with Esra influenced my view on technology. She knows almost everything how the technology works in classrooms and our interaction with her influenced me and started to integrate technology" (Gamze, assistant professor at Educational sciences).

The colleagues in the department or peers in close social environment were accepted as influential individuals on the faculty members' behavior performance. The suggestions or encouragement of experienced colleagues helped the faculty members (*n* = 2) by exchanging their experiences on technology integration. The technologies which were already experienced by other faculty members were mostly disposed to be used in the faculty members' classrooms. Pelin, assistant professor at economics, specified this as "I received support from the faculty members who have been working here and integrating the technologies that they are using". Similarly, Ela, associate professor at Business administration, indicated, "…hanging out with peers contributed my technology integration behavior during lunch hours". Onur, assistant professor at Electrical engineering, voiced that he consulted "the experienced faculty members who were integrating technology on the videos". Ali, professor at Physics, who was already experienced with Piazza as a way of technology integration before FTM, learned it from one of his friends working at another university. His friend analyzed his usage and exchanged views on his implementation procedures. Likewise, Baki, assistant professor at Sociology, expressed that "the influence of social environment on his staying informed about applicable educational technologies".

In addition to colleagues, the teaching assistants (n = 4) were considered as key agents influencing behavior. They, while working with the faculty members on teaching a course, took the responsibility to propagate technology integration such as, managing the platform, teaching it to the faculty member, helping students to be active users of technology. Cansu indicated that "Firstly, the teaching assistants learned how to solve the problems and then informed me about the ways of the solution. I requested this." Likewise, Deva informed as "Assistants do everything with technology such as uploading students' artifacts, projects, or creation of the archive for students". The teaching assistants aided in significantly reducing the workload of the faculty members by leveraging the usage of technology as well as disseminating relevant information on its usefulness. For Yaren, associate professor at Health informatics, "…when teaching assistants know the technology, they can aid the faculty members to adoption of the course."

Among the faculty members, only 3 of them expressed having no support or influence of the peers. For them, there was little interaction with their peers because members of their departments, which can be considered large departments, had limited interaction scopes. Onur, assistant professor at Electrical engineering, summarized as "Our department has more than 50 faculty members. Since it is a large department, there is no formal interaction, unfortunately".

For faculty members, students (n = 15) were influential factor regarding the behavior because of their background (n = 10) and interest in using technology (n =

14). The faculty members asserted that students' background directed their thoughts on student's technology usage expertise and the technological tools they were already familiar with. Didem, assistant professor at Educational sciences, and Ela, associate professor at Business administration, specified student mobile device usage in the classroom. Didem, assistant professor at Educational sciences, thought that "It is remarkable for me that students are always handling mobile phones or any device, I could minimize this behavior but I prefer to direct their usage toward educational activities in classroom. I have a chance to catch students' attention while they are with these devices". Similarly, Seda, assistant professor at economics, had been searching "how to use technology for my classroom in which everyone is dealing with mobile phones and it is like catching the era". Pelin, assistant professor at economics, stressed student technology usage in both their daily life and their educational life. And she thought "They liked technology usage in the classroom by downloading an app and answering questions on this app" after she tried to use student response system. On the other hand, three of the faculty members were suffered from having students who had not have any devices (laptops, tablets or smartphones) connected to the Internet in their classroom. This was a limitation to use some technologies in the classroom. For that reason, they were required to have a back-up plan to manage this. Two of them preferred to bring questions or materials both in soft and hard copy formats in the classroom (Serkan, associate professor at Industrial engineering) or chose another technology which did not required Internet connection like Clickers (Seda, assistant professor at economics).

Nine of the faculty members were directed to use some specific technologies in their classroom by their students to meet the students' needs. A large number of students were adept in using technological devices and had the technological opportunities with them, such as mobile phones, tablets - PCs, laptops, wireless Internet connection that was provided by the university. For example, Sadi, assistant professor at Chemistry, indicated "Each student had smart phones which was the opportunity for me. And using smart phones or tablets, which are the devices commonly used by students, in classroom draw their interest to the class." For Yaren, associate professor at Health informatics, it was important that "There was no way out, I had to get a Facebook account because all of my students were there. When something happened, they said we shared on Facebook. Gamze, assistant professor at Educational sciences, mentioned about getting help from students on solving technological problems in classroom. This was an important trigger for their inclination toward integrating technology, which eliminates reluctance for performing the behavior. She quoted that “I am getting help from students who direct me to click a button. Indeed, it is good for me in a sense because I am learning with them”. For three of the faculty members, although students were exposed to technology too much in their daily life, some of them had a tendency of not interacting with some of the educational technologies because the technology could not catch their attention. So, they selected other technologies that were more user friendly and addressed their students interest. Deva, who maintained a blog page for her course, stated, “I need to force the students to engage in the platform. If the technology is pulling students in it, it would be easier for me… Making the students familiar with the blog is biggest pressure for me.”

In addition to students’ background, the faculty members mentioned about the effect of students’ interest on technology (n = 14). Banu, assistant professor at Psychology, had observed, “Students had been enthusiastic at the first few weeks”. Similarly, for Figen, assistant professor at Mechanical engineering, and Deva, instructor at industrial material design, the students had positive attitude toward educational technologies. They were highly motivated and interested in the innovations so they more enthusiastic about the faculty member who was actively using mobile phone in classroom. As expected, the faculty members (n = 4) referred that the students who were already interested in technology were more engaged in educational technologies that the faculty members integrated. Banu, assistant professor at Psychology, specified, “Among my students, the ones who like technology paid more attention and engaged in it than others, that is related to their inclination towards technology… I am trying to make the others’ resistance break”. Students’ expertise on technology usage, enthusiasm, positive attitude, and demands about technology integration were among the driving forces to perform technology integration behavior.

The last antecedent of subjective norm was referred by the faculty members was termed as administrator influence (*n* = 13) by the faculty members in this study instead of superior influence as specified in DTPB owing to the absence of any supervisor or other superior personnel in the context of the university. Specifically, the faculty members were not under supervision of any other experienced faculty members except administrators as department heads, the dean, and administrators from the rector's office. Among the faculty members, nine of them specified that there was no support from the institution. Interestingly, seven of the faculty members implied the support of the institution for supporting their technology integration behavior. The support of institution was classified as the orientation and general professional development opportunity named as Faculty Members' Development Program (FMDP) for newcomers (*n* = 7), FTM (*n* = 4), and overall supplied infrastructure and technical support (*n* = 6). FMDP program included a session for the faculty members, which is related to introduction of the technological opportunities for them, such as learning management system of the university and instructional technology support office. Because all the faculty members had participated in the program, they were familiar with available technologies on campus. Contrastingly, when it was considered in a specific context such as specialized content area and certain courses, more than half of the faculty members (*n* = 9) declared that they had not received any support, encouragement, or favor from the administration. "Administrators were not aware of anything" (Deva, instructor at industrial material design), and "I can say that we did not get any support from administrators" (Onur, assistant professor at Electrical engineering) were only two of the quotations. From the view of Serkan, associate professor at Industrial engineering, there was no need to have any support from administrators because "Socrative is really basic and easy to use and no need to get support from administration." Administrative influence stemmed from new faculty orientation program (*n* = 7), FTM (*n* = 4), and technical support (*n* = 6). Interestingly, nine of the faculty members stated that there was no support from the institution.

4.2.1.5. Perceived Behavior Control

Two of the interview questions were directly related to sub-dimensions of perceived behavior control; "How does your confidence/belief in success influence you during learning technology integration? Which sources or opportunities do you utilize while you were integrating technology? Hardware? Software? Technical support?". All of the sub-dimensions of the perceived behavior control (PBC) (n = 17) were referred by the faculty members; facilitative conditions-technology (n = 17), facilitative conditions-resources (n = 15), and self-efficacy (n = 13). As the sub-dimension of PBC; learning management system (LMS) (n = 13), student response systems (n = 14), websites (n = 11), social-media (n = 10), online videos (n = 6), presentation tools (n = 5), and educational software were listed as facilitative technologies. Moodle was the university-wide used learning management system that was offered by the administrators. Because of this, most of the faculty members indicated it as 'facilitative technology'. Majority of the faculty members (n = 14) were introduced to or experienced at least one of the student response systems, such as Socrative, Kahoot, e-choice, clicker, and LetsFeedback. The blogs, professional or academic webpages, and public documents as webpages were used as technology with educational purposes. The presentation tools, such as Prezi and PowerPoint, were commonly used ones among the faculty members (n = 5).

The presence of resources and opportunities had an influence on intention determination. Referred facilitative resources were classified under three categories; instructor technologies (n = 2), student technologies (n = 3), and infrastructure (n = 15). Instructor and student technologies had similar technological devices including smart phone, tablet PC, computer or laptop that can be used in the classroom. Infrastructure, such as the availability of a computer center, instructional technology support office, computers and projectors in classes, wireless networks, and availability of instructors' and students' own devices influenced the decisions for technology integration. Computer and projection systems in the classrooms, wireless Internet connection in an extensive area of campus and cable Internet connection for each office, classrooms, labs, dormitories, and the technical opportunities were indicated as infrastructure support under facilitative resources for 15 of the faculty members.

Under PBC, the faculty members' self-efficacy (n = 13) is the factor affecting the faculty members' technology integration behavior. For the faculty members, their technology knowledge and expertise, and confidence on technology promoted their self-efficacy on technology integration, which enhances faculty members' technology integration behavior. For example, Ali, professor at Physics, indicated that, "At least, I like dealing with technology". Similarly, Onur, assistant professor at Electrical engineering, was "enthusiastic about technology before FTM." To integrate new technologies, Baki, assistant professor at Sociology, believed that there should be "self-confidence on technology". In general, Yaren, associate professor at Health informatics, indicated the general concern of the faculty members, as "I have to be a step further than the students" which consolidates the traditional role (expert) of the faculty members in the classroom. To see the conclusion of technology integration on students learning, Gamze, assistant professor at Educational sciences, indicated, "Firstly, I have to try technology integration and then answer the question (whether technology is effective in her classroom or not). Otherwise I could not answer it". 13 of the faculty members believed that technology integration was not difficult and could be manageable under any circumstance. Their self-efficacy was related to their performance and control of the behavior.

4.2.2. Perspectives on FTM

To analyze the FTM program from the perspective of the mentee faculty members, the questions about FTM were asked in the interview to answer the following research question: What are faculty members' perspectives on the effectiveness of FTM? References and sources of the categories and subcategories were presented in Table 4.5.

Table 4.5.

Sources and References of the Faculty Members' Perceptions on Contributions of the FTM Program and Suggestions

	n
Contributions	17
Influence on peer	10
Mentor support on technology	7
Mentor support on teaching	6
Increase awareness	6
Practice of students	2
Increase motivation	2
Long term effect	2
Vision extension	2
Effect of online quizzes to participation	2
Individualized program	1
No change	1
Closure meeting	1
Suggestions	14
Community of practice	4
Regular meetings	3
Improve matching strategy	3
Workshop	3
FTM announcement	2
Early start	2
Platform specific mentors	2
Experience based activities	2
Include assistants	2
Regular class visits of mentors	2
Finding support needed personnel	1

The faculty members' perspectives on FTM were categorized into two: contributions of FTM (n = 17) and suggestions for development of FTM (n = 14). In terms of the contributions, 10 of the faculty members stressed their influence on peers after FTM. Once they experienced technology integration professionally, they started to inform and direct their peers to integrate technology in their classrooms. For example, Seda, assistant professor at economics, who was using twitter in her classrooms, had shared her class hash tag with her peer and s/he wanted to try in her/his classrooms. Suat, assistant professor at Electrical engineering, directed his colleagues who were willing to learn and integrate technology to participate FTM.

Some of the friends of Figen, assistant professor at Mechanical engineering, wanted to integrate technology when she explained technology integration and showed her practices in her classrooms. Secondly, they emphasized their mentor's support on both technology usage (n = 7) and their teaching practices (n = 6). The mentors helped the faculty members by contributing their pedagogical practices and technological knowledge. With FTM, the faculty members' awareness (n = 5) and motivation (n=2) were increased. The faculty members (n = 2) learned some kinds of educational technologies and were aware that there were myriads of educational technologies to be explored for solving their instructional problems.

FTM extended the faculty members (n = 2) vision on educational technology and awareness on technology integrated teaching environments with the help of the individualized activities in the program. In terms of social atmosphere, Sadi, assistant professor at Chemistry, emphasized the contribution of the closure meeting, with all mentors and mentees, which created an informal environment and an opportunity to meet other faculty members of the program. Most of the faculty members' evaluative comments concentrated on the contribution of FTM in their practice, the advantage of mentor guidance in changing their teaching styles (n = 6), and the development of technology integration knowledge (n = 7). Overall, faculty members agreed that FTM program contributed positively to their development on technology integration by influencing their pedagogical approach.

The suggestions for improvement focused on publicizing FTM program to the entire university (n = 2); enriching FTM with recurrent technology workshop (n = 3), arranging regular mentee-mentor meetings (n = 3) and classroom visits from mentors (n = 2), improving matching strategy to identify compatible pairing (n = 3), inclusion of teaching assistants (n = 2), creating community of practice in which all mentors and mentees participated (n = 4), and involving the faculty members who needs support (n = 1). The faculty members believed in a campus-wide implementation of FTM in order to encourage wider number of faculty members to join the program. For example, Yaren, associate professor at Health informatics, indicated, "This program should be declared to whole university". Within the program, changing matching strategy and regular visits could enhance effectiveness of the program. For example, because of scheduling problem, Suat's mentor could not visit his classroom to see how his class was going and which specific challenges were occurring. For him, if they could manage this, mentoring process would be more productive.

4.2.3. Challenges and Solutions

The faculty members were asked in the interview about the challenges that they confronted while exploring and integrating technology into their classrooms to answer the following research question: "What are the challenges and solutions associated with faculty members' technology integration into higher education classrooms within FTM context?" Sources and references of the categories and subcategories were presented in Table 4.6.

Among the faculty members, 17 faculty members directly identified several challenges related to technology as student related (n = 12), context related (n = 16), and instructor related (n = 17). These three kinds of challenges were negatively associated with performing the behavior. Student-related challenges, which are less mentioned challenges compared to other, can be listed as unavailability of student devices (n = 7), student habits (n = 5), student motivation (n = 5), and student's behavior in classroom (n = 2). Students' motivation to use technology encouraged the faculty integrate technology in their classrooms, as informed by faculty members. One of the faculty members stated, "Whatever you made the technology integrated activity attractive, basic student motivation is required for me." Similarly, student technology usage habit can be a problem sometimes.

Table 4.6.

Sources and References of the Challenges Faced during Technology Integration within the FTM Contest

	n
Challenges	17
Context related	16
Technical problems	12
Class size	7
Nature of the department	5
Physical conditions	5
Platforms limitations	5
Tool deficiency	4
Ethical concerns	2
Requirement for renovation	2
Disruption on flow of course	1
Lack of institutional support	1
Instructor related	17
Time problem	13
Increase workload	5
Heavy workload	3
Lack of awareness of different technologies	3
Need backup plan	2
Needs planning	2
Being technology immigrant	1
Need expert support	1
Needs being careful	1
Needs extra effort	1
Needs pedagogical expertise	1
Not actively usage	1
Not enough teaching assistants	1
Student related	12
Student devices	7
Student habit	5
Decrease on student motivation	3
Lack of student interest	3
Classroom management problems	2

It can be problematic if they do not familiarize with a specific technology. For example, Seda, assistant professor at economics, indicated, “The most important obstacle is that students do not even check their inboxes… If they are not interested in technology, it is hard to deliver the content with technology.” On the other hand, faculty members noted that students' habits of technology use could pose a challenge if they were not familiarized with a specific technology that the faculty intended to use in class. For instance, one of the participants, Ela, indicated: "The most important obstacle is that students do not even check their inboxes… If they are not interested in technology, it is hard to deliver the content with technology. Additionally, students consider it an extra workload if they are instructed to learn the technology".

Content related challenges encompass general technical difficulties (n = 10), such as slow or no Internet connection, hardware failures, class size (n = 7), physical opportunities (n = 5), nature of departments (n = 5), platforms' limitations (n = 5), ethical concerns (n = 2), and concerns on safety of technology (n = 1). Pelin, assistant professor at economics, stated, "I have to check the projector in class each week to see whether it works or is broken, which makes me demotivated. After a while, I do not want to use this technology. Checking the devices waste time. I spend at least ten minutes for it, each course." More importantly, digital devices are to be properly integrated in classroom. Some programs particularly require smartphones that are not accessible to all students in class. Suat, assistant professor at Electrical engineering, specified that "I want to use technologies in my class but some of the students may not have their own devices with them." This results in major setbacks and compels the instructor to resort to a backup plan, such as using paper-based instead of technology-supported activities. The need for more assistants who can help to find out new technologies meeting the needs was another problem. Additionally, technologies have their own limitations. For example, Socrative, a classroom management app, does not allow teachers to ask students open-ended question while it was useful for multiple-choice or short answer questions.

All of the faculty members (n = 17) cited instructor related challenges that indicates their awareness on the challenges related to them. The most common instructor related problem was time constraint (n = 13). Faculty members mostly reported as not having sufficient time to integrate technology. For them, it demanded a detailed preparatory process, as per the statement of Sadi, assistant professor at Chemistry, "It is indispensable to spare time for technology integration." Suat, assistant professor at Electrical engineering, specifies that "There are two points; first one is that I have to be well-prepared at least one day before the instruction. However, we do not have such a long time for preparation. Secondly, revision of materials requires technology familiarity." Not only technology integration requires additional time to be prepared for instruction but also it can potentially amount to loss of time in class. Notably, technical difficulties or malfunctions can consume more than the intended timespan during in-class instruction. For example, Pelin, assistant professor at economics, affirmed that "Technology cause panic among the students as they need to learn new thing. In the classroom, we can face with the problems of connecting Internet, enrolling in the platform, opening pages, etc. I had some troubles during that time in the classroom." Seda, assistant professor at economics, indicated that she has been "…spending my 5 or 10 minutes at the beginning of the class for checking the computer and projector whether they were working. This disheartens me."

In addition to time, familiarity with technology and finding the exact tools and resources to meet specific needs of faculty members can sometimes be a challenging matter. For example, Seda, assistant professor at economics, indicates,

> *The most difficult part is to choose the appropriate technology for the content. Moreover, we are almost novice faculty members. We spend all our energy to prepare the content. We could not deal with the content delivery method. Yet we do not have enough time so we are taking baby steps.*

There is an example of given emphasize on competency of choosing technology. Particularly, expertise on detecting which technology is compatible with course content is important for the faculty memerbs. Additionally, required time for technology integration is challenging for the faculty members. These difficulties raise concerns on classroom management of technology-integrated classes, such as to lose the attention of students and to lose control of the classroom. Faculty members' lack of motivation to integrate technology, especially the absence of external motivators surfaced as a notable factor. Suat, assistant professor at electrical engineering, relates the problem, as "Although technology integration requires effort and time, it is not attractive and supported by the institution, therefore we do not have such motivation." Furthermore, planning and preparation for the technology integrated classroom creates extra load for the faculty members (*n* = 6). For example, Suat, assistant professor at Electrical engineering, expressed that “We have to do a perfect planning one day before which needs extra time, that we do not spend such long time for planning.” Banu, who experienced Socrative within mentoring activities, voiced that “…Because the questions had to be prepared before class. At first, I thought that –what about it. They were only 3 or 4 questions. However, prepare questions, deal with research, keep up with paper work made me hard to manage my time.” Finally, the workload of the faculty members (*n* = 4); the need for back-up plan (*n* = 2) to eliminate the potential challenges when the technology does not work; the need for adequate knowledge on that specific technology (*n* = 3) and the requirement of pedagogical expertise (*n* = 2); requirement for teaching assistant (*n* = 1); and need for the support of technology expert (*n* = 1) are the other challenges referred by the faculty members.

In order to improve their technology integration intention and behavior, the faculty members’ suggestions can be categorized into professional development, support, and collaboration. Sources and references of the categories and subcategories were presented in Table 4.7.

Table 4.7.

Solutions for the Challenges on Technology Integration within FTM Contest

	n
Support	
Increase awareness	7
Change attitude	3
Need technical opportunities	3
Support from assistants	2
Need for promotion	2
Office foundation for tech mentoring	1
Professional Development	
Seminar	7
Spread FTM	4
Policy change on PD's	3
Collaboration	
Experience sharing	10
Collaboration among departments	4
Departmental specialization	2
Improvement of orientation program	1

In terms of support, faculty members suggested more professional development opportunities for themselves and other faculty members who did not join the FTM program. Particularly, regular seminars (n = 7) are required to acquaint them with new technologies and to increase their awareness about technology integration into their classes. Didem, assistant professor at Educational sciences, stated, “Seminar series provides the opportunity to make all faculty members to be familiar with technology and make them up to date about educational technologies available for them.” Additionally, one of the participant opined that the orientation program for new coming faculty members facilitated by the institution requires more comprehensiveness with a focus on technology integration into higher education. For example, Gamze, assistant professor at Educational sciences, suggested, the including a dimension, which focuses on practice of technology integration, to the orientation program would encourage the newcomers would implement in their classrooms. New trends in teaching in higher education, such as online learning platforms, massive open online courses, and flipped classroom were to be introduced to faculty members. Ela, associate professor at Business administration, suggests,

> *Faculty members need to be familiar with educational technologies on a basic level which I do right now. FTM is an opportunity for me and I joined by chance in this program. However, other faculty members did not have this chance; hence, particularly newcomer faculty members have to be introduced with the new technologies in the orientation program.*

This illustrated the importance familiarity to be engaged in technology integration process. FTM influenced faculty members’ increased awareness on educational technologies was inferred in this quotation. In terms of support, the faculty members suggested increase of the awareness of all faculty members to perform technology integration (n = 7). This was a necessary action to make the faculty members, who showed resistance to use technology with educational purposes, to develop interest in technology and change their attitude toward technology integration (n = 3). From Banu’s perspective, in order to ask a question about LetsFeedback, she had to know or at least hear about it previously, which is directly related to the awareness of faculty members. Another recommendation was on obtaining more technical support (n = 3) instead of an Information Technology (IT) support team for troubleshooting as well as competent teaching assistants or mentors for individual needs. Furthermore, Onur suggested constituting a new office that specifically concentrated on technology integration. Faculty members frequently dealt with hardware and software failures that could be solved by means of the support team. For the faculty members (n = 2), the assistants from respective departments with technology integration expertise can take the initiative role to integrate technology for the faculty members. Finally, from the perspective of two of the faculty members, in order to engage the educators through extrinsic motivation, a reward system or promotion opportunities from the institution could be an effective measure. Baki emphasized the importance of promotions to encourage faculty who have the passion and are unfortunately struggling to adopt educational technology owing to lack of proper infrastructure and incentives.

The faculty members also suggested collaboration among departments and individuals. In terms of collaboration, sharing experiencing (n = 10), such as samples of relevant integration implementations, cooperation among peers from same or different departments (n = 4) to share and exchange views and opinions of experiences, discussion of challenges, and prospective solutions were regarded as a panacea to accustom faculties to use technology as well as reinforce their technology integration behavior. For example, interaction with the peers who were practicing technology integration makes the faculty members more active in technology integration, for Ali, professor at Physics, and Baki, assistant professor at Sociology. With the belief in the power of experience sharing, Banu, assistant professor at Psychology, wanted to "share my experiences because my colleagues in department do not know what technology integration and how it works in classroom". Finally, two of the faculty members suggested performing technology integration acts by considering departmental specialization to meet the different needs of the faculty members from different departments. According to the faculty members, the institution had a potential role in solving faculty members' technology integration challenges; faculty members needed to have more university-wide professional development opportunities with up gradation of available technology plans (n = 3), administering FTM to all campus (n = 4), and the supply of advanced digital devices (n = 3) in order to fulfill the goal of technology integration.

To sum up, the analysis of the data revealed that faculty members considered all factors of DTPB as significantly influential in their technology integration intention and behavior. In addition to the factors, they specified the challenges that they confronted during their technology integration experiencing process and the solutions for these challenges. Faculty members' technology integration can be sometimes impeded by some challenges. Faculty members, during and after FTM program, came across with challenges such as lack of time, insufficient technological knowledge, need for more pedagogical knowledge (for classroom management problems, etc.), and lack of motivation. Decreasing their heavy workload (decreasing administrative tasks or paper works), could help them to increase their technology knowledge. Establishing individual support office, conducting relevant seminars and workshops, troubleshooter for departmental problems, more technical opportunities, and incentivizing integration behavior (extrinsic motivation, extra promotions, etc.) could help faculty members to overcome these challenges. Aligned with the proposed solutions to these challenges, revision of FTM program is also required, that may include publicizing the FTM program, regular and pre-scheduled meetings, classrooms observations, and determination of more favorable mentors to the faculty members in terms of time schedule, academic interest, and technology expertise. The summary of results was presented Figure 4.3.

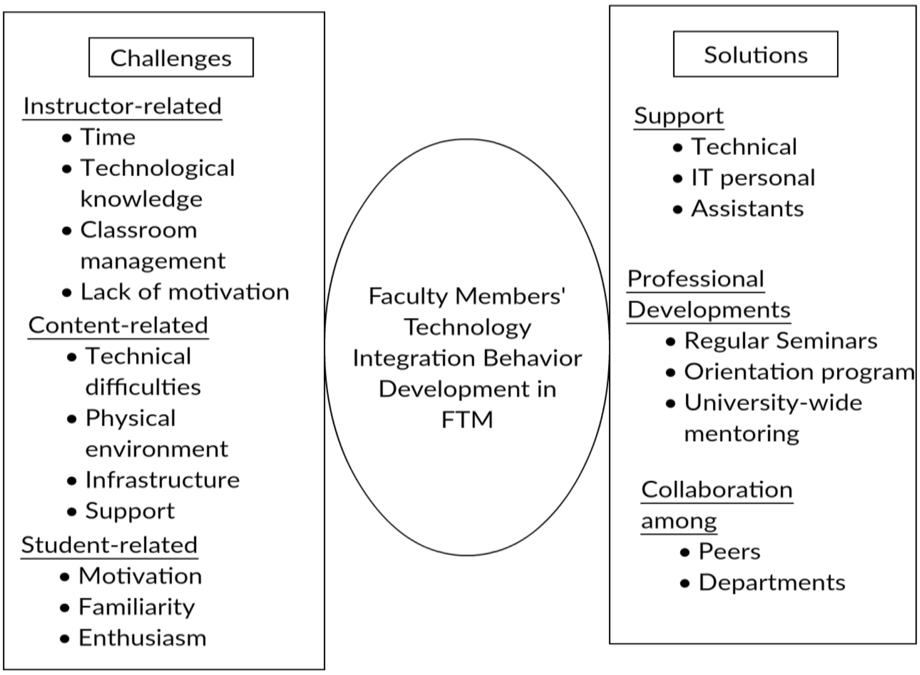


Figure 4.3: Challenges in Technology Integration Process and Solutions of Faculty Members

CHAPTER V

DISCUSSION

This chapter represents, firstly, discussions on factors affecting faculty members' technology integration behavior, effectiveness of faculty technology mentoring program (FTM), and challenges that faculty members faced during experiencing technology integration behavior and promoted solutions for these challenges. Secondly, conclusions coming from the results of the study, recommendations for future research, and implications for practice were discussed.

The purpose of this study was to examine faculty members' technology integration intention and behavior, development process of the behavior within the faculty technology mentoring program (FTM) context, contribution and suggestions to improve FTM program, and challenges that they faced during this exploration process with the potential solutions to overcome. This study concentrated on enlargement of the understanding how faculty members' technology integration intention and behavior is connected to these factors within their exposure process in FTM context. Using mixed method design, this study enabled to get a general overview of the faculty members' technology integration intention and behavior and a deeper understanding of the ways the factors affecting faculty members' technology integration intention and behavior, in the exploration and experiencing process of technology integration in FTM.

5.1. Factors Affecting Faculty Member's Technology Integration Intention

The findings of the piloting phase of the study results in a model of faculty members' technology integration intention that have these five sub-dimensions of decomposed theory of planned behavior (DTPB). The model is summarized in the Figure 5.1. The model test reveals that it explains almost 50% of the variance on the behavioral intention of faculty members that is considerably significant. In the figure, the model visualized usage behavior as blurry, which refers to unmeasured actual behavior, only self-reported usage. The participants did not share their technology integration experiences which was the indicator of actual usage behavior.

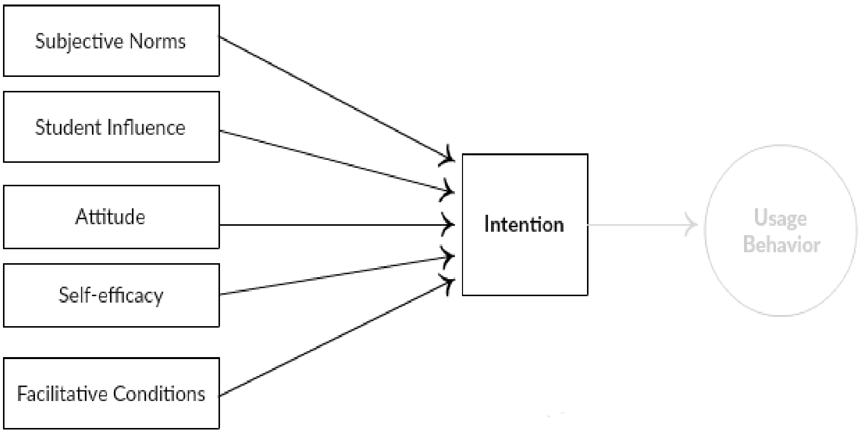


Figure 5.1: Model of Faculty Members' Technology Integration Intention

The model includes subjective norm and attitude instead of their sub-dimensions. The factors specified in DTPB as perceived ease of use, perceived usefulness, compatibility, superior/administrative influence, and peer influence were grouped under their main categories as attitude and subjective norm. This indicates that these two factors were perceived as total instead of in detailed. The prediction levels of the factors imply that self-efficacy, student influence, and attitude have almost the same influence on the behavior while subjective norm and facilitative conditions have no significant contribution on the performance of the behavior.

Considering the sub-dimensions of the integration suggested by DTPB and the model arisen from this study together, intention constitutes the core of the behavior analysis. In this model, intention is directly affected by subjective norms, student influence, attitude, self-efficacy, and facilitative conditions, the results of this study revealed that intention is significantly predicted by attitude, self-efficacy, and student influence. The findings are in line with Paver et al. (2014) that intention is significantly related to attitude, student influence, and self-efficacy when they test the whole dimension of DTPB. In their figure reflecting the flow in DTPB, ease of use, compatibility, resource facilitative conditions, and technology facilitating conditions have no significant relations while other explained the intention significantly. These significant relations indicate that the faculty members consider and intent to plan and implement integrating technology in their classrooms, when the faculty members have positive attitude, feel comfortable with technology, and consider their students' needs and demands on technology usage in instructional activities. It is noteworthy that student influence, self-efficacy, and facilitative conditions (Lee, 2009; Sadaf et al., 2012a), as component of salient beliefs, are found to be related with the intention to integrate technology in higher education. The result of this study provides insights on effectiveness of faculty members' attitude, self-efficacy, and student needs.

The results obviously display the fact that faculty members' perceptions on the usefulness and easy usage of technology in the classroom pave the way to their preferences on the technology integration which is parallel with the findings of Findikcay-Coskun and Ozkan (2013) indicating the perceived usefulness and ease of use result in faculty members' performance on teaching with technology in their model on factors affecting the faculty members' learning management system usage. In their models, intention is directly related to perceived usefulness and perceived ease of use whereas it is indirectly related to compatibility, self-efficacy, subjective norms, and complexity. Their model emphasizes the influence of sub-dimensions of attitude in DTPB on intention. Faculty members' intention toward the technology increases with the help of their efficient and effective teaching practices. Similarly, Lee et al. (2010) specify attitude for inclination toward integrating technology is under the control of the perceived value of technology. In accordance with this study, Sugar et al. (2004) reveal the prediction of attitude on intention in technology adoption process. Even if the faculty members have moderate level of technology integration intention, attitude influenced their intention toward performing the technology integration behavior. To sum up, once the faculty members perform technology integration in an effective way and experience the contributions of technology both their teaching and the students' learning, their intention intensifies and they continue to integrate the same or different technologies that help to solve their pedagogical problems.

The results have stressed the importance of sub-dimensions of perceived behavior control instead of it as a general frame. Normally, DTPB emphasizes that individual's complacency in integrating technology as perceived behavior control is determined by self-efficacy and facilitative conditions as technology and resources. Although previous studies imply that perceived behavior control comprising of the facilitative resource conditions, facilitative technology conditions, and self-efficacy is directly related to both intention and the behavior (Ajzen, 1991), the model in this research provides powerful evidence for the important contribution of facilitative conditions and self-efficacy respectively.

The model suggests considering facilitative conditions together instead of technology and resources separately. The reason behind this can be that faculty members consider them similar to each other and perceived them under the same category. In the literature, it is justified as technology holds great potential to be a resource (Clegg, Gardner, & Kolodner, 2011; Nguyen, 2008) in higher education to be utilized to empower learning activities. The results of this study indicate that resources and technologies as facilitative conditions do not have significant contribution to faculty members' technology integration intention. In accordance with this result, the model tested by Ajjan & Hartshorne (2008) indicates non-significant contribution of both resources and technologies on technology integration intention and behavior of adjunct faculty members. In contrast to the results of this study, several research studies examining technology integration intention and behavior reveal significant relationship between facilitative conditions and intention to perform behavior (Atsoglou & Jimoyiannis, 2012; Hartshorne & Ajjan, 2009; Lee et al., 2010, Smarkola, 2008; Taylor & Todd, 1995). In details, Mak and Ross (2003) state that "If the more resources and opportunities individuals believed they possessed, and/or the fewer obstacles or impediments they anticipated" (p. 310).

Although the results of this study differ from these studies, it is consistent with those that (Ajjan & Hartshorne, 2008; Cuban, Kirkpatrick, & Peck, 2001; Cullen & Greene, 2011) highlighted no contribution of facilitative conditions on technology integration intention. Harsthorne and Ajjan (2009) indicate that facilitative conditions do not have impact on the intention although training to develop technology integration skills and access to resources are important mechanisms. The reason behind this non-significant relation in this study may be related to the fact that the faculty members in the sample of this study might not be fully aware of the available technologies and sources in the campus though the university is covered by so many technologies and opportunities for its members to use them with academic and educational aims. The other, primarily thought reason might be stated as the fact that faculty members' own technologies and opportunities, which are used to enrich their instructions; since, once they have these opportunities within their hands, they do not need the ones offered by the administration.

In DTPB, behavioral intention is significantly predicted by subjective norm (Sugar et al., 2004; Teo, 2011). People surrounding the individual contribute or inhibit the performance of the behavior. Nonetheless, this study reveals no significant relation between subjective norm and intention of faculty members, which is parallel to the results of the studies conducted by Ajjan and Hartshorne (2008), Ma, Andersson, and Streith (2005), and Sadaf et al. (2014). This clear lack of relation can be attributed to the context of the higher education. In these institutions, faculty members are given the freedom on how to design and implement their instructional activities. In other words, administrators, colleagues or other peers in the institutions have little concern on the teaching activities.

DTPB mentions that student influence is one of the sub-dimensions of subjective norms coupled with peer and administrative influence as an antecedent of the intention (Ahmed & Ward, 2016; Capo & Oreallana, 2011; Sadaf et al., 2012). This means that all three sub-dimensions have equal emphasis in the theory. However, the model derived from this study indicates an emphasis on student influence. Yi and Hwang (2003) indicate that student technology usage is correlated with faculty members' technology integration behavior. Particularly, students' demands, technological skills and abilities, devices, motivation or resistance to use for course activities, and specific needs may be some of the underlying reasons to influence the behavior (Ajjan & Harsthorne, 2008; Brinkerhoff, 2006). On the contrary to the theory (Paver et al., 2014), student influence affectes the intention in technology integration into higher education context separated from subjective norm. Sadaf et al. (2014) confirm that student's expectations and motivation to use technology with educational aims in the classroom had strongest effect on technology integration intention. Students are the impulse for the technology integration of faculty members. Once students demand technology usage within instructional activities', faculty members' consider this as a need to integrate technology in their classroom.

The model suggested in this study comprised of attitude, self-efficacy, student influence, facilitative conditions, and subjective norm, explain almost half of the variance of faculty members' intention. However, the faculty members who participated in the data collection with interview phase of this study indicate that they have moderate level intention to integrate technology in their classrooms. The reason behind this may be the faculty members' lack of awareness on technology integration since almost more than half of the faculty members had not participated into any professional development program which have the potential to increase their familiarity with new technologies and introduce novel usefulness of technology integration (Keengwe, Onchwari, & Wachira, 2008; Vannatta & Beyerbach, 2014). Hence it implies the importance of professional development experiences on faculty members' technology integration intention and behavior.

Overall, this study comes up with a model on technology integration intention in which self-efficacy, student influence, attitude, subjective norm, and facilitative condition are emerged as key factors influencing the intention. The model is aligned with the theory and great amount of the literature on technology integration intention and behavior. In accordance with the theory, the model indicates that intention related to subjective norm and attitude. However, the point of having direct relation with student influence is discerned from subjective norm, self-efficacy and facilitative conditions apart from perceived behavior control which contradicts the literature. On the other hand, perceived behavior control proposed by DTPB does not take part in the model revealed in this study. Perceived usefulness, perceived ease of use, and compatibility are not specified in the model, which are, nonetheless, require to be included in the process of decision making to comprehend the nature of technology and explore possible avenues of integration (Dalal, Archambault, Robles, & Reed, 2017; Kimet al., 2013). Supportively, Rogers (1995) founded his theory on the attributes of any technological innovation, which play roles during the planning and implantation process of technology integration. Additionally, peer influence and administrative influence which are not represented in the model of this study, are jointly perceived under subjective norm together, however student influence exempt from subjective norms. This may indicate the importance of student influence and limited impact of peers and administrators on faculty members' technology integration intention with the aim to reveal the factors affecting technology integration intention. This reiterates the aim to reveal the factors associated with technology integration intention of faculty members based on this model, and the model test was run at a university equipped with educational technologies. The results indicate that faculty members' technology integration intention is significantly predicted by attitude, students' influence, and self-efficacy while subjective norm and facilitative condition have no significant relation with their intention. Finally, determination of the factors gives clues on how to develop faculty members' technology integration skills to enhance this behavior among the campus and draw a general framework on how to design and implement any professional development program for faculty members by considering these factors.

5.2. Perceptions on Technology Integration Behavior in FTM Context

Considering the results, faculty members who took part in FTM shared their perceptions that are categorized in to three dimensions that are parallel to sub-research questions: factors related to technology integration behavior in the FTM context; challenges and the solutions associated with technology integration of faculty members in FTM context; and effectiveness of FTM program.

Faculty members emphasize the contribution of technology to their instruction. Increasing the student engagement via technology integration was reflected by the faculty members. Technology changes the way of instructional delivery in which students in their classrooms were more engaged with learning and learning environment (Mokhtari, Reichard, & Gardner, 2009). Transformation of instructional activities is formed with technology from traditional instructional activities to technology-enriched student engaged learning activities (Hopson, Simms, & Knezek, 2011). It is considered as a renewed and enhanced instructional delivery to free up in-class time. Delivering core content with technology contributes to "decrease workload on academics while keeping a high level of educational quality" (Henrikson, Johansen, Wever, & Berry, 2016, p. 234).

The use of educational technology in instructional activities intensifies addressing educational needs both students and faculty members in higher education classrooms. Innovative educational experiences appeal to needs notwithstanding time and place of learning (Bernardo et al., 2004). "Pedagogical power of technology for themselves and their students" (Gross, Truesdale, & Bielec, 2001, p. 166) have opportunity to meet pedagogical needs of faculty members (Georgine & Hosford, 2009). Technology usage in higher education classrooms has potential to meet the expectations from the classrooms. The phases of it are defined as course design, course development, course implementation, course evaluation and revision (Olapiriyakul & Scher, 2006). Particularly, within these phases, the activities such as, classrooms management, course design, content delivery, in-class activities, out-class tasks, and assignments encounter with technologies.

5.2.1. Factors Related to Technology Integration Behavior in FTM Context

The analysis of qualitative data gathered through interviews indicate that all the factors specified in DTPB have influence on faculty members' technology integration behavior within the FTM context while experiencing technology integration behavior. As specified in the literature, technology integration in higher education classroom is somehow directed by faculty members' intrinsic and extrinsic motivation (Surry & Land, 2000). The quantitative results indicate that faculty members' technology integration intention is significantly predicted by attitude, students' influence, and self-efficacy while subjective norm and facilitative condition have no significant relation with their intention. Finally, determination of the factors gives clues on how to develop faculty members' technology integration skills to enhance this behavior among the campus and draw a general framework on how to design and implement any professional development program for faculty members by considering these factors.

A second model is arisen from qualitative data, which summarizes the perceptions of the faculty members who had experienced technology integration professionally within the mentoring program. The model is presented in Figure 5.2.

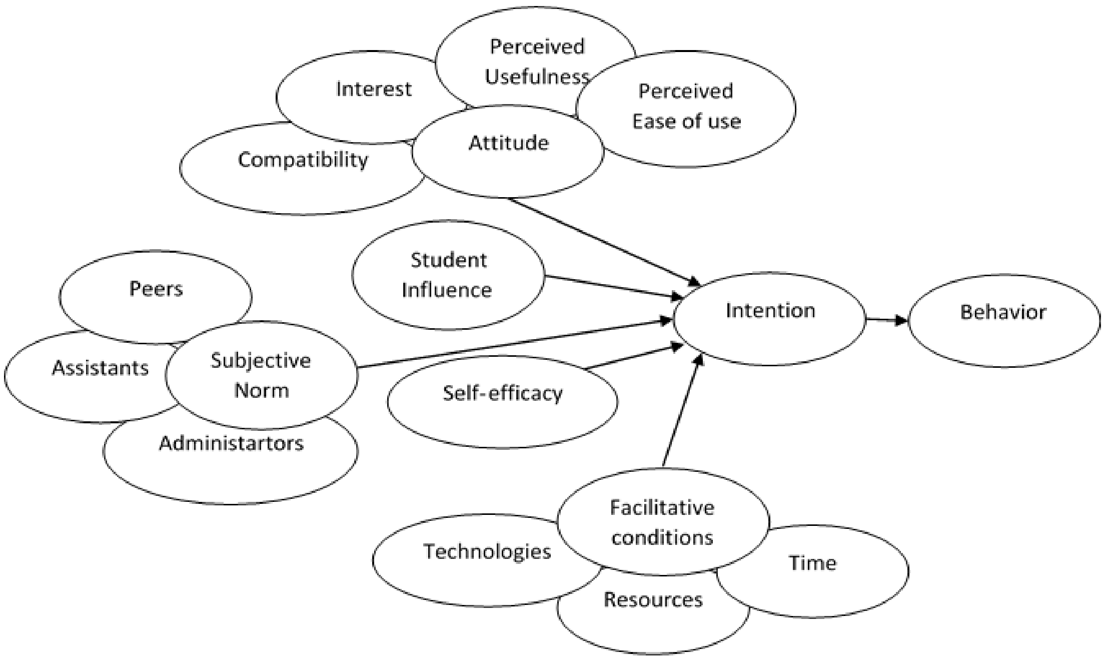


Figure 5.2: Faculty Members' Technology Integration Behavior Model

The model is based on the model created at the quantitative phase of this study. In the model of faculty members' technology integration behavior in FTM program, behavior is directly related to intention and intention has antecedents as in the intention model of this study; attitude, student influence, subjective norm, self-efficacy, and facilitative conditions. Among these antecedents, attitude, subjective norm, and facilitative conditions have their own sub-dimensions. When compared to

DTPB, subjective norm has a new dimension named as interest. Lack of interest is accepted not only as an obstacle but also as a motivational factor to integrate technology at higher educational level (Mohammadzadeh, Farzaneh, & Mousavi, 2012). Because of this two-dimensional important role of interest on technology integration, it is considered as a sub-dimension of attitude.

In this technology integration behavior model, subjective norm includes peer influence, administrator influence, and assistant influence as sub-dimensions. Once compared to DTPB, assistant influence is seen as a new dimension of subjective norm. In the context of the study, faculty members are teaching with the help of their assistants from planning to evaluation phases of their courses. Teaching assistants help to reduce students' cognitive load and affect their engagement in technology-integrated courses (White et al., 2010) that decrease faculty members teaching and classroom management load.

As the facilitative conditions, technologies and resources are represented in the DTPB, separately. In this model, faculty members refer time as an additional sub-dimension of facilitative conditions. Because of both being inhibitor and enabler, time plays crucial role on the behavior. They perceive technology integration as time consuming at the beginning and time saving after being acquainted with the technology. Faculty members have to spend their all-time to fill their teaching and research responsibilities and they have limited time to devote on experiencing new educational technologies (Morales & Roig, 2002). From the instructional perspective, course design and implementation needs considerable amount of time as well as both learning and implementing technology in the course (Davies, Sean, & Ball, 2013). Therefore, time is considered as one of the factors affecting faculty members' technology integration behavior.

Both to solve some of their pedagogical problems and to enrich their instruction, thereby resulting in optimal utilization of technology integration to amplify the learning process in higher education context. Their students' further professions, their daily technology usage, and their previous technology integration practices contributed to intrinsic motivation of faculty members. In terms of extrinsic motivation, faculty members thought that the behavior can be initiated and sustained to perform by the help of extrinsic motivator as rewards, incentives, or encouragement. Bitner and Bitner (2002) specify 8 different areas to be considered for successful technology integration including the motivation. For them, “administrators must be prepared to demonstrate the importance of integrating technology by providing incentives, such as extra pay or release time” (p.98). In line with this, Cook, Ley, Crawford and Warner (2009) specify, “Faculty members wanted their basic physiological needs met by university administration through extrinsic motivators, such as salary increases and course releases” (p. 149). The administrators play an important role in providing impetus, such as rewards and incentives. Within their heavy workload, the faculty members need a valuable reason to allocate time and energy for planning and implementing technology in the classrooms. The contributions of the technology for faculty members such as, ease of implementing teaching activities and promoting to students learning, can be supported by decreasing faculty members’ workload.

Routine of preparation for teaching and learning in the classrooms are supported by technology (Hammond, 2014). Moreover, enabling more collaboration and active participation environment in the classrooms support learner-centered, experiential learning environment where students are actively involved in the learning process actively at technology-integrated classroom with the help of the faculty members when they need (Deaney, Ruthven, & Hennessy, 2003). Because of this, faculty members are expected to be technologically confident in addition to having content and skill-based expertise as well as context-dependent pedagogical strategies. Parallel to this, students in technology-integrated courses have the opportunity to self-regulate their learning process and transform their performance to a greater degree (Lawless & Pellegrino, 2007). This study reveals that in higher education classroom, technology enables faculty members to teach with fewer difficulties when compared to traditional pedagogical methods after spending time on exploring and integrating technology into their courses. Additionally, technology supports student learning by enriching the collaborative learning opportunities.

Conceptualization and practice of technology integration are generally shaped by its contributions and challenges. Williams and Williams (2011) underline contribution of technology use as enriching student's motivation, which is parallel to the findings of the study. Practicing technology integration, which has a substantial positive effect on teaching and learning process in higher education, results in increased motivation and enthusiasm of the faculty members participating in FTM. Moreover, the faculty members participating in FTM emphasized certain aspects which direct the attitude toward technology integration behavior. Instances include compatibility with class size (Sawang, O'Connor, & Ali, 2017), course content, pedagogical needs such as learner feedback and increased communication and interaction among students (Ertmer, 2005), student preparedness (Haydn & Barton, 2007; Waggoner, 1994), and easy use of the technology. In terms of compatibility, for example, faculty members do not prefer to integrate some technologies in the larger classes (Peluchette & Rust, 2005), which may cause classroom management problems. Within the FTM program, the faculty members experienced how to integrate technology effectively by considering and managing these circumstances.

In the literature, it is evidenced that while integrating technology, major concern of the faculty members is their workload (Samarawickrema & Stacey, 2007). In this study, the faculty members in FTM context finds technology integration as time consuming and additional workload till getting familiar with the technology. As their interaction with technology grows, they discover the process to be time efficient with diminished workload. Although faculty members' workload is a barrier for to integrate technology, their interest to learn and implement technology integrated courses ease it. Interestingly, interest toward technology use in instruction is defined as one of the major factor within the FTM context. In line with this, Chompu-Inwai and Doolen (2008) list interest as one of the key points for successful implementation of technological devices and platforms. Hence the findings of this study indicate that interest is needed to be considered as one of the sub-dimensions of attitude affecting faculty members' technology integration intention alongside perceived ease of use, perceived usefulness, and compatibility.

The findings confirm the notion that all facets referred by DTPB could explain users' behavior (Paver et al., 2014, Taylor & Todd, 1995). The behavior performance of the faculty members depends on the support from colleagues, peers, and assistants, which is parallel to previous studies (Salajan, Welch, Ray, & Peterson, 2015). While the support of the individuals close to faculty members contributes to the intention and behavior, there is limited or no influence of administrators on the intention and behavior for the faculty members except the institutional facilities. Among these groups, students are the most influential ones on the technology integration intention and behavior. Prior research found supplementary impact of influence on it of student influence as a predictive factor (Ajjan & Hartshorne, 2008; Hartshorne & Ajjan, 2009; Lee et al., 2010; Paver et al., 2014). The biggest concern of the faculty members is their students while integrating technology in their classrooms. The students' demand and encouragement to integrate technology help to direct the behavior in a positive or negative way and reinforce the development of positive attitude which might be critical to advancing technology integration agenda of both faculty members and higher education.

Faculty members' technology integration behavior is commonly based on perceived behavior control defined by self-efficacy, and facilitative resources and facilitative technologies (students' devices, instructor's technologies, infrastructure supported by institution, technology knowledge, technological support personnel, and confidence on technology) that are confirmed by the literature (Hsu & Chiu, 2004, Buchanan et al., 2013). As a facilitative condition, lack of time to learn new technologies (Butler & Sellbom, 2002) and insufficient time for planning technology-integrated instruction (Earle, 2002; Ertmer, 1999) are crucial to instructional planning and implementation of technology-integrated courses. This is confirmed by the study of Salajan et al. (2015), which clarifies that time constraint, is an important determinant of the performance of faculty members' technology integration. Faculty members, however, suffer from not having enough time to think, plan, implement, and evaluate technology-integrated courses (Watlington, Murley, Cornelius, & Kelley, 2014) because of their many responsibilities that include teaching, research, administration, and management (Oshagbemi, 2000) as reflected from this study. The lack of access to technology and ongoing support (Schrum, 1999) are not major obstacles to technology integration of the faculty members. Technology rich environment and the self-confidence in themselves on technology integration positively affect their intention and behavior. On the other hand, the results indicated non-significant relation with facilitative conditions and the intention. Half of the faculty members did not participate any professional development program on technology integration, which is one of the signs of limited awareness on technology integration. Hence, limited awareness and understanding of the potential of technology integration might play a critical role in recognizing and appreciating available technologies around them. As Al-Emran, Elsherif, and Sheelen, (2016) reveal that technological awareness contributes to faculty members' readiness to utilize implement technological devices in their classrooms. These drawbacks may be explained by the lack of awareness of the faculty members on both technology integration and facilitative conditions.

The technology integration intention and behavior highly depend on suitable settings and elimination of the inhibitor factors of technology usage. It seems that increasing success rate on overcoming the challenges contributes to self-efficacy, which has a direct relation to motivation (Bandura, 1997). Optimistic perspective and attitude help the faculty members overcome challenges resulting in increased self-efficacy and motivation (Youssef, 2012) that arises from experiencing the productive impact of technology on teaching and learning within the FTM context of this study. Practice-oriented and context-oriented arrangements (Lukas, 2014) support learning and practicing technology integration as in the one-to-one mentoring programs. Mentoring, as a PD activity is equally important according to the results of the study by giving faculty members a chance to interact with the experts to meet their unique needs of the faculty members.

Under PBC, time is crucial for instructional planning as facilitating condition. Ertmer (1999) listed time as first-order barrier to integrate technology. Correspondingly, Veletsianos and Kimmons (2013) emphasize the time limitations as a major issue while integrating technologies. In line with the results of this study, the faculty members specified time as a major challenge to integrate technology. Having limited time to deal with the technologies that are hard to understand and use, the faculty members believe that these technologies would not enhance their job performance. Faculty members suffer from not having enough time to think, plan, implement, and evaluate technology-integrated courses because of their responsibilities as teacher, researcher, advisor, and contributing members of the society. On the other hand, the faculty members who are already familiar with technologies contribute their enthusiasm and to learn and integrate technology in their classrooms. Although they have limited time to learn it, their enthusiasm and familiarity influence the behavior positively.

Within the FTM program, the mentors are accepted as change agents on faculty members' teaching with technology practices. In line with the study of Baran (2016b), mentors are motivated to actualize the pedagogical transformation of faculty members. Moreover, the faculty members have started to assume the role as experts on technology integration while they are interacting with their colleagues, that allows learning transmission to their peers and diffusion of the FTM contributions to the university. While DTPB indicates peers influence on the behavior, being exposed to technology integration, faculty members influence their peers' technology integration behavior, thereby accelerating diffusion of innovation (Kopcha, Reiber, & Walker, 2015). Furthermore, by supporting the social connectedness of the students and faculty members (Hung & Yuen, 2010), technology integration makes learning experiences more favorable. Salajan et al. (2015) confirm the increasing degree of expertise of the faculty members who learned about LMS and started to use it regularly in their classrooms.

To sum up, technology integration behavior is enhanced with the help of mentors, expert on technology integration, in the FTM program and during this process, faculty members have experienced technology integration that is affected by their attitude, perceived behavior control, and subjective norm as specified in DTPB. The major contribution to the field is that it revealed the importance of faculty members' interest to technology and its relation to the intention to integrate technology. There is limited influence of administrators on the behavior, although administrative support carries importance on enhancement of the technology integration behavior. While peers have somehow limited role in the behavior, students are the major influential groups of individual around the faculty members in terms of enhancement or inhibition of the behavior. Finally, faculty members' perception of high level of self-efficacy on technology integration and the availability of technology and resources as facilitative conditions play an important role in the performance and occurrence of technology integration behavior in higher education.

5.2.2. Effectiveness of the FTM Program

The results concur with the literature in terms of the contributions of FTM from the perspectives of participating faculty members and the ways to improve its effectiveness. One of the results implies the faculty members' influence on the peers as an outcome of the program because the faculty members who participated in FTM acted as a change agent in their departments and among their peers. In the literature the thoughts of the peers or colleagues are commonly accepted as the influential factor for technology integration is commonly accepted (Layne, Froyd, Morgan, & Kenimer, 2002, Wicks et al., 2015). Research, also, prove that sharing technology integration experiences with the colleagues have the potential to increase confidence and comfort on technology integration (Soodjinda, Parker, Meyer, & Ross, 2015). Related to this interaction among departments, Lumpkin (2001) suggests inter-departmental mentoring in which faculty members feel more comfortable while articulating concerns and asking questions than as they do within their department (Boice, 1992) Secondly, faculty members are supported by their mentors in terms of technology usage and teaching practices. Community of practice opportunity in FTM program helps to increase technology awareness of faculty members (Ellis, 2004; Judge & O'Bannon, 2008) by supporting their growth and confidence on technology integration. FTM program increases faculty members' technology awareness and motivation to integrate technology.

Results of the study provide an opportunity to examine contributions of the FTM programs that facilitate technology integration in higher education. Faculty members need a diffused and enriched FTM program (Baran, 2016a) with greater number of workshops on latest educational technologies, arrangement of regular mentor-mentee meetings and classroom observations, improvement of pairing strategy including teaching assistants, whole group communication, and involvement of particularly the faculty members who need support on technology integration.

To implement an effective FTM program, regular meeting is one of the key points. Lumpkin (2011) lists the steps for successful faculty mentoring programs which are “defining a clear purpose, goals, and strategies; selecting, matching, and preparing protégés and mentors for their new roles; holding regular meetings to nurture interactions among protégés and mentors; and evaluating program effectiveness.” (p. 359-360) Regular meetings, among these steps, strengthen the relation between mentee and mentor and provide continuity of the interaction (Allen, Eby, & Lentz 2006). However, it is hard to set regular meetings because of time constrains. Both faculty members and their mentors have time problems related to their workloads and constantly changing work schedules.

During the planning process of FTM, matching mentor and mentee has an important role on the future of mentoring relation. Parallel to this, an improved matching strategy is suggested by the faculty members, Similarly, Thompson (2006) recommends to take into account both mentees and mentors subject-area interests, potential compatibility, and their expertise on educational technologies as a strategy to match them. This is parallel to the faculty members’ suggestions on pairing strategies. However, for the FTM program, mentees’ technology expertise vary from novice to expert as mentors. Correspondingly, faculty members’ subject areas had a large variety, and so it is hard to match them according to their academic backgrounds or interest. Match length and match quality are the basis for reaching the benefits of the mentoring programs (Grossman, Chan, Schwartz, & Rhodes, 2012). Because of critical role of matching the pairs, the mentees’ and mentors’ technology expertise levels and mentors’ willingness to study with a specific subject area are considered.

To progress in current technology-driven world, faculty members should develop a deeper understanding and teaching practices with technology (Georgina & Hosford, 2009). For that reason, this study aims to contribute to the understanding their practice and helps develop their behavior with the FTM program. This program and technology integration provide opportunities for faculty members to evolve their pedagogical practices with technology, therefore it provides higher education students equal opportunities to be exposed to technology. Additionally, some elements are needed for designing technology-rich teaching and learning environment. Creating a higher education environment by following faculty members' suggestions is critical to improve technology-integrated practices in higher education.

5.2.3. Challenges and the Solutions Associated with Technology Integration of Faculty Members in FTM Context

Faculty members, who were exposed to the process of technology integration behavior within the one-to-one mentoring program, specify certain challenges that they faced during the experiential process. Student related, context related and instructor related challenges were the sources of the difficulties during their first-time professionally technology integration process. Technology-rich environment has the potential for integrating technology in an effective way (Tiene & Luft, 2001) and generate valuable learning and teaching outcomes with an appropriate vision of technology integration (Earle, 2002). As a result, technical difficulties (slow or no Internet connection, hardware failures, etc.), class size, physical opportunities, nature of the department, technological limitations, ethical issues and technological safety concerns, and finally, lack of support are the challenges in the context of the FTM. The concerns related to teaching context, particularly technical and administrative support (Inan & Lowter, 2010), lack of technical or technological opportunities and support, and absence of role models (Ertmer, 2005) make the faculty members think thoroughly about the process to reach the effective implementation strategy. Designing the process and ensuring satisfactory learning outcomes are the most challenging parts for the teachers who participated in a study conducted by Kafyulilo, Fisser, and Voogt (2014) even though they are in the context of professional development based on design team application where they can get support from more than one teacher and expert. Oliver (2007) urge that ethical issues should be considered before technology integration into classrooms, which may create challenge for both implementers and administrators. Snoeyink and Ertmer (2001) list first-order barriers as lack of technology and equipment, lack of support on technology, and resource-related issues. Almost two decades ago, Fabry and Higgs (1997) determined the challenges to technology integration as negative attitude toward technology, limited support, training, and finance, and limited access to technological tools. Interestingly, the results of this study support Fabry and Higgs's findings after 20 years. In other words, technology integration intention and behavior are inhibited by similar problems more than two decades later. This indicates the urgent need to overcome these challenges by constructing an environment that supports technology integration in higher education in an optimal way.

Student-related and rarely confronted challenges in comparison to others, are listed as availability of student devices, student habits, student motivation, and student's behavior in classroom. The most common concern among faculty members is related to student population in class and the availability of appropriate devices that fit the scheme of teaching and classroom activities. The same concern is echoed in the study of Viberg and Grönlund (2015) that specified accessibility of student's personal technologies as one of the points to be considered while integrating technologies. From the perspective of faculty members, what and how to integrate technology in the classroom is meaningless if student-owned devices are not available for the educational activities.

The common instructor-related problems are defined as limited time, less familiarity with technology to help finding the exact tools and resources to meet specific needs of faculty members, lack of external motivators for integrating technology, creating extra load in addition to their heavy workload, needed for back-up plan, needed of technological knowledge, the requirement of pedagogical expertise, limited support of technology experts and teaching assistants are the challenges referred by the faculty members. More efforts for integrating technology are made by the teachers with prior technological experience, which intensifies the effectiveness of the implementation (Tondeur, Roblin, Braak, Voogt, & Prestige, 2016) complying the results of this study. In contrary to the results of Vajoczki et al

(2010)'s study in which the instructors are not faced with increased workload, it was a challenge for the faculty members in this study. The reason can be that the instructors partaking in the study of Vajoczki et al. (2010) deal with premade, content specific podcasts that required little effort to integrate. On the other hand, in this study, the faculty members need to find, explore, adopt, and implement technology into their content-specific courses that absorb too much energy and time when compared to the podcasts usage. Thus, the results indicate the increase in faculty members' workload with technology integration.

Workload of faculty members is specified as a possible factor influencing the classroom transition with technology integration (Bate, 2010). While planning the technology-integrated courses, the instructors need to consider too many variables and to overcome some challenges. They have to prepare a backup plan to withstand possible difficulties (Hofer & Bell, 2015; Muilenburg & Berge, 2015). Additionally, in the study of Kafyulilo, Fisser, and Voogt (2014), it is revealed that novelty about technology integration may result in time consumption that is one of the challenges of technology integration.

In order to improve their technology integration intention and behavior, the faculty members emphasize the need for more professional development opportunities, support, and collaboration. Additionally, the followings are the specific suggestions for development of all faculty members on technology integration.

1) Regular seminars on current educational technologies,
2) The orientation program for new coming faculty members which is more comprehensive on technology integration,
3) More technical service facilities in terms of information technology (IT) support team for troubleshooting
4) Competent teaching assistants or mentors to address individual needs,
5) Collaboration among departments and individuals, such as sharing experiencing, samples lesson plans and exemplary technology integration implementations,
6) Cooperation among peers from same or differing departments,

7) University-wide mentoring program.

The faculty members who experienced FTM emphasize the importance of the need for university-wide mentoring program (Baran, 2016a) that have the potential to diffuse technology integration all over the campus. In the literature, there are similar suggestions related to opportunities for professional development, role models, exemplary executions of effective technology integration (Sprague, Kopfman, & Levante, 1998), available technical support personnel (Ng, 2015) and collaboration in designing process with the potential to share knowledge, skills, and experiences on technology integrated teaching activities (Kafyulilo, Fisser, & Voogt, 2014). In their review study, Norris, Smolka, and Soloway (2000), too, have listed a set of critical conditions facilitating technology integration such as availability of technology, time for technology integration, and training on technology, institutional support, and well-designed curriculum.

Overall, the study indicates that teaching in a technology-rich environment does not mean teaching with technology. To adopt teaching practices to the innovation process of higher education, faculty members who are the key individuals of instruction process need more professional support to increase their behavior performance. The faculty members' suggestions aim to foster technology integration intention and behavior of all faculty members irrespective of their academic or professional background, their teaching experience, and other contextual factors. In order to support faculty members' technology integration intention and behavior, the critical challenges should be effectively eliminated. This would result in creation of an environment that is a more easy-going, supportive, and productive space for more innovative teaching and learning opportunities. Since the main aim of this study is to enrich the understanding of technology integration at higher education classrooms, perspectives of the faculty members in FTM to enrich their technology integration behavior were crucial and helpful for faculty members who were in the process of learning how to effectively perform the behavior that makes the analysis meaningful. At the end of the FTM, the faculty members state that they benefit in terms of contribution to the performance of technology integration behavior. The intention and behavior are affected by all the factors in DTPB and some challenges on the technology integration are reported which are instructor-related, student-related, and context-related. The solutions for the challenges are asserted and suggestions to improve FTM program are presented within the study.

CONCLUSIONS

The purpose of this study is to develop the understanding of faculty members' technology integration behavior by concentrating on the factors affecting the behavior specified in decomposed theory of planned behavior (DTPB). It is aimed to understand general picture of faculty members' intention toward integrating technology in their classrooms and to examine on how the factors affected the behavior of faculty members during their experiences of technology integration implementations. The university, equipped with educational technologies and facilities, is good fit to examine the behavioral performance of faculty members on technology integration.

A model, is developed within the study, revealed that the faculty members' technology integration intention is predicted by attitude, student influence, and self-efficacy positively. On the other hand, subjective norm as peer and superior/administrator influence and facilitative conditions are not predicting the intention toward technology integration. Student has unique effect on faculty members' intention when compared to peers and administrators in the research context (Al-Otaibi & Houghton, 2015). Attitude of the students has positive effect on the way of using technology in the classrooms and in the process, technology also influences students' learning (Christensen, 2002). Technology integration and students influence has a reciprocal influence that positively contributes to teaching and learning activities.

While the faculty members are integrating technology in their classrooms, their intention, attitude, subjective norm, and perceived behavior control affected the behavior affecting different rates (Hartshorne & Ajjan, 2009; Yusop, 2014). The performance of technology integration behavior mostly depends on the facilitative technologies around faculty members. After the evaluation of the faculty members, compatibility with the context and content, eligibility for teaching and learning activities, and accessibility and easy usage, etc. direct the usage of a specific technology with educational aims.

Faculty member’s technology integration can be sometimes impeded by some challenges while they were performing the technology integration behavior. The most common challenges that faculty members face are lack of time to learn and integrate technology, insufficient technological knowledge, need for more pedagogical knowledge (for classroom management problems, etc.), and lack of motivation. These challenges limit the usage of technology, as Cuban (2001) noted “As the infrastructure matures and teachers’ beliefs about teaching and learning evolve, more and more teachers will change their practices and become serious users of computers in their university and public classrooms (p. 179).”

Providing sufficient time, technical assistance and support, administrative support, adequate resources, continuous funding, and built-in evaluations (Rodriquez & Knuth 2000) enhance technology integration of faculty members. Additionally, the study has discussed the need for decreasing their heavy work-load (decreasing administrative tasks or paper works) for having time to integrate technology, helping them to increase their technology knowledge (founding individual support office, enabling seminars series, departmental problem solver stuff, and more technical opportunities), and promoting integration behavior (extrinsic motivation, extra promotions, etc.), as the ways of elimination of inhibitor factors.

With the help of the mentoring activities, faculty members gain skills, increase motivation and awareness, and develop their unique solutions to their pedagogical problems. The research comes up with some suggestion to develop effective faculty technology mentoring programs. The various mentoring programs are developed and implemented in different contexts and there are common elements among effective technology mentoring programs (Chuang et al., 2014). Although having common elements, the program needs some adjustments to serve better faculty members (Leh, 2005) because of the different contexts of higher education institutions from not only K-12 settings but also other universities.

6.1. Recommendations for Future Research

The results of the study imply some recommendations for further research on technology integration in higher education. Recommendations derived from this study to contribute further research studies are grouped under three categories related to the model created within this study, DTPB in faculty technology mentoring program (FTM) context, and behavior monitoring.

6.1.1. Faculty Members Technology Integration Behavior Model

The study results in the model representing the factors affecting faculty members' technology integration intention. This study partially confirmed the constituents within DTPB theoretical framework and some factors such as, perceived ease of use, perceived usefulness, compatibility, superior/administrative influence, and peer influence appeared not to have significant correlation. The factors shaping faculty members' technology integration behavior during professionally experiencing process in the context of FTM are determined as intention, attitude, subjective norm, and perceived behavior control that are parallel to the theory. Although intention is only directly related with behavior in the theory, it is a rarely implied factor by faculty members in FTM context and the reasons of which needs clarification.

This study concentrates on the general intention of the faculty members and the behavior itself in FTM context while they were experiencing. To reveal out the ways to increase performance of the behavior, analysis of the planning, performing, and assessing, and intervention of the behavior have importance in regular context of a higher education institute. Additionally, the behavior could be examined through peer mentoring, seminar series process, or one-to-one experiencing processes with the support of workshops and seminars to reveal the relations among the factors. Moreover, action researches and participatory research methods should be conducted to get a deeper understanding of the development of faculty members' technology integration behavior. Furthermore, cognitive interviews, think aloud method, ethnographic interviews, and observation should be used as data collection tool to get clues of designing of the behavior and acts of technology integration in teaching activities.

6.1.2. Envision of DTPB and FTM in Higher Education Institutions

The analysis of interviews indicates that among the factors, compatibility is one of the key factors on technology integration behavior. However, after piloting the survey, the factor structure indicates that compatibility is not clearly explicit among the factor structure. Such dubious results require clarification. Similar to this, the results of this study show that faculty members focus on facilitative technologies and facilitative resources jointly. On the contrary, DTPB suggests concentrating on these two, separately. Perceptions of the faculty members allow considering these factors as a unified entity. The limited research on faculty technology integration behavior should be enriched from these points of DTPB on technology integration in higher education.

The results of this study indicate that interest of the faculty members could influence the behavior of faculty members. For that reason, faculty members' technology interest should be tested as a new sub-dimension of attitude, which requires qualitative and quantitative support of further studies conducted in different contexts. Moreover, a new version of the modified survey, faculty members' technology integration intention survey, can be developed and implemented with students of the faculty members to collect detailed information about their behavior. Else, perceptions of the students and peers about the faculty member's behavior may help to analyze the behavior from the different perspectives.

Mentors' interpretation on the faculty members' development on technology integration behavior to enrich data on the behavior may lead to improvement in the understanding of the faculty members' technology integration behavior. Furthermore, to reveal the consequences of the performing the behavior in higher education classrooms, perceptions and developments of the students of these faculty members can be captured. In terms of the revision FTM program, faculty members who are expert on technology integration could be mentor of the novice faculty members instead of a graduate student. Also, previously scheduled and fix mentor and mentee meetings could be arranged. In order to reveal the behavior that have not exposed technology integration experience, more research is needed to get general understanding of the behavior.

6.1.3. Monitoring Faculty Members' Technology Integration Behavior

In addition to the factors, faculty members' pedagogical objectives and the ways to integrate technology in their classroom other focal points in technology integration in higher education research. Actual implications of technology integration into higher education classrooms and the ways to improve contributions of technology integration on meeting the faculty member's pedagogical needs can be vital to reveal for technology integration researches. Indeed, the behavior of faculty members who participated in the FTM program were monitored and revealed within this study but it could be further clarified with observations of classroom proceedings and mentoring meetings with their mentors that could unfold additional nuances about the process and factors in specific situations. Another context where administrative support enhances the behaviour can be examined to reveal more information on administrative influence on the behaviour by comparing with little administrative support. The faculty members participating in FTM faculty technology integration behavior interview indicated that they had little support from the administrators and no influence of the administrators on the behavior was detected.

6.2. Implications for Practice

Herewith, there are some useful outcomes for all stakeholders in higher education: 1) faculty members had an opportunity to improve themselves on technology integration, and develop adequate skills to help their colleagues or peers on technology integration, 2) administrators can renew their policies to support technology integration of faculty members by eliminating the challenges determined in this study, 3) national policy makers such as national higher education council, etc. can have the chance to update national policies related to higher education by considering the suggestions of the faculty members of this study. Overall there are main stakeholder groups to which the outcomes of this study can be highly related including faculty members, administrators, and national higher education council. The following paragraphs characterize how these stakeholders may utilize results of this study.

6.2.1. Implications for Faculty Members

Initially, the faculty members currently teaching in higher education institutions, no matter they are integrating technology in their courses or not, are the fundamental audience of this study. The results of this study indicate the increase of faculty members' awareness on the importance and usefulness of technology integration into their classrooms with the help of FTM program. Parallel to the main purpose of this study, analysis of the faculty members' technology integration behavior helps them to understand how to gain or develop technology integration behavior. Theoretical framework of this study, DTPB (Taylor & Todd, 1995), gives them some insights them to analyze their current technology integration behavior and renew this behavior with the help of the outcomes of this study. Additionally, artifacts of FTM (FTM webpage, FTM Facebook page) give them the opportunity to analyze, evaluate, emulate, and implement similar practices that are implemented by the faculty members of FTM. Additionally, the faculty members who did not participate in the FTM can expand their views on technology integration and revise their teaching practices with the help of presented information and FTM artifacts. All faculty members are presented with a starting point to shape their own pathway of technology integration into their classrooms.

The faculty members who are novice or expert on technology integration have the possibility to influence, admire, or direct their peers or colleagues on renewal of their teaching practices. They can also create a community of practice to improve their technology integration behavior with the help of the results of this study. In addition to formal mentoring programs, informal mentoring can be encouraged and supported. The dissemination of informal mentoring among faculty members enables friendly and collaborative environment, which empowers organizational culture.

6.2.2. Implications for Administrators in Higher Education Institutions

Secondly, the outcomes of this study can be the starting point by drawing the attention of the administrators or leaders to the importance and necessity of technology integration in higher education institutions. Gaining a better concept of faculty members' technology integration behavior may result in the potential interventions that can promote technology integration into instruction in higher education classrooms. Notably, the administrators play a crucial role in facilitating the environment to support the faculty members' technology integration behavior. Instead of case specific mentoring programs, the university-wide version of the FTM, implemented in this study, can help institutions to develop their own model on faculty technology mentoring. This way, institutions can reorganize themselves for faculty member's professional development on technology with more institutionalized mentoring programs. Moreover, they can organize programs for newcomer in order to both adopt them to the institutional environment and reinforce their technology integration mentality.

The individuals with decision-making power can put account to find the ways to facilitate and encourage technology integration of the faculty members. Evidently, willingness is the propellant for joining the mentoring program, as established in the Chuang, Thompson, and Schmidt (2003) study. There is no encouragement for joining such programs and, no support for technology integration on institutional level in most universities. In order to gain permanence of technology integration into higher education classrooms, faculty members require encouragement, such as incentives, for continuity of technology integration. Besides, the results of this study including the factors affecting faculty members' technology integration behavior inform the administrators to contemplate these factors to encourage the faculty members who have not integrated technology in their classrooms and to promote technology integration behavior of faculty members who are already acclimated. The outcomes of this study pave the ways to revise professional development opportunities, to arrange budget plans for technological support of faculty members, and to arrange technical support and infrastructure related to instructional activities by the administrators.

6.2.3. Implications for Nation-Wide Policy Makers

Finally, the other stakeholder is the nation-wide policy maker. They can prepare new regulations to enhance technology-integrated higher education institutions. By considering the suggestions of this study, the council can reconstitute promotion opportunities of faculty members or the universities by giving incentives or extra financial support to promote technology integration behavior. The results of the study recommend revising the FTM implementation process, transforming the teaching and learning environment with the support of administrators, peers, and students, and increasing the awareness of the faculty members for facilitating essential time, effort and energy to integrate technology. After careful examination of the contributions of FTM programs that promote technology integration in higher education, some of its features and the university in which this revised FTM will be implemented can be listed as:

- Implementing a revised FTM by increasing collaboration among departments to develop interest in technology and enriching mentoring activities with technology training workshops;
- Extending interaction between peers, support from assistants, incentives from administrators, and development of Ph.D. students or teaching assistants who help the faculty members;
- Offering seminars to increase awareness, providing technical support, improving orientation program for newcomer faculty members, sharing

implemented project samples among departments, and analyzing academic courses to identify and meet technology requirements.

REFERENCES

Adams, D. A., Nelson, R. R., & Todd, P. A. (1992). Perceived usefulness, ease of use, and usage of information technology: A replication. *MIS Quarterly*, *16*(2), 227―247. doi: 10.2307/249577.

Admiraal, W., van Vugt, F., Kranenburg, F., Koster, B., Smit, B., Weijers, S., & Lockhorst, D. (2017). Preparing pre-service teachers to integrate technology into K–12 instruction: Evaluation of a technology-infused approach. *Technology, Pedagogy and Education*, *26*(1), 105―120.

Ahmed, E., & Ward, R. (2016). Analysis of factors influencing acceptance of personal, academic and professional development e-portfolios. *Computers in Human Behavior*, *63*, 152―161. doi:10.1016/j.chb.2016.05.043

Ajjan, H., & Hartshorne, R. (2008). Investigating faculty decisions to adopt Web 2.0 technologies: Theory and empirical tests. *The Internet and Higher Education*, *11*(2), 71―80. doi:10.1016/j.iheduc.2008.05.002

Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In J. Kuhl & J. Beckmann (Eds.), *Action control from cognition to behavior* (pp. 11―39). Berlin Heidelberg: Springer.

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, *50*(2), 179―211. doi:10.1016/07495978(91)90020-T

Ajzen, I. (2015). The theory of planned behaviour is alive and well, and not ready to retire: A commentary on Sniehotta, Presseau, and Araújo-Soares. *Health Psychology Review*, *9*(2), 131―137.

Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Engle-wood-Cliffs, N.J.: Prentice-Hall.

Akbaba-Altun, S., Kalayci, E., & Avcı, Ü. (2011). Integrating ICT at the faculty level: A case study. *The Turkish Online Journal of Educational Technology*, *10*(4), 230–240.

Al-Ajlan, A., & Zedan, H. (2008, November). The extension of web services architecture to meet the technical requirements of virtual learning environments (Moodle). In H. M. A. Fahmy, A. M. Wahba, M. W. El-Kharashi, A. M. B. El-Din, M. A. Sobh, & M. Taher (Eds.) *International Conference on Computer Engineering & Systems.* (pp. 27—32). IEEE.

Al-Hattami, A. A., Muammar, O. M., & Elmahdi, I. A. (2013). The need for professional training programs to improve faculty members teaching skills. *European Journal of Research on Education, 1*(2), 39—45.

Al-Otaibi, Y. D., & Houghton, L. (2015). Examining the theoretical factors that influence university students to adopt Web 2.0 technologies: The Australian perspective. *International Journal of Information and Communication Technology Education*, *11*(1), 1—26. doi: 10.4018/ijicte.2015010101

Allen, T. D., Eby, L. T., & Lentz, E. (2006). The relationship between formal mentoring program characteristics and perceived program effectiveness. *Personnel Psychology, 59*(1), 125—153. doi: 10.1111/j.17446570.2006.007 47.x

Altın, N. (2004). *Eğitim programları ve öğretim alanında yapılan yüksek lisans tezlerinin analizi (Ankara, Gazi ve Hacettepe Üniversitesi)* [An analysis of research conducted on curriculum and instruction (Ankara, Gazi, and Hacettepe University)]. Unpublished Master Thesis, Ankara University, Ankara.

Ambrosetti, A., & Dekkers, J. (2010). The interconnectedness of the roles of mentors and mentees in pre-service teacher education mentoring relationships. *Australian Journal of Teacher Education*, *35*(6), 42—55.

Amoako-Gyampah, K. (2007). Perceived usefulness, user involvement and behavioral intention: An empirical study of ERP implementation. *Computers in Human Behavior*, *23*(3), 1232—1248. doi: 10.1016/j.chb.2004.12.002

Anastasi, A. (1982). *Psychological testing*. New York: Macmillan.

Armitage, C. J., & Conner, M. (2001). Efficacy of the theory of planned behavior: A meta-analytic review. *British Journal of Social Psychology*, *40*(4), 471—499. doi: 10.1348/014466601164939

Atsoglou, K., & Jimoyiannis, A. (2012). Teachers' decisions to use ICT in classroom practice: An investigation based on decomposed theory of planned behavior. *International Journal of Digital Literacy and Digital Competence, 3*(2), 20—37. doi: 10.4018/jdldc.2012040102

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, *84*(2), 191—215.

Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist*, *37*(2), 122—147.

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

Baran, E. (2016a). Examining the benefits of a faculty technology mentoring program on graduate students' professional development. J*ournal of Digital Learning in Teacher Education*, *32*(3), 95—104. doi: 10.1080/21532974.2016.1169958

Baran, E. (2016b). Investigating faculty technology mentoring as a university-wide professional development model. *Journal of Computing in Higher Education*, *28*(1), 45—71. doi:10.1007/s12528-015-9104-7

Barczyk, C., Buckenmeyer, J., & Feldman, L. (2010). Mentoring professors: A model for developing quality online instructors and courses in higher education. *International Journal on E-Learning*, *9*(1), 7—26.

Bariso, E. U. (2003). The computer revolution: Friend or foe to FE college staff. *British Journal of Educational Technology*, *34*(1), 85—88. doi: 10.1111/1467-8535.00308

Bate, F. (2010). A bridge too far? Explaining beginning teachers' use of ICT in Australian schools. *Australasian Journal of Educational Technology*, *26*, 1042—1061. doi: 10.14742/ajet.1033

Bauer, J., & Kenton, J. (2005). Toward technology integration in the schools: Why it isn't happening. *Journal of Technology and Teacher Education*, *13*(4), 519—546.

Bayır, E. A. ve Ertas, H. (2010). *Aksaray Üniversitesi Öğretim Elemanlarının Bilgisayar Özyeterlilik Algıları [Faculty members' perceptions on computer self-efficacy at Aksaray University]*. 19. Eğitim Bilimleri Kurultayı. Uluslarası Kıbrıs Üniversitesi.

Bean, N. M., Lucas, L., & Hyers, L. L. (2014). Mentoring in higher education should be the norm to assure success: Lessons learned from the faculty mentoring program, West Chester University, 2008–2011. *Mentoring & Tutoring: Partnership in Learning*, *22*(1), 56―73.

Beaudin, L. C. (2002). *Bernard Lonergan's notions of authenticity and technology integration* (Unpublished doctoral dissertation). University of Calgary, Calgary, Alia, Canada.

Bernardo, V., Ramos, M. P., Plapler, H., de Figueiredo, L. F. P., Nader, H. B., Anção, M. S., ... & Sigulem, D. (2004). Web-based learning in undergraduate medical education: development and assessment of an online course on experimental surgery. *International Journal of Medical Informatics*, *73*(9), 731–742.

Beyene, T., Anglin, M., Sanchez, W., & Ballou, M. (2002). Mentoring and relational mutuality: Proteges' perspectives. *The Journal of Humanistic Counseling*, *41*(1), 87―102.

Bhagat, K. K., Wu, L. Y., & Chang, C. Y. (2016). Development and validation of the perception of students towards online learning (POSTOL). *Journal of Educational Technology & Society*, *19*(1), 350―359.

Bitner, N., & Bitner, J. (2002). Integrating technology into the classroom: Eight keys to success. *Journal of Technology and Teacher Education*, *10*(1), 95―100.

Boice, R. (1992). *The new faculty member: Supporting and fostering professional development*. San Francisco: Jossey-Bass.

Boulay, R. A., & Fulford, C. P. (2009). Technology mentoring: Research results across seven campuses. In A. Tatnall & A. Jones (Eds.), *Education and technology for a better world* (pp. 273―281). Berlin Heidelberg: Springer. doi: 10.1007/978-3-642-03115-1_29

Briggs, N. E., & MacCallum, R. C. (2003). Recovery of weak common factors by maximum likelihood and ordinary least squares estimation. *Multivariate Behavioral Research*, *38*(1), 25―56. doi:10.1207/S15327906MBR3801_2

Brinkerhoff, J. (2006). Effects of a long-duration, professional development academy on technology skills, computer self-efficacy, and technology integration beliefs and practices. *Journal of Research on Technology in Education*, *39*(1), 22―43. doi:10.1080/15391523.2006.10782471

Britten, J.S. & Craig, P. (2006). Developing contextualized faculty training: Faculty development to support university-wide digital portfolio initiatives. *College Quarterly*, *9*(2). Retrieved from http://www.eric.ed.gov/ERICWebPortal/contentdelivery/servlet/ERICServlet?accno=EJ835401

Brock, T. R., & Holtschneider, M. (2015). Simulation Operations, Curriculum Integration, and Performance Improvement. In L.T. Gantt & H. M. Young (Eds.), *Healthcare simulation: A Guide for operations specialists* (pp. 56―77). New Jersey: John Wiley & Sons, Inc.

Brown, J. D. (2009). Principal components analysis and exploratory factor analysis–definitions, differences, and choices. *Shiken: JALT Testing & Evaluation SIG Newsletter*, *13*(1), 26―30.

Buabeng-Andoh, C. (2012). Factors influencing teachers' adoption and integration of information and communication technology into teaching: A review of the literature. *International Journal of Education and Development Using Information and Communication Technology*, *8*(1), 136―155.

Buchanan, T., Sainter, P., & Saunders, G. (2013). Factors affecting faculty use of learning technologies: Implications for models of technology adoption. *Journal of Computing in Higher Education*, *25*(1), 1―11. doi: 10.1007/s12528-013-9066-6

Butler, D. L., & Sellbom, M. (2002). Barriers to adopting technology. *Educause Quarterly*, *2*, 22―28.

Butler, T., & Chao, T. (2001). Partners for change students as effective technology mentors. *Active Learning in Higher Education*, *2*(2), 101―113. doi: 10.1177/1469787401002002002

Cagıltay, K., Yıldırım, S., Aslan, İ., Gök, A., Gürel, G., Karakuş, T., ... & Yıldız, İ. (2007). Öğretim teknolojilerinin üniversitede kullanımına yönelik alışkanlıklar ve beklentiler: Betimleyici bir çalışma [Habits and expectations toward using educational technologies at university: A descriptive study]. *Akademik Bilişim'07-IX. Akademik Bilişim Konferansı, Dumlupınar Üniversitesi, Kütahya*.

Campbell, T. (1996). Technology, multimedia, and qualitative research in education. *Journal of Research on Computing in Education, 30*(9), 122—133. doi:10.1080/08886504. 1997.10782219

Capo, B. H., & Orellana, A. (2011). Web 2.0 technologies for classroom instruction: High school teachers' perceptions and adoption factors. *Quarterly Review of Distance Education, 12*(4), 235—253.

Cattell, R. B. (1966). The scree test for the number of factors. *Multivariate Behavioral Research*, *1*(2), 245—276. doi:10.1207/s15327906mbr0102_10

Celik, L. (2010). Evaluation of the views of pre-service teachers taught with Moodle during the course named "Instructional Technology and Material Design" on the use of teaching materials. *Procedia-Social and Behavioral Sciences, 9*, 1793–1797.

Chan, L. K. J. (2014). *Validating the college student mentoring scale (CSMS) for a peer mentoring program in higher education: An exploratory study in Hong Kong| NOVA*. (Doctoral dissertation). Retrieved from http://nova.newcastle .edu.au /vital/access/ manager/Repository/uon:19762

Cheon, J., Coward, F., Song, J., & Lim, S. (2012). Factors predicting pre-service teachers' adoption of web 2.0 technologies. *Research in the Schools*, *19*(2), 17—29.

Cheon, J., Lee, S., Crooks, S. M., & Song, J. (2012). An investigation of mobile learning readiness in higher education based on the theory of planned behavior. *Computers & Education*, *59*(3), 1054—1064. doi: 10.1016/j. compedu.2012.04.015

Chiang, F. K., Wuttke, H. D., Knauf, R., Sun, C. S., & Tso, T. C. (2011). Attitudes of German university students towards the integration of innovation information technology. *International Journal of Engineering Education, 27*(2), 431—446.

Chompu-Inwai, R., & Doolen, T. L. (2008). The impact of mobile wireless technology on student attitudes in higher education classrooms. *International Journal of Engineering Education, 24*(1), 14—22. doi: 10.1016/0949-149X/91

Christensen, R. (2002). Effects of technology integration education on the attitudes of teachers and students. *Journal of Research on Technology in Education*, *34*(4), 411—433.

Chuang, H. H., Thompson, A., & Schmidt, D. (2003). Faculty technology mentoring programs: Major trends in the literature. *Journal of Computing in Teacher Education, 19*(4), 101—106. doi: 10.1080/10402454.2003.10784472

Chung, A., & Rimal, R. N. (2016). Social norms: A review. *Review of Communication Research*, *4*, 1—28.

Cigdem, H., & Topcu, A. (2015). Predictors of instructors' behavioral intention to use learning management system: A Turkish vocational college example. *Computers in Human Behavior*, *52*, 22—28. doi: 10.1016/j.chb. 2015.05.049

Clegg, T. L., Gardner, C., & Kolodner, J. (2011). Technology for supporting learners in out-of-school learning environments. In A. Dimitracopoulou, C. O'Malley, D. Suthers, & P. Reinmann (Eds.), *Proceedings of the 9th International Conference of Computer-Supported Collaborative Learning* (Vol. 1). (pp. 248—255).

Compeau, D. R., & Higgins, C. A. (1995). Computer self-efficacy: Development of a measure and initial test. *MIS Quarterly*, 189—211.

Cook, R. G., Ley, K., Crawford, C., & Warner, A. (2009). Motivators and inhibitors for university faculty in distance and e-learning. *British Journal of Educational Technology*, *40*(1), 149—163. doi: 10.1111/j.1467-8535.2008. 00845.x

Creswell, J. W. (2008). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (3rd ed.). Upper Saddle River, NJ: Pearson, Merrill, Prentice Hall.

Creswell, J. W., & Clark, V. L. P. (2011). *Designing and conducting mixed methods research*. London: Sage Publications.

Creswell, J. W., Plano Clark, V. L., Gutmann, M. L., & Hanson, W. E. (2003). Advanced mixed methods research designs. In A. Tashakkori & C. Teddlie (Eds.) *Handbook of mixed methods in social and behavioral research* (pp. 209—240). London: Sage Publications.

Cuban, L., Kirkpatrick, H., & Peck, C. (2001). High access and low use of technologies in high school classrooms: Explaining an apparent paradox. *American Educational Research Journal*, *38*(4), 813—834. doi: 10.3102/00028312038004813

Cuban. L. (2001). *Oversold and underused: Computers in the classroom*. Cambridge, MA: Harvard University Press.

Cudeck, R. (2000). Exploratory factor analysis. In H. E. Tinsley & S. D. Brown (Eds.). *Handbook of applied multivariate statistics and mathematical modeling* (pp: 265—296). San Diego, California: Academic Press.

Cullen, T. A., & Greene, B. A. (2011). Preservice teachers' beliefs, attitudes, and motivation about technology integration. *Journal of Educational Computing Research*, *45*(1), 29—47. doi: 10.2190/EC.45.1.b

Czerniak, C., Lumpe, A., Haney, J., & Beck, J. (1999). Teachers’ beliefs about using educational technology in the science classroom. *International Journal of Educational Technology, 1*(2), 1—18.

Dalal, M., Archambault, L., Robles, R., & Reed, A. (2017, March). Examining perceptions and decision-making related to technology integration in the common core high school classroom. In P. Resta & S. Smith (Eds.), Society for Information Technology & Teacher Education International Conference (pp. 2302—2310). Association for the Advancement of Computing in Education (AACE).

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

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, *13*(3), 319―340.

Dawson, P. (2014). Beyond a definition: Toward a framework for designing and specifying mentoring models. *Educational Researcher*, *43*(3), 137–145.

de Hei, M., Strijbos, J. W., Sjoer, E., & Admiraal, W. (2016). Thematic review of approaches to design group learning activities in higher education: The development of a comprehensive framework. *Educational Research Review*, *18*, 33―45.

Deaney, R., Ruthven, K., & Hennessy, S. (2003). Pupil perspectives on the contribution of information and communication technology to teaching and learning in the secondary school. *Research Papers in Education*, *18*(2), 141―165. doi:10.1080/02671520320 00081913

Denton, J. J., Davis, T. J., Smith, B. L., Strader, R. A., Clark, F. E., & Wang, L. (2004). Net Generation Undergraduates as Technology Mentors for Teacher Educators. *e-Education Group*. Retrieved from http://files.eric.ed.gov/fulltext/ ED503456.pdf

Denzin, N. K. (1978). *Sociological methods: A sourcebook*. Chicago: McGraw-Hill.

Desimone, L. M., & Garet, M. S. (2015). Best practices in teachers' professional development in the United States. *Psychology, Society and Education*, *7*(3), 252―263.

Dey, I. (2003). *Qualitative data analysis: A user friendly guide for social scientists*. Newyork: Routledge.

Diatmika, I. W. B., Irianto, G., & Baridwan, Z. (2016). Determinants of behavior intention of accounting information systems based information technology acceptance. *Imperial Journal of Interdisciplinary Research*, *2*(8), 125―138.

Donegan, M. M., Ostrosky, M. M., & Fowler, S. A. (2000). Peer coaching: Teachers supporting teachers. *Young Exceptional Children*, *3*(9), 9–16.

Earle, R. S. (2002). The integration of instructional technology into public education: Promises and challenges. *Educational Technology*, *42*(1), 5—13.

Ehrich, L. C., Hansford, B., & Tennent, L. (2004). Formal mentoring programs in education and other professions: A review of the literature. *Educational Administration Quarterly*, *40*(4), 518—540. doi: 10.1177/0013161X04267118

Ellis, R. A. (2004). *Faculty development to help preservice educators model the integration of technology in the classroom: Perspectives from an action research case study* (Unpublished doctoral dissertation). Retrieved from http://lib.dr.iastate.edu/rtd/774/

Ertmer, P. A. (1999). Addressing first-and second-order barriers to change: Strategies for technology integration. *Educational Technology Research and Development*, *47*(4), 47—61. doi: 10.1007/BF02299597

Ertmer, P. A. (2005). Teacher pedagogical beliefs: The final frontier in our quest for technology integration?. *Educational Technology Research and Development*, *53*(4), 25—39. doi: 10.1007/BF02504683.

Ertmer, P. A., Ottenbreit-Leftwich, A., & York, C. S. (2006). Exemplary technology-using teachers: Perceptions of factors influencing success. *Journal of Computing in Teacher Education, 23*(2), 55—61. doi: 10.1080/10402454. 2006.10784561.

Fabrigar, L. R., Wegener, D. T., MacCallum, R. C., & Strahan, E. J. (1999). Evaluating the use of exploratory factor analysis in psychological research. *Psychological Methods*, *4*(3), 272—299. doi: 10.1037/1082-989X.4.3.272

Fabry, D. L., & Higgs, J. R. (1997). Barriers to the effective use of technology in education: Current status. *Journal of Educational Computing Research*, *17*(4), 385—395. doi: 10.2190/C770-AWA1-CMQR-YTYV

Field, A. (2013). *Discovering statistics using IBM SPSS statistics.* Sage Publications.

Findik-Coskuncay, D., & Ozkan, S. (2013). A Model for Instructors' Adoption of Learning Management Systems: Empirical Validation in Higher Education Context. *Turkish Online Journal of Educational Technology, 12*(2), 13—25.

Fishbein, M. E. (1967). *Readings in attitude theory and measurement*. Oxford, England: Wiley.

Fishbein, M., & Ajzen, I. (1977). Belief, attitude, intention, and behavior: An introduction to theory and research. *Journal of Bussiness Venuring, 5,* 177—189.

Fraenkel, W., Wallen, N.E., & Hyun, H. H. (2012). *How to design and evaluate research in education.* McGraw-Hill Higher Education.

Gabriel, M. A., & Kaufield, K. J. (2008). Reciprocal mentorship: An effective support for online instructors. *Mentoring & Tutoring: Partnership in Learning*, *16*(3), 311—327. doi: 10.1080/13611260802233480

Garrison, D. R., & Vaughan, N. D. (2013). Institutional change and leadership associated with blended learning innovation: Two case studies. *The Internet and Higher Education*, *18,* 24—28. doi: 10.1016/j.iheduc.2012.09.001

Gautreau, C. (2011). Motivational factors affecting the integration of a learning management system by faculty. *Journal of Educators Online*, *8*(1), 1—25.

Georgina, D. A., & Hosford, C. C. (2009). Higher education faculty perceptions on technology integration and training. *Teaching and Teacher Education*, *25*(5), 690—696. doi: 10.1016/j.tate.2008.11.004

Georgina, D. A., & Olson, M. R. (2008). Integration of technology in higher education: A review of faculty self-perceptions. *The Internet and Higher Education*, *11*(1), 1—8. doi: 10.1016/j.iheduc.2007.11.002

Gross, D., Truesdale, C., & Bielec, S. (2001). Backs to the wall: Supporting teacher professional development with technology. *Educational Research and Evaluation*, *7*(2-3), 161–183.

Grossman, J. B., Chan, C., Schwartz, S. E. O., & Rhodes, J. E. (2012). The test of time in school-based mentoring: The role of relationship duration and re-matching on academic outcomes. *American Journal of Community Psychology*, *49*, 43–54.

Grove, K., Strudler, N., & Odell, S. (2007). Assessing technology integration in mentoring practices during student teaching: Multi-case analyses.

International Journal of Technology in Teaching and Learning Education, 3(1), 66—82.

Groves, M. M., & Zemel, P. C. (2000). Instructional technology adoption in higher education: An action research case study. *International Journal of Instructional Media, 27*(1), 57—65.

Guilford, J. P. (1954). *Psychometric methods* (2nd ed.). New York: McGraw-Hill.

Gulbahar, Y. (2008). ICT usage in higher education: A case study on preservice teachers and instructors. *The Turkish Online Journal of Educational Technology,* 7(1), 32–37.

Gunuc, S. (2015). Implementation and evaluation of technology mentoring program developed for teacher educators: A 6M-framework. *Qualitative Research in Education, 4*(2), 164—191. doi: 10.17583/qre.2015.1305

Hair, J., Black, W., Babin, B., & Anderson, R. (2010). *Multilevel data analysis: A global perspective* (7th ed.). Upple Saddle River, NJ: Pearson.

Hall, M., & Elliott, K. M. (2003). Diffusion of technology into the teaching process: Strategies to encourage faculty members to embrace the laptop environment. *Journal of Education for Business, 78*(6), 301—307. doi:10. 1080/08832320309598617

Hammond, M. (2014). Introducing ICT in schools in England: Rationale and consequences. *British Journal of Educational Technology, 45*(2), 191—201. doi: 10.1111/bjet.12033

Han, J., Pei, J., & Kamber, M. (2012). *Data mining: Concepts and techniques* (3rd ed.). Waltham, MA: Elsevier.

Hartshorne, R., & Ajjan, H. (2009). Examining student decisions to adopt Web 2.0 technologies: Theory and empirical tests. *Journal of Computing in Higher Education, 21*(3), 183—198. doi: 10.1007/s12528-009-9023-6.

Haydn, T. A., & Barton, R. (2007). Common needs and different agendas: How trainee teachers make progress in their ability to use ICT in subject teaching. Some lessons from the UK. *Computers & Education, 49*(4), 1018—1036. doi: 10.1016/j.compedu. 2005.12.006

Haynes, S. N., Richard, D., & Kubany, E. S. (1995). Content validity in psychological assessment: A functional approach to concepts and methods. *Psychological Assessment*, *7*(3), 238–247. doi:10.1037/10403590.7. 3.238

Henrikson, F., Johansen, K., Wever, R., & Berry, P. (2016). Student-developed laboratory exercises-An approach to cross-disciplinary peer education. *DS 85-2: Proceedings of NordDesign (Vol. 2), Trondheim, Norway*. (pp. 226–235).

Hew, K. F., & Brush, T. (2007). Integrating technology into K-12 teaching and learning: Current knowledge gaps and recommendations for future research. *Educational Technology Research and Development*, *55*(3), 223―252. doi: 10.1007/s11423-006-9022-5

Hicks, T. L. (2016). *Community college full-time faculty members' intentions to integrate audio or video technology into their Instruction: A Qualitative Study* (Unpublished doctoral dissertation). Retrieved from ProQuest (Document ID: 1873478355)

Hismanoglu, M. (2012). Prospective EFL teachers' perceptions of ICT integration: A study of distance higher education in turkey. *International Forum of Educational Technology & Society*. *15*(1). 185–196

Hofer, M., Bell, L. (2015). Introduction. In M. J., Hofer, L., Bell, & G. Bull, (Eds.) *Practitioner's guide to technology, pedagogy, and content knowledge (TPACK): Rich media cases of teacher knowledge* (pp. 1―8). AACE, Waynesville, NC, USA.

Hopson, M. H., Simms, R. L., & Knezek, G. A. (2001). Using a technology-enriched environment to improve higher-order thinking skills. *Journal of Research on Technology in education*, *34*(2), 109–119.

Hsu, M. H., & Chiu, C. M. (2004). Internet self-efficacy and electronic service acceptance. *Decision Support Systems*, *38*(3), 369―381. doi: 10.1016/j.dss. 2003.08.001

Huang, E., & Chuang, M. H. (2007). Extending the theory of planned behaviour as a model to explain post-merger employee behaviour of IS use. *Computers in Human Behavior*, *23*(1), 240–257.

Hung, H. T., & Yuen, S. C. Y. (2010). Educational use of social networking technology in higher education. *Teaching in Higher Education*, *15*(6), 703—714. doi: 10.1080/ 13562517.2010.507307

Hung, W. C., & Jeng, I. (2013). Factors influencing future educational technologists' intentions to participate in online teaching. *British Journal of Educational Technology*, *44*(2), 255—272. doi: 10.1111/j.1467-8535.2012.01294.x

Hutcheson, G. D., & Sofroniou, N. (1999). *The multivariate social scientist: Introductory statistics using generalized linear models*. London: Sage Publications.

Inan, F. A., & Lowther, D. L. (2010). Factors affecting technology integration in K-12 classrooms: A path model. *Educational Technology Research and Development, 58*(2), 137—154. doi: 10.1007/s11423-009-9132-y.

International Society for Technology in Education (ISTE). (2002). *Educational computing and technology standards*. Retrieved from http://cnets.iste.org/ programreview

Johnson, L., Adams Becker, S., Estrada, V., & Freeman, A. (2015). *The NMC horizon report: 2015 museum edition*. Austin, Texas: The New Media Consortium.

Johnson, W. B. (2015). *On Being a Mentor: A Guide for Higher Education Faculty*. Newyork: Routledge.

Judge, S., & O'Bannon, B. (2008). Faculty integration of technology in teacher preparation: Outcomes of a development model. *Technology, Pedagogy and Education, 17*(1), 17—28. doi: 10.1080/14759390701847435.

Kafyulilo, A., Fisser, P., & Voogt, J. M. (2014, March). Determinants of the sustainability of teacher design teams as a professional development arrangement for developing technology integration knowledge and skills. In M. Searson & M. N. Ochoa (Eds.) *Proceedings of Society for Information Technology & Teacher Education International Conference* (pp. 2130—2136).

Kaiser, H. F. (1960). The application of electronic computers to factor analysis. *Educational and Psychological Measurement, 20*(1), 141―151. doi: 10.1177/001316446002 000116

Kaiser, H. F. (1974). An index of factorial simplicity. *Psychometrika*, *39*(1), 31-36. doi: 10.1007/BF02291575

Kane, R. T., Shaw, M., Pang, S., Salley, W., & Snider, J. B. (2016). Faculty professional development and student satisfaction in online higher education. *Online Journal of Distance Learning Administration*, *19*(2), 1―12.

Keengwe, J., Onchwari, G., & Wachira, P. (2008). Computer technology integration and student learning: Barriers and promise. *Journal of Science Education and Technology*, *17*(6), 560―565. doi: 10.1007/s10956-008-9123-5.

Kerlinger, F. N. (1973). *Foundations of behavioral research: Educational, psychological and sociological inquiry*. Newyork: Holt Rinehart and Winston. doi:10.1598/JAAL.52.7.6.

Keyser, D. J., Lakoski, J. M., Lara-Cinisomo, S., Schultz, D. J., Williams, V. L., Zellers, D. F., & Pincus, H. A. (2008). Advancing institutional efforts to support research mentorship: A conceptual framework and self-assessment tool. *Academic Medicine*, *83*(3), 217―225. doi: 10.1097/ACM.0b13e3181637

Kilinc, A., Ertmer, P., Bahcivan, E., Demirbag, M., Sonmez, A. & Ozel, R. (2016). Factors influencing Turkish preservice teachers' intentions to use educational technologies and mediating role of risk perceptions. *Journal of Technology and Teacher Education*, *24*(1), 37―62.

Kim, C., Kim, M. K., Lee, C., Spector, J. M., & DeMeester, K. (2013). Teacher beliefs and technology integration. *Teaching and Teacher Education*, *29*, 76―85. doi:10.1016/ j.tate.2012.08.005

Kirkwood, A., & Price, L. (2013). Missing: Evidence of a scholarly approach to teaching and learning with technology in higher education. *Teaching in Higher Education*, *18*(3), 327―337. doi: 10.1080/13562517.2013.773419

Koehler, M. J., Mishra, P., Hershey, K., & Peruski, L. (2004). With a little help from your students: A new model for faculty development and online course design. *Journal of Technology and Teacher Education*, *12*(1), 25—55.

Kopcha, T. J., Rieber, L. P., & Walker, B. B. (2015). Understanding university faculty perceptions about innovation in teaching and technology. *British Journal of Educational Technology, 47*(5), 945—957. doi: 10.1111/bjet. 12361.

Krippendorff, K. (2004). *Content analysis: An introduction to its methodology*. California: Sage Publications.

Kucuk, S., Aydemir, M., Yildirim, G., Arpacik, O., & Goktas, Y. (2013). Educational technology research trends in Turkey from 1990 to 2011. *Computers & Education*, *68*, 42–50.

Kurtts, S, A. & Levin, B. B. (2000). Using peer coaching with pre-service teachers to develop reflective practice and collegial support. *Teaching Education*, *11*(3), 297—309. doi: 10.1080/713698980.

Kurubacak, G. (2006). Turkish K12 teachers' intentions toward new communicational technologies: Building an effective technology plan via the theory of planned behavior. *Journal on School Educational Technology*, *1*(3), 45—60.

Kvale, S. (2008). *Doing interviews*. London: SAGE Publications.

Larson, L. (2009). A descriptive study of mentoring and technology integration among teacher education faculty. *International Journal of Evidence Based Coaching and Mentoring, 7*(1), 119—135.

Latane, B. (1981). The Psychology of social impact. *American Psychologist*, *36*(4), 343—356.

Lawless, K., & Pellegrino, J. (2007). Professional development in integrating technology into teaching and learning: Knowns, unknowns and ways to pursue better questions and answers. *Review of Educational Research*, *77*(4), 575-614. doi: 10.3102/00346543 07309921.

Lawley, D. N. (1971). *Factor analysis as statistical method* (2nd ed.) London: Butterworth.

Layne, J., Froyd, J., Morgan, J., & Kenimer, A. (2002, November). Faculty learning communities. In *32nd Annual Frontiers in Education*: Vol. 2, (pp. 13-18). IEEE. Retrieved from http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=1158114

Lee, J., Cerreto, F. A., & Lee, J. (2010). Theory of planned behavior and teachers' decisions regarding use of educational technology. *Educational Technology and Society*, *13*(1), 152–164.

Lee, M. C. (2009). Factors influencing the adoption of internet banking: An integration of TAM and TPB with perceived risk and perceived benefit. *Electronic Commerce Research and Applications*, *8*(3), 130—141. doi: 10.1016/j.elerap.2008.11.006.

Leh, A. S. (2005). Lessons learned from service learning and reverse mentoring in faculty development: A case study in technology training. *Journal of Technology and Teacher Education, 13*(1), 25—41.

Lim, W. Y., Lee, Y. J., & Hung, D. (2008). "A prophet never accepted by their own town": A teacher's learning trajectory when using technology. *Asia-Pacific Journal of Teacher Education*, *36*(3), 215—227.

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. London: Sage Publication.

Lumpkin, A. (2011). A model for mentoring university faculty. *The Educational Forum, 75*(4), 357–368. doi:10.1080/00131725.2011.602466

Ma, W. W. K., Anderson, R., & Streith, K. O. (2005). Examining user acceptance of computer technology: An empirical study of student teachers. *Journal of Computer Assisted Learning*, *21*(6), 387—395. doi: 10.1111/j.1365-2729.2005.00145.x

MacCallum, R. C., Widaman, K. F., Zhang, S., & Hong, S. (1999). Sample size in factor analysis. *Psychological methods*, *4*(1), 84—99. doi: 10.1037/1082-989X.4.1.84

Mak, J. Y., & Ross, C. M. (2003). Using the theory of planned behavior to predict leisure educators' intentions to use instructional technology. *Leisure/Loisir, 28*(3-4), 307—328. doi: 10.1080/14927713.2003.9651317

Manning, M. (2009). The effects of subjective norms on behaviour in the theory of planned behaviour: A meta-analysis. *British Journal of Social Psychology, 48*(4), 649–705.

Massey, W. F., & Zemsky, R. (1995). Using information technology to enhance academic productivity. *EDUCOM NLII White Paper*. Retrieved from https://net.educause.edu/ir/ library/html/nli0004.html

McLaughlin, C. (2010). Mentoring: What is it? How do we do it and how do we get more of it?. *Health Services Research*, *45*(3), 871—884. doi: 10.1111/j.1475-6773.2010.01090.x

Merriam, S. B. (1998). *Qualitative research and case study applications in education, revised and expanded from "Case study research in education"*. San Francisco, CA: Jossey-Bass Publishers.

Mertler, C. A., & Vannatta, R. A. (2005). *Advanced and multivariate statistical methods*. Glendale: Routledge.

Miles, M. B., & Huberman, A. M. (1984). *Qualitative data analysis: A sourcebook of new methods*. Newbury Park, CA: Sage Publications.

Mishra, P., & Koehler, M. J. (2003). Not "what" but "how": Becoming design-wise about educational technology. In Y. Zhao (Edt.), *What teachers should know about technology: Perspectives and practices* (pp. 122—151.). Connecticut: Information Age Publication.

Mohammadzadeh, M., Farzaneh, J., & Mousavi, M. (2012). Challenges And Strategies For E-Learning Development In The Payame Noor University Of Iran. *Turkish Online Journal of Distance Education*, *13*(1), 148–159.

Mokhtari, K., Reichard, C. A., & Gardner, A. (2009). The impact of Internet and television use on the reading habits and practices of college students. *Journal of Adolescent & Adult Literacy*. *52*(7), 609–619.

Montano, D. E., & Kasprzyk, D. (2015). Theory of reasoned action, theory of planned behavior, and the integrated behavioral model. In K. Glanz, B. K. Rimer, & K. Viswanath (Eds.), *Health behavior: Theory, research and practice* (5th edt.) (pp. 95—124) San Francisco, CA.: Wiley & Sons, Inc.

Mouza, C. (2002). Learning to teach with new technology: Implications for professional development. *Journal of Research on Computing in Education, 35*(2), 272—289. doi: 10.1080/15391523.2002.10782386

Muilenburg, L. Y., & Berge, Z. L. (2015). Revisiting teacher preparation: responding to technology transience in the educational setting. *Quarterly Review of Distance Education*, *16*(2), 93—105.

Natividad, G., Mayes, R., & Spector, J. M. (2015). Balancing stable educational goals with changing educational technologies: Challenges and opportunities. *E-mentor, 1,* 83—94.

Nellis, M. D. (2017). Transitions in US higher education: Implications for geography learning. *Journal of Geography in Higher Education*, *41*(2), 155—165. doi: 10.1080/03098265.2017.1293018

Nguyen, L. V. (2008). Technology-enhanced EFL syllabus design and materials development. *English Language Teaching, 1*(2), 135—142. doi: 10.5539/elt.v1n2p135

Norris, C., Smolka, J., & Soloway, E. (2000). Extracting value from research: A guide for the perplexed. *Technology & Learning*, *20*(11), 45—48.

Nunnally, J. C. (1978). *Psychometric theory,* New York: McGraw-Hill.

Ocak, M. A. (2011). Why are faculty members not teaching blended courses? Insights from faculty members. *Computers & Education*, *56*(3), 689—699. doi: 10.1016/j.compedu.2010.10.011

Olapiriyakul, K., & Scher, J. M. (2006). A guide to establishing hybrid learning courses: Employing information technology to create a new learning experience, and a case study. *The Internet and Higher Education*, *9*(4), 287–301.

Oliveira, T., & Martins, M. F. (2011). Literature review of information technology adoption models at firm level. *The Electronic Journal Information Systems Evaluation, 14*(1), 110—121.

Oliver, K. (2007). Leveraging web 2.0 in the redesign of a graduate level technology integration course. *TechTrends: Linking Research and Practice to Improve Learning, 51*(5), 55–61. doi: 10.1007/s11528-007-0071-3

Onwuegbuzie, A., Teddlie, C. (2003). A framework for analyzing data in mixed methods research. In A. Tashakkori & C. Teddlie (Eds.), *Handbook of mixed methods in social & behavioural research*, (pp. 351—383). London: Sage Publications.

Orpen, C. (1997). The effects of formal mentoring on employee work motivation, organizational commitment and job performance, *Learning Organization, 4*(2), 53—60. doi: 10.1108/09696479710160906

Osborne, J. W., & Costello, A. B. (2009). Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis. *Pan-Pacific Management Review, 12*(2), 131—146.

Oshagbemi, T. (2000). How satisfied are academics with their primary tasks of teaching, research and administration and management?. *International Journal of Sustainability in Higher Education, 1*(2), 124—136. doi: 10.1108/1467630010371876

Pajo, K., & Wallace, C. (2001). Barriers to the uptake of web-based technology by university teachers. *Journal of Distance Education, 16*(1), 70—84.

Pamuk, S. (2008). *Faculty technology mentoring: How graduate student mentors benefit from technology mentoring relationship* (Unpublished doctoral dissertation). Retrieved from ProQuest (Document ID: 304636138).

Pamuk, S., & Thompson, A. D. (2009). Development of a technology mentor survey instrument: Understanding student mentors' benefits. *Computers & Education, 53*(1), 14—23. doi: http://dx.doi.org/10.1016/j.compedu.2008.12.017

Patton, K., Griffin, L. L., Sheehy, D., Arnold, R., Gallo, A. M., Pagnano, K., ... & James, A. (2005). Chapter 2: Navigating the mentoring process in a research-based teacher development project: A situated learning perspective. *Journal of Teaching in Physical Education, 24*(4), 302—325. doi: http://dx.doi.org/10.1123/jtpe.24.4.302

Patton, M. Q. (2002). *Qualitative research and evaluation methods* (3rd ed.). Thousand Oaks, CA: Sage Publications.

Paver, J. D. (2012). *Factors Influencing the Integration of Technology by Community College Adjunct Faculty* (Unpublished doctoral dissertation). Retrieved from ProQuest (Document ID: 1294267898)

Paver, J., Walker, D. A., & Hung, W. C. (2014). Factors that predict the integration of technology for instruction by community college adjunct faculty. *Community College Journal of Research and Practice, 38*(1), 68—85. doi: 10.1080/10668926.2013. 799449

Pavlou, P., & Fygenson, M. (2006). Understanding a predicting electronic commerce adoption: An extension of the theory of planned behavior. *MIS Quarterly, 30*(1), 115—143.

Peluchette, J. V., & Rust, K. A. (2005). Technology use in the classroom: Preferences of management faculty members. *Journal of Education for Business, 80*(4), 200—205. doi: http://dx.doi.org/10.3200/JOEB.80.4.200-205

Pierce, R., & Ball, L. (2009). Perceptions that may affect teachers’ intention to use technology in secondary mathematics classes. *Educational Studies in Mathematics, 71*(3), 299—317. doi: 10.1007/s10649-008-9177-6.

Pierson, M. E. (2001). Technology integration practice as a function of pedagogical expertise. *Journal of Research on Computing in Education, 33*(4), 413—430. doi: 10.1080/ 08886504.2001.10782325

Porter, W. W., Graham, C. R., Spring, K. A., & Welch, K. R. (2014). Blended learning in higher education: Institutional adoption and implementation. *Computers & Education, 75*, 185-195.

Poulsen, K. M. (2013). Mentoring programs: Learning opportunities for mentees, for mentors, for organizations and for society. *Industrial and Commercial Training, 45*(5), 255―263.

Prensky, M. (2001). Digital natives, digital immigrants (Part 1). *On the Horizon, 9*(5), 1―6. doi: 10.1108/10748120110734687

Pynoo, B., Tondeur, J., Van Braak, J., Duyck, W., Sijnave, B., & Duyck, P. (2012). Teachers' acceptance and use of an educational portal. *Computers & Education, 58*(4), 1308―1317. doi: 10.1016/j.compedu.2011.12.026

Quintana, M. G. B., & Zambrano, E. P. (2014). E-mentoring: The effects on pedagogical training of rural teachers with complex geographical accesses. *Computers in Human Behavior*, *30*, 629–636.

Reid, P. (2014). Categories for barriers to adoption of instructional technologies. *Education and Information Technologies, 19*(2), 383―407. doi: 10.1007/ s10639-012-9222-z.

Robertson, K. (2005). Active listening: More than just paying attention. *Australian Family Physician, 34*(12), 1053―1055.

Roblyer, M. D., Edwards, J., & Havriluk, M. A. (2006). *Integrating educational technology into teaching* (Vol. 2). Upper Saddle River, NJ: Pearson/Merrill Prentice Hall.

Rogers, D. L. (2000). A paradigm shift: Technology integration for higher education in the new millennium. *Educational Technology Review*, *13,* 19―27.

Rogers, E. M. (1995). Diffusion of Innovations: Modifications of a model for telecommunications. In M. W. Stoetzer & A. Mahler (Eds.), *Die Diffusion von Innovationen in der Telekommunikation* (pp. 25―38). Berlin: Springer.

Russell, M., Bebell, D., O'Dwyer, L., & O'Connor, K. (2003). Examining teacher technology use implications for preservice and in-service teacher preparation. *Journal of Teacher Education, 54*(4), 297―310. doi: 10.1177/0022487103255 985.

Sadaf, A. (2014, March). Moving from intentions to practice: an investigation of pre-service teachers' web 2.0 technology integration In M. Searson, & M. N. Ochoa (Eds.), *Procedings of Society for Information Technology & Teacher Education International Conference*, (pp. 1450—1455). Jacksonville, FL: USA.

Sadaf, A., Newby, T. J., & Ertmer, P. A. (2012a). Exploring factors that predict preservice teachers' intentions to use Web 2.0 technologies using decomposed theory of planned behavior. *Journal of Research on Technology in Education*, *45*(2), 171—196.

Sadaf, A., Newby, T. J., & Ertmer, P. A. (2012b). Exploring pre-service teachers' beliefs about using Web 2.0 technologies in K-12 classroom. *Computers & Education, 59*(3), 937—945. doi: 10.1080/15391523.2012.10782602

Saettler, P. (2004). *The evolution of American educational technology*, Englewood, CO: Libraries Unlimited.

Salajan, F. D., Welch, A. G., Ray, C. M., & Peterson, C. (2015). The role of peer influence and perceived quality of teaching in faculty acceptance of web-based learning management systems. *International Journal on E-Learning*, *14*(4), 487—524.

Salleh, S. (2016). Examining the influence of teachers' beliefs towards technology integration in classroom. *The International Journal of Information and Learning Technology*, *33*(1), 17—35.

Salleh, S. M., & Laxman, K. (2014). Investigating the factors influencing teachers' use of ICT in teaching in Bruneian secondary schools. *Education and Information Technologies*, *19*(4), 747—762. doi: 10.1007/s10639-013-9251-2

Salleh, S., & Laxman, K. (2015). Examining the effect of external factors and context-dependent beliefs of teachers in the use of ICT in teaching using an elaborated theory of planned behavior. *Journal of Educational Technology Systems*, *43*(3), 289—319. doi:10.1177/0047239515570578

Samarawickrema, G. & Stacey, E. (2007). Web-based learning and teaching: A case study in higher education. *Distance Education, 28*(3), 313—333.

Sawang, S., O'Connor, P., & Ali, M. (2017). IEngage: Using technology to enhance students' engagement in a large classroom. *Journal of Learning Design, 10*(1), 11―19.

Schrum, L. (1999). Technology professional development for teachers. *Educational Technology Research and Development, 47*(4), 83―90. doi: 10.1007/ BF02299599

Schwarzer, R. (2014). *Self-efficacy: Thought control of action*. Newyork: Taylor & Francis.

Semiz, K., & Ince, M. L. (2012). Pre-service physical education teachers' technological pedagogical content knowledge, technology integration self-efficacy and instructional technology outcome expectations. *Australian Journal of Educational Technology*, *28*(7), 1248―1265. doi: 10.14742/ ajet.800

Shankar, P. R. (2017). The best teacher is the one who does not 'teach'!. *Janaki Medical College Journal of Medical Science*, *4*(1), 1―4.

Shimp, T. A., & Kavas, A. (1984). The theory of reasoned action applied to coupon usage. *Journal of Consumer Research, 11*(3), 795―809. doi: 10.1086/209015.

Shiue, Y. M. (2007). Investigating the sources of teachers' instructional technology use through the decomposed theory of planned behavior. *Journal of Educational Computing Research, 36*(4), 425―453. doi: 10.2190/A407-22RR-50X6-2830.

Silva, K., Correia, A. P., & Pardo-Ballester, C. (2010). A faculty mentoring experience: Learning together in Second Life. *Journal of Computing in Teacher Education*, *26*(4), 149―159.

Simsek, O., Demir, S., Bagceci, B. & Kinay, İ. (2014). Examining technopedagogical knowledge competencies of teacher trainers in terms of some variables. *Ege Education Journal, 14*(1), 1–23.

Simsek, A., Ozdamar, N., Uysal, O., Kobak, K., Berk, C., Kilicer, T., & Cigdem, H. (2009). Current trends in educational technology research in Turkey in the new millennium. *Educational Sciences: Theory and Practice, 9*(2), 961-966.

Smarkola, C. (2008). Efficacy of a planned behavior model: Beliefs that contribute to computer usage intentions of student teachers and experienced teachers. *Computers in Human Behavior*, *24*(3), 1196—1215. doi: 10.1016/ j.chb.2007.04.005

Smith, S. J., & Israel, M. (2010). E-mentoring: Enhancing special education teacher induction. *Special Education Leadership, 23*(1), 30—40.

Snoeyink, R., & Ertmer, P. A. (2001). Thrust into technology: How veteran teachers respond. *Journal of Educational Technology Systems*, *30*(1), 85—111. doi: 10.2190/YDL7-XH09-RLJ6-MTP1

Song, J., & Zahedi, F. M. (2005). A theoretical approach to web design in e-commerce: A belief reinforcement model. *Management Science, 51*(8), 1219—1235. doi: 10.1287/mnsc.1050.0427

Soodjinda, D., Parker, J. K., Meyer, E. J., & Ross, D. L. (2015). CSU digital ambassadors: An empowering and impactful faculty learning community. *Journal of Digital Learning in Teacher Education*, *31*(1), 35—42. doi:10.1080/21532974.2015.979634

Sprague, D., Cooper, J., & Pixley, C. (2004). High tech mentoring: Evaluating the impact of a PT3 project. In *Annual Conference of the American Educational Research Association, San Diego.* Retrieved from http://citeseerx.ist.psu.edu/ viewdoc/ download? doi: 10.1.1.546.5964&rep=rep1&type=pdf

Sprague, D., Kopfman, K., & Levante Dorsey, S. D. (1998). Faculty development in the integration of technology in teacher education courses. *Journal of Computing in Teacher Education*, *14*(2), 24—28.

Strauss, A., & Corbin, J. (1990). *Basics of qualitative research: Grounded theory procedures and techniques*. Thousand Oaks, CA: Sage Publication.

Strauss, S. E., Johnson, M. O., Marquez, C., & Feldman, M. D. (2013). Characteristics of successful and failed mentoring relationships: A qualitative study across two academic health centers. *Academic Medicine, 88*(1), 82—89.

Sugar, W., Crawley, F., & Fine, B. (2004). Examining teachers' decisions to adopt new technology. *Journal of Educational Technology & Society*, *7*(4), 201―213.

Surry, D. W., & Land, S. M. (2000). Strategies for motivating higher education faculty to use technology. *Innovations in Education and Teaching International*, *37*(2), 145―153. doi: 10.1080/13558000050034501

Tabachnick, B. G., & Fidell, L. S. (2014). *Using multivariate statistics*. Needham Height, MA: Allyn & Bacon.

Tashakkori, A., & Teddlie, C. (Eds.). (2010). *Sage handbook of mixed methods in social & behavioral research*. London: Sage Publications.

Taylor, S., & Todd, P. A. (1995). Understanding information technology usage: A test of competing models. *Information Systems Research*, *6*(2), 144―176. doi: 10.1287/isre.6.2.144

Teo, T. (2011). Factors influencing teachers' intention to use technology: Model development and test. *Computers & Education, 57*(4), 2432―2440. doi: 10.1016/j.compedu.2011. 06.008

Teo, T. (2012a). Examining the intention to use technology among pre-service teachers: An integration of the technology acceptance model and theory of planned behavior. *Interactive Learning Environments*, *20*(1), 3―18. doi: 10.1080/10494821003714632

Teo, T. (2012b). Proposing a model to explain teachers' intention to use technology: Identifying constructs and formulating hypotheses. *International Journal of Information and Communication Technology Education*, *8*(3), 22―27. doi: 10.4018/jicte.2012070103

Teo, T. & Tan, L. (2012). The theory of planned behavior (TPB) and pre-service teachers' technology acceptance: A validation study using structural equation modeling. *Journal of Technology and Teacher Education, 20*(1), 89―104.

Teo, T., Zhou, M., & Noyes, J. (2016). Teachers and technology: Development of an extended theory of planned behavior. *Educational Technology Research and Development*, *64*(6), 1033―1052.

Terzis, V., & Economides, A. A. (2011). The acceptance and use of computer based assessment. *Computers & Education, 56*(4), 1032—1044. doi: 10.1016/j. compedu.2010.11.017

Thompson, A. (2006). Lessons learned. In A. Thompson, H.-H. Chuang, & I. Sahin (Eds.), *Faculty mentoring: The power of students in developing expertise* (pp. 135—146). Greenwich, CT: Information Age Press.

Thompson, A. D., Chuang, H. H., & Sahin, I. (2007). *Faculty mentoring: The power of students in developing technology expertise.* Greenwich, CT: Information Age Press.

Thompson, R. L., Higgins, C. A., & Howell, J. M. (1991). Personal computing: toward a conceptual model of utilization. *MIS Quarterly*, *15*(1), 125—143. doi: 10.2307/249443

Tiene, D., & Luft, P. (2001). Teaching in a technology-rich classroom. *Educational Technology*, *41*(4), 23—31.

Tondeur, J., Pareja Roblin, N., van Braak, J., Voogt, J., & Prestridge, S. (2016). Preparing beginning teachers for technology integration in education: ready for take-off?. *Technology, Pedagogy and Education, 26*(2), 1—21. doi: 10.1080/1475939X. 2016.1193556

Tondeur, J., van Braak, J., Ertmer, P. A., & Ottenbreit-Leftwich, A. (2016). Understanding the relationship between teachers' pedagogical beliefs and technology use in education: a systematic review of qualitative evidence. *Educational Technology Research and Development,* 1—21. doi:10.1007/s11423-016-9481-2

Tornatzky, L. G., & Klein, K. J. (1982). Innovation characteristics and innovation adoption-implementation: A meta-analysis of findings. *IEEE Transactions on Engineering Management*, (1), 28–45.

Triandis, H. C. (1979, December). *Values, attitudes, and interpersonal behavior.* In Nebraska Symposium on Motivation. (Vol. 27, pp. 195–259).

Vajoczki, S., Watt, S., Marquis, N., & Holshausen, K. (2010). Podcasts: Are they an effective tool to enhance student learning? A case study from McMaster

University, Hamilton, Canada. *Journal of Educational Multimedia and Hypermedia*, *19*, 349―362.

Vance, C. (2016). Finding a Mentor. Duffy, M., Dresser, S., & Fulton, J. S. (Eds.). *Clinical nurse specialist toolkit: A guide for the new clinical nurse Specialist* (pp. 69―76). Springer.

Vannatta, R. A., & Beyerbach, B. (2000). Facilitating a constructivist vision of technology integration among education faculty and preservice teachers. *Journal of Research on Computing in Education*, *33*(2), 132―148. doi: 10.1080/08886504.2000.10782305

Veletsianos, G., & Kimmons, R. (2013). Scholars and faculty members' lived experiences in online social networks. *The Internet and Higher Education*, *16*, 43―50. doi: 10.1016/ j.iheduc.2012.01.004

Velicer, W. F., Eaton, C. A., & Fava, J. L. (2000). Construct explication through factor or component analysis: A review and evaluation of alternative procedures for determining the number of factors or components. In R. D. Goffin, & E. Helmes, (Eds.) *Problems and solutions in human assessment* (pp. 41―71). USA: Springer.

Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science, 46*(2), 186―204. doi: 10.1287/mnsc.46.2.186.11926

Viberg, O., & Grönlund, Å. (2015). Understanding students' learning practices: challenges for design and integration of mobile technology into distance education. *Learning, Media and Technology*, 1―21. doi: 10.1080/1743 9884.2016.1088869

Vijayasarathy, L. R. (2004). Predicting consumer intentions to use on-line shopping: The case for an augmented technology acceptance model. *Information & Management*, *41*(6), 747―762. doi: 10.1016/j.im.2003.08.011

Waggoner, M. D. (1994). Disciplinary differences and the integration of technology into teaching. *Journal of Information Technology for Teacher Education 3*(2), 175―186. doi: 10.1080/0962029940030205

Wang, J. (2001). Contexts of mentoring and opportunities for learning to teach: a comparative study of mentoring practice. *Teaching and Teacher Education, 17*(1), 51―73.

Watlington, D., Murley, R., Cornelius, A., & Kelley, T. (2014). Preparing educators for development of ınnovative teaching using mobile technology. In J. Keengwe (Edt.), *Promoting Active Learning through the Integration of Mobile and Ubiquitous Technologies*, (pp. 74―97), Hershey PA: Information Science Reference.

Watty, K., McKay, J., & Ngo, L. (2016). Innovators or inhibitors? Accounting faculty resistance to new educational technologies in higher education. *Journal of Accounting Education*, *36*, 1―15.

Wedman, J., & Diggs, L. (2001). Identifying barriers to technology-enhanced learning environments in teacher education. *Computers in Human Behavior*, *17*(4), 421―430. doi: 10.1016/S0747-5632(01)00012-7

Weng, C., & Tsai, K. (2014). Online teaching evaluation for higher quality education: Strategies to increase university students' participation. *Turkish Online Journal of Educational Technology*, *13*(4), 105―114.

White, C. R., Ramirez, R., Smith, J. G., & Plonowski, L. (2010). Simultaneous delivery of a face-to-face course to on-campus and remote off-campus students. *TechTrends*, *54,* 34–40.

Wicks, D. A., Craft, B. B., Mason, G. N., Gritter, K., & Bolding, K. (2015). An investigation into the community of inquiry of blended classrooms by a faculty learning community. *The Internet and Higher Education*, *25,* 53―62. doi: 10.1016/j.iheduc.2014.12.001

Williams, K. C., & Williams, C. C. (2011). Five key ingredients for improving student motivation. *Research in Higher Education Journal*, *12,* 1―23.

Yıldırım, A., & Şimşek, H. (2006). *Sosyal bilimlerde nitel arastirma yöntemleri* [Qualitative research methods in social sciences]. Ankara: Seckin Yayıncılık.

Young, C. (2014). Innovation and adaptation. In C. Young (Edt.), *The problem solution framework: Process guidance for adaptation practitioners* (pp. 28―

33). Victoria Institute of Strategic Economic Studies, Victoria University, Melbourne.

Yzer, M. C. (2013). Reasoned action theory. In J. P. Dillard & L. Shen (Eds.), *The SAGE handbook of persuasion: Developments in theory and practice* (pp. 120—136), LA: Sage.

Zayim, N., Yildirim, S. & Saka, O. (2006). Technology Adoption of Medical Faculty in Teaching: Differentiating Factors in Adopter Categories. *Educational Technology & Society*, 9 (2), 213–222.

Zeller, R. A., & Carmines, E. G. (1980). *Measurement in the social sciences: The link between theory and data*. Cambridge: Cambridge University Press.

Zhao, Y., Pugh, K., Sheldon, S., & Byers, J. (2002). Conditions for classroom technology innovations. *Teachers College Record*, *104*(3), 482—515.

Zwick, W. & Velicer, W. (1986). Comparison of five rules for determining the number of components to retain. *Psychological Bulletin*, *99*(3), 432—442. doi: 10.1037/0033-2909.99.3.432

APPENDICES

1. PILOTED VERSION OF THE SURVEY

Faculty Members' Technology Integration Survey

Dear Participant,

This survey is prepared for my doctoral research study. The purpose of the study is to gain better understanding of the factors affecting faculty members' technology integration behavior. Your voluntary participation in this study is highly valuable for the results of the study. In this survey, information revealing your identity is not requested. Please answer all the questions below and select only one option for each question. Thank you for your time, attention, and support.

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Section 1: Demographic information

Gender: ☐ Female ☐ Male
Age: ____________
Academic title: ☐ Assistant Professor ☐ Associate Professor ☐ Professor ☐ Instructor
Your department:____
Number of courses you are offering this semester: _______________
Number of students you are teaching this semester:_______________
Years of teaching experience: ________________________________
Hours you spending preparing to teach your courses at faculty each week: ________________
Participation to professional development trainings (e.g. courses, workshops, seminars, mentoring programs): ☐ No ☐ Yes (If Yes, How many?_______________)
Current usage of technology into instruction: ☐ No ☐ Yes (If Yes, How long?________)

Section 2: Technology integration behavior items

Items in this section are about the integration of technology into instruction.
Strongly Disagree1 2 3 4 5 6 7 Strongly Agree

Strongly Disagree (1) …………………...(7) Strongly Agree	**1**	**2**	**3**	**4**	**5**	**6**	**7**
I do not feel that integrating technology into instruction will help my students learn more about the subject.	1	2	3	4	5	6	7
I feel that integrating technology into instruction will improve students' satisfaction with the course.	1	2	3	4	5	6	7
I do not feel that integrating technology into instruction will improve students' grades.	1	2	3	4	5	6	7

Strongly Disagree (1) …………………...(7) Strongly Agree	1	2	3	4	5	6	7
I feel that integrating technology into instruction improve students' learning.	1	2	3	4	5	6	7
I am confident that I can integrate technology into instruction if I wanted to.	1	2	3	4	5	6	7
For me, integrating technology into instruction is easy.	1	2	3	4	5	6	7
Whether I integrate technology into instruction or not is entirely up to me.	1	2	3	4	5	6	7
Students influencing my behavior think that I should integrate technology into instruction.	1	2	3	4	5	6	7
Student performance is important to me so I should integrate technology into instruction.	1	2	3	4	5	6	7
I have to integrate technology into instruction because my students require it.	1	2	3	4	5	6	7
My students do not think that I should integrate technology into instruction.	1	2	3	4	5	6	7
My students do not expect me to integrate technology into instruction.	1	2	3	4	5	6	7
My peers are integrating technology into instruction.	1	2	3	4	5	6	7
My administrator confirms my ability and knowledge to integrate technology into instruction.	1	2	3	4	5	6	7
My colleagues think I benefit from integrating technology into instruction.	1	2	3	4	5	6	7
My administrator thinks it is important that I integrate technology into instruction.	1	2	3	4	5	6	7
My students think it is important that I integrate technology into instruction.	1	2	3	4	5	6	7
I do not feel comfortable integrating technology into instruction.	1	2	3	4	5	6	7
I can easily integrate technology into instruction on my own.	1	2	3	4	5	6	7
I do not know enough to integrate technology into instruction.	1	2	3	4	5	6	7
I am be able to integrate technology into instruction even if there is no one around to help me overcome problems in using it.	1	2	3	4	5	6	7
If I want to, I could easily integrate technology into instruction on my own.	1	2	3	4	5	6	7
My expectation is to integrate technology into instruction in the next semester.	1	2	3	4	5	6	7
I want to integrate technology into instruction in the next semester.	1	2	3	4	5	6	7
I intend to integrate technology into instruction in the next semester.	1	2	3	4	5	6	7
Technology integration into instruction is clear and understandable.	1	2	3	4	5	6	7
Technology integration into instruction does not require a lot of mental effort.	1	2	3	4	5	6	7
I find technology integration to be easy to use.	1	2	3	4	5	6	7

Strongly Disagree (1) …………………...(7) Strongly Agree	1	2	3	4	5	6	7
I find it easy to get technology integration to do what I want to do with it.	1	2	3	4	5	6	7
My friends would think that I should integrate technology.	1	2	3	4	5	6	7
Generally speaking, I want to do what my friends think I should do.	1	2	3	4	5	6	7
I can integrate technology into instruction using any technological tools (computers, mobile phones, tablets, etc.).	1	2	3	4	5	6	7
There is not enough technology for instruction to use at the faculty.	1	2	3	4	5	6	7
I could easily get access to the resources that are needed to integrate technology into instruction.	1	2	3	4	5	6	7
I do not have sufficient resources to integrate technology into instruction.	1	2	3	4	5	6	7
I have everything I need to integrate technology into instruction. There are no barriers for me to integrate technology into instruction.	1	2	3	4	5	6	7
Integrating technology into instruction is beneficial.	1	2	3	4	5	6	7
Integrating technology into instruction is good.	1	2	3	4	5	6	7
Integrating technology into instruction is unpleasant (for me).	1	2	3	4	5	6	7
Integrating technology into instruction is useful.	1	2	3	4	5	6	7
Integrating technology into instruction is not compatible with the way I teach.	1	2	3	4	5	6	7
Integrating technology into instruction fits well with the way I teach.	1	2	3	4	5	6	7
The setup of technology at the faculty is compatible with the way I work.	1	2	3	4	5	6	7
I do not think integrating technology into instruction is compatible with my lifestyle.	1	2	3	4	5	6	7
I think integrating technology into instruction fits well with all aspects of my teaching activities.	1	2	3	4	5	6	7
My administrator, who influences my behavior would think that I should integrate technology into instruction.	1	2	3	4	5	6	7
My administrator whom I report to does not think that I should integrate technology into instruction.	1	2	3	4	5	6	7
I have to integrate technology into instruction because my faculty requires it.	1	2	3	4	5	6	7
My superior does not think that I should integrate technology into instruction.	1	2	3	4	5	6	7
My superior expects me to integrate technology into instruction.	1	2	3	4	5	6	7
The technology at the faculty is compatible with the computer I already use for teaching.	1	2	3	4	5	6	7
I do not believe that the technology support at the faculty is sufficient to allow me to integrate technology into instruction.	1	2	3	4	5	6	7
I believe that the online learning systems (i.e., Blackboard) at the	1	2	3	4	5	6	7

Strongly Disagree (1) …………………...(7) Strongly Agree	**1**	**2**	**3**	**4**	**5**	**6**	**7**
faculty are compatible with the way I teach.							
I do not use technology for instruction because the computers at the faculty are outdated/slow.	1	2	3	4	5	6	7
The software at the faculty is not compatible with the software I use.	1	2	3	4	5	6	7
I believe that I could communicate to others to decrease the time required to develop and prepare materials for technology integration.	1	2	3	4	5	6	7
I would have no difficulty explaining why integrating technology into instruction may or may not be beneficial.	1	2	3	4	5	6	7
I have not significantly increased my integration of technology into instruction during the past two years.	1	2	3	4	5	6	7
I do not usually place learning materials online, use online discussions, or use online synchronous learning.	1	2	3	4	5	6	7
I integrate technology into instruction frequently.	1	2	3	4	5	6	7

Section 3: Technology integration implications

Which technologies (devices, programs, apps, etc.) are you using for your instruction? Please give examples.

Thank you for your participation to this survey.
Hatice Çilsalar

2. FINALIZED VERSION OF THE SURVEY

Faculty Members' Technology Integration Survey

Dear Participant,

The purpose of this survey is to gain a better understanding of factors influencing faculty members' technology integration behavior. Your voluntary participation in this study will be valuable for understanding faculty members' decisions when using technology. Technology usage is not defined, purposefully, to get your technology usage and perception. The survey is anonymous. No specific information with the potential to reveal your identity is requested. If you feel uncomfortable, you can skip some demographics. Please answer all questions to the best of you. If you have any questions about the study, please contact us. Thank you for your time and support.

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Section 1: Demographic information

What is your gender? ☐ Female ☐ Male
What is your year of birth? ______________
What is your academic title? ☐ Assistant Professor ☐ Associate Professor ☐ Professor ☐ Instructor
What is your faculty? ☐ Faculty of Architecture ☐ Faculty of Education ☐ Faculty of Arts and Sciences ☐ Faculty of Engineering ☐ Faculty of Economic and Administrative Sciences ☐ Graduate Schools ☐ Technical vocational School of Higher Education ☐ School of Foreign Languages ☐ Other ______________________________________
How many courses were you offering in the fall semester? _________________
How many students were you teaching in the fall semester? _________________
How many years have you been teaching in higher education? _____________
How many professional development trainings <u>on technology integration</u> (e.g. courses, workshops, seminars, mentoring programs) have you attended? ☐ No, I have not ☐ 1 ☐ 2 ☐ 3 ☐ 4 or more
Have you participated "Faculty Technology Mentoring Program" offered by Faculty of Education? ☐ No, I have not. ☐ Yes, I have.

Section 2: Technology integration implications

Which technologies (devices, tools, programs, apps, etc.) are you using for your instruction? Please give specific examples.

Section 3: Technology integration behavior items

This section contains items related to technology integration. "Technology integration" term in this study refers using technological tools or resources to solve pedagogical problems or support teaching and/or learning activities within the course. The tools or resources can be specialized software, online classroom management tools, learning management systems (ODTU-Class, etc.), open/online courses, student response systems, online collaboration and/or communication tools, blogs, forums, online materials or platforms, etc. Using the above as a baseline, please select one response for each of following statements. Responses range from "1 = Strongly Disagree" to "7 = Strongly Agree"

Items Related to Context

	Strongly Disagree (1)……………..……...(7) Strongly Agree	**1**	**2**	**3**	**4**	**5**	**6**	**7**
1	I could easily get access to the resources that are needed to integrate technology into instruction.	1	2	3	4	5	6	7
2	I do not have sufficient resources to integrate technology into instruction.	1	2	3	4	5	6	7
3	I do not use technology for instruction because the computers at the faculty are outdated or slow.	1	2	3	4	5	6	7
4	The technology at the faculty is compatible with technologies I already use for teaching.	1	2	3	4	5	6	7
5	My administrator, who influences my behavior think that I should integrate technology into instruction.	1	2	3	4	5	6	7
6	I have to integrate technology into instruction because my faculty requires it.	1	2	3	4	5	6	7
7	My administrator thinks it is important that I integrate technology into instruction.	1	2	3	4	5	6	7
8	My administrator confirms my ability and knowledge to integrate technology into instruction.	1	2	3	4	5	6	7
9	Students influencing my behavior think that I should integrate technology into instruction.	1	2	3	4	5	6	7
10	I have to integrate technology into instruction because my students require it.	1	2	3	4	5	6	7
11	My students think it is important that I integrate technology into instruction.	1	2	3	4	5	6	7

Items Related to Individual

	Strongly Disagree (1) …………..……...(7) Strongly Agree	**1**	**2**	**3**	**4**	**5**	**6**	**7**
1	I intend to integrate technology into instruction in the next semester.	1	2	3	4	5	6	7
2	I do not know enough to integrate technology into instruction.	1	2	3	4	5	6	7
3	I can easily integrate technology into instruction on my own.	1	2	3	4	5	6	7
4	I am able to integrate technology into instruction even if there is no one around to help me overcome problems in using it.	1	2	3	4	5	6	7
5	I find it easy to get technology integration to do what I want to do with it.	1	2	3	4	5	6	7
6	I want to integrate technology into instruction in the next semester.	1	2	3	4	5	6	7
7	I can integrate technology into instruction using any technological tools (computers, mobile phones, tablets, etc.).	1	2	3	4	5	6	7
8	Integrating technology into instruction is beneficial.	1	2	3	4	5	6	7
9	Integrating technology into instruction is useful.	1	2	3	4	5	6	7

	Strongly Disagree (1) ………….……...(7) Strongly Agree	1	2	3	4	5	6	7
10	Integrating technology into instruction is good for instruction.	1	2	3	4	5	6	7
11	I feel that integrating technology into instruction improve students' learning.	1	2	3	4	5	6	7
12	Student performance is important to me so I should integrate technology into instruction.	1	2	3	4	5	6	7
13	The setup of technology at the faculty is compatible with the way I work.	1	2	3	4	5	6	7
14	My expectation is to integrate technology into instruction in the next semester.	1	2	3	4	5	6	7
15	My colleagues think I benefit from integrating technology into instruction.	1	2	3	4	5	6	7
16	If I want to, I could easily integrate technology into instruction on my own.	1	2	3	4	5	6	7

Thank you for your participation to this survey.
Hatice Çilsalar

3. INTERVIEW PROTOCOL (IN ENGLISH)

Faculty Member Technology Integration Behavior Interview Protocol
Department:
Date:
Synonym:
Starting Time:

Hi,

My name is Hatice Cilsalar. I am research assistant and PhD student at THE UNIVERSITY Department of Educational Sciences. I focus on faculty members' technology integration behavior for my doctoral research. With this aim, I am planning to interview with faculty members' attended to faculty mentoring program and experienced technology integration into their courses. To give a general impression about my research, I want to share my research questions.

1. How do faculty members perceive their planned technology integration behavior in the FTM context?

This study aims to contribute faculty members' technology integration and helps to create environment for eliminating problems that problems of faculty members who is integrating technology. Because of this reason, getting your opinions about technology integration carries importance.

I want to remind some points related to interview process. All your sharing will be used for scientific purposes and they will not be shared with others except me and my advisor. Any information revealing your name and identity will not be used during reporting of results. For this reason, synonyms will be included in the study. Everything that will be said in this interview will be kept confidential. Please feel free to ask for any clarification at any time. If any question will make you uncomfortable, just say that you prefer not to answer.

You can pause or stop our conversation when you do feel uncomfortable or you do not want to go on the interview. Our interview will take almost 30 minutes.

Warm-up

1) "This is the typical IRB consent with all the elements, do you mind to read and agree to sign?" [*Sign "Informed consent statement."]*

2)Do you mind to fill in this demographics questionnaire? [*Give "Demographic questionnaire" to fill in.]*

3)Could you give me the permission for taping the interview? [*If the interviewee does not give permission to tape the interview, take notes.*]

4) If you are ready, shall we start?

Initial Background Questions:

[*No need in-depth answer here. The interviews short answers will be enough, there is no need to elaborate, unless you do not understand something. ıf they give more comprehensive idea about background, let them talk unless it surpasses 10 minutes.]*

- Could you give me some information on your educational and academic background?
- Could you inform me about your current position in the faculty, your ongoing duties?

(Courses, projects, student consultancy, social service, etc.)

- (Optional)Have you attended any training on teaching methods? [*Do not ask faculty members of faculty of education*]
- Could you describe any activity that you have enjoyed during your faculty technology mentoring program?
- Which sources or opportunities do you utilize while you were integrating technology?
  - Hardware
  - Software
  - Technical support
- How do your courses change after faculty technology mentoring program?
  - Teaching activities- planning, implementation, and evaluation
  - Teacher role
  - Student role, motivation, and success
  - Student-teacher interaction, student-student interaction.

Grand Questions

[*In depth answer for question so important for this section. If it is possible, encourage interviewee to give comprehensive answers for each question. The questions are not answered in detail could be asked afterward by using different wording.*]

1) What are the benefits of technology integration for you?
   - Student: Success, course participation, motivation
   - Teacher: Motivation, Course effectiveness
2) What are challenges of technology integration?
   - For teacher?
   - For student?
3) How does your attitude/opinions toward effect your technology integration?
   - Resistance?
4) What are supports or challenges of individuals around you on technology integration into your courses?
   - Students
   - Friends/Colleagues
   - Superiors/Administrators
5) Which factor/s does/do challenge you to integrate technology into your courses?
6) How does your confidence/belief in success influence you during learning technology integration?
7) What do you think about most influential factor on technology integration process? Why?
8) What do you suggest for increase technology integration of faculty members who have not integrated technology?
   - For changing their attitudes in a positive way?
   - For increase contribution of individuals around them?
   - For decreasing negative effect of factors?
   - For increasing contribution of factors?
9) What do you suggest to develop faculty technology mentoring program?

Closure:

10) Do you want to add anything that you think it will contribute this study?

Thank you very much for your participation to this study and valuable views on technology integration.

4. INTERVIEW PROTOCOL (IN TURKISH)

Öğretim Üyesi Görüşme Protokolü

Bölüm: **Tarih:**

Katılımcı (takma isim): **Saat:**

Merhaba,

Benim adım Hatice Çilsalar. ODTÜ Eğitim Bilimleri Bölümünde araştırma görevlisi ve doktora öğrencisiyim. Doktora tezim kapsamında fakülte öğretim üyelerinin teknoloji entegrasyonu davranışlarını çalışıyorum. Bu noktada "fakülte teknoloji mentörlüğü" programına katılmış ve teknolojilerin derslere entegrasyonunu deneyimlemiş öğretim üyeleri ile görüşmeyi planlıyorum. Size araştırma ile genel bir bilgi vermesi açısından araştırma sorularımı paylaşmak istiyorum:

1. Fakülte Teknoloji Mentörlüğü programı boyunca fakülte üyeleri kendilerinin teknoloji entegrasyonu davranışlarını nasıl algıladırlar?

Bu araştırma; öğretim üyelerinin teknolojiyi derslerinde kullanımlarını artırmayı ve hali hazırda kullanan öğretim üyelerinin karşılaştıkları sorunları en aza indirmek için gerekli olan koşulların oluşturulmasına yardımcı olmayı amaçlamaktadır. Bu nedenlerle sizin teknoloji entegrasyonu ile ilgili görüşleriniz çalışmam için çok büyük önem taşıyor.

Görüşmemize başlamadan önce bazı hatırlatmalar yapmak istiyorum. Görüşme sürecinde yaptığınız tüm paylaşımlar sadece bilimsel amaçlı kullanılacak, ben ve danışmanım dışında kimse ile paylaşılmayacaktır. Araştırma boyunca ve sonuçların raporlanmasında isminiz veya kimliğinizi ortaya çıkaracak hiçbir bilgi paylaşılmayacaktır. Bu nedenle takma isimler kullanılacaktır. Görüşme sırasında kendinizi rahat hissetmediğiniz ya da devam etmek istemediğiniz noktada görüşmemizi durdurabilir veya tamamen kesebiliriz. Görüşmemiz yaklaşık yarım saat sürecektir.

Başlangıç Soruları

2. Öncelikle bu çalışmaya gönüllü olarak katıldığınıza dair gönüllü katılım formunu okuyup imzalayabilir misiniz?
3. Sizinle ilgili bazı demografik bilgilere ihtiyacım olacak. Bununla ilgili formu doldurabilir misiniz?
4. Eğer izin verirseniz hiç bir noktayı kaçırmamak için görüşmemizin ses kaydınız yapabilir miyim?
5. Hazır iseniz başlayabilir miyiz?

Hazırlık Soruları:

[Bu kısımda çok kapsamlı cevaplara ihtiyaç olmayacak. Görüşmeci kısa cevaplar verdiğinde anladığın sürece daha fazla bilgi almak için çabalamaya gerek olmayacak. Eğer katılımcı gönüllü olarak kapsamlı bilgi vermek isterse bu bölüm için en fazla 10 dakika ayıracak şekilde ona zaman verebilirsin.]

- Eğitim ve çalışma hayatınızla ilgili bilgi verebilir misiniz?
- Üniversitedeki şu anki pozisyonunuz ve yürütmekte olduğunuz görevlerden bahsedebilir misiniz? (Dersler, ünvan, projeler, öğrenci danışmanlığı, sosyal hizmet, vs.)
- (Optional) Eğitim veya öğretim yöntemleri üzerine özel bir eğitim aldınız mı?
- Mentörlük programında yaptığınız ve hoşunuza giden bir etkinlikten bahsedebilir misiniz?

- Teknolojiyi derslerinize entegre etmede hangi kaynaklar ve olanaklar etkili oldular?
    - Yazılım, Donanım, Teknik destek
- Programdan sonra derslerinizde ne gibi değişikler oldu?
    - Öğretim faaliyetleri- planlama, uygulama ve değerlendirme
    - Öğretmen rolü
    - Öğrenci rolü, motivasyonu ve başarısı
    - Öğrenci- hoca, öğrenci-öğrenci etkileşimi.

Görüşme Soruları

[Bu kısımda soruların cevaplarının detaylı olması oldukça önemli. Mümkün olduğunda katılımcının cevaplarını detaylandırması için imkanlar oluşturulmalı. Anlaşılmayan noktalarda sorular bir süre sonra farklı açılardan sorulmalıdır.]

1. Sizin için derslerinize teknolojiyi entegre etmenin faydaları nelerdir?
    a. Öğrenci açısından: başarısı, derse katılım, motivasyon
    b. Hoca açısından: motivasyon, dersin etkililiği
2. Sizin için derslerinize teknolojiyi entegre etmenin güçlükleri nelerdi?
    a. Hoca açısından
    b. Öğrenci açısından
3. Teknolojiye karşı tutumunuz/görüşleriniz teknolojiyi entegre etme sürecinde sizi nasıl etkiledi?
    a. Direnç
4. Teknoloji entegrasyonu gerçekleştirdiğiniz derslerinize çevrenizdeki kişilerin bu teknolojileri kullanmanızda destek oldukları veya zorlaştırdıkları noktalar nelerdi?
    a. Öğrenciler
    b. Arkadaşlar
    c. Yöneticiler
5. Derslerinizde teknolojiyi kullanmanıza engel teşkil eden unsurlar nelerdir?
6. Teknolojiyi entegre etmeye yönelik kendinize duyduğunuz güvenin/başarabilirim düşüncesinin bu süreçte size ne gibi etkileri oldu?
7. Sizin için teknolojiyi entegre etme sürecinde etkili olan en önemli faktör nedir? Neden?
8. Teknolojiyi kullanmayan öğretim üyelerinin teknolojiyi entegre etmelerini sağlamak için önerileriniz nelerdir?
    a. tutumlarını olumlu yönde değiştirmek için öneriler?
    b. çevrelerindeki kişilerin katkısını artırmak için?
    c. faktörlerin olumsuz etkilerini gidermek için?
    d. faktörlerin katkılarını artırmak için?
9. Teknoloji mentörlüğü programının geliştirilmesi için neler önerirsiniz?

Kapanış:

10. Bu çalışmaya katkısı olduğunu düşündüğünüz ve eklemek istediğiniz başka birşey var mı? Çalışmaya katılımınız ve teknoloji entegrasyonu ile ilgili değerli düşünceleriniz için teşekkür ederim.

5. DEMOGRAPHICS FORM

Demographic Information Form

Gender: ☐ Female ☐ Male
The Year of Birth: ________________________
Academic Title:
☐ Assistant Prof. ____ ☐ Associate Prof. ____ Professor ____ Instructor ____
Department:
____
Participation year of Faculty Technology Mentoring Program: ______________________
Number of offered course during the program: ____
Number of students enrolled the course/s during the program: _____________________
Start Year of Teaching: ____
Have you attended any other training (workshop, seminar, professional development program, course) except Faculty Technology Mentoring Program?
☐ Yes ____ ☐ No ____
How do you define your expertise level on technology integration into education?
☐ Novice ____ Talented ____ Skillful ____ Proficient ____ Advanced ____ Expert ____

How many years have you been integrating technology you're your courses?_____________________

Usage Frequency of Educational Technologies into Your Courses	Never	Rarely	Sometimes	Usually	Always
Projection Systems					
Smart Boards					
Online Presentation Tools (Prezi, etc.)					
Graphic Software (Photoshop, Flash, etc.)					
Student Response Systems (Clicker, Socrative, etc.)					
Podcasting					
Video Creation/ Editing tools (Movie maker, iMovie, etc.)					
Social Media					
Social Bookmarking Tools (Diigo, delicious, etc.)					
Online Educational Tools					
Mobile Applications					
Blogs					
Learning Management Systems (LMS [of the university], Moodle, Blackboard, etc.)					
File Sharing Tools (Dropbox, Google Drive, etc.)					
Collaborative Editing Tools (Google Docs, Wikis)					
Online Communication Tools(Skype, etc.)					
Simulations					
Online Communities of Practice					
Flipped Classrooms					
Virtual Learning Environments					
Other Educational Technologies					
1)					
2)					

6. APPROVAL LETTER FROM METU HUMAN SUBJECTS ETHICS COMMITTEE

UYGULAMALI ETİK ARAŞTIRMA MERKEZİ
APPLIED ETHICS RESEARCH CENTER

ORTA DOĞU TEKNİK ÜNİVERSİTESİ
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21 ARALIK 2015

Gönderilen: Yrd. Doç.Dr. Evrim BARAN

Eğitim Bilimleri

Gönderen: Prof. Dr. Canan SÜMER

İnsan Araştırmaları Komisyonu Başkanı

İlgi: Etik Onayı

Sayın Yrd.Doç.Dr. Evrim BARAN danışmanlığını yaptığınız doktora öğrencisi Hatice ÇİLSALAR'ın "Faculty Members' Technology Integration Behavior: A Mixed-Method Study" isimli araştırması İnsan Araştırmaları Komisyonu tarafından uygun görülerek gerekli onay 10.12.2015-15.10.2016 tarihleri arasında geçerli olmak üzere verilmiştir.

Bilgilerinize saygılarımla sunarım.

Prof. Dr. Canan SÜMER

Uygulamalı Etik Araştırma Merkezi

İnsan Araştırmaları Komisyonu Başkanı

Prof. Dr. Meliha ALTUNIŞIK
Etik Komitesi Üyesi

Prof. Dr. Aydan BALAMİR
Etik Komitesi Üyesi

Prof. Dr. Mehmet UTKU
Etik Komitesi Üyesi

Prof. Dr. Ayhan SOL
Etik Komitesi Üyesi

7. INFORMED CONSENT FORM

ARAŞTIRMAYA GÖNÜLLÜ KATILIM FORMU

Bu araştırma, ODTÜ Eğitim Bilimleri Bölümü öğretim elemanlarından Yrd. Doç. Dr. Evrim Baran danışmanlığında Arş. Gör. Hatice Çilsalar tarafından yürütülen teknoloji entegrasyonu çalışmasıdır. Bu form sizi araştırma koşulları hakkında bilgilendirmek için hazırlanmıştır.

Çalışmanın Amacı

Araştırmanın amacı, katılımcıların teknoloji entegrasyonuna etki eden faktörleri belirlemek için bilgi toplamaktır.

Araştırmaya Katılım

Araştırmaya katılmayı kabul ederseniz, sizden beklenen, görüşme boyunca sorulan soruları cevaplandırmanızdır. Bu çalışmaya katılım ortalama olarak 45 dakika sürmektedir.

Bilgilerin Kullanımı

Araştırmaya katılımınız tamamen gönüllülük temelinde olmalıdır. Ankette, sizden kimlik belirleyici hiçbir bilgi istenmemektedir. Cevaplarınız tamamıyla gizli tutulacak, sadece araştırmacılar tarafından değerlendirilecektir. Katılımcılardan elde edilecek bilgiler toplu halde değerlendirilecek ve bilimsel yayımlarda kullanılacaktır. Sağladığınız veriler gönüllü katılım formlarında toplanan kimlik bilgileri ile eşleştirilmeyecektir.

Katılımınızla ilgili bilmeniz gerekenler:

Görüşme formu, genel olarak kişisel rahatsızlık verecek sorular içermemektedir. Ancak, katılım sırasında sorulardan ya da herhangi başka bir nedenden ötürü kendinizi rahatsız hissederseniz cevaplama işini yarıda bırakıp çıkmakta serbestsiniz.

Araştırmayla ilgili daha fazla bilgi almak isterseniz:

Çalışma ile ilgili bütün sorularınız görüşme öncesi ve sonrasında cevaplanacaktır. Bu çalışmaya katıldığınız için şimdiden teşekkür ederiz. Çalışma hakkında daha fazla bilgi almak için Eğitim Bilimleri Bölümü öğretim üyelerinden Yrd. Doç. Dr. Evrim Baran (E-posta: ebaran@metu.edu.tr) ya da araştırma görevlisi Hatice Çilsalar (E-posta: cihatice@metu.edu.tr) ile iletişim kurabilirsiniz.

Yukarıdaki bilgileri okudum ve bu çalışmaya tamamen gönüllü olarak katılıyorum.

(Formu doldurup imzaladıktan sonra uygulayıcıya geri veriniz).

İsim Soyisim	Tarih	İmza
	---/----/-----	

8. CODEBOOK

Code	Description	Example
Behavior	The way in which faculty member behaves or not behave in response to integrate technology.	“Additionally, I am using ODTU-Class. I am using to share PowerPoints, to make announcements to students, to collect homeworks” (Seda, assistant professor at economics).
Reasons	The cause or explanation for which faculty members integrate technology	
Reason to use	The aim to integrate a technology in a course, how the technology serve for faculty members	“I am posting all readings, presentations, assignments to the platform (ODTU-Class), and sending emails via it. My teaching assistant is enrolled the platform. S/he is communicating from there, and posting the grades” (Olcay, professor at educational sciences).
Reasons not to use	The aim not to use technology in a course, why a faculty member does not integrate technology into a course	“I mean; I do not want to say it is related to their age but the time span of teaching the same course is highly correlated with their resistance to change their behavior toward integrating technology into their courses. You know, it is really hard to say any faculty member who has been teaching the same course for 30 years to change your class notes that you have been using for 30 years, make online presentations, use these applications, and integrate this platform to your class” (Onur, assistant professor at Electrical engineering). “I did not know about such system (student response system), we put into practice this system. In other words, we examined it. It was an applicable system for my courses and me. And I had not known and learned it” (Baki, assistant professor at Sociology).
Used technology	The specific technologies explored and integrated into a course	“There was a program named as Diigo. We (students, faculty member, and teaching assistant) shared something (some sources or links) related to mathematics and teaching on which we concentrated in class and we wanted students’ oat attention about them” (Cansu).
Contribution of technology	The act of contribute in instructional activities by solving previous problems in or out classrooms	

Contribution to Instructor	The help provided by technology to solve a problem or ease the instruction process for faculty members	"I have to have photocopy of all documents that I want to share with the students and some of the students could not get because of not being in the classroom (at that specific time). This force my hand. Now I can create links all of them and post (to the course platform) to share with students" (Pelin, assistant professor at economics). "I have no communication problem with my students, anymore. Giving feedback is quite easy" (Ela).
Contribution to Student	The help provided by technology to solve a problem or ease the learning process of the students	"It makes (teaching) a bit entertaining and helps to review the course content" (Gamze, assistant professor at educational sciences). "(With the help of technology) course becomes more joyful and more attractive for students" (Olcay, professor at educational sciences).
Intention	An act or instance of determining mentally upon integrating technology.	"I always check the classroom before the semester starts whether there is computer and projector. Because I had had a classroom without the projector and the curtain and had trouble to find a movable projector and curtain" (Pelin, assistant professor).
Attitude	The expression of favor or disfavor toward a person, the degree to which performance of the behavior is positively or negatively valued. A feeling, belief, or opinion of approval or disapproval towards something.	"I think it is a good application… In time I reconciled myself to educational technologies you know I am not the fan of technology in my daily life. I really like it but it has not been a part of my life" (Banu).
Compatibility	The level of consistency that is the innovation with the values, past experiences, and needs of the potential adopter	"I do not know whether my courses were appropriate. I had too crowded classroom with more than 170 students. Because of this, I could not do all kinds of activities" (Banu).
Interest	The desire or demand to know or learn about technology integration, feeling that accompanies or causes special attention to integrate	"I think there is no way out of technology… I am aware of that is required to use it (educational technology). The current pedagogical approaches require this. I think I have no chance to stand out against technology" (Didem, assistant professor at educational sciences).

	technology	
Perceived ease of use	The perception on the innovation's easiness to understand, use, and maintain, easy to explain to others	"Once you learned it you can upload the quizzes from excel. Somehow I understood to write quizzes to students' mails, it was not too difficult for me" (Sadi, assistant professor at Chemistry).
Perceived usefulness	The perceptions on the innovation being better than what it replaces, the risk involved in the worthiness to change.	"It was not useful for me. Frankly speaking, not only students but also I did not like it" (Gamze, assistant professor at educational sciences). "The student who did not understand any point can write a post under the link shared in the class page and there were other students who did not understand. When their classmates or I made any explanation we could reach 95% of the students at the same time. Thus it became more interactive and information flow accelerated" (Baki, assistant professor at Sociology).
Subjective Norms	The perceived social pressure or effect to perform or not to perform technology integration behavior by faculty members	
Peer Influence	The influence on faculty members by peers, colleagues, or other people working in the same place or an individual who gets encouraged to follow their peers by changing their attitudes, values, or behaviors to conform to those of the influencing group or individual	"Assistants do everything with technology such uploading students' artifacts, projects, or creation of archive for students" (Deva, instructor at industrial material design).
Student Influence	The influence on faculty members by students who demand or require to involve in technology integrated classroom.	"…how to use technology for my classroom in which everyone is dealing with mobile phones and it is like catching the era" (Seda, assistant professor at economics). "Students had been enthusiastic at the first few weeks." (Banu)

Administrator Influence	The influence on faculty members by administrators or superiors who is controlling all administrative work.... “Faculty Member’s Development Program-FMDP” for newcomers (n:7), FTM (n:4) and overall supplied infrastructure and technical support	“Administrators were not aware of anything” (Deva, instructor at industrial material design) ... ”I can say that we had not get any support from administrators” (Onur, assistant professor at Electrical engineering)
Perceived Behavior Control	The perception of the ease or difficulty of the technology integration behavior for faculty members	
Facilitative Resources	The resources which are available and elaborate teaching and learning process in higher education. computer center, instructional technology support office (ITS)	“Almost all students have smart phone or tablets, however, some of them do not have” (Suat, assistant professor at Electrical engineering).
Facilitative Technology	The technologies which are available and elaborate teaching and learning process in higher education.....instructors and students technologies, infrastructure	“Once I taught in central engineering building, there was a portable projector and its curtain. In that classroom, projector did not reflect properly and screen was seen in V or trapezium shape. Honestly, it indisposed even me. But in time this was disappeared” (Banu).
Self-efficacy	The faculty members' belief in their ability to succeed in technology integration. ... their technology knowledge and expertise, and being tech-native promote	“I have to be a step further than the students, ... I have to try and answer the question (whether technology is effective in her classroom or not). Otherwise I could not answer it.” (Yaren, associate professor at Health informatics).

Faculty Technology Mentoring	The program implemented to contribute faculty members technology integration behavior with the help of graduate students who are mentors.	
Contribution	The help of the program to develop faculty members, in specific, teaching and learning process, in general.... mentors support on both technology usage (n:7) and their teaching (n:6).awareness (n:5) and motivation (n:2) were increased	"My friends were helpful when I explained what I do and they demand to learn and implement technology integration" (Figen, assistant professor at Mechanical engineering). "... Even this semester break, I am planning to implement a seminar series-I do not want to name it as training- about computer technologies and soft wares that they can use for their research" (Onur, assistant professor at Electrical engineering).
Suggestions	The ways proposed by the faculty members to contribute and develop the program to implement more efficiently	"This program should be declared to whole university" (Yaren, associate professor at Health informatics).
Challenges	The problems/challenges were faced while the technology integration process	
Context related	The challenges arise from the context such as technological or environmental base	"I have to check the projector in class each week whether it works or is broken, which makes me discharge. After a while, I do not want to use this technology. Checking the devices waste of time. I spend at least ten minutes for it, each course" (Figen, assistant professor at Mechanical engineering).
Instructor related	The challenges arise from faculty members	"There are two points; first one is that I have to be well-prepared at least one day before the instruction. However, we do not have such a long time for preparation. Secondly, revision of materials requires technology familiarity" (Suat, assistant professor at Electrical engineering)
Student related	The challenges arise from students of the faculty members, such as student devices, student habits, student motivation, and student's behavior in classroom.	"The most important obstacle is that students do not even check their inboxes… If they are not interested in technology, it is hard to deliver the content with technology"(Seda, assistant professor at economics)

Suggestions	The suggestions to improve all faculty members technology integration behavior and to extend technology integration to all higher education classroom	“Seriously, it is needed to be explained why it is meaningful” (Ali).
Contribution of technology	The act of contribute in instructional activities by solving previous problems in or out classrooms	
Instructor	The help provided by technology to solve a problem or ease the instruction process for faculty members	“I have to have photocopy of all documents that I want to share with the students and some of the students could not get because of not being in the classroom (at that specific time). This force my hand. Now I can create links all of them and post (to the course platform) to share with students” (Pelin, assistant professor at economics). “I have no communication problem with my students, anymore. Giving feedback is quite easy” (Ela).
Student	The help provided by technology to solve a problem or ease the learning process of the students	“It makes (teaching) a bit entertaining and helps to review the course content” (Gamze, assistant professor at educational sciences). “(With the help of technology) course becomes more joyful and more attractive for students” (Olcay, professor at educational sciences).

9. EXTENDED TURKISH SUMMARY

Giriş

Yüksek öğretim kurumları, 21. yüzyılda üniversite öğrencilerinin öğrenme deneyimlerinin planlanması ve uygulanması süreçlerini derinden etkileyen önemli değişiklikler geçirmektedir. Bir çok kurum bu değişimler kapsamında ters-yüz edilmiş sınıflar, çevrimiçi eğitimler, kitlesel açık çevrimiçi kurslar gibi modelleri uygulamaya başlamıştır. Yüksek öğretim kurumlarının değişen çehresi, öğretim üyelerinin derslerinde yeni öğrenme ve öğretme stratejilerinin uygulanmasına yönelik bir baskı oluşturmaktadır. Öğretim üyelerinin etkili teknoloji entegrasyonunu desteklemek için üniversiteler yüz yüze veya çevrimiçi, eş zamanlı veya eş zamanlı olmayan, tek oturumluk veya yinelenen profesyonel gelişim programlarını öz yönetimli öğrenme deneyimleri, profesyonel görüşmeler, çalıştaylar ve konferanslar şeklinde uygulamaktadırlar (Johnson, 2015).

En yaygın olarak tercih edilen profesyonel gelişim programları ise; çalıştaylar, eğitimler ve akran koçluğu şeklinde karşımıza çıkmaktadır (Desimone & Garet, 2015). Düzenlenen çalıştay ve eğitimlerin temel sorunlarının başında öğretim üyelerinin hem kişisel hem de alana, sınıfa ve derse özgü ihtiyaçlarını karşılayamaması gelmektedir. Benzer şekilde akran koçluğunda ise uygulamanın etkili olabilmesi için eğitimci rolündeki akranların gönüllü olarak süreci yönetmek için zaman ve enerji harcamaları gerekmesi ayrı bir sorun oluşturmaktadır (Kurtts & Levin, 2000). Bu problemlerle karşı karşıya gelmemek için, çok farklı ihtiyaçları olan öğretim üyelerine bire bir çalışma imkanı sağlayan fakülte mentörlüğü programları uygulanmaya başlamıştır (Chuang, Thompson, & Schmidt, 2003). Uzun süreli ve genişletilmiş etkileşim sağlayan mentörlük programları (Larson, 2009) öğretim üyelerinin ihtiyaç duydukları zamanda ihtiyaç duydukları şekilde kişiye özgü desteği edinmelerini sağlamaktadır. Ayrıca öğretim üyelerinin teknoloji entegrasyonu konusunda gelişimlerini desteklemek için profesyonel gelişim uygulamalarına bilimsel bir yaklaşım ile katkıda bulunmaktadır (Kirkwood & Price, 2013).

Mentörlük uygulamalarına katılan öğretim üyeleri sınıflarında uyguladıkları öğretim yaklaşımlarını değiştirmeyi sağlayan teknolojik ve pedagojik uygulamaları mentörleri ile birlikte deneyimleme fırsatına sahip olmaktadır. Mentörlük uygulamaları kapsamında öğretim üyelerinin gelişimi için şu aşamalar izlenmektedir: (a) ihtiyaçların belirlenmesi, (b) teknolojilerin güçlü ve zayıf yanlarının belirlenmesi, (c) süreci planlama, (d) geri dönütleri paylaşma, (e) teknoloji, pedagoji ve alan bilgilerini harmanlayarak uygulamaya dönüştürmek ve (f) değerlendirme (Baran, 2016a, p. 56). Fakülte teknoloji mentörlüğü (FTM) programları destekleyici öğretim ortamları, mentörlük ilişkileri, farklı iletişim kanalları ve ihtiyaç duyulan desteğin sağlanması ile stratejik olarak öğretim üyelerinin teknoloji entegrasyonu davranışını desteklemektedir. Çünkü FTM bireye özgü uygulanan bir program olduğu için değişken ve çok farklı ihtiyaçları karşılama potansiyeline sahiptir (Leh, 2005). Bu kapsamda planlanan davranış değişikliğinin nasıl ve hangi süreçlerde gerçekleştiğinin anlaşılabilmesi ve geliştirilebilmesi için davranışın bağlı olduğu öz-yeterlilik, araç etkililiği, öğrenciler, iş arkadaşları ve arkadaşlar gibi faktörlerin incelenmesi katkıda bulunabilmektedir (Buabeng-Andoh, 2012; Inan & Lowther, 2010). Diğer yandan, teknik destek, akran veya öğrenci etkisi, yönetici baskısı, ihtiyaç duyulan zaman ve teknik yetersizlikler öğretim üyelerinin derslerine teknoloji entegrasyonu davranışlarını destekleyen veya kısıtlayan faktörler arasında yer almaktadır (Mayes, Natividad, & Spector, 2015). Bu farklı bakışlar nedeniyle, öğretim üyelerinin teknoloji entegrasyonu uygulamalarını deneyimlemeleri için destekleyen faktörlerin belirlenmesi ve ayrıca kısıtlayan faktörlerin azaltılması gerekliliği bulunmaktadır.

Bu çalışma kapsamında, ayrıştırılmış planlı davranış teorisi (APDT) (Taylor & Todd, 1995) öğretim üyelerinin teknoloji entegrasyonu davranışına etki eden faktörlerin incelenmesi için temel alınmıştır. Teori kapsamında ele alınan bütün faktörler davranışlar doğrudan veya dolaylı şekilde bağlantılıdır. Bu bağlantılar teknoloji entegrasyonu davranışının ölçülmesi ve geliştirilmesi için önem taşımaktadır. Teorinin açıkladığı davranış modelinde niyet, tutum, subjektif norm ve algılanan davranış kontrolü davranışın temel öğelerini oluşturmaktadır. Bu faktörler ve ilişkileri ile ilgili temel düzeyde akademik araştırmalar olmakla birlikte, teknoloji entegrasyonu davranışının bir yüksek öğretim kurumunda incelenmesi ve özel olarak ise bu davranışı profesyonel olarak ilk kez deneyimleyen öğretim üyelerinin süreçte edindikleri deneyimlerin analiz edilmesine yönelik çok az çalışma bulunmaktadır. Bu nedenle hem FTM programına katılan hem de katılmayan öğretim üyelerinin teknoloji entegrasyonuna karşı görüşleri ve bu davranışa etki eden faktörlere yönelik algılarını incelemeyi amaçlamıştır. Bu çalışma şu temel araştırma sorularına cevap aramaktadır;

1) Öz-yeterlilik, subjektif norm, kolaylaştırıcı durumlar, öğrenci etkisi ve tutum öğretim üyelerinin teknoloji entegrasyonuna yönelik niyetlerini nasıl yordamaktadır?

2) Öğretim üyeleri fakülte teknoloji mentörlüğü bağlamında teknoloji entegrasyonu davranışını nasıl algılamaktadırlar?

Çalışmanın Kuramsal Çerçevesi

APDT bireylerin niyetleri tarafından yönlendirilen davranışlarını açıklamada yakın çevrelerinde bulunan bilgileri kullanma eğilimleri ve hareketleri arkasındaki mantığı tanımlamaktadır (Taylor & Todd, 1995). Bu davranış, davranışa yönelik niyet ve algılanan davranış kontrolü ile doğrudan bağlantılıdır (Ajzen, 2002). Davranışın anlaşılması niyetin üç öncülü olan tutum, subjektif norm ve algılanan davranış kontrolüne dayanmaktadır. Bu üç boyut da kendi içinde üçer tane alt boyutları barındırmaktadır.

Tutum; algılanan kullanım kolaylığı, algılanan fayda ve uyumluluk tarafından belirlenmektedir. Bunlardan ilki olan algılanan kullanım kolaylığı "bir yeniliğin anlaşılması ve kullanımının kişiye göre değişen algılanan zorluk derecesi" (Tornatzky& Klein, 1982, p. 154) olarak tanımlanmıştır. Tutumun ikinci kategorisi olan algılanan fayda "göreli fayda" olarak isimlendirilen eşdeğerliği gibi Davis (1989) tarafından "bir kişinin kendi iş performansını geliştirecek sistemleri kullanmaya yönelik inanç derecesi" (p. 320) olarak tanımlanmıştır. Algılanan kullanım kolaylığı ve algılanan fayda ile kişilerin davranışları arasında anlamlı bir ilişki bulunmaktadır (Amoako-Gyampah, 2007). Başka bir deyişle, davranıştan beklenen faydalar artıkça davranışın gösterilme olasılığı artmaktadır. Üçüncü kategori olarak uyumluluk "yeniliğin; muhtemel kullanıcılarının ihtiyaçları, geçmiş yaşantıları ve var olan değerleri ile tutarlı olarak algılanma derecesi" olarak tanılanmıştır (Roger, 1995, p. 224).

Subjektif norm, bireyin belirli bir davranışı göstermesine yol açan sosyal baskı ve sosyal etkiyi betimlemektedir (Ajzen, 1991). Bir davranışın bir ortamda kontrol edilmesinde, davranışı gerçekleştiren kişinin önemli gördüğü bireylerin bu davranış veya kişi hakkındaki görüşlerinden olumlu veya olumsuz şekilde etkilenmektedir. Taylor ve Todd (1995) bu birey gruplarını akranlar, öğrenciler, iş arkadaşları, amirler, yöneticiler, ve diğerleri olarak sınıflandırmışlardır. Genellikle öğretim üyelerinin davranışlarında üç grup etkili olarak düşünülmektedir: akranlar, öğrenciler ve yöneticiler (Ajzen & Harsthone, 2008; Mouza, 2002). Alan yazında da genel olarak kabul edildiği gibi bu çalışma kapsamında da bu üç grup subjektif normun alt kategorileri olarak kabul edilmiştir.

Algılanan davranış kontrolü hem davranışın açığa çıkarılmasında hem de davranışın tahmin edilmesinde katkı sağlamakta ve öz-yeterlilik, kolaylaştırıcı kaynak durumları ve kolaylaştırıcı teknoloji durumları olmak üzere üç alt kategorisi bulunmaktadır (Taylor & Todd, 1995). Öz-yeterlilik özel bir durumda başarılı bir şekilde davranma yeterliliğine olan güvene dayanmaktadır ve hem davranışın kendisine hem de algılanan davranış kontrolüne önemli oranda katkı sağlamaktadır. Kişilerin davranışını iyi bir şekilde gerçekleştirme düzeylerine yönelik algı düzeylerinin yükseldikçe o davranışı gösterilmelerine yönelik güvenlerini ve davranışın gerçekleştirilmesi düzeyini artıracaktır (Atsoglou & Jimoyiannis, 2012). Algılanan davranış kontrolünün diğer bir boyutu ise davranışı yerine getiren bireyin hevesi etkileyen davranışın gerçekleştirileceği ortamındaki faktörler olarak tanımlanan ve teknoloji ve kaynaklar kolaylaştırıcı durumlardır. Thompson, Higgings ve Howell (1991) kolaylaştırıcı durumları eğitimcilerin teknoloji kullanım kararlarını etkileyen çevresel faktörlerin etkisi olarak tanımlamıştır. Teknoloji entegrasyonu davranışı mevcut teknoloji ve kaynaklar tarafından kolaylaştırılmaktadır. Bunlar zaman, para, diğerleri ile işbirliği, bilgisayar, internet, profesyonel gelişim imkanları ve teknik ve kişisel destekler olarak listenebilir.

APDT, öğretim üyeleri teknoloji entegrasyonunu desteklemek için kolaylaştırıcı ortamın düzenlenmesi ve planlanan teknoloji entegrasyonu davranışının geliştirilmesi için davranışın detaylı bir şekilde açıklanmasına imkan sağlamaktadır (Ajjan & Hartshorne, 2008). Yapılan çalışmalar, APDT'nin bileşenlerinden davranış-niyet ve niyet-tutum (Lori, Cronan, & Kreie, 2004), niyet-subjektif norm ve niyet-algılanan davranış kontrolü (Ajjan & Hartshorne, 2008; Mak & Ross, 2003; Paver, Walker, & Hung, 2014) arasında anlamlı ilişki olduğunu ortaya çıkarmıştır. Paver, Walker ve Hung (2014) öğrencilerin öğrenmelerini desteklemek için yarı zamanlı çalışan misafir öğretim üyelerinin teknoloji kullanımına odaklanmışlardır ve davranış-niyet, uyumluluk-tutum, öz-yeterlilik-niyet, subjektif norm ve niyetin bütün alt kategorileri arasında anlamlı ve önemli bağlantılar olduğunu vurgulamıştır.

Öğretim üyelerinin teknoloji entegrasyonu niyetleri ve davranışları ile ilgili kısıtlı olan alan yazındaki ihtiyaca cevap vermek ve katkıda bulunmak amacıyla bu çalışma yürütülmüştür. Yüksek öğretim sınıflarına teknoloji entegrasyonu planı sağlamayı hedefleyen belirgin bir vizyon, öğretim üyelerinin teknoloji entegrasyonu imkanlarını genişletmek ve öğretim politikasını değiştirmeye yardımcı olabilmektir. (Georgina & Hosford, 2009). Yüksek öğretimde teknoloji entegrasyonu araştırmalarında teknoloji entegrasyonun belirli yollarına odaklanılmakla birlikte, alan yazında teknoloji entegrasyonuna yönelik davranışsal niyet ve davranışın kendisine yönelik ilişkili olduğu faktörleri inceleyen araştırmaların azlığı oldukça dikkat çekmektedir. Dolayısıyla, bu çalışma teknoloji entegrasyonu alan yazınına farklı açılardan katkıda bulunmayı amaçlamaktadır. Bunlar: (1) öğretim üyelerinin teknoloji entegrasyonu davranışı ve niyetlerini etkileyen faktörleri netleştirmek, (2) yüksek öğretim sınıflarının teknoloji ile zenginleştirilmesi için öğretim üyelerinin bu davranışlarını kısıtlayan ve kolaylaştıran faktörleri belirlemek ve (3) FTM programlarının daha etkili olarak tasarlanabilmesi ve uygulanabilmesi için öneriler sunmak olarak sıralanabilir.

Taylor ve Todd (1995) tarafından da vurgulandığı gibi, öğretim üyelerinin bu davranışı niyet ile doğrudan tutum, subjektif norm ve algılanan davranış kontrolü ile dolaylı olarak ilişkilidir. Yüksek öğretimde teknoloji entegrasyonunu inceleyen araştırmalar öğretim üyelerinin bakış açısında var olan çok çeşitli engeller ve bu engelleri ortadan kaldırması için yapılan tavsiyelere odaklanmışlardır (Pajo & Wallace, 2001; Beaudin, 2002; Snoeyink & Ertmer, 2001; Bariso, 2003). Fakat, bu faktörlerin niyet ve davranışı nasıl etkilediği, öğretim üyelerinin özellikle teknoloji entegrasyonu davranışını bire bir profesyonel gelişimi kapsamında ilk kez deneyimleyen öğretim üyelerinin bakış açısından değerlendirilmiştir (Lim, Lee, & Hung, 2008). Buna bağlı olarak öğretim üyelerinin genel algılarına dayalı detaylı bilgiye ulaşmak (Kane et al., 2016), özellikle de bu davranışı profesyonel olarak ilk defa deneyimleyen öğretim üyelerinin deneyimleme süreçleri hakkında görüşlerini edinmek açısından da bu çalışma önemli bir katkıda bulunmayı hedeflenmektedir.

Çalışmanın amaçlarına paralel olarak, araştırma sonuçlarının yüksek öğretim kurumlarında yürütülen öğretim faaliyetlerinin düzenlemesi için öğretim üyelerini desteklemeye yönelik ipuçları vermeyi amaçlamaktadır. Ayrıca, FTM programlarının hem program katılımcıları hem de karar vericiler için daha güçlü olacak şekilde yeniden tasarlanması ve uygulanmasına yönelik öneriler sunması beklenmektedir. Literatür taraması çalışmalarında Chuang ve diğerleri (2003) FTM programlarının genellikle eğitim fakültelerinde uygulandıklarını ve araştırmacıların öğretmen, öğrenme ve pedagoji alanında uzman olan öğretmen eğitimcilere yönelik uygulandıkları sonucuna ulaşmışlardır. Bu çalışmaların sınırlılığı ise bütün öğretim üyelerine ulaşmak yerine belirli bir uzmanlık alanına dahil olan öğretim üyelerine hitap etmemesi nedeniyle kurumsal olarak bireylerin teknoloji entegrasyonuna yönelik genel bakış açısını ortaya koymamasıdır. Üniversitedeki bütün bölümlerde görev yapan öğretim üyelerine ulaşmak için Baran (2016a) bu tür programların üniversite genelinde uygulanmasını önermektedir.

Fakülte teknoloji mentörlüğü etkinlikleri sırasında bazı zorluklarla karşı karşıya kalınsa da, yüksek öğretim kurumlarının sağladığı faydaları göz ardı edilemeyecek düzeydedir (Bean, Lucas, & Hyers, 2014). Buna ek olarak, öğretim üyelerinin pedagojik ihtiyaçlarını karşılama hedefiyle; FTM programları teknoloji entegrasyonunu deneyimleme sürecinin ortaya çıkarılmasını amaçlamakta ve öğretim üyelerinin sürece aktif katılımını sağlamaktadır (Quintana& Zambrano, 2014). Son olarak, öğretim üyelerinin teknolojiyi entegre ederken karşılaştıkları zorluklar ve teknoloji entegrasyonu davranışı ve niyetlerini desteklemeyi sağlayacak muhtemel yollarının belirlenmesi oldukça önemlidir (Buchanan, Sainter, & Saunders, 2013). Teknoloji entegrasyonu kişisel bir süreç ve her öğretim üyesi için farklı olmasına rağmen (Tondeur, van Braak, Ertmer, & Ottenbreit-Leftwich, 2016) bu sürecin genel boyutlarını derinlemesine incelemek, değerlendirmek ve birçok öğretim üyesinin sınıflarında teknoloji kullanmaktan kaçınmalarının önleyici tedbirler almak önem taşımaktadır (Hicks, 2016; Watty, McKay, & Nogo, 2016). Uygulanan mentörlük programının öğretim üyeleri tarafından değerlendirilmesi sonucunda yüksek öğretim kurumlarında uygulanması ve planlanan profesyonel gelişim uygulamalarının geliştirilmesine yönelik öneriler ortaya koymayı amaçlamaktadır.

Bu çalışma dahilinde, öğretim üyelerinin teknoloji entegrasyonu davranış ve niyetlerinin hem bir yüksek öğretim kurumunun genelinde hem de FTM programı kapsamında değerlendirilmesi; öğretim üyelerinin teknoloji entegrasyonu davranışına yönelik algılarının derinlemesine incelenmesi, bu davranışa etki eden faktörlerin belirlenmesi ve davranışın gösterilmesi sürecinde yaşanan zorluklar ile bu zorluklara yönelik potansiyel çözüm yollarının belirlenmesine olanak sağlamaktadır. Ayrıca kolaylaştırıcı ortamların oluşturulmasının bir aşamasında bu davranışın analiz edilip yol haritasının oluşturulmasından geçmektedir.

Çalışmanın Metodu

Bu çalışmada araştırma sorularını cevaplamak için karma yöntem uygulanmıştır. Karma yöntem türlerinden eş zamanlı üçgenleme yöntemi (Creswell, Plano Clark, Gutmann, & Hanson, 2003) belirlenmiştir. Tashakkori ve Teddlie (2003) “tek çalışma içinde bulguları desteklemek, karşılıklı kontrol etmek veya güçlendirmek” (p. 229) amacıyla kullanıldığını belirtmişlerdir. Hem nitel hem de nicel verilerin eş zamanlı toplanarak verilerin yorumlanması kısmında bütünleştirilmesine sağlayan bu metot ile birlikte çalışmanın teknoloji entegrasyonu davranışını etkileyen faktörlerin belirlenmesine kapsamlı bir bakış açısıyla davranışın analizine katkıda bulunmaktadır.

Çalışmanın Kapsamı

Bu çalışma Türkiye'de mühendislik, fen-edebiyat, mimarlık, iktisadi ve idari bilimler, eğitim fakülteleri ve rektörlük birimine bağlı birkaç bölüm ve enstitüden oluşan bir devlet üniversitesinde yürütülmüştür. Bu üniversite hem öğretim üyelerinin hem de öğrencilerin kolaylıkla ulaşabilecekleri şekilde eğitim teknolojileri ve teknolojik olanaklarla donatılmış olması nedeniyle seçilmiştir. Bu teknoloji ve olanaklar ise bilgisayar merkezi, öğretim teknolojileri destek ofisi, öğrenme ve öğretmeyi destekleme ofisi, sınıfların tamamına yakınında bulunan bilgisayar ve projeksiyon sistemleri, tüm kampüste aktif olan kablosuz ve kablolu internet ağları, eğitim yapılan bütün binalarda yer alan bilgisayar laboratuvarları örnek olarak verilebilir.

Bu olanakların dışında, çalışmanın yürütüldüğü dönemde üniversite bütün ders içeriklerinin Moodle temelli yeni bir öğrenme yönetim sistemine taşındığı bir değişim süreci geçirmekteydi. Bütün öğretim üyeleri bu platformu keşfederken bir yandan da teknoloji olarak bu platformun derslere entegre edilmesini deneyimleme imkanı bulmuşlardır. Bu değişim bütün öğretim üyelerinin en azından bu platformu analiz etme ve platformun sunduğu olanakları inceleme fırsatı sunmuştur. Öğrenme öğretme araçlarından biri olan Moodle temelli öğrenme yönetim sistemi sosyal yapılandırmacılık felsefesi temeline dayanan ve internetin sunduğu işbirlikçi öğrenme imkanlarının kullanımı ile öğrenci merkezli öğretim faaliyetlerini destekler niteliktedir (Al-Ajlan & Zedan, 2008). Moodle, öğretim üyelerinin doküman ve ders malzemelerinin paylaşılması, öğrencileri değerlendirme, çevrimiçi tartışma forumları oluşturma, ödevlerin dağıtılması ve toplanması, notların ilan edilmesi, ve birçok etkinlik gerçekleştirmede yardımcı olmaktadır. Bunları yerine getirirken öğretim üyelerine çevrimiçi olarak dersin kolaylıkla yönetilmesi, kontrol edilmesi ve değiştirilmesi gibi olanaklar sunmaktadır. Bu değişim sürecinde üniversitenin eğitim teknolojileri destek ofisi ve bilgisayar merkezi öğrenme yönetim sistemi üzerinde derslerin açılması, platformun tanıtımına yönelik çalıştayların düzenlenmesi ve yaşanan teknik problemlerin giderilmesi konusunda bütün öğretim üyelerine yardımda bulunmuşlardır. Aynı şekilde, (1) bütün üniversite kapsamında hizmet veren teknoloji destek ofisi ve her fakültenin kendi bünyesinde bulunan teknik destek ofisleri, (2) bu ofisler, kütüphane ve öğrenme ve öğretme destek birimleri tarafından öğretim üyelerine yeni akademik veya eğitimsel teknolojilerin tanıtımına yönelik düzenlenen eğitimler ve (3) kampüsün tamamında yer alan kablosuz internet ağı ve diğer bazı teknolojik araçlarla desteklemiş sınıflar ile öğretim üyelerine teknoloji entegrasyonu konusunda üniversite yönetimi kurumsal destek sağlamaya çalışmıştır.

Fakülte Teknoloji Mentörlüğü Programı

Bire bir mentörlük programı şeklinde uygulanan FTM programının katılımcılarını 24 gönüllü öğretim üyesi ile 24 lisans üstü eğitimine devam eden ve “Öğretmen Eğitiminde Teknoloji Araştırmaları ve Uygulamaları” dersini alan öğrencilerden oluşmaktadır. Eğitim bilimleri bölümü tarafından sunulan ders kapsamında öğrencilerin teknoloji entegrasyonu konusunda hem teorik hem de pratik açıdan gelişmelerini desteklemek için hizmet öncesi ve hizmet içi öğretmen eğitimi ile yüksek öğretimde öğretim üyelerinin profesyonel gelişim uygulamaları kapsamında teknoloji entegrasyonu davranışının geliştirilmesine yönelik teknoloji entegrasyonu ile ilgili kavramlar, teoriler, modeller ve yaklaşımları kapsamaktadır. Mentörlük etkinliklerini öğrenciler ders kapsamında dönem boyu yürüttükleri bir proje olarak, dönem sonunda yazdıkları örnek olay araştırması şeklinde dönem sonu ödevi olarak raporlamışlardır.

Mentörlük programına katılım için öğrenme ve öğretmeyi destekleme ofisinin yürütmüş olduğu eğitime katılan ve bu ofisin mail listesinde bulunan, ayrıca öğretim teknolojileri destek ofisinden çalıştaylar veya bireysel yollarla yardım alan öğretim üyelerine mail yoluyla davet gönderilmiş olup gönüllü olanlar programa dahil edilmişlerdir. Programa davet için bu e-mail listelerinin seçilmesinin nedeni ise bu kişilerin teknoloji entegrasyonuna yönelik ilgilerini bu ofislere başvurarak belirtmeleridir. Ayrıca bu yolla tek bir bölüm veya fakülteden değil çok farklı akademik ilgisi olan öğretim üyelerinin katılımı ile programın üniversitede devam eden kapsamlı değişimin desteklemesi ve ayrıca bölümsel çeşitliliğin sağlanması amaçlanmıştır. Özellikle eğitim fakültesi dışındaki öğretim üyelerinin pedagojik problemlerini çözmek için ihtiyaç duydukları uzman yardımını sağlayarak onların profesyonel gelişimlerine de katkıda bulunmak hedeflenmiştir. Bu süreçte en önemli kriter öğretim üyelerinin tamamen gönüllü olarak programa katılmalarıdır.

FTM programı 2014 ve 2015 bahar dönemlerinde olmak üzere iki dönem uygulanmıştır. Program katılımcıları olan lisansüstü öğrencileri (mentörler) öğretim üyeleri (mentiler) ile bire bir eşleşerek mentörlük grupları oluşturulmuştur. Bu gruplardan iki tanesi diğerlerinde farklı olarak mentörlük takımına dönüşmüşlerdir. Bu takımlardan biri aynı dersi aynı ders izlencesi iki farklı gruba veren iki öğretim üyesi ve bir mentörden oluşurken, diğer takım ise aynı dersi aynı ders izlencesi ile veren dört öğretim üyesinden oluşan bir öğretme takımı ve bir mentörden oluşmaktadır.

FTM programı kapsamında mentörlük gruplarından haftalık olarak toplanmaları ve öğretim üyelerinin öğretim ortamına yönelik teknolojik çözümler üzerinde çalışması beklenmiştir. Çünkü bu program öğretim üyelerinin teknolojik ve pedagojik bilgiye yönelik farkındalıklarını artırarak teknoloji entegrasyonlarını desteklemek ve kolaylaştırmayı amaçlamaktadır. Bu süreçte eğitim fakültesinde eğitime devam eden daha önceden pedagojik uzmanlığı olan ve eğitim teknolojileri uzmanlığını ise bahsedilen ders kapsamında sağlayan lisans üstü öğrencileri rehberliğinde ve desteğinde, mentiler tarafından teknoloji entegrasyonunu deneyimlenmesi sağlanmıştır.

Mentör ve mentilerin program sürecinde (a) öğretim üyelerinin ihtiyaçlarının belirlenmesi, (b) bu ihtiyaçları karşılama yollarının ortaya çıkarılması, (c) muhtemel teknoloji entegrasyonu yollarının belirlenmesi ve plan hazırlanması, (d) hazırlanan teknoloji entegrasyonu planın uygulanması ve (e) teknoloji entegrasyonu uygulamasının değerlendirilmesi ve uygulama sonuçlarının paylaşılması hedeflenmiştir (Baran, 2016a). Katılımcılara mentörlük etkinlikleri için temel beklentiler ve temel mentörlük uygulamaları aşamalarından oluşan bir rehber niteliğinde bir el kitapçığı sunulmuştur. Mentörlük aktiveleri ise katılımcıların süreç boyunca yaptıklarını özetleyen bir sunum yapılması, montörlerin oluşturduğu örnek olay raporları teslim edilmesi ve mentörlük bloglarının yayınlanması ile tamamlanmıştır.

Çalışmanın Katılımcıları

Karma yöntemin doğası gereği, çalışmaya iki farklı grup katılımcı dahil edilmiştir. Çalışmanın bütün katılımcılarının üniversite bünyesinde aktif olarak eğitim vermekte olan tam zamanlı öğretim üyeleri olmasına dikkat edilmiştir. Bu nedenle katılımcılar öğretim görevlileri, yardımcı doçentler, doçentler ve profesörlerden oluşmaktadır.

Öğretim Üyelerinin Teknoloji Entegrasyonu Niyeti Anketi Katılımcıları

Üniversite popülasyonu ($N = 894$) ulaşılabilir sayıda olması nedeniyle katılımcı seçimi yoluna gidilmemiş ve evrende yer alan bütün öğretim üyeleri anket çalışmasına katılmak için davet edilmiştir. Üniversite genelinde görev yapmakta olan öğretim üyelerin dağılımı ise şöyledir; yardımcı doçent doktor ($N = 234$), doçent doktor ($N = 179$), profesör ($N = 356$) ve öğretim görevlisi ($N = 125$). Bu yöntem araştırmacıların hedeflenen evrende yer alan bütün bireylere örneklem seçmeden ulaşmayı sağlamaktadır (Fowler, 2013; Marco, 2004; Vogt, King, & King, 2004). Bu yöntemle etkili uygulamaların planlanmasına yönelik geniş çaplı bilgiler toplanmasına olanak sağlamaktadır.

Anket uygulamasının odak noktasını, hali hazırda üniversitede aktif olarak öğretim faaliyetlerini yürüten öğretim üyeleri oluşturmaktadır. Bu noktada üniversitedeki genel eğilimlerini belirlenmek amacıyla öğretim üyelerinin teknoloji entegrasyonu deneyim düzeyleri dikkate alınmamıştır. Verilerin çok çeşitli bir kitleden toplaması hedeflendiği için, derslerinde teknoloji aktif olarak entegre eden ve etmeyen bütün öğretim görevlileri çalışma kapsamına dahil edilmiştir. Böylelikle üniversitenin genel çerçevesinin ortaya konulması amaçlanmıştır. Ayrıca katılımcıların çeşitliliğini sağlayabilmek için farklı uzmanlık alanlarına sahip olanların çalışmaya katılması oldukça önem taşımıştır.

Ankete toplamda 167 öğretim üyesi katılmıştır. Ankete katılan öğretim görevlilerin dağılımı ise şöyledir; yardımcı doçent doktor (n=28), doçent doktor (n = 39), profesör (n = 69) ve öğretim görevlisi (n = 31). Demografik bilgileri Tablo 1'de özetlenmiştir. Fakülteler temelinde öğretim üyelerinin dağılımı üniversite genelini yansıtmakta olup katılımcılar arasında mühendislik fakültesinde görev yapanlarının sayısının çok olması ve eğitim fakültesinden az olması bunun en büyük göstergesidir. Dağılımları ise şöyledir; mimarlık fakültesi (n = 22), fen-edebiyat fakültesi (n = 16), iktisadi ve idari bilimler fakültesi (n = 10), eğitim fakültesi (n = 8), mühendislik fakültesi (n = *88*) ve modern diller bölümü (n = 21).

Tablo 1.

Anket katılımcılarının demografik bilgileri

	n	*Min*	*Max*	*M*	*SD*
Yaş	53	27	78	47.39	11.36
Açılan ders sayısı	67	0	8	2.10	0.89
Öğrenci sayısı	66	0	380	96.34	45.30
Öğretim deneyimi (yıl)	66	1	55	17.46	11.94

Ankete katılan öğretim üyeleri çok farklı teknolojik araç, gereç, program ve uygulama kullanmaktadır. Öğretim üyelerinin en yaygın şekilde kullandıkları teknolojik araç ise üniversite genelinde ilk kez kullanılan öğrenme yönetim sistemidir (n = 84). Buna ek olarak, öğretim üyeleri dersleri kapsamında paket programların (n = 93) kullanımına özen göstermektedir. Özellikle mühendislik ve mimarlık fakültesi derslerinde kapsamında öğrencilere iş hayatında da kullanacakları programların kullanımında deneyim edindirmek amaçlanmaktadır. Matlab gibi programlama temelli programlar ise farklı fakültelerde görev yapmakta olan öğretim üyeleri tarafından tercih edilmesi nedeniyle en yaygın kullanılan programdır. Kullanılan teknolojik araçlar arasında sosyal medya, simülasyon programları ve öğrenci cevaplama sistemleri en az tercih edilen teknolojiler olarak dikkat çekmektedir. Teknolojik araçlar olarak ise, öğretim üyeleri tüm üniversite genelinde yaygın olan bilgisayar ve projektör sistemlerini, akıllı telefon ve tablet bilgisayarlara oranla daha fazla tercih etmektedir. En az tercih edilen ise üniversite genelinde sadece eğitim fakültesinde yer alan akıllı tahtalardır.

FTM Teknoloji Entegrasyonu Davranışı Görüşmesi Katılımcıları

FTM programına katılan öğretim üyeleri (n = 24) arasında 17 kişi görüşmeye katılmayı kabul etmiştir. Çok farklı geçmiş deneyimleri olmasına rağmen ortalama sekiz yıllık öğretmen deneyimine sahip bu öğretim üyelerinin yaşları (M = 38.3) 31 ile 49 arasında değişmektedir. Program süresince öğretim üyeleri iki (n = 9), üç (n = 6) ve dört (n = 2) dersi aynı anda yürümekteydiler ve bu derslere kayıtlı öğrenci sayısı (M:102) 30 ile 320 arasında değişmektedir.

Görüşmeye katılan öğretim üyeleri mentörlük programından önce en az bir kez teknoloji entegrasyonu ile ilgili bir profesyonel gelişim programına katılmışlardır. Bu durum öğretim üyelerinin teknoloji entegrasyonu ile ilgili farkındalıklarının olduğunu işaret etmektedir. Teknoloji entegrasyonu deneyim düzeyleri ile ilgili olarak, uzmanlık düzeyleri teknolojik araçlara göre değişmekle birlikte genel olarak kendilerini orta düzeyde görmektedirler. Öğretim üyeleri çoğunlukla kampüs genelinde ulaşılabilir ve yaygın olarak kullanılan teknolojiler ve çevrimiçin kullanımı bedava ve kolay olan teknolojileri tercih etmektedirler. Bunlar arasında bilgisayar projeksiyon sistemleri, öğrenme yönetim sistemi, dosya paylaşım platformları, öğrenci cevaplama sistemleri ve sosyal medya yer almaktadır. Diğer tarafından çevrimiçi uygulama toplulukları olanakları, ters-yüz edilmiş sınıflar uygulamaları, sanal gerçeklikle öğrenme ortamları, podcastler, sosyal imleme platformları ve eğitsel oyunlar en az tercih edilen eğitim teknolojisi uygulamaları arasında yer almaktadır.

Veri Toplama Araçları ve Verilerin Toplanması

Çalışmanın amaçları ve dayandığı araştırma metodunun gereği olarak iki farklı türden veri toplanması planlanmış ve veri toplama araçları geliştirilip uygulanmıştır. Çalışmanın yürütüldüğü üniversitenin tamamında uygulanmak üzere geliştirilen "öğretim üyelerinin teknoloji entegrasyonuna yönelik niyet anketi" ve FTM programına katılan öğretim üyelerine uygulanmak üzere hazırlanan "FTM teknoloji entegrasyonu davranışı görüşme formu" bu çalışmanın veri toplama araçlarını oluşturmaktadır.

Öğretim Üyelerinin Teknoloji Entegrasyonu Niyeti Anketi: Birinci araştırma sorunu cevaplamak için bu çalışmanın ön çalışma kısmında geçerlilik ve güvenilirlik çalışmaları yürütülmüş olan anket ile veri toplanmıştır. Temelde APDT'ne dayanan anket öğretim üyelerinin teknoloji entegrasyonu davranışını etkileyen faktörlere yönelik yarı zamanlı çalışan misafir öğretim üyeleri ile Paver ve diğerleri (2014) tarafından yürütülen çalışma kapsamında geliştirilmiş anket temel alınmıştır. Bu nedenle 60 maddenin 13 faktörü oluşturduğu orijinal anketin bazı faktörlerine ait maddeler başka çalışmalarda kullanılan maddeler ile değiştirilmiştir. Özellikle orijinal ankette yer alan ve düşük Croanbach Alpha düzeylerine sahip olan üç faktörün (subjektif norm, algılanan kullanım kolaylığı ve akran etkisi) maddelerinin değiştirilmesi gerekliliği doğmuştur.

Ön uygulama için hazırlanan anket; çalışmayı tanıtıcı genel bilgiler (1) demografik bilgiler, (2) kullanılan teknolojiler ile ilgili açık uçlu soru, (3) teknoloji entegrasyonunu etkileyen faktörleri ölçen anket maddeleri (4) olmak üzere dört farklı bölümden oluşmaktadır. Demografik bilgiler bölümü katılımcılarla ilgili detaylı bilgiler edinmek için şu 10 farklı soruyu içermektedir: cinsiyet, yaş, unvan, fakülte, o dönem sunulan ders sayısı, ve bu derslere kayıtlı öğrenci sayısı gibi soruları içermektedir. Ön uygulaması yapılan anketi Ekler kısmında verilmiştir.

İki farklı alandan dört faklı uzmanın görüşüne sunulup gerekli düzenlemeler yapıldıktan sonra, anket üç öğretim üyesine uygulanarak açıklığı, okunabilirliği ve anlaşılabilirliği açısından incelenip düzenlendikten sonra anketin ön uygulanmasına başlanmıştır. Bu süreçte ana uygulamanın yapılacağı üniversitede de olduğu gibi öğretim dili İngilizce olan ve teknolojik imkanları birbirine benzer olan 7 farklı üniversiteden 237 öğretim üyesinden veri toplanmıştır.

Ön uygulama verilerinin toplanmasının ardından açıklayıcı faktör analizi çalışmaları yürütülmüş ve 27 maddeden oluşan 6 faktörlü yapı ortaya çıkarılmıştır. Elde edilen faktörler, APDT tarafından da önerilen niyet, öz-yeterlilik, tutum, kolaylaştırıcı durumlar, subjektif norm ve öğrenci etkisi olarak adlandırılmış ve yürütülen testler ile de güvenilirlik katsayılarının Hari ve arkadaşları (2010) tarafından önerilen 0.7 değerinden yüksek olduğu belirlenmiştir.

Son hali verilen anket uygulamasına çalışmanın yürütüldüğü üniversitede görev yapmakta olan bütün öğretim üyeleri öncelikle e-mail yoluyla davet edilmiş ve ilk davetten sonra iki kez birer hafta ara ile hatırlatma mailleri gönderilmiş ve katılımın az olması nedeniyle yüz yüze uygulama gerçekleştirilmiştir. Öğretim üyelerinin ofisleri ziyaret edilerek uygun olan ve çalışmaya katılmayı kabul edenlerle anket uygulaması tamamlanmıştır. Uygulama sonunda toplamda farklı bölümlerden faklı akademik geçmişlere sahip 167 öğretim üyesinden anket yolu ile veri toplanmıştır.

FTM Teknoloji Entegrasyonu Davranışı Görüşme Formu: FTM programına katılan öğretim üyelerine uygulanmak üzere yarı-yapılandırılmış görüşme formu hazırlanmıştır. Bu form APDT dayandırılarak teoride belirlemiş olan faktörleri ve araştırma sorularını temel alan soruları içermektedir. Görüşme protokolü; akademik geçmiş soruları ve temel sorular olmak üzere iki temel bölümden oluşmaktadır. FTM'e katılan bütün öğretim üyeleri bu çalışmaya katılmaları için programa katılımlarından bir dönem sonra davet maili gönderilerek gönüllü olanlar ile ofislerinde görüşmeler yapılmıştır. Ortalama 45 dakika süren görüşmelere başlamadan önce öğretim üyelerinden kendileri ile ilgili bazı demografik bilgilere yönelik olan formu doldurmaları istenmiştir.

Veri Analizi

Çalışmada birinci araştırma sorusunu cevaplamak için toplanan anket verileri çoklu doğrusal regresyon yöntemi ile analiz edilmiştir. Analiz araştırmacılara belirli değişkenlerim etkisinin inceleme olanağı sunmaktadır (Mertler & Vannatta, 2005). Bu analiz teorinin de önerdiği gibi belirlenen faktörler arasında yer alan niyetin diğer faktörler tarafından yordaması düzeyini belirlemeye yardımcı olmuştur.

Araştırmanın ikinci sorusunu cevaplamak için toplanan görüşme verisinin analiz edilmesi için nitel veri analizi yöntemlerinden Strauss ve Corbin (1990) önerdiği kodlama sürecinde belirli bir kod listesine analiz sürecinde eklenen yeni kodlarla birlikte oluşturulan kod listesine göre analiz etme yolu izlenmiştir. Bu süreçte APDT tarafından sunulan faktör listesi temel alınmakla birlikte araştırmanın alt sorularını cevaplamak için farklı kod kategorileri de eklenerek çalışmaya özgü bir kod listesi oluşturulmuştur. Veri analizin sonucunda alt sorular paralelinde (1) teknoloji entegrasyonu davranışına etki eden faktörler, (2) FTM programının katkıları ile geliştirilmesine yönelik öneriler ve (3) teknoloji entegrasyonu sürecinde yaşanan zorluklar ile bu zorlukları aşmaya yönelik önerilerden oluşan kodlar üç ana kategoride toplanmıştır.

Bulgular

Anket uygulaması sonucunda elde edilen verilerin analizi sonucunda öğretim üyelerinin teknoloji entegrasyonuna yönelik niyetlerini çoklu doğrusal regresyon analizine dahil edilen beş değişkenin anlamlı bir şekilde yordadığı ortaya çıkmıştır (R^2 = 0.46, ΔF(5, 161) = 28.28, p < 0.05). Analize dahil edilen model öğretim üyelerinin niyetinin %45.4'ünü açıklamaktadır. Modelde yer alan öz-yeterlilik (β=0.36, t(167)=3.54, p= 0.001), öğrenci etkisi (β = 0.35, t(167) = 2.99, p = 0.003) ve tutum (β = -0.28, t(167) = 3.12, p = 0.002) öğretim üyelerinin teknoloji entegrasyonu niyetleri ile anlamlı bir şekilde ilişkilidir. Fakat kolaylaştırıcı durumların (β = 0.01, t(167) = 0.09, p = 0.92) ve subjektif normun (β = 0.35, t(167) = 0.12, p = 0.66) niyet ile anlamlı bir şekilde ilişkili olmadığı ortaya çıkmıştır.

İkinci araştırma sorusu öğretim üyeleri ile yapılan görüşmelerle ile cevaplandırılmaya çalışılmış ve verilerin analizi kapsamında üç alt tema ortaya çıkmıştır. Bunlar; öğretim üyelerinin teknoloji entegrasyonu davranışlarına etki eden faktörler, FTM programın değerlendirilmesi ve FTM uygulamaları sırasında öğretim üyelerinin teknoloji entegrasyonu ile ilgili yaşadıkları zorluklar ve bu zorlukları aşmak için sundukları önerilerdir.

Bulgulara göre, FTM programına katılan öğretim üyeleri APDT'inde belirlenen bütün faktörlerin davranış üzerinde farklı düzeylerde de olsa etkisi olduğunu ortaya çıkarılmıştır. Bunlar arasında tutum altında öğretim üyelerinin "teknolojiye yönelik ilgileri"nin de bir alt kategori olarak yer almasına yönelik bulgular elde edilmiştir. Bulgular, teknolojiye karşı olumlu tutumu olan öğretim üyelerinin teknolojiye karşı ilgili oldukları, teknolojinin kullanım kolaylığı ve kullanılışlığa ek olarak teknolojinin entegre edileceği ortama uygunluğunun etkili olduğunu belirtmektedirler. Öğretim üyelerinin çevrelerinde yer alan gruplar arasında öğrencilerinin öğretim elemanlarının teknolojiyi entegre etmelerinde önemli derecede etkili olduğu ortaya konulmuştur. Bulgulara göre, öğrencilerin teknolojik ilgileri ve ihtiyaçlarının yanı sıra teknolojik deneyimleri, öğretim üyelerinin bu davranışı gösterirken göz önünde bulundurdukları önemli etmenlerden olduğu ortaya çıkmıştır. Bunun yanı sıra akranlar ve yöneticilerin davranış üzerinde çok kısıtlı etkileri olduğu belirlenmiş olup öğretim üyelerinin teknoloji entegrasyonunu deneyimledikten sonra akranlarının davranışları üzerinde etkili olduklarını belirtmişlerdir. Son olarak öğretim üyelerinin algıladıkları davranış kontrolü kapsamında öz yeterlilik düzeyleri ve kolaylaştırıcı durumların ulaşılabilirliği davranışın gösterilmesini ve sıklığını etkilediği tespit edilmiştir.

Faktörlerin dışında, öğretim üyeleri teknoloji entegrasyonunu deneyimleme sürecinde karşılaştıkları zorlukları ve bu zorluklara yönelik önerilerini belirtmişlerdir. Karşılaşılan zorlukları öğretim üyesi, öğrenci ve kapsamla ilgili zorluklar olarak üç grupta toplayabiliriz. Öğrenciler ile ilgili zorluklar arasında öğrencilerin motivasyonu, teknolojiye olan aşinalıkları ve hevesleri sıralanabilir. Bu noktalarda öğretim üyesi öğrencinin ilgisini teknoloji ile zenginleştirilmiş sınıftaki etkinliklere çekmekte güçlük çekmekte ve davranışı olumsuz yönde etkilenmektedir. Diğer taraftan öğretim üyesinin kullanmayı planladığı belirli bir teknoloji ile daha önce karşılaşmamış öğrencilerin teknoloji kullanama alışkanlıkları da problem oluşturmaktadır. Ayrıca öğrencilerin yeni bir öğretim teknolojisini öğrenmesinin de ayrıca bir yük oluşturduğunu belirtmişlerdir.

Öğretim üyeleri ile ilgili zorlukların başında ise zaman gelmektedir. Öğretim üyelerinin yeterli zamana sahip olmamaları ve teknoloji entegrasyonunu öğrenmek, planlamak ve uygulamak için zamana ihtiyaç duymaları öğretim üyeleri için zorluk oluşturmaktadır. Özellikle ön hazırlığa ihtiyaç olması, öğretim faaliyetlerinin planlanması sürecinde fazladan zaman ayrılmasını ve ayrıca sınıfın düzenlenmesi için de sınıf içinde zaman kaybına yol açmasından dolayı zorluklar oluşturmaktadır. Öğretim üyelerinin işaret ettiği diğer bir nokta olan teknik zorluklar ve aksaklıklar öğretimin planlanandan daha fazla zaman almasına yol açmaktadır. Zaman probleminin dışında; teknolojik bilgi, teknolojilere aşina olma ve pedagojik ihtiyaçları karşılamak için uygun teknolojik araçları ve kaynakları bulma konularında zaman sıkıntı çektiklerini belirtmişlerdir. Ek olarak, sınıf kontrolünü ve öğrenci dikkatini kaybetme gibi teknoloji entegre edilmiş sınıfların yönetimine dair de endişelenmektedirler. Öğretim üyelerinin teknoloji entegrasyonuna yönelik motivasyon düşüklüğü, özellikle dışsal motivasyon kaynaklarının azlığı dikkate değer zorlaştırıcı etmenler arasında yer almaktadır. Ortam ile ilgili zorluklar arasında ise internet bağlantısı kopması, yazılım ve donanım sorunları, kalabalık sınıflar ve sınıfların fiziksel dizaynı gibi genel olarak teknik zorlukların ağırlıkta olduğu ortaya çıkmıştır. Üstelik bazı programlar akıllı telefon gibi bazı özelliklere sahip dijital araçları gerektirmektedir ancak öğrencilerin hepsinin bu araçlara sahip olmadığı durumlarda zorluklar yaşanabilmektedir. Çünkü öğrencilerinin hepsine ulaşmayı hedefleyen öğretim üyeleri, bu gibi durumlarda karşılaştıklarında planladıkları etkinliği değiştirmek veya yedek bir plan hazırlamak durumunda kalmaktadırlar. Ayrıca uygulamayı planladıkları teknolojilerinde kendi içlerinde kısıtlılıkları olduklarını belirten öğretim üyeleri, Socrative gibi uygulamaların açık uçlu soruları veya detaylı görseli olan soruları sormalarına izin vermediği için kullanımı konusunda sıkıntı oluşturduğunu belirtmişlerdir.

Teknoloji entegrasyonu davranışının geliştirilmesi için öğretim üyeleri üç temel yolu önermişlerdir: profesyonel gelişim, destek ve işbirliği. Bütün öğretim üyelerini kapsayan profesyonel gelişim olanaklarının artırılması ve düzenli seminerlerin yürütülmesi ile öğretim üyelerinin teknoloji entegrasyonu farkındalıklarının artırılabileceğini belirtmişlerdir. Göreve yeni başlayan öğretim üyelerinin dahil edildiği uyum programının içeriğinin yüksek öğretimde teknoloji entegrasyonuna yönelik içeriğinin daha kapsamlı ve etkili bir şekilde sunulması gerektiğini belirtmişlerdir. Özellikle çevrimiçi öğrenme platformları, ters-yüz edilmiş sınıflar, çevrimiçi sınıflar, kitlesel açık çevrimiçi kurslar gibi yüksek öğretimde güncel olan teknolojilerin kullanımlarına yönelik tanıtım ve eğitimlerin eksikliğinin giderilmesi gerektiğini vurgulamışlardır. Mevcut olan teknik destek imkanlarının donanımlı araştırma görevlileri veya mentörler ve öğretim teknolojileri destek ofisi takımının geliştirilmesi ile daha kapsamlı hale getirilmesinin gerekliliğini ortaya koymuşlardır. Öğretim üyelerinin görüşlerine göre, teknoloji entegrasyonu sırasında çok sık karşılaşılan zorlukların başında gelen yazılım ve donanım problemleri var olan desteğin artırılması ile kolaylıkla çözülebilmektedir. Bu nedenle öğretim üyeleri kendilerine teknoloji entegrasyonu konusunda yardımcı olacak uzman mentörler ile bir dönem yerine en az bir yıl birlikte çalışmanın uzun süreli etkiyi artıracağını belirtmişlerdir. Bölümler arası ve kişiler arası teknoloji entegrasyonu konusunda işbirliğinin artırılmasının farklı ve örnek teşkil edecek uygulamaların bütün öğretim üyeleri ile paylaşılması ve diğer hocaların konu ile ilgili neler yaptığının yayınlanması farkındalığı ve etkililiği artıracağı belirtilmişlerdir. Öğretim üyelerine göre, problemlerin çözülmesi için kurum yönetiminin önemli bir rolü olduğu ve bunun için öğretim üyelerinin ihtiyaç duyduğu kampüs genelinde uygulanan profesyonel gelişim eğitimleri, var olan teknoloji entegrasyonu planının geliştirilmesi, ileri düzey teknolojik araçların sağlaması gibi faaliyetlerle sağlanabileceğini vurgulamışlardır. Öğretim üyeleri, kurum yönetiminin teknoloji entegrasyonu konusunda heyecanlı ve azimli olan öğretim üyelerinin bu çabalarının desteklemesi ve özverilerinin ödüllendirildiği bir teşvik sistemi geliştirilmesini önermektedirler.

Analizler sonucunda ortaya çıkan üçüncü kategori olan öğretim üyelerinin FTM programına yönelik görüşleri ise FTM'in katkıları ve FTM'in geliştirilmesine yönelik öneriler olmak üzere iki başlık altında toplanmıştır. Programın en çok vurgulanan katkıları; teknoloji entegrasyonu farkındalığı, bilgisi ve becerisinin artırması, hem teknolojik hem de pedagojik bilginin geliştirilmesine yönelik mentörlerin desteği, incelenen eğitim teknolojilerinin sınıf içindeki etkisini doğrudan deneyimle imkanının olması, öğretim yönetiminin değişmesi ve çalışma arkadaşlarının teknoloji entegrasyonuna yönelik farkındalıklarının artırılmasına yönelik etkileri vurgulanmıştır. Özellikle hem FTM'e katılan öğretim üyelerinin farkındalıklarının artması hem de bu öğretim üyeleri vasıtasıyla onların çevresinde yer alan çalışma arkadaşlarının da farkındalıklarını artırmaya yönelik adımları FTM'in etkisinin program katılımcılarının da dışına taşındığını işaret etmektedir. FTM ile ilgili en önemli önerilerden birisi programın tüm üniversite kapsamında uygulanmasını ve bütün bölümlerdeki öğretim üyelerinin bu programdan faydalanmasını sağlamaktır. Ek olarak; FTM uygulamalarını desteklemek için program kapsamına çalıştayların eklenmesi, mentör ve mentiler arasından düzenli toplantıların ve sınıf ziyaretlerinin planlanması, eşleştirme stratejisinin geliştirilmesi, öğretim üyelerinin yanı sıra araştırma görevlilerinin de program kapsamında menti olarak yer almaları, bütün mentör ve mentilerin katılacağı bir uygulama topluluğu oluşturulması ve desteğe ihtiyacı olan bütün öğretim görevlilerinin gönüllülüğe bakılmaksızın programa dahil edilmesini önermektedirler.

Özetle, FTM programına katılan öğretim üyelerinin görüşlerine göre, teknoloji entegrasyonu davranışı en çok algılanan davranış kontrolü, subjektif norm ve tutum ile bağlantılıdır. Davranışa yönelik niyet ise en az değinilen nokta olmuştur. Öğretim üyelerinin hepsi bu davranışı gösterirken zorluklarla karşılaşmış olmaları nedeniyle bu zorluklarla baş edebilmek için uygulama ve politika geliştirmeye yönelik öneriler sunmuşlardır. Son olarak öğretim üyeleri katıldıkları FTM programının katkılarını sıralarken daha etkili bir şekilde uygulanabilmesi için öneriler sunmuşlardır.

Tartışma ve Sonuçlar

Bu çalışma öğretim üyelerinin teknoloji entegrasyonu davranışını etkileyen faktörlerin üniversite genelinde ve FTM programı özelinde belirlenmesini amaçlamıştır. APDT'nin belirlediği davranışın bütün alt boyutlarının FTM programı özelinde etkili olduğu belirlenmiştir. Davranışa yönelik niyetin analiz edildiği üniversite geneline bakıldığında öğrenci etkisi, öz-yeterlilik ve tutumun niyete anlamlı bir etkisi olduğu ancak akran ve yönetici etkisinden oluşan subjektif normun ve kolaylaştırıcı durumlar anlamlı etkisi olmadığı ortaya çıkmıştır. Genel olarak bulgular APDT'nin varsayımlarını destekler niteliktedir (Paver, Walker, & Hung, 2014). Daha önce yürütülen çalışmalarda olduğu gibi (Salajan, Welch, Ray, & Peterson, 2015) bu çalışma kapsamında öğretim üyelerinin teknoloji entegrasyonu performansı genelde öğrenciler tarafından özelde ise hem öğrenciler hem de iş arkadaşları, araştırma görevlileri ve akranların desteği ile şekillenebileceğini ortaya koymuştur.

Teknoloji entegrasyonun kavramsallaştırılması ve uygulamaları teknolojinin eğitimsel uygulamalarına katkıları ve oluşturduğu zorluklar tarafından şekillenmektedir. Bu çalışmada olduğu gibi Williams ve Williams (2011) teknoloji entegrasyonun öğrenci motivasyonuna katkısı olduğunu ortaya çıkarmıştır. Teknoloji entegrasyonu uygulamaları motivasyonu ve ilgiyi artırması nedeniyle yüksek öğretim kurumlarındaki öğrenme ve öğretme süreçlerini olumlu yönde etkilemektedir.

Teknoloji entegrasyonu davranışı uygun koşullara ve kısıtlayıcı etmenlerin etkisinin minimuma indirilmesine bağlıdır. Motivasyonla doğrudan alakalı olan öz-yeterlilik, zorluklarla baş edebilme konusunda başarı düzeyini artırmaktadır. Olumlu bir bakış açısına ve tutuma sahip olmak, öğretim üyelerinin zorlukların üstesinden gelmesini, motivasyonlarının artmasını ve teknolojiyi etkili bir şekilde uygulamaya yönelik kendilerine olan güvenlerinin artmasını sağlamaktadır (Youssef, 2012). Bu noktada en önemli etmen FTM programı kapsamında teknoloji entegrasyonunu deneyimleme fırsatı bulma ve öğrenme-öğretme etkinliklerine olan katkısını gözlemlemek olduğu söylenebilir. Uygulama ve ortamın düzenlenmesine yönelik öneriler (Lukas, 2014) ile teknoloji entegrasyonu uygulamaları ve öğrencilerin öğrenmeleri desteklenebilmektedir. Profesyonel gelişim etkinliği olarak öğretim üyelerinin kişiye ve ortama özgü ihtiyaçlarını karşılamaya yönelik oluşturduğu etkileşim nedeniyle mentörlük uygulamaları da davranışın gösterilmesi ve performansın geliştirilmesinde etkili olduğu ortaya çıkmıştır.

Mentörlük uygulamaları kapsamında değişim ajanları olarak kabul edilen mentörler, öğretim üyelerinin pedagojik yaklaşımlarının değiştirilmesine yönelik destek sağlamakta ve motive etmektedirler (Baran, 2016b). Öğretim üyelerinin pedagojik yaklaşımlarını yeniden yapılandırılması sırasında öğrenci katılımı, motivasyonu ve iletişiminin artması, teknoloji yardımı ile öğrencilerin öğrenme deneyimlerinin sınıf duvarları dışına taşınması ve öğrenmenin eğlenceli hale getirilerek kalıcılığının artırılmasına katkıda bulunması gibi derslerindeki değişimleri gözlemleme imkanına sahip olmuşlardır. Bunun sonucunda ise öğretim üyeleri iş arkadaşları veya akranları ile iletişime geçtiklerinde teknoloji entegrasyonu uzmanı gibi davranmaya başlayıp onların bu konuya yönlendirilmesine katkıda bulunmaktadırlar. Salajan ve diğerleri (2015) teknolojiyi kullanmaya başlayan öğretim üyelerinin teknoloji uzmanlığı rolüne sahip olmaya başladıklarını ortaya çıkarmıştır. Bununla birlikte FTM'in katkılarının iş arkadaşlarına, akranlara ve hatta bütün üniversiteye yayılmaya başladığının göstergesidir. Bu noktada teknoloji entegrasyonu öğretim üyelerinin kendi aralarında ve öğrencileriyle olan sosyal bağlılığını destekleyerek, öğrenme deneyimlerini daha kıymetli hale getirmektedir (Hung & Yuen, 2010).

Çağın gereklerini yakalayabilmek için öğretim üyelerinin teknoloji ile öğretim uygulamalarına yönelik kapsamlı bir bakış açısı geliştirmeleri oldukça önemlidir (Georgina & Hosford, 2009). Bu çalışma teknoloji entegrasyonu davranışı anlamaya yönelik yolları betimlemenin yanında FTM programına katılan öğretim üyelerinin davranışı geliştirme sürecini detaylı bir şekilde incelemiştir. Bu kapsamda hem üniversite genelinde teknoloji entegrasyonuna yönelik görüşlerin incelenmesi hem de profesyonel bir şekilde uygulama fırsatı bulan öğretim üyelerinin süreç boyunca ne tür zorluklarla karşılaştıkları ve bunlara ne tür çözümler önerdiklerini ortaya çıkararak alan yazına katkıda bulunmuştur. Genel olarak, APDT kapsamına dahil edilen bütün faktörlerin sürece dahil olan öğretim üyelerine etkisi olduğu ortaya çıkarken bazı faktörlerin bu süreci profesyonel olarak dahil olmayan öğretim üyelerinin davranışına yönelik niyetleri üzerinde etkili değildir. Burada deneyimleme sürecinde teknoloji entegrasyonuna bakış açısının farklılaştığı ve dikkat edilmesi gereken noktalara olan farkındalık arttıkça etki eden faktörlerin çeşitliliği de değişim gösterdiğini işaret etmektedir.

Öneriler

Araştırma kapsamında elde edilen sonuçlar doğrultusunda yürütülecek olan araştırmalara ve uygulamalara yönelik öneriler sıralanmıştır. Araştırmaya yönelik öneriler çalışmada geliştirilen model, FTM kapsamında APDT ve davranışın gözlenmesi olmak üzere üç başlık altında toplanmıştır.

FTM programında öğretim üyelerinin davranışını belirleyen faktörler arasında yer alan niyete öğretim üyelerinin çok az değinme nedenlerinin incelenmesi gereken bir noktadır. Çünkü APDT kapsamında niyet davranışı doğrudan etkileyen en güçlü faktörlerden biri olarak ortaya konmuştur. Davranışın analizi için FTM kapsamında akran mentörlüğü, seminer serisi süreci, bire bir deneyimlemenin çalıştay ve seminerlerle desteklenmesi ile etkileyen faktörlerin ortaya çıkarılması için kullanılarak daha farklı açılardan inceleme yapılabilir. Ayrıca eylem araştırması ve katılımcı araştırma yöntemlerini öğretim üyelerinin gelişimlerini incelemek için farklı avantajalar olan araştırma türleri olduğu için faktörlerin incelemesi konusunda da katkıda bulunabilecek yöntemlerdendir. Anket ve yarı yapılandırılmış görüşmeler dışında bilişsel görüşmeler, sesli düşünme yöntemi, etnografik görüşme veya gözlem yöntemleri kullanılarak davranışın değişik açılardan da incelenmesi sağlanabilir.

Araştırma sonuçlarına, öğretim üyelerinin bakışları bazı faktörleri ayrıştırmak yerine birlikte düşünmeye yönlendirmektedir. Akran ve yönetici etkisini ayrı ayrı ele almak yerine subjektif norm olarak değerlendirip yapılacak olan çalışmalarda bunun başka kapsamlarda test edilmesi gerekmektedir. Ayrıca kolaylaştırıcı durumları öğretim üyeleri teknoloji ve kaynaklar olarak ayrı ayrı algılamak yerine bir bütün olarak ele alarak ona göre değerlendir-mişlerdir. Bu noktada da araştırma sonuçlarının desteklenmesi gerekmektedir. Bunlara ek olarak, öğretim üyelerinin ilgiye verdikleri önem nedeniyle ilginin de tutumun alt başlıklarından biri olarak farklı çalışmalarda nitel ve nicel veriler yardımıyla değerlendirilebilir. Araştırma kapsamında, FTM sürecinde öğretim üyelerinin öğretim için yürüttükleri etkinlikleri gözlemleme fırsatı olmamıştır. Bu nedenle bu sürecin gözlemlenmesi ve davranışın süreç içerisinde nasıl değiştiğini ortaya koymak davranışın anlaşılmasına katkıda bulunacaktır.

Araştırmanın uygulamaya dönük önerileri ise yüksek öğretim kurumlarının paydaşlarına yönelik gruplandırılmış olup şu üç başlık altında toplanmıştır. Bunlar;

(1) öğretim üyeleri için kendilerini geliştirmeye yönelik imkanlar edinip hem kendilerinin hem de iş arkadaşları ve akranlarının teknoloji entegrasyonunu geliştirmelerine yardımcı olabilmek için içgörü edinebilirler, (2) yöneticiler için bu çalışma kapsamında elde edilen sonuçlar ile öğretim üyelerini teknoloji entegrasyonunu destekleyecek uygulamalarının hayata geçirilmesi ve teknolojik imkanların teknoloji entegrasyonunu destekleyecek şekilde kullanılabilirliğinin artırılması ayrıca var olan zorlukların aşılmasına yardımcı olacak önlemler almak, (3) ulusal karar verici olarak yüksek öğretim kurumu için ulusal politikaları güncellenip öğretim üyelerinin hem pedagojik hem de teknolojik açıdan gelişmesine olanak sağlayacak şekilde yüksek öğretim kurumlarının yapılandırılmasında göz önünde bulundurmak şeklinde özetlenebilir.

Özet olarak, araştırma sonuçları FTM programının uygulama sürecinin gözden geçirilip yeniden düzenlemesini, yönetici, öğrenci ve akran desteği ile öğrenme ve öğretme sürecinin teknoloji desteği ile düzenlemesi, ve teknolojinin derslere entegre edilmesi için gerekli olan zaman ve enerjinin öğretim üyelerine sağlanmasını önermektedir. Katkılarının incelenmesinden sonra teknoloji entegrasyonunu etkili bir şekilde deneyimlemeyi sağlamaya odaklanan FTM programının özellikleri ve uygulanması planlanan üniversite ortamının özellikleri şöyle özetlenebilir:

(1) Teknoloji eğitimi ve çalıştayları ile desteklenen mentörlük etkinliklerinin bölümler arası teknoloji entegrasyonu işbirliğini artıracak şekilde imkanlar sunması,
(2) İş arkadaşları arasındaki etkileşimi artıran, araştırma görevlilerinin desteği ve yöneticilerin sağladığı teşvikler ve öğretim üyelerine yardımcı olan doktora öğrencilerinin ve araştırma görevlilerinin gelişimlerini desteklemesi,
(3) Farkındalığı artırmak için seminerler düzenlenmesi, teknik destek sağlanması, yeni öğretim üyeleri için oryantasyon programının geliştirilmesi, bölümler arasında etkili uygulama örneklerinin paylaşılması ve akademik derslerin analiz edilip teknoloji ihtiyaçlarının belirlenmesidir.

10. CURRICULUM VITAE

PERSONAL INFORMATION

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EDUCATION

Year of Education	Status	University	Area of Specialization
2010-2011	Master	Erciyes University	Curriculum and Instruction
2006-2007	Undergraduate	Erciyes University	Primary School Teacher Education
2002-2003	Higher School	Kocasinan High School	Math-Science

WORK EXPERIENCE

Semester	Status	University	Department
November 2011-ongoing	Research Assistant	Middle East Technical University	Educational Sciences
March 2016-October 2016	Visiting Scholar	University of Delaware	Learning Technologies
November 2009-November 2011	Research Assistant	Bozok University	Educational Sciences

PUBLICATIONS

Peer-Reviewed Articles:

Baran, E., **Cilsalar, H.** & Mesutoğlu, C. (2017). The examination of transfer and mobilization of pre-service teachers' classroom management knowledge. *Kastamonu Educational Journal*, 25(1), 155-170.

Ok, A., **Cilsalar, H.,** & Sarıkaya-Erdem, Y. (2014). An evaluation of Cappadocia Vocational College two-year restoration curriculum. *International Journal of Curriculum and Instructional Studies*, 4(8). 1-21.

Web-based Publications

Cilsalar, H. (2013) A view to K-5 (Primary & Pre-school) teacher education with TPACK lens. In E. Baran (Edt.), *The Many Faces of TPACK: Perspectives and Approaches.* From: https://en.wikibooks.org/wiki/The_Many_Faces_of_TPACK/ Primary_Teacher_Education

Procedings:

Cilsalar, H. (2016). Investigation of faculty members' point of view on technology integration: A case study. In *The Third International Congress on Curriculum and Instruction: Curriculum Studies in Higher Education: Proceeding Book* (pp.73-90), Ankara.

Cilsalar, H. & Baran, E. (2014). Designing in-service technology integration training program for vocational instructors. In *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2014* (pp. 1851-1857). Chesapeake, VA: AACE.

Baran, E., Uygun, E., Altan, T., Bahcekapili, T. & **Cilsalar, H.** (2014). Investigating technological pedagogical content knowledge (TPACK) in action: Workshop design cases. In *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2014* (pp. 1536-1541). Chesapeake, VA: AACE.

Presentations (National Conference):

Ok, A., Sarıkaya-Erdem, Y., & **Cilsalar, H.** (2014) Kapadokya Meslek Yüksekokulu Restorasyon Programının Etkililiğinin Paydaşların Algılarına Göre Değerlendirilmesi. [Evaluation of Restoration Program at Cappadocia Vocational College: Perceptions of Stakeholders] 3. Ulusal Eğitim Programları ve Öğretim Kongresi [3rd National Congress of Curriculum and Instruction](7-9 Mayıs). Gaziantep, Türkiye.

Cilsalar, H. & Akar, H. (2012). İlköğretim hayat bilgisi programı değerlendirme çalışmalarına genel bir bakış [A general overview: Evaluation studies of elementary social sciences curriculum]. Applied Education Congress (13-15 September 2012) Ankara, Türkiye.

Yıldırım, Ö.F., Yılmaz, E., **Çilsalar, H**.& Öden-Acar, A. (2012). Evaluation of educational science courses at Middle East Technical University: A case study. Applied Education Congress (13-15 September 2012) Ankara, Türkiye.

Cilsalar, H. & Cihan-Güngör, H. (2012). Erciyes Üniversitesi Öğretim Elemanlarının Profili [The profile of Erciyes University instructors]. 21. Ulusal Eğitim Bilimleri Kongresi [National Congress of Educational Sciences](12-14 September 2012) İstanbul, Türkiye.

Presentations (International Conference):

Pan, E., Mouza, C., Yang, H., & **Cilsalar, H.** (2017). Growing computational thinkers: Trajectories of middle school students. American Educational Research Association-2017.

Cilsalar, H. (2015). Investigation of instructors' point of view toward technology integration. *7th International Congress of Educational Research* (May, 28-31) Muğla, Turkey.

Sarıkaya-Erdem, Y., & **Cilsalar, H.** (2015) A meta review on self-efficacy beliefs of pre-service, novice and in-service turkish teachers. *ECER 2015: Education and Transition. Contributions from Educational Research* (September,8-11) Budapest, Hungary.

Cilsalar, H. (2015). Investigation of faculty members' point of view on technology integration: A case study. *3rd International Congress on Curriculum and Instruction* (October, 22-24) Adana, Turkey.

Cilsalar, H. & Baran, E. (2014). Designing of in-service training program about technology integration for vocational instructors. *EdMedia 2014 - World Conference on Educational Media and Technology* (June,23-27) Tampere, Finland.

Baran, E., Uygun, E., Altan, T., Bahçekapılı, T., & **Cilsalar, H.** (2014). Investigating technological pedagogical content knowledge (TPACK) in action: Workshop design cases. *EdMedia 2014 - World Conference on Educational Media and Technology*(June,23-27) Tampere, Finland.

Cilsalar, H. & Barış-Pekmezci, F. (25-27 June 2013). Students' achievement from different school types: Comparison of Turkey with Shanghai-China, Canada, and France, *International Conference on New Horizons on Education (INTE)*, Rome-Italy.

Training:

The school of education/ European Education Research Association Summer School 2015: Data and Educational Research, University of Sheffield, UK.

Awards:

Turkish National Science Foundation- TÜBİTAK Domestic PhD Scholarship.

HOBBIES

Tracking, Travelling, Handcrafts

11.TEZ FOTOKOPİSİ İZİN FORMU

ENSTİTÜ

Fen Bilimleri Enstitüsü ☐

Sosyal Bilimler Enstitüsü ☐

Uygulamalı Matematik Enstitüsü ☐

Enformatik Enstitüsü ☐

Deniz Bilimleri Enstitüsü ☐

YAZARIN

Soyadı : ÇİLSALAR
Adı : Hatice
Bölümü : Eğitim Bilimleri

TEZİN ADI: INVESTIGATING FACULTY MEMBERS' TECHNOLOGY INTEGRATION INTENTION AND BEHAVIOR: A CASE OF A HIGHER EDUCATION INSTITUTION

TEZİN TÜRÜ : Yüksek Lisans ☐ Doktora ☐

1. Tezimin tamamından kaynak gösterilmek şartıyla fotokopi alınabilir. ☐
2. Tezimin içindekiler sayfası, özet, indeks sayfalarından ve/veya bir bölümünden kaynak gösterilmek şartıyla fotokopi alınabilir. ☐
3. Tezimden bir bir (1) yıl süreyle fotokopi alınamaz. ☐

TEZİN KÜTÜPHANEYE TESLİM TARİHİ: