2019

Mobile-Based Assessment and Iranian College Students' Motivation, Self-efficacy, and Academic Performance

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The Office of the Provost

Walden University
2019

Abstract

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by

Abrisham Mokhtari

MA, University of Tehran, 2011

BA, Payame Noor University, 2008

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Education

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Abstract

Mobile learning can increase students' access to more affordable and quality college education for those living in remote areas. Even though the instructional aspect of mobile learning has received much attention, there has been limited consideration of the assessment aspect. The purpose of this qualitative study was to explore the perceptions of Iranian college students on the utilization of mobile devices as assessment tools and the influence it has on motivation, self-efficacy, and academic performance in their learning process. The conceptual framework of this study included the unified theory of acceptance and use of technology and Bandura's self-efficacy theory. Data were collected from 8 Iranian learners, studying at Tehran's universities, through semistructured, face-to-face interviews. The data were collected in Farsi, the native language of the participants. Data were hand coded, and data analysis included identifying codes, patterns, themes, and selected quotes, which were translated to English. The results of this study revealed that the participants had a positive attitude toward the utilization of mobile devices as assessment tools. The participants claimed that mobile devices made assessment convenient, accessible, and less stressful; however, they stated concerns with technical issues and lack of support networks. Most of the participants also indicated that utilizing mobile devices for assessment purposes positively influenced their motivation, self-efficacy, and academic performance. This research provides knowledge that administrators can use to assist Iranian learners throughout the country for equal opportunities to receive accessible and affordable college education.

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Dedication

I dedicate this study to my beautiful parents, Mamar and Mehran Mokhtari, who have always loved, encouraged, and supported me unconditionally. You have been the most amazing and inspirational parents and friends I could ever ask for. I love you dearly mom and dad.

Acknowledgments

Firstly, I would like to express my sincere gratitude to my excellent committee, Dr. Courduff, Dr. Hyder, and Dr. Dawidowicz, for their immense knowledge, support, and kindness throughout this process. I would also like to especially thank Dr. Courduff and her wonderful family. She hasn't just been the most amazing dissertation mentor but also the most generous source of encouragement and inspiration in my life.

I want to thank my grandmother whose her beautiful soul will always live among us. She was never given an opportunity to receive formal education, but she was a fierce advocate of education all her life. I would also like to thank my significant other for loving, supporting, and inspiring me in this journey. Finally, and most importantly, I would like to thank and appreciate my mom and dad who never stopped believing in me. They have sacrificed their priorities and put their heart in everything they have done for me. You all bore with me, encouraged me, and were there for me during all my ups and downs. THANK YOU!

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Chapter 1: Introduction to the Study

The invention of smart mobile phones as well as other handheld and wireless devices, especially tablets and laptops, has made a significant difference in people's lives during the past two decades. Mobile devices have provided a larger number of people with easy and inexpensive access to information, which has impacted teaching and learning. Mobile devices as educational tools has turned the process of learning more motivating, engaging, and personal to learners and the process of teaching more productive and enjoyable to teachers (Domingo & Garganté, 2016; Jan, Ullah, Ali, & Khan, 2016).

Though there is research on mobile devices as instructional tools in students' learning process (Dashtestani, 2016; Heflin, Shewmaker, & Nguyen, 2017; Huang & Chiu, 2015; Mohammadi, 2015b; Zydney & Warner, 2016), there is limited research on their use as assessment tools in general (Nikou & Economides, 2016a, 2016b, 2017a, 2017b, 2018) and in Iran (Tarighat & Khodabakhsh, 2016). Thus, I explored the perceptions of Iranian college students on the utilization of mobile devices as assessment tools on their motivation, self-efficacy, and academic performance. The findings of this research could help design pedagogical approaches and curricula that address a wider range of learners' needs and create more productive learning opportunities for individuals.

In this chapter, the background to literature, problem statement, and purpose statement together with research questions and the theoretical framework of this study are discussed. Separate sections are allocated to the nature of the study, definitions,

assumptions, scope of delimitations, limitations, and significance of this study. Finally, a summary section is provided to review the significant points of this chapter.

Background

Mobile learning was introduced to the field of education a decade ago. Mobile learning is the utilization of portable (mobile) and wireless devices such as smart phones, tablets, and laptops for teaching and learning (Fuller & Joynes, 2015; Sung, Chang, & Liu, 2016; Tu, Turel, Yuan, & Archer, 2015). Mobile devices have been found to be influential learning tools because they are more accessible and easier to use (Kiat, Ali, Halim, & Ibrahim, 2016; Raman, 2015). Consequently, mobile devices can provide learners with personalized and contextual education as well as meaningful and authentic learning opportunities in their everyday life (Huang & Chiu, 2015; Zydney & Warner, 2016). Mobile-based learning has also had a positive influence on students' motivation, academic performance, and satisfaction (Dashtestani, 2016; Furió, Juan, Seguí, & Vivó, 2015).

Even though the literature suggests that mobile learning may have a positive impact on individuals' process of learning, there are still concerns that need to be addressed (Furió et al., 2015; Hashim, Tan, & Rashid, 2015; Sung et al., 2016). One misconception is that more advanced the technology will lead to a more productive the learning process. However, researchers have suggested that adopting productive pedagogy leads to effective learning and not necessarily the technology used in the design and production of mobile devices (Aliaño, Hueros, Franco, & Gómez, 2019; Brown, & Mbati, 2015; John, Thavavel, Jayaraj, Muthukumar, & Jeevanandam, 2016;

Osipov, Nikulchev, Volinsky, & Prasikova, 2015). To find and utilize appropriate pedagogies when using mobile devices as educational tools, both instructional and assessment aspects have to be equally addressed in research. For example, Nikou and Economides (2017a, 2017b) explored students' willingness to utilize mobile devices as educational assessment tools, suggesting that perceived motivation and self-efficacy are important factors. Nikou and Economides (2018) also indicated that learning more about students' perceptions and experiences with using mobile devices as educational tools can help researchers to find approaches to increase learners' motivation and academic performance, especially for those in different cultural or age groups.

During the past decade, information technology (IT) researchers have focused on mobile learning in Iran (Chavoshi & Hamidi, 2018; Dashtestani, 2016; Mohammadi, 2015a). Their discoveries have been similar to findings in other countries (Ahmed & Kabir, 2018; Ali & Arshad, 2016; El-Masri & Tarhini, 2017; Heflin et al., 2017; Huang & Chiu, 2015; Zydney & Warner, 2016). Iranian researchers have learned that some cultural, social, and personal differences among Iranian learners might have an impact on their willingness to utilize mobile devices in their learning process (Chavoshi & Hamidi, 2018; Hamidi & Chavoshi, 2018; Mohammadi, 2015a, 2015b). However, there is limited research, and most of it has been focused on the instructional aspect of mobile learning (Chavoshi & Hamidi, 2018; Dashtestani, 2016; Hamidi & Chavoshi, 2018; Mohammadi, 2015b; Tarighat & Khodabakhsh, 2016). For example, Tarighat and Khodabakhsh (2016) are one of the few to concentrate on using mobile devices as assessment tools, focusing on Iranian language learners' perceptions of using a mobile application (WhatsApp) for

assessing their English-speaking skills. The findings suggested that students have mixed feelings about utilizing WhatsApp application as an assessment tool in their English language learning process (Tarighat & Khodabakhsh, 2016). However, more research needs to be done to gain insight into the perceptions and experiences of Iranian learners on the utilization of mobile devices as assessment tools in a more comprehensive setting.

A gap exists in Iranian literature to seek more insight into college students' experiences and perceptions of using mobile devices as assessment tools in their learning process. Nikou and Economides's works from 2016 to 2018 are the only quantitative works focusing on students' willingness to use mobile devices as assessment tools. Based on the findings of Chavoshi and Hamidi (2018) as well as the suggestions of Nikou and Economides (2018) and Tarighat and Khodabakhsh (2016) for further research, I conducted this study to explore the Iranian college students' perceptions on the utilization of mobile devices as assessment tools in their learning process.

Problem Statement

Cutting-edge technology has become a key component of teaching and learning for educators and students during the past few decades (Englund, Olofsson, & Price, 2017; Venkatesh et al., 2016). Mobile devices are considered effective 21st-century technologies with instructional and pedagogical merits for learners (Domingo & Garganté, 2016; Jeno, Grytnes, & Vandvik, 2017). Recent research in the field of mobile-based assessment indicates that utilizing mobile devices as assessment tools provides educators and curriculum designers with innovative pedagogical approaches and enhances learner motivation, self-efficacy, and academic performance (Nikou &

Economides, 2016a, 2016b). However, there is little or no research focusing on students' experiences and perceptions on mobile-based assessment and its possible influence on their learning process in Iran. For instance, though Tarighat and Khodabakhsh (2016) concentrated on the perceptions of a group of Iranian English language learner on the utilization of a mobile application (WhatsApp) for assessing their English language skills, there is a need to more thoroughly understand Iranian college students' perceptions on the utilization of mobile devices as assessment tools in their learning process.

To gain a more comprehensive understanding of learners' experiences and perceptions on mobile assessment, more studies have to be conducted in different cultures, countries, and among different age groups (Nikou & Economides, 2018). Research has suggested that the perceptions of students on the utilization of mobile devices as educational tools vary from developed to developing countries (El-Masri & Tarhini, 2017; Tarhini, Hone, & Liu, 2015). Iran is a developing country with a growing economy with a gross domestic product of 447.7 billion dollars (The World Bank, 2018). Thus, there may be differences in Iranian students' perceptions on the utilization of mobile devices as educational and assessment tools. Researchers have also indicated that cultural, social, and financial differences could affect Iranian students' willingness to utilize mobile devices as learning tools more than their peers in other countries (Chavoshi & Hamidi, 2018; El-Masri & Tarhini, 2017).

This study addressed a gap in the literature by gaining a deeper understanding of Iranian college students' perceptions and willingness to utilize mobile devices as innovative assessment tools in their learning process. The study also shed light on the

possible influence of mobile-based assessment on students' motivation, self-efficacy, and academic performance.

Purpose Statement

The purpose of this qualitative study was to explore Iranian college students' perceptions of the utilization of mobile devices as innovative assessment tools in their learning process. The research on mobile learning and focusing on both its instructional and assessment aspects have provided teachers, curriculum designers, and educational application developers with opportunities to facilitate the process of learning to individuals all over the world. However, there needs to be more research on mobile learning, especially regarding Iranian students' perceptions on the utilization of mobile devices (Nikou & Economides, 2018; Tarighat & Khodabakhsh, 2016). Iran is a developing country where its learners' might show different tendencies towards mobile-based learning because of their cultural, social, and financial differences in comparison to their peers in developed countries (Chavoshi & Hamidi, 2018; El-Masri &Tarhini, 2017).

The findings of the current study addressed a gap in the literature by providing insight into the current generation of Iranian college students' perceptions on the utilization of mobile devices as assessment tools and the possible effects on their motivation, self-efficacy, and academic performance. Discovering more about Iranian students' intentions of utilizing mobile devices as assessment tools could enable educators and curriculum designers to initiate innovative technology-supported interventions to motivate and help students achieve academic success. The research

findings may also provide Iranian college students with opportunities to enhance their technology literacy and self-efficacy as 21st-century skills.

Research Questions

To explore the perceptions of Iranian learners on the utilization of mobile devises as assessment tools and learn about the possible influences of such devices on learners' motivation, self-efficacy, and academic performance, I designed the following research question and three subquestions:

Main research question: What are the perceptions of Iranian college students on the utilization of mobile devices as assessment tools?

Subquestion 1: What are the possible influences of the utilization of mobile devices as assessments tools on learners' motivation?

Subquestion 2: What are the possible influences of the utilization of mobile devices as assessment tools on learners' self-efficacy?

Subquestion 3: What are the possible influences of the utilization of mobile devices as assessment tools on learners' academic performance?

Conceptual Framework of the Study

The conceptual framework of this study was based on the unified theory of acceptance and use of technology (UTAUT) and Bandura's self-efficacy theory. The UTAUT was constructed on eight leading theories in various disciplines and was first introduced by Venkatesh, Morris, Davis, and Davis (2003) to provide more insight into technology acceptance and adaptation. Performance expectancy, effort expectancy, social influence, and facilitating conditions were identified as core constructs determining

behavior intention of users (Parameswaran, Kishore, & Li, 2015). I adopted the UTAUT to explore the intentions of individuals to use a specific form of technology and identify main factors affecting their technology use in everyday life (Williams, Rana, & Dwivedi, 2015). Venkatesh et al. (2013) later found gender, age, experience, and voluntariness are four mediating factors in addition to the already identified core constructs.

Further studies suggested that some modifications had to be made to the UTAUT to be able to use it in educational settings. It was suggested that voluntariness had to be eliminated as a mediating factor (El- Masri & Tahrini, 2017; Venkatesh et al., 2016; Venkatesh, Thong, & Xu, 2012). To make necessary modifications to the original UTAUT, Venkatesh and his colleagues developed UTAUT2 as a more advanced model in 2012. They introduced hedonic motivation, price value, and habit as new constructs and removed voluntariness of use from the meditating factors (Venkatesh et al., 2012).

Many researchers in education have adopted the UTAUT and UTAUT2 to explore various factors influencing individuals' technology acceptance and their intention to use different forms of technology such as mobile devices. Research has suggested that performance expectancy, ease of use, effort expectancy, and hedonic motivation are among the most influential factors affecting individuals' use of mobile devices as technological tools in their learning process (Suki, & Suki, 2017; Dečman, 2015; Ali & Arshad, 2016; Ahmed & Kabir, 2018; El-Masri & Tarhini, 2017). Moreover, the findings of Iranian researchers adopting the UTAUT have suggested that performance expectancy, motivation, and self-efficacy are the main factors influencing Iranian learners'

willingness to use technological tools such as mobile devices in their learning process (Abdekhoda, Dehnad, Mirsaeed, & Gavgani, 2016).

The purpose of this study was to explore Iranian college students' perceptions on the utilization of mobile devices as assessment tools and their motivation, self-efficacy, and academic performance with the UTAUT2. For example, Koohestani, Arabshahi, and Ahmadi (2018) and Mohammadi (2015b) used the UTAUT to investigate the willingness of Iranian college student to utilize mobile devices in their learning process. However, I used the UTAUT to focus on the use of mobile devices as assessment tools.

Self-Efficacy Theory

Because Venkatesh et al. (2003) also identified self-efficacy as influential on individuals' willingness to use technology in their learning process, I selected Bandura's self-efficacy theory as to help form the conceptual framework of this study. Bandura (1977) defined *self-efficacy* as the perception of an individual on his or her abilities that can affect his or her life events and experiences. Mastery experiences, vicarious experiences, social persuasion, and physiological responses are four sources of self-efficacy beliefs (Bandura, 1997).

The utilization of mobile devices not only contributes to students' self-efficacy, but an increase in their self-efficacy might also add to learners' motivation and academic performance. Researchers have suggested that using various forms of technology as educational tools have increased learners' self-efficacy and academic performance (Venkatesh et al., 2016; Lai & Hwang, 2016; Prior, Mazanov, Meacheam, Heaslip, & Hanson, 2016). Researchers have also discovered that the utilization of mobile devices

positively affected learners' technological self-efficacy, thus their motivation, satisfaction, and academic performance were also increased (Broadbent & Poon, 2015; Cho & Heron, 2015; Han & Shin, 2016; Shin & Kang, 2015). Therefore, in this study, I used both the UTAUT2 and Bandura's self-efficacy theory to learn more about the possible influence of the utilization of mobile devices as assessment tools on Iranian college students' motivation, self-efficacy, and academic performance.

Nature of the Study

This study was a basic qualitative study, which helps learn about the experiences of participants and the meaning they form from their experiences (Merriam, 1998). The purpose of this study was to provide insight into participants' perceptions of the utilization of mobile devices as assessment tools; therefore, a qualitative basic design was the most appropriate research design. I recruited eight to 12 participants from learners studying different majors at various universities in Tehran through posting invitations on my social media accounts.

The data were collected through face-to-face, semistructured interviews because they helped develop shared meaning and deeper understanding of the topic between me and the participants (see Thorne, 2016). The interview questions were semistructured and based on emerging themes that I found in my review of the literature. I also asked other follow-up questions when needed throughout the interview process. The following are the interview questions for the study:

1. How do you feel about using mobile devices as assessment tools?

2. What are the advantages and disadvantages of using mobile devices as assessment tools in comparison to traditional models (paper-based assessments)?
3. How do you think using mobile devices is easier than using other technologies for assessment?
4. To what extent using mobile devices for assessment has changed your approach towards taking tests?
5. How does using mobile devices for assessment can influence your motivation to take tests?
6. How can using mobile devices as assessment tools affect your performance in tests and general assessments?
7. How do think using mobile devices for taking tests might influence your academic performance?
8. How do you feel about using mobile devices for self-assessment or comprehensive course assessment? Why?
9. What are some problems you have faced or concerns you have had when used mobile devices for taking tests?
10. What is your advice to students who don't use mobile devices as assessment tools?

In this study, I intended to utilize a thematic inductive analysis to gain more insight into Iranian college students' perceptions of the utilization of mobile devices as assessment tools. The data were hand-coded, as the original interviews were conducted in

Farsi, which was the native language of the participants. To not lose the authenticity of the participants' responses in the process of translations, the collected data were categorized into units of meanings, patterns, and themes in Farsi. Later, I translated the acquired codes, categories, and themes to English. The accuracy of the translations was assured because I received my bachelor's degree in Persian–English translation from an accredited college, so I was considered an expert in this field. I kept reflective journals and take notes throughout all stages of design.

Definitions

Mobile assessment: Mobile assessment is known as any form of educational formal or informal evaluation where the assessment is delivered through the utilization of various types of mobile devices (Nikou & Economides, 2018).

Online self-efficacy: Online self-efficacy refers to the perceptions of individuals on their skills to execute online-related actions to achieve certain online objectives (Su, Zheng, Liang, & Tsai, 2018).

Process of learning: In this study, the process of learning refers to both instructional and assessment aspects of the educational journey that learners go through inside and/or outside of the classroom (Sikandar, 2015).

Technology acceptance: Technology acceptance refers to the integration of various forms of technology in individuals' lives and their level of satisfaction with them at the same time (Fathema, Shannon, & Ross, 2015).

Social media: Social media is defined as any website, application, or program that enables online users to communicate, create content, and share information (Topolovec-

Vranic, & Natarajan, 2016). In this study, social media platforms usage is limited to my LinkedIn, Twitter, and Instagram accounts.

Technology self-efficacy: Technology self-efficacy refers to the beliefs of individuals about their abilities to perform certain tasks utilizing technological tools (Ozturk, Bilgihan, Nusair, & Okumus, 2016).

Voluntariness: Voluntariness in the UTAUT model is defined as an individual's willingness to utilize a form of technology without being obliged from an outside source (Venkatesh et al., 2003).

Assumptions

One of the assumptions of this study was that the participants were truthful during the process and that they were be able to provide meaningful answers to the research questions. The participants were selected through posting invitations on my Linkedin, Twitter, and Instagram accounts. Therefore, another assumption of this research was that the participants might not have been the representatives of the Iranian college learners studying in Tehran universities.

Scope and Delimitations

The scope of this study extended to eight to 12 Iranian college learners with different educational backgrounds studying in various universities in Tehran. This was a voluntary study in which participants were college students who had utilized mobile devices such as smartphones, tablets, and laptops as assessment tools in their learning process. I conducted the interviews in a private and quiet room in my personal office. I

ensured that the interviews were conducted during the hours when no employee was at the office, so the identities of the participants remained confidential.

Limitations

A potential limitation was participants losing their interest, willingness, and commitment through the process of data collection, which might have affected the results. However, all the participants remained motivated and committed throughout the entire process. Another limitation was that the participants were selected through homogeneous purposive sampling. The participants were selected from Iranian college learners studying in universities located in Tehran that is the country's political, financial, and academic capital and Iran's most privileged and modern city. Because I only collected data from participants studying in Tehran, the outcome is not necessarily generalizable to the students in other less privileged and smaller universities located in other areas of the country. Moreover, because the data were collected from the participants recruited from LinkedIn, Twitter, and Instagram, the data might not be generalized to college learners who do not have access to these platforms. One strategy to address this was to increase the transferability of the study through keeping reflective journals and memos as well as recording every step taken in the process of the research to help other researchers replicate it in different contexts.

Other limitations could have involved bias, which are unavoidable elements of research. My bias could have affected this work during the interview process, where I could have possibly led participants toward providing desired answers. To address this potential bias, the interview questions were designed to allow the participants to express

their opinion freely, providing responses to the main and follow-up interview questions. As the interviewer, I encouraged the participants to talk about their experiences and elaborate on them. I was also cautious not to let my personal opinions interfere with their perceptions and experiences.

Significance

This study filled a gap in understanding by exploring the perceptions of Iranian college students on the utilization of mobile devices as assessment tools in their learning process. This research is significant because it is concentrated on mobile learning in general and mobile-based assessment as a popular yet underresearched field in Iran (Mohammadi, 2015a). The perceptions and adaptation strategies of curriculum designers, educators, and students toward the implementation of mobile devices as educational tools in the Middle East differ significantly from their counterparts in educationally advanced countries (Jan et al., 2016). Therefore, through gaining deeper insight about Iranian college students' perceptions on mobile-based assessment, this study can assist educators in utilizing more innovative curriculums and pedagogical approaches addressing students' specific needs, especially in less privileged and remote areas. Moreover, the results of this study may provide mobile application designers with more understating of the needs, concerns, and preferences of Iranian students and help app developers design more productive and innovative mobile-based assessment tools accordingly. The research can also inform students' process of learning by explaining the possible effects of mobile-based assessment on their motivation, self-efficacy, and academic performance.

Summary

The purpose of this study was to explore the perceptions of Iranian students on the utilization of mobile devices as assessments tools and the possible effects on their motivation, self-efficacy, and academic performance. The foundation of this study was developed on the UTAUT2 and Bandura's self-efficacy theory as conceptual frameworks. The data were collected through homogeneous purposive sampling from eight to 12 college learners who had used mobile devices as assessment tools in their learning process and are studying at different universities in Tehran, the capital city of Iran. I recruited the participants on LinkedIn, Twitter, and Instagram. I then conducted semistructured, face-to-face interviews to acquire data from the selected participants. The data were later categorized to units of meanings, patterns, and categories utilizing a thematic analysis approach (Braun & Clarke, 2006). The research questions, as well as the purpose and problem statement of this study, were aligned with UTAUT2 model and Bandura's self-efficacy theory, which are as the conceptual frameworks of this study that is further discussed in Chapter 2. The connection of these theories to education and mobile learning and assessment in Iran and other countries are also addressed in Chapter 2.

Chapter 2: Literature Review

Introduction

The purpose of this research was to explore the perceptions of Iranian college students on the utilization of mobile devices as educational tools. This research was conducted on the foundation of the UTAUT2 (Venkatesh et al., 2012) and self-efficacy (Bandura, 1997). Qualitative data were collected through individual interviews from Iranian college students majoring in several different fields of studies. This chapter includes the literature review and theoretical framework that support the topic, research questions, and methodology of this study. This chapter includes four sections, which are as follows: Literature Search Strategy, Conceptual Framework, Literature Review Related to Key Variables and/or Concepts, and Summary and Conclusions.

Literature Search Strategy

The research selected for this literature review was focused on the utilization of mobile devices as learning and assessment tools and the willingness of teachers and learners on utilizing mobile devices in their instruction or learning process. The perception of teachers and learners on using mobile devices as educational tools and their possible impact on the self-efficacy, motivation, and academic performance of students were analyzed. Five databases were used to search for current and relevant research: EBSCO, SAGE Premier, Education Recourses Information Center (ERIC), Google Scholar, and ProQuest Central. ResearchGate was also used to learn about and find the latest works in the field of education. The website of Central Library and Documentation

Center of the University of Tehran was also used to search for the existing Farsi articles and dissertations.

The keywords used in the literature review of this study were *technology acceptance, UTAUT, UTAUT2, UTUAT theory in higher education, technology acceptance among Iranian students, technology acceptance among college students, mobile-based learning, mobile-based assessment, the impact of m-learning on students' academic performance and motivation. Bandura Self-Efficacy theory, the effect of technology on self-efficacy of teachers, the effect of technology on self-efficacy of learners, technological self-efficacy, online self-efficacy, m-Learning and self-efficacy,* and *mobile learning.*

Conceptual Framework

Unified Theory of Acceptance and Use of Technology

With the emergence of advanced technology and the increase in needs for seeking more information, especially in various businesses, theories have been developed to fulfill these needs (Andersson, Dasí, Mudambi, & Pedersen, 2016). For example, the TAM was introduced as one of the first theories to explore and understand the behavioral intentions of users. Since then, various TAMs have been were identified to address the needs and intentions of diverse users. Thus, a new unified model was needed to combine existing models and theories of technology acceptance that can address the integration of various forms of technology in individuals' lives and their level of satisfaction with them at the same time. Therefore, the UTAUT was introduced (Wingo, Ivankova, & Moss, 2017; Venkatesh et al., 2003).

The UTAUT was constructed on eight leading theories in various disciplines. UTAUT was a framework first introduced by Venkatesh et al. (2003) to provide researchers with more information on the area of technology acceptance and adaptation (Parameswaran et al., 2015). Venkatesh et al. focused on performance expectancy, effort expectancy, social influence, and facilitating conditions as the four core constructs determining behavior intention and use behavior derived from the empirical comparison of the eight prominent theories.

Performance expectancy is the degree to which individuals assume that the utilization of technology might be productive and enhancing their daily lives (Maruping, Bala, Venkatesh, & Brown, 2017). Perceived usefulness, extrinsic motivation, job-fit, relative advantage, and outcome expectations are five elements derived from performance expectancy (Maruping et al., 2017). Perceived usefulness addresses the degree to which individuals find technologies influential in achieving professional improvements and enhancing their job performance (Venkatesh et al., 2003). For instance, different technologies are continually being invented to maximize job performance, improve organizations' environments, and decrease short- and long-term turnovers (Carlson, Carlson, Zivnuska, Harris, & Harris, 2017). Extrinsic motivation is motivation from external rewards to help achieve an objective (Kuvaas, Buch, Weibel, Dysvik, & Nerstad, 2017). In the UTAUT, *extrinsic motivation* is defined as a degree in which people are willing to use technology as an outside source because it might help them obtain an outcome (Kucukusta, Law, Besbes, & Legohérel, 2015). Another effective parameter of performance expectancy is job-fit, which is the extent to which

individuals think that utilizing technologies can help them with their job performance (Venkatesh et al., 2003). Relative advantage refers to the degree to which an innovative technology might be better than its older version (Venkatesh et al., 2003). Finally, *outcome expectation* is defined as the possible consequence that individuals may face when using technologies in their everyday lives (Venkatesh et al., 2003). Even though using various forms of technologies can have a positive impact on individuals' personal, professional, educational, and social lives, it might also create some challenges and consequences (Abbasi, Tarhini, Elyas, & Shah, 2015).

Effort expectancy is another core construct of UTAUT. *Effort expectancy* is defined as the degree to which individuals can easily use various forms of technologies. Perceived ease of use, complexity, and ease of use are the key constructs of effort expectancy. Most people are willing to utilize technology because they think that using different types of technologies could make the fulfillment of their daily tasks easier, and it can bring more practicality to their everyday lives. Perceived ease of use is the extent to which individuals believe that they can utilize technologies without facing difficulties. However, some forms of technologies are more frequently used than the others because learning to work with them is easier, meaning they have less complexity. Complexity is defined as the degree to which a technology is seen as difficult to use and understand. Additionally, some technologies seem easy to use, but individuals face challenges when using them. Thus, ease of use is the degree to which an innovation is difficult to use, whereas perceived ease of use refers to an individual's speculations about the difficulty of utilizing a system. (Alalwan et al., 2016; Elkaseh et al., 2016).

Social influence is another significant core construct of the UTAUT. *Social influence* can be defined as the degree to which individuals' use of technology depends on the perception of the people around them and their environment (Dwivedi, Rana, Jeyaraj, Clement, & Williams, 2017). Subjective norm, social factors, and image are three influential factors in the development of social influence. Individuals' actions and thought are affected by their society, environment, and people close to them. Therefore, some decisions that people make regarding using technologies are influenced by the perceptions and judgments of others. *Subjective norm* is defined as the understanding of individuals about the perception of people around them on technology use. Social factors are the social, cultural, and interpersonal agreements that individuals have formed with their peers on the utilization of technology in a specific social context (Venkatesh et al., 2014). Finally, the last key element of social influence is image, which refers to the degree to which users believe that utilization of specific innovations might enhance their sociocultural status (Cimperman, Brenčič, & Trkman, 2016).

Facilitating condition is the last core construct of the UTAUT. *Facilitating condition* is defined as the degree to which individuals who use certain technologies believe that a reliable and well-funded support system is established to help them with the technology. The stronger the system of support or customer service of a particular form of technology, there is a higher chance that people may use this technology or find it easy to use. Perceived behavioral control, facilitating conditions, and compatibility are derived from facilitating condition. Perceived behavioral control refers to the extent to which individuals think that the availability of recourses might help them with the utilization of

a certain technological tool (Venkatesh et al., 2003). Facilitating conditions are the environmental factors and behaviors that individuals think that might affect the accomplishment of their tasks and daily activities positively. Lastly, compatibility is the degree to which individuals find a system or a technological tool consistent with their social norms, values, and experiences (Maillet, Mathieu, & Sicotte, 2015).

Many studies were conducted on the UTAUT and various factors related to it. For example, Williams et al. (2015) identified gender, age, experiences, and voluntariness as factors affecting individual's technology acceptance; when the experience of users increases, the relationship between facilitating conditions and intention to use also increases, and the relationship can be best found in the older ages. Further, attitudes, anxiety, and self-efficacy are newer mediating factors (Celik, 2016; Bervell, & Umar, 2017; Jewer, 2018). Researchers have also conducted research in academic environments, supporting the findings of previous works about the effectiveness of performance expectancy, effort expectancy, facilitating conditions, and attitude toward using technology on technology acceptance among users as core constructs of the UTAUT (Burton-Jones & Straub, 2006; Venkatesh et al, 2003). Gender and age have also been confirmed as main moderating factors of the UTAUT, with research showing that adolescents and youth showed more interests in utilizing different forms of technologies in their daily lives (Abu-Shanab & Pearson, 2009). Other findings have suggested that performance expectancy positively affected male's willingness to use different types of technology in comparison to females (Afonso, Roldán Salgueiro, Sánchez Franco, &

González, 2012). Their discoveries also suggested that some other factors such as motivation might have an influence on individuals' intentions of technology use.

Further studies have resulted in looking for extensions to the UTAUT and even though the UTAUT can be influential in educational environments, certain modifications have to be made to it to make it fit educational settings (Bagozzi, 2007; Maruping et al., 2017). For instance, it was suggested that voluntariness had to be eliminated as a mediating factor to make UTAUT more education-friendly (El- Masri & Tahrini, 2017; Venkatesh et al., 2016). Recommendations like these led to the introduction of the UTAUT2 as a more advanced model.

Transformation of Unified Theory of Acceptance and Use of Technology in Education

The results of further research on the UTAUT indicated a need for extensions to the original UTAUT, as new possible factors influencing individuals' willingness to use technology emerged and some of the old ones were found controversial (Al-Gahtani, Hubona, & Wang, 2007; Armida, 2008; Neufeld, Dong, & Higgins, 2007). Research has suggested that habits and price value could have an impact on technology acceptance, but voluntariness was not found as an influential factor (Chan, & Gupta, 2007; Benbasat & Barki, 2007). Thus, Venkatesh et al. (2012) added three more core constructs to the original UTAUT and eliminated voluntariness to extend and modify it in accordance to the outcome of the studies available at that time. Hedonic motivation, price value, and habit were the new constructs, and they developed a new questionnaire in alignment with the new seven constructs.

Hedonic motivation is defined as the joy and pleasure that utilizing various forms of technology bring to individuals who use different forms of technology in their everyday lives. Hedonic motivation affects users' willingness to adopt a specific kind of technology, especially when they can use the Internet and smartphones (Lai, 2015; Lai & Hwang, 2016). Hedonic motivation also influences behavioral intention, as it is significantly moderated by factors such as age, gender, and experience (Oye, Iahad, & Rahim, 2014). Second, *price value* is defined as the relationship between the benefits that individuals may receive from using certain technology and the price they have to pay for either buying that technology or using it (Venkatesh et al., 2012). This is highly mediated by age and gender; the younger the consumers are, the more willing they are to spend money on technologies and they believe that spending on technologies would be beneficial to them (Madigan, Louw, Wilbrink, Schieben, & Merat, 2017).

Habit is the third and last identified core construct of the UTAUT2. Individuals form a series of habits and develop certain behaviors both during their learning process and as its outcome (Astawa, Handayani, Mantra, & Wardana, 2017). Accordingly, *habit* is defined as the automatic behavior that technology users might tend to display as the result of learning (Venkatesh et al., 2012). Individuals' preferences and differences can be influential factors on the effect of habit as a core construct on the users' willingness to utilize technologies. Therefore, habit might have a direct or indirect mediating effect in the use of technology (Morosan & DeFranco, 2016). In conclusion, the introduction of the UTAUT2 as a more expanded and comprehensive version of the original model of the UTAUT has contributed to various fields such as e-banking, e-commerce, e-learning,

management and the world of finance and academia in general (Arenas Gaitán, Peral, & Ramón Jerónimo, 2015; Escobar-Rodriguez, & Bonson-Fernandez, 2017; Macedo, 2017; Mosweu, Bwalya, & Mutshewa, 2016; Rodrigues, Sarabdeen, & Balasubramanian, 2016).

Figure 1 displays a comparison between the core constructs and mediating factors of UTAUT and UTAUT2. The dark grey boxes and nodes are the representative of core constructs and mediating factors of UTAUT and their relationships. The light grey boxes and nodes show the added and eliminated core constructs, mediating factors, and their connections. This figure displays the improvements and changes that have been made when transiting from the UTUAT and the UTAUT2.

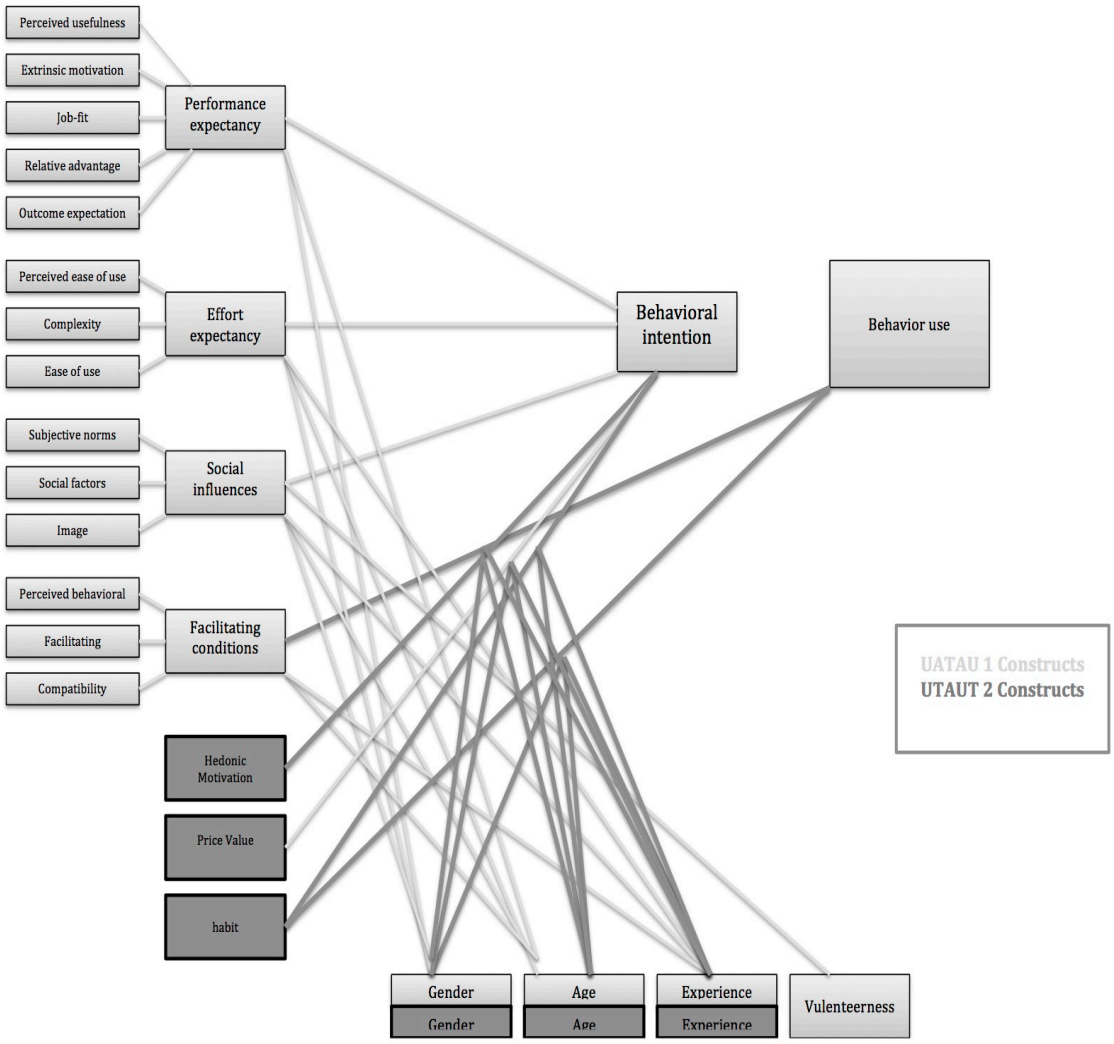

Figure 1. Comparison of UTAUT and UTAUT2's core constructs, mediating factors, and their relationship.

Bandura's Self-Efficacy Theory

In an era where the most effective pedagogies are technology-related, the perceptions of learners on their abilities to utilize technologies to achieve academic success gain significance (Claro, Nussbaum, López, & Contardo, 2017). Accordingly, it is important to obtain a deeper understanding of the self-efficacy theory in general as well as technology and online self-efficacy of learners in specific. Bandura (1977) defined *self-efficacy* as the perception of an individual about his or her abilities that can affect his or her life events and experiences. He identified four sources of self-efficacy beliefs: mastery experiences, vicarious experiences, social persuasion, and physiological responses (Bandura, 1997).

Mastery experiences. Mastery experiences refer to the insight individuals find and experiences they gain during learning how to fulfill a task successfully or overcoming obstacles. Mastery experiences can build confidence and self-belief when achieving success and develop a sense of resilience when failing a task (Bandura, 1991). Bandura (1997) stated that mastery experiences help learners develop efficacy and motivation to achieve positive outcomes (Bandura, 1997). The confidence that is created as a result of obtaining self-efficacy positively affects the motivation and success of students (Su et al., 2018).

Outcome expectancy is the belief of an individual that a particular trait leads to achieving a certain outcome (Bandura, 1997). Outcome expectancy is derived from the element of mastering experiences (Bandura, 1986). Therefore, it is necessary to learn about the self-efficacy through mastering experiences of students in their process of

learning as it can directly impact their outcome performance and motivation (Bandura, 1997; Ross, Perkins, & Bodey, 2016).

Vicarious experiences and social persuasion. Vicarious experiences are a source of self-efficacy identified as the judgments that individuals make about their capabilities and skills based on their observation of the environmental performances and how people around them conduct certain tasks (Bandura, 1977). Verbal persuasion is another source of self-efficacy. Verbal persuasion is identified as the effect that peoples' words and verbal reactions can have on the beliefs of individuals about their personal abilities and performances (Bandura, 1986). Peoples' encouragements, discouragements, praises, and threats may influence the performance of other people around them (Ahn, Usher, Butz, & Bong, 2016) found that individual factors such as age and gender influence the sources of self-efficacy; however, the effects of peers and teachers as role models are the most contributing factors to vicarious experiences and verbal persuasion as significant sources of self-efficacy in students.

Peer interaction plays a significant role in the formation of confidence and self-identity in students leading to the development of their self-efficacy. The behavior and verbal persuasion power of teachers as role models can also influence the self-efficacy of learners, especially their self-directed technology use (Robnett, Chemers, & Zurbriggen, 2015; Lai, 2015). Consequently, striving to understand about the self-efficacy of learners and the factors affecting that, it is crucial to concentrate on the experiences they gain from observing the behavior and actions of their peers and teachers as well as the feedback they receive from them.

Psychological responses. Psychological, physiological, and emotional states of individuals are some other effective factors that can influence the perception of individuals of their capabilities. The feelings and psychological states of learners towards various concepts and educational subject matters have an impact on their perceived abilities and academic success as well as their level of motivation and engagement in their learning process (Martin & Rimm-Kaufman, 2015; Skaalvik, federici, & Klassen, 2015). According to Bandura (1992) the motivation of learners influences their outcome-expectancy and performance and accordingly, their self-efficacy. As a result, to gain more insight about the self-efficacy of students, their emotional and psychological states have to be considered as such conditions directly affect the perception of learners on their achievements, success, and failures (Cho, Harrist, Steele, & Murn, 2015).

Literature Review Related to Key Concepts

Mobile-Based Learning in Education

Mobile and portable devices, especially smartphones, tablets, and laptops have become popular during the past two decades. These devices have gained significance in the everyday lives of a diverse population of people coming from different age ranges, backgrounds, and genders due to their accessibility. Soon, mobile devices and the popularity of them among people received the attention of researchers in the field of education because it had the potential to break the barrier of time and location in learning (Bannan, Cook, & Pachler, 2016). As a result, mobile learning was introduced as a part of the educational system, and the emergence of this concept has made impactful changes in teaching and learning environments.

However, even though it can be argued that laptops might not be considered as mobile devices due to the speedy process of turning them on and off, the cutting edge technology used in newly-developed laptops sometimes makes impossible to distinguish them from tablets (Crompton, Burke, Gregory, & Gräbe, 2016; Cimperman et al., 2016). Therefore, these newly designed laptops can still be considered as wireless mobile devices. Researchers identified mobility, immediacy, and conveniences as the distinct features of mobile learning that can contribute to individualized, collaborative, inquiry-based, flipped, and informal learning (Heflin, Shewmaker, & Nguyen, 2017; Kiat et al., 2016; Raman, 2015). The portability of mobile devices and their convenience to use have made it possible for learners to access information anywhere and anytime. Learners using mobile phones and wireless devices are provided with opportunities to receive contextual and personalized education as well as gaining experiences in real-world situations resulting in the occurrence of meaningful learning (Huang & Chiu, 2015; Zydney & Warner, 2016). Even though mobile-based learning was found to positively impact the performance and motivation of students in general, utilizing handheld devices are more effective in the inquiry-oriented and informal learning environments (Hashim, Tan, & Rashid, 2015; Sung et al., 2016).

The findings of various studies proposed that learners enjoy the process of learning outside of the classroom made possible to them through the utilization of mobile devices. Mobile learning is known to be more motivating, timely, and satisfying (Dashtestani, 2016; Furió et al., 2015; Hwang, Lai, & Wang, 2015; Su & Cheng, 2015). The discovery of the recent research conducted by Shadiev, Hwang, Huang, and Liu

(2018) provided evidence that even though it was claimed previously that the complexity of some mobile learning environments might not benefit less experienced and skilled students, when used in collaboration, mobile learning is favorable and beneficial to both skilled and less skilled learners.

It also has to be remembered that mobile learning is not without challenges and drawbacks. One of the general beliefs about mobile learning is that it is the technology and the utilization of mobile devices that result in learning. However, even though technological tools have the potential to enhance the teaching and learning process, it is the use of productive pedagogy that leads into active learning (Aliaño et al., 2019; John et al., 2016; Brown & Mbati, 2015; Osipov et al., 2015). Mobile learning is still considered as a new application of educational technology; therefore, there are some challenges in technological and pedagogical designs as well as some problems trying to integrate the technology and forming a support network (Khaddage et al., 2015; Khaddage, Müller, & Flintoff, 2016; Viberg & Grönlund, 2017). Despite the fact the mobile learning can be known as one of the most effective technologies in teaching and learning, its drawbacks also have to be considered when intending to be utilized in an educational environment (Huang & Chiu, 2015).

How Unified Theory of Acceptance and Use of Technology Affected Education

UTAUT model has been effectively adopted in various fields to learn more about technology acceptance. Education is one of the most prominent disciplines that UTAUT is applied in. The UTAUT model was used to investigate the influence of gender and educational background as well as assessing the model's appropriateness in an e-learning

higher education setting in Slovenia, Malaysia, and Palestine. The result confirmed the suitability of the UTAUT model to be used in e-learning environments. They also suggested that social influence and performance expectancy had an impact on utilization of technology whereas age and educational background were not influential factors Suki, & Suki, 2017; Sabah, 2016, Dečman 2015).

In an on-going research in Nigeria, the researchers utilized the core constructs of the UTAUT model to explore the perceptions and readiness of college of education students to use mobile learning devices as educational tools (Chaka & Govender, 2017). Their findings are in general alignment with the work of Dečman (2015). They proposed that performance expectancy, effort expectancy, and social influence have a moderate influence on students' technology acceptance. However, Dečman (2015) found a strong correlation between such factors and learners' willingness to use technology. Chaka and Govender (2017) also found that facilitating conditions also play an influential role in students' intention to utilize mobile devices as educational tools. Their discoveries were also confirmed by the study conducted by Botero, Questier, Cincinnato, He, and Zhu (2018) stating that facilitating conditions are among influential factors affecting the use of technology among college students in developing countries and has to be further improved technology integration in the field of education.

Yang, Feng, and MacLeod (2019) stated that even though effort expectancy and social influence were found as influential factors on learners' cloud classroom acceptance, performance expectancy and facilitating conditions had no effect on their acceptance of this form of technology in their educational process. Their findings

together with discoveries of Lawson-Body, Willoughby, Lawson-Body, and Tamandja (2018) also proposed that the type of technology used as well as its method of implication and instruction might have an impact on learners' behavioral intentions.

Researchers in different fields of study such as Tarhini, El-Masri, Ali and Serrano (2016) in banking; Hoque and Sorwar (2017); Sezer and Yilmaz (2019) in management, and Alshahrani and Walker (2017) in education investigated the validity and reliability of UTAUT model. Their findings suggested that even though UTAUT model was a robust model to utilize in measuring technology acceptance among individuals and organizations, UTAUT2 might have more potential to shed light on the factors influencing individuals' acceptance of technology and their willingness to use them.

In their latest work, Venkatesh et al. (2016) categorized the years of UTAUT research into three categories of UTATU application, UTAUT integration, and UTAUT extension. They suggested that further research has to be conducted in newer areas using the UTAUT2 model; therefore, the utilization of the UTAUT2 model in mobile-based learning and mobile-based assessment will be discussed in the following sections.

Unified Theory of Acceptance and Use of Technology and Mobile Devices as Educational Tools

Ali and Arshad (2016) utilized a version of the UTAUT2 model and extended it with mobility, interactivity, and enjoyment as three new factors to examine Egyptian learners' intention to use mobile devices as educational tools. Their findings suggested that performance expectancy, ease of use, interactivity, and enjoyment were influential on students' intentions to use mobile devices as educational tools at school complimenting

their traditional learning approaches. The UTAUT2 model was further used to discover the factors influencing the utilization of smart mobile phones as educational tools among undergraduate students in Egypt, Bangladesh, and other universities. The result revealed that performance expectancy, effort expectancy, and hedonic motivation are the most influential factors affecting the intentions and willingness of students to utilize mobile phones as educational tools (Ahmed & Kabir, 2018; Ali & Arshad, 2016; Althunibat, 2015).

El-Masri and Tarhini (2017) conducted a study investigating factors affecting the utilization of mobile devices as learning tools in Qatar and USA utilized an extended UTAUT2. The outcome suggested performance expectancy and hedonic motivation as significant predictors of college students' behavioral intention in both countries. However, their findings proposed that there were discrepancies in influential factors affecting the intention of students in adopting mobile tools in developed countries like the USA and developing countries like Qatar. Moreover, Tarhini et al. (2015) utilized the UTUAT2 model to examine and compare the elements influencing the intention of British and Lebanese college students of using mobile phones as educational devices. Their discoveries supported the findings of El-Masri and Tarhini (2017) that even though some similarities existed, there were significant differences between factors affecting college students' willingness to utilize mobile devices in their learning process in developed and developing countries.

Utilized the UTAUT2 model, the findings of some studies proposed some new factors such as culture-specific beliefs and values, technological culturation, and national

information technology (IT) development that could influence students' willingness to use mobile devices as educational tools in some Middle Eastern countries (Ameen, Willis, & Thomas, 2015; Al-Adwan, Al-Adwan, & Berger, 2018; Alasmari, & Zhang, 2019). Accordingly, as the purpose of this research is to focus on college students' perceptions on the utilizing mobile devices as educational assessment tools in Iran as a developed country, the existing literature concentering on the use of mobile devices as educational and assessment tools in Iran will be addressed in the next section.

Mobile Devices as Educational Tools in Iran

Mohammadi (2015a) researched to investigate the factors affecting Iranian college students' intentions to utilize mobile devices as educational tools using the UTAUT model. The outcome revealed that self-efficacy, perceived usefulness, and performance expectancy played a crucial role in adopting mobile devices as educational tools among Iranian students and encouraged them to use such devices in their learning process. This study can be named as one of the very few works conducted in Iran using the UTAUT model with aiming to learn about the intentions of students to utilize technology. Therefore, their research can be used as a benchmark for this study in various aspects. Abdekhoda et al., (2016) applied the UTAUT model to investigate the willingness of faculty and students of a university in Iran to utilize mobile devices as educational tools. Their findings suggested performance expectancy, effort expectancy, and social influences as influential factors in adopting mobile devices as learning tools by faculty at the University of Tabriz.

In a case study conducted at Toosi University in Iran, Hamidi and Chavoshi (2018) used the UTAUT model to learn more about the utilization of mobile devices as educational tools among Iranian college students. The outcome proposed that certain personal factors such as self-efficacy and motivation had a positive impact on students' behavioral intentions and their willingness to utilize mobile devices in their learning process. However, the result of the work of, Koohestani et al. (2018) that adopted the UTAUT2 model to investigate the perception of healthcare students on mobile learning acceptance contradicts some findings of the previous works. They suggested some factors caused a dilemma for studying whether to use or not to use mobile devices as educational tools. The outcomes of the work of Kalavani, Kazerani, and Shekofteh (2018) were also aligned with the discoveries of (Koohestani et al., 2018). The research revealed that perceived attraction, motivation, ease of use, and academic performance were controversial factors that created uncertainty for students on utilizing mobile devices as a legitimate educational tool in their process of learning. Moreover, the latest research adopting the UTAUT model examining the factors influencing the acceptance of mobile learning among Iranian students suggested that various social, cultural, and personal factors might affect Iranian learners' acceptance of mobile devices as educational tools (Chavoshi & Hamidi, 2018). As a result, it can be inferred that even though there are some similarities in the findings of a very few studies conducted in Iran utilizing the UTAUT model as their theoretical framework, some noteworthy contractions also exists in their results.

According to Mohammadi (2015b) college students together with other students all around the world are becoming more interested in utilizing mobile devices as educational tools; however, their willingness towards using mobile devices as assessment tools in their process of learning is not clearly identified. Consequently, it is necessary to gain a deeper understanding of students' perceptions of utilizing mobile devices as assessment tools in their educational journey. Accordingly, this study aims to use the UTAUT2 model to more insightfully explore the perceptions of Iranian college students on the utilization of mobile devices as educational and assessment tools.

Mobile Devices as Educational Assessment Tools

Nikou and Economides (2017a) investigated the influential factors affecting students' willingness to utilize mobile devices as educational assessment tools using an integrated model of TAM and UTAUT. Their findings revealed that mobile self-efficacy, together with perceived motivation and anxiety were among significant factors having an impact on students' behavioral intentions to use mobile devices as assessment tools. They stated that gaining more insight on students' perceptions on utilizing mobile devices as educational assessment tools could increase students' motivation and promote their learning process (Nikou & Economides, 2017a; Nikou & Economides, 2016b). In another study, Nikou and Economides (2017b) explored the influential factors affecting students' intentions to use mobile devices as assessment tools adopting an integrated model of TAM, UTAUT, and Theory of motivation. Their discoveries proposed that a relationship existed between the motivation of students and their willingness towards utilizing mobile devices as educational assessment tools.

Nikou and Economides (2018) reviewed 43 articles in the area of mobile-based assessment published in seven major educational journals investigating the effects of utilization of mobile devices as assessment tools on the motivation and learning performance of students. Their result revealed that the utilization of mobile devices as assessment tools had a positive impact on students' learning motivation and learning performance. However, they suggested that more research is needed to be conducted in both science, technology, engineering, and mathematics (STEM) and non-STEM disciplines. They proposed that further studies should focus on different cultures and within various age groups to explore the effects of using mobile devices as assessment tools on learners' academic performance and finding a stronger connection between student motivation and mobile-based assessment.

Tarighat and Khodabakhsh (2016) utilized the UTAUT model to explore Iranian learners of English as their foreign language attitudes towards using mobile devices as educational assessment tools to evaluate their speaking abilities. The outcome suggested that Iranian EFL learners had mixed attitudes towards the utilization of mobile devices as assessment tools in their English language process. However, the research pointed out that to find a more in-depth understanding about Iranian learners willingness on using mobile devices as assessment tools more research had to be conducted in other fields of study in different settings and contexts. To serve that purpose and shed more light on Iranian college students' perceptions on using mobile devices as assessment tools, the purpose of this research is to explore students' perceptions on the utilization of mobile devices as assessment tools in their learning process.

Iranian Learners and Self-Efficacy

Collaboration and performing tasks to gain mastery in groups of peers increase the self-efficacy of learners (Lu, Jiang, Yu, & Li, 2015; Feldman, & Kubota, 2015). The finding of Hassankhani, Aghdam, Rahmani, and Mohammadpoorfard (2015) in an Iranian educational setting, confirmed the discoveries of Lu et al. (2015). The researchers also reached another significant result. They found that motivation positively affected self-efficacy and self-efficacy equally affected motivation of Iranian learners, and as a result of it, the academic performance of students was also improved. Therefore, it can be claimed that there is a direct relationship between motivation, self-efficacy, and academic performance of Iranian college learners (Zarrin, Abdi, Paixão, & Panahandeh, 2017; Hassankhani et al., 2015).

However, it is worth mentioning that cultural and social beliefs and perceptions can affect self-efficacy of the learners and can also impact their achievements (Ahn et al., 2016; Meissel & Rubie-Davies, 2016). In Finland self-enhancement and in Japan self-improvement had significant effects on self-efficacy. The Iranian culture tended to raise students with self-judgment and control belief in learning; these factors were known the influential elements affecting their self-efficacy (Yada, Tolvanen, & Savolainen, 2017; Manavipour & Saeedian, 2016). Cultural factors and the beliefs of learners about themselves and their society play a significant role in their academic performance, motivation, and self-efficacy. Consequently, it is crucial to understand more about the self-efficacy of Iranian college students considering these factors in this study (Hallinger, Hosseingholizadeh, Hashemi, & Kouhsari, 2017).

As it was discussed earlier in this section, there are various sources to self-efficacy and self-efficacy is also applied to many different aspects of life. Technology self-efficacy is known to be one of the most significant kinds of self-efficacy that was emerged after the expansion of cutting-edge technology in the life of the current generation. As s result, the concept of technology self-efficacy will be addressed in the next section.

The Relationship Between Technology and Self-Efficacy

With the advancement of technology and the emergence of the world wide web, the education system moved toward developing online platforms and utilizing technological tools to promote the academic success and motivation of learners in various educational settings (Barak, Watted, & Haick, 2016). To serve that purpose and to increase the performance of learners, it is necessary to gain a comprehensive understanding of the effects of technological tools and online platforms on the self-efficacy of teachers and learners.

The effect of technology integration on the self-efficacy of teachers was proven to be controversial. Findings of various research suggested that technology use and competencies have a positive impact on the self-efficacy of pre-service teachers and their abilities to transfer knowledge using multiple forms of technologies (Joo, Park, & Lim, 2017; Yerdelen-Damar, Boz, Aydın-Günbatar, 2017). However, technology integration is not the most effective approach to enhance the self-efficacy of teachers and learners. Notwithstanding of the discoveries about teachers and students, the research on the

relationships between the self-efficacy of learners and technology integration indicated different results (Claro et al., 2017; Venkatesh et al., 2014).

Many researchers proposed that technology integration in the learning environments of learners both inside and outside of the classroom increased the self-efficacy and academic performance of these students (Venkatesh et al., 2016; Lai & Hwang, 2016; Prior et al., 2016). Therefore, it can be concluded that the utilization of various forms of technology in the learning process of students either directly or indirectly has a positive influence on the learning process of students (Chen et al., 2016).

The concepts of technology self-efficacy and online self-efficacy refer to the beliefs and perceptions of individuals about their abilities to perform specific tasks utilizing technological tools and their capacities to execute online-related actions to achieve certain online objectives (Ozturk et al., 2016; Su et al., 2018). The discoveries of significant studies in the field revealed that even though factors such as age, gender, and psychological characteristics of learners were influential factors, utilization of online learning platforms, mobile devices, and educational games positively affected their technological and online self-efficacy. Accordingly, the motivation, satisfaction, and academic performance of the students were also improved as a result of the increase on their self-efficacy (Han & Shin, 2016; Shin & Kang, 2015; Cho & Heron, 2015; Broadbent & Poon, 2015). Most of the existing research conducted with their focus on the effects of utilization of technologies such as mobile devices have found that technology use has a positive impact on the self-efficacy of learners in general and their technological and online self-efficacy in specific.

The Impact of Technology on the Self-Efficacy of Iranian Learners

Even though several researchers investigated the effects of using mobile devices on the self-efficacy of learners, Nikou and Economides (2016b) conducted the only existing research addressing the effects of the utilization of mobile devices as assessment tools on the self-efficacy of students. Therefore, as the purpose of this study is to gain a deeper understanding of the perceptions of Iranian college students on the possible effects of utilization of mobile devices as educational tools on their self-efficacy in general and technological and online self-efficacy in specific more knowledge has to be gained to lead the path of this study.

Summary and Conclusions

Mobile devices have been widely used as educational tools in teaching and learning all around the world. However, even though several studies focus on the instructional aspect of the utilization of mobile devices as educational tools, not enough research is conducted concentrating on assessment aspect of the utilization of mobile devices in students' learning process. There is almost no study exists exploring using mobile devices as educational and assessment tools in Iranian literature.

The findings of a few existing studies on the perceptions of students on the utilization of mobile devices as educational tools propose that further research has to be conducted focusing on different age groups from different cultures, ethnicities, and backgrounds Brown & Mbati, 2015; Nikou and Economides, 2016b; and Tarighat and Khodabakhsh, 2016). Accordingly, this study may fill a gap not only in Iranian literature but also in the literature of the world in two aspects.

The purpose of this study is to gain a better understanding of the perceptions of Iranian college students on the utilization of mobile devices as educational tools. Therefore, the outcome of this study would firstly, create a new opportunity for researchers in the field to learn more about the viewpoints of college students as a different age group from the age groups selected in previous works mainly focused on high school learners (Nikou & Economides, 2016a). Secondly, the discoveries of this research may provide the researchers with the perceptions of Iranian students who are culturally and socially different from the participants of the studies that had previously conducted in the discipline (Brown & Mbati, 2015).

The discoveries of this study could also help the policy makers, curriculum designers, and educators to develop innovative teaching and learning approaches and also help app designers to develop more productive educational applications. The invention of new pedagogies and the development of educational applications that have considered both instructional and assessment aspects of mobile learning in their design can provide the individuals residing in remote and less privileged areas to receive equal and quality higher education.

The UTAUT model was originally designed to add to the IT literature through gaining a deeper understanding about the concept of the technology acceptance and the willingness of individuals to use technologies. However, later on, the UTUAT model was used in various disciplines such as Internet banking, mobile technology, online management system, and education (Venkatesh et al., 2016). The model was used to explore the willingness of learners to utilize various forms of the technology in their

learning process and what factors could possibly affect their learning. The UTATU model was later improved to a more advanced model UTAUT2 that is currently being used in many studies (Venkatesh et al., 2012). Utilizing the UTAUT and UTAUT2 models as leading frameworks in educational research and focusing on the willingness and intentions of learners on the utilization of mobile devices as educational tools indicated using such devices have a positive impact on the motivation, satisfaction, and performance of learners.

Self-efficacy that Bandura defined as the perception of individuals of their abilities to do certain tasks and achieve certain outcomes (1977) is also known as an effective factor in the learning process of students. The existing literature suggests that using technological tools in general and in the learning process in specific contributed to an increase in the self-efficacy of the learners. Moreover, the utilization of mobile devices as educational tools was also found to play a significant role in the promotion of self-efficacy in learners.

It can be concluded that the existing body of research in the field of education revealed that using mobile devices as educational tools in the learning and assessment process affect the self-efficacy, motivation, and academic performance. However, as not enough studies exist in Iranian literature on the utilization of mobile devices as assessment tools, this study can add to the body of research. This research can add to the literature through learning more about the perceptions of Iranian college students on mobile devices as assessment tools and the effect of using them on their self-efficacy, motivation, and academic performance.

Quantitative and qualitative methods were used in the research exploring the perceptions and intentions of students using mobile devices as learning and assessment tools. Quantitative research was used utilizing the UTUAT2 model using surveys and questionnaires to inquire about technology acceptance among students. Qualitative research was used to provide information about the perceptions of students on using mobile devices and the effect of it on their self-efficacy, motivation, and academic performance. The purpose of this study was to use a qualitative approach to explore the perceptions of Iranian college students on the utilization of mobile devices as assessment tools (Merriam, 1998).

Chapter 3: Research Methodology

Introduction

The purpose of this study was to explore the perceptions of Iranian college learners on the utilization of mobile devices as assessment tool. I used a basic, qualitative design to collect data and answer the research question and subquestions. In this chapter, I discuss the research questions as well as the research design and rationale for the chosen approach. I also address my role as the researcher and the strategies to face biases and challenges. In the Methodology section, I discuss the participant recruitment procedure, the instruments used in the research and, the interview questions as well as the data collection procedure and analysis. Finally, the credibility, transferability, dependability, and conformity of the research together with the ethical procedures of the study, are addressed.

Research Design and Rationale

To gain a deeper understanding of Iranian college students' perceptions and experiences on mobile-based assessment and its influence on their motivation, self-efficacy, and academic performance, I designed one main research question and three subquestions:

Main question: What are the perceptions of Iranian college students on the utilization of mobile devices as assessment tools?

Subquestion1: What are the possible influences of the utilization of mobile devices as assessment tools on learners' motivation?

Subquestion 2: What are the possible influences of the utilization of mobile devices as assessment tools on learners' self-efficacy?

Subquestion 3: What are the possible influences of the utilization of mobile devices as assessment tools on learners' academic performance?

Based on the purpose of the study and the research questions, I selected a qualitative research design over a quantitative because it was more aligned with the nature of the study. In a quantitative design, researchers formulate hypotheses based on their prior knowledge, and every step has been designed in advance (McCusker & Gunaydin, 2015). In a qualitative design, researchers have no advanced knowledge about the topic, and they aim to gain a deeper understanding about individuals' experiences and perceptions utilizing a more flexible design and paying attention to contextual details (Patton, 2015). The purpose of this study was to explore Iranian college students' perceptions of the utilization of mobile devices as assessment tools. I had no prior knowledge of their opinions or assumptions about the results of study; therefore, I selected a qualitative design. The foundation of this qualitative study was developed on the UTAUT2 (Venkatesh et al., 2012) and Bandura's self-efficacy theory (1997) to find answers to the research questions.

This study was a basic qualitative study. The basic qualitative research design helps the researcher to learn more about the experiences of participants and the meaning they form from their experiences (Merriam, 1998). Throughout the meaning-making process of their experiences, participants become able to express their beliefs, opinions, and feelings toward the subject being studied (Patton, 2015). A basic qualitative design

best fits educational research and helps researchers find in-depth information regarding the most effective teaching and learning processes (Merriam & Tisdell, 2015). In the current study, I aimed to provide descriptive insight about participants' experiences and perceptions on the utilization of mobile devices as assessment tools that can be used to design an innovative pedagogy, so a basic qualitative design was the most appropriate research design.

Role of the Researcher

The most significant instrument in a qualitative study is the researcher because he or she has to gain meaningful and authentic data that results in valid and reliable research (Marshall & Rossman, 2015). As a result, my role as the researcher was to collect, analyze, and synthesize the data to answer the research questions as well as report the outcome accurately with no bias (see Rubin & Rubin, 2012). Another role for me as the researcher was not only to provide participants with consent forms and ensure that they are willing to take part in the study but also to establish a good rapport with them through creating a friendly, respectful, and a safe environment (see Patton, 2015).

As a qualitative researcher, it was also my responsibility to address the gap in the literature through gaining in-depth understanding of the topic being studied. The findings of this study helped fill a gap in Iranian literature on the topic of mobile-based assessment. I also provided other researchers and educators with more in-depth knowledge on the utilization of mobile devices as assessment tools that can lead to the development of more innovative pedagogies and educational mobile applications.

My enthusiasm for using mobile devices as learning tools and my personal belief that mobile learning can bring equal educational opportunities to individuals could make me a biased researcher. To control my biases, I kept reflective journals and made precise notes during the entire process of research. I then shared my reflective journal, notes, and all other documents with expert researchers and my colleagues and asked about their prior experiences in researching to ensure that my biases were minimized.

Methodology

Participant Selection Logic

Participants were Iranian college students who had used mobile devices as assessment tools in their learning process. The participants were selected through purposive sampling and recruited via social media platforms, as there are not too many college students utilizing mobile devices as assessment tools in Iran. Through adopting a homogeneous purposive sampling approach, eight to 12 college students who had used mobile devices as assessment tools in their learning process were identified.

One of the criteria for participation in this study was for the participants to have prior experience using smartphones, tablets, or laptops for their course assessments or self-assessments. The other criteria was that the participants studied different disciplines in different colleges in Tehran to provide a diverse sample that could lead to the development of more in-depth understanding. To ensure that all the participants met the criteria of participation of this study, I contacted the possible candidates prior to the interview and informally inquire about their experience of using mobile devices as assessment tools and their fields of study.

Data saturation occurs when the acquired patterns and themes from the collected data become redundant and no further data need to be gathered (Palinkas et al., 2015). Previous research indicated that the first stage of identification of themes usually emerge within the first six interviews, and data saturation usually takes place within six to 12 interviews (Guest, Bunce, & Johnson, 2006; Hagaman & Wutich, 2017). Accordingly, a sample size of eight to 12 can be sufficient before the researcher arrives at the point of saturation of data (Patton, 2015; Pietkiewicz & Smith, 2014). In this study, I aimed to achieve a wide range of perceptions, experiences, and reflections on the utilization of mobile devices as assessment tools among Iranian college students (see Percy, Kostere, & Kostere, 2015). Therefore, a sample size of eight to 12 participants was selected for this study. If data saturation had not occurred—determined based on analyzing the data and not seeing a repetitive pattern and still seeing new themes—more participants would have been recruited.

Instrumentation

In this study, I aimed to elicit information about the experiences and perceptions of Iranian college students on the utilization of mobile devices as assessment tools through the designed interview questions. The purpose was to ask questions that would help collect data about learners' self-efficacy, motivation, and academic performance influenced by the utilization of mobile devices as assessment tools. I collected data through face-to-face, semistructured interviews, which result in the development of shared meaning and deeper understanding of the topic between the interviewer and the interviewees (Rubin & Rubin, 2012). The interview questions were open-ended and

aligned with the conceptual framework, and more questions were asked when other related subjects and themes emerge during the interview (DiCicco & Crabtree, 2006). Some of the advantages of conducting face-to-face interviews were establishing a better rapport with the participants and being able to ask for further information and elicit more accurate and truthful data (Patton, 2015; Whiting, 2008).

I interviewed the participants individually in a safe and quiet room of my personal office and all the interviews were audio recorded. The audio recordings were then transcribed in Farsi, as this was the native language spoken by the participants and the researcher. The transcripts were not translated to English before the data were coded, categorized in themes, and analyzed. I translated the acquired codes, categories, and themes to English. The accuracy of the translations was assured because I received my bachelor's degree in Persian–English translation from an accredited college, so I can be considered an expert in this field. I also kept reflective journals and took notes throughout all stages of design and data collection to ensure that my biases did not affect the results.

Interview Questions

To gain a deeper understanding of the perceptions of Iranian college learners on the utilization of mobile devices as assessment tools, nine interview questions were designed that were aligned with the theoretical framework and the research questions of this study. Table 1 displays the preliminary interview questions and their alignment with the theoretical framework, research questions, subquestions, and the data source.

Table 1

Preliminary Interview Questions

Research questions & Subquestions	Interview Questions	Theoretical Frameworks	Data Source
Research question: What are the perceptions of Iranian college students on the utilization of mobile devices?	How do you feel about using mobile devices as assessment tools?	UTAUT2	Preliminary Interview
	What are the advantages and disadvantages of using mobile devices as assessment tools?	UTAUT2	Preliminary Interview
	How do you feel about using mobile devices for self-assessment or comprehensive course assessment? Why?	UTAUT2	Preliminary Interview
	What are some problems you have faced or concerns you have had when used mobile devices for taking tests?	UTAUT2	Preliminary Interview
	What is your advice to students who don't use mobile devices as assessment tools?	UTAUT2	Preliminary Interview
Subquestion 1: How do Iranian college students perceive the use of mobile devices for assessment and its influence on their motivation?	How does using mobile devices for assessment can influence your motivation to take tests?	UTAUT2	Preliminary Interview
Subquestion 2: How do Iranian college students perceive the use of mobile devices for assessment and its influence on their feelings of self-efficacy?	How do you think using mobile devices is easier than using other technologies for assessment?	Self-efficacy	Preliminary Interview
	To what extent using mobile devices for assessment has changed your approach towards taking tests?	Self-efficacy	Preliminary Interview
Subquestion 3: How do Iranian college students perceive the use of mobile devices for assessment and its influence on their motivation?	How can using mobile devices as assessment tools affect your performance in the tests and general assessments?	UTAUT2	Preliminary Interview

Procedures for Recruitment, Participation, and Data Collection

The purpose of this study was to gain a deeper understanding of the perceptions of Iranian college learners on the utilization of mobile devices as assessment tools. To serve that purpose, I as the researcher and the person who also collected the data and did the interviews selected LinkedIn, Twitter, and Instagram as platforms to recruit participants. After that, I posted invitations with information about this study on my social media platforms. The invitations intended to attract the attention of college students of various majors in different universities in Tehran. The qualified candidates were the ones who had used smart mobile phones, tablets, or laptops as self or course assessment tools in their process of learning. I then conducted individual face-to-face interviews with each participant in a quiet room in my personal office.

The main research question of this study is "What are the perceptions of Iranian college learner on the utilization of mobile devices as assessment tools in their learning process?" To find answers to research questions, a basic qualitative research was conducted and the required data were collected through semistructured, face-to-face interviews. To serve that purpose, the following steps were taken.

After IRB approval (approval no. 08-16-19-0556047) for collecting data were obtained, I posted invitations for participant recruitment on my social media platforms such as LinkedIn, Twitter, and Instagram. I offered potential candidates informal face-to-face or phone meetings to provide them with the necessary information about the process and determine whether they met participant requirements. When the candidates showed interest in the study, I scheduled an interview in a safe and quiet room in my personal

office. Before the interview began, a hard copy of the consent form was handed to participants and any other questions were answered. The participants were assured that the interview process would be completed voluntarily, and they could leave or stop the process at any time. When the consent form was signed, another copy was provided to the participants and they were informed that the interview would be recorded. The first couple of minutes of the interview was spent to build a friendly and safe environment for the participants after which they were asked if they were still willing to do the rest of the interview. The full interview took between 30-60 minutes. Notes and memos were taken during the interviews and were reviewed immediately after the interviews.

After the interviews, I thanked the participants for their participation and time. The participants were also informed that a transcript of their interview would be e-mailed to them within a week of the interviews and after reviewing it, they would have the opportunity to ask me to withdraw their provided answers and data from the study. I ensured that participants had all my contact information should they have had any further inquiries or follow-up questions. The participants were also informed that I might have contacted them within a few weeks of the initial interview for some follow-up questions if required. The participants would also be informed that the findings of the study would be announced to the participants after the dissertation was defended and approved.

The interviews were transcribed within a day or two days of each interview, and the notes and memos were used to complement the transcripts. Finally, the collected data were organized for hand-coding and analysis. If the saturation had not happened after the primary interviews and more data had been needed to be collected, the same procedure

would have been repeated, and I would have posted the invitation again on my social media platforms to recruit more qualified candidates and conduct more interviews. The procedure of posting invitations on my LinkedIn, Twitter, and Instagram accounts to recruit more participants and conducting more interviews was repeated in various phases till the data saturation takes place and similar data patterns emerge.

Data Analysis Plan

Basic qualitative inquiry is defined as a qualitative approach to help the researcher gain more in-depth understanding of the ways individuals interpret their real-world experiences focusing on forming relevant themes (Merriam, 1998). In order to obtain a deeper understanding of Iranian college students' experiences and perceptions on the utilization of mobile devices as assessment tools, I utilized thematic inductive analysis to analyze the collected data. According to Braun and Clarke (2006) searching through the data to find certain and repeated patterns within the data set is the process researchers need to follow in conducting thematic analysis. Categorizing the information gained from the participants into classes as well as themes and sub-themes for comparison are the most significant aspects of thematic inductive analysis. The coding method that was selected for analyzing and coding the interviews was hand-coding.

I used hand-coding to analyze the data because the interviews were conducted in Farsi that was the native language of the participants. I transcribed the interviews in Farsi and hand-coded them in the same language not to lose the authenticity of the participants' wordings and statements. If I had translated the transcripts to English first and then coded them, meaning and discourse might have been lost in the process of translation.

Therefore, I was not able to use any coding application as I intended to code the data provided to me in Farsi and there was no application that could have coded the text in Farsi language. The following were the steps I took to analyze the acquired data:

1. I transcribed the interviews within a day or two days of the interviews.
2. I kept memos before and after the interviews, took notes during the interviews, and kept a reflective journal to be able to gain a deeper understanding and meaning of the transcripts of the interviews.
3. I coded the unit of meaning, then organized similar codes to categories, patterns, and themes.
4. Then I reviewed and revised all themes and created a matrix that represented all the acquired code, patterns, and themes.
5. Finally, I developed comprehensive themes that were aligned with my frameworks and research questions.

When confronting a discrepant case, I went back and listened to the original interview conducted with that participant, read the transcript as well as reviewing my memos and reflective journal to learn whether any misunderstanding or miscommunication occurred in the process. If I had realized that the discrepancy occurred due to lack of mutual understanding between the interviewer and the interviewee, I would have contacted the participant and asked for further explanation and clarification on the issue. However, when I learned that no misapprehension had taken place, I reported the discrepant case truthfully and tried to analyze and synthesize it in a manner aligned with the study's theoretical frameworks.

Issues of Trustworthiness

In order to establish trustworthiness four significant criteria of credibility, transferability, dependability, and conformity must be addressed (Elo et al., 2014; Guba, 1981). As stated by Guba and Lincoln (1981) credibility refers to the link that exists between the finding of the study and the world reality and how it can be demonstrated in real-world settings. One of the significant strategies that can help the researcher achieve credibility is triangulation that enables him/her to use multiple sources of data to achieve a comprehensive understanding of the phenomenon (Anney, 2014). In order to achieve credibility I used multiple approaches to collect and analyze data such as conducting interviews, keeping reflective journals, taking detailed notes during the entire process of design and data collection, and receiving peer-reviewed feedback from my colleagues.

The other factor that had to be considered was transferability that refers to the extent to which the discoveries are properly recorded and can be used in other contexts, situations, times, and populations (Guba & Lincoln, 1981). Using multiple sources to gather and record data during and after the interview, such as different technological devices and recording the data in multiple locations added to the transferability of the study.

Dependability is defined as the degree to which data can remain stable over time and conditions and whether it can be repeated in different contexts (Lincoln & Guba, 1985). Dependability can be best achieved through triangulation and external audit (Lincoln, 1995). In this study, the data were collected from college students with different disciplines studying at various universities in Tehran and memos, notes, and reflective

journals were kept that led to the establishment of triangulation. The study was also examined by the mentor, methodologist, URR, and the IRB and this process created external audit.

Confirmability is to ensure that the narrative of participants is reported and the study is not affected by the researcher's bias. I kept a reflective journal and took precise notes before, during, and after the process of interviews, analyzing, and synthesizing data in an attempt to report the authentic results and keep it bias-free.

Ethical Procedures

The participants of this study were selected from the Iranian college students who had utilized mobile devices such as smartphones, tablets, and laptops for as assessment tools in their learning process. I posted an invitation on my social media platforms such as LinkedIn, Twitter, and Instagram to recruit the potential candidates. I had to ensure that the invitation posted on the intended social media platforms were in compliance with the policies of the mentioned platforms before posting the invitations. As I intended to conduct this study internationally, I had to learn that whether the local government had its own research ethic approval system. I learned that the local government of Iran did not have its own research ethic approval system after reviewing the International Compilation of Human Research Standards document.

The potential ethical issues that had to be considered in this study could have been misusing the particpnats, completeing consents forms by the participants, researchers's biases and porssible individual history with participants, and confidentaility of the partiapnats. Therefore, appropriate measures had to be taken to manage such possible

ethical considerataions. It is also worth mentioning that the nature of this study did not cause any physical or mental harm to the participants. I recruited the participants with different educational backgrounds from various universities in Tehran and informed them about the process of the research through posting invitations on my LinkedIn, Twitter, and Instagram accounts. I also ensured that I had no prior contact and familiarity with the participants neither professionally nor personally. The participants were treated in accordance to the procedures identified by Psychological Associations' Code of Ethics (APA, 2017).

I provided the participants with the Informed Consent Form and ensured that the participants willingly signed the forms. I spent needed time to answer any possible concerns or questions that participants had. The participants were also informed that the entire process was voluntarily and they could withdraw at any time. Moreover, the participants were ensured that their names would remain confidential and that pseudonyms would be used in the study through utilization of an alphanumeric systyem of coding. The real identities of the participants were only available to the researcher, committee, and the IRB. All forms of data that including audio-recorded interviews, notes, journals, and memos are restored in a secured place in the researcher's personal office and are only availbale to the reseacher herself. The data will be destroyed after 5 years.

Summary

The objective of this study was to explore the perceptions of Iranian college students on the utilization of mobile devices as assessment tools. In order to find

appropriate answers to the research question, a basic qualitative approach was utilized. The data were collected through semi-structured face-to-face interviews for the researcher to find more in-depth knowledge about the experiences and perceptions of the participants on the utilization of mobile devices as assessment tools in their process of learning. I used homogeneous purposive sampling to recruit participants through posting invitations on my social media accounts.

The acquired data are coded and analyzed in the next chapter, and the result are be discussed and more thoroughly synthesized. The next chapter also includes detailed findings acquired from the repsonses of Iranian college students on the utilizationo of mobile devices as assessment tools. The results and participants responses are also reported in alignment with reseach questions.

Chapter 4: Results

Introduction

My purpose was to explore the perceptions of Iranian college students on the utilization of mobile devices as assessment tools and its possible influence on their motivation, self-efficacy, and academic performance. The main question was "What are the perceptions of Iranian college learners on the utilization of mobile devices as assessment tools in their learning process?" The study also addressed three subquestions:

1. What are the possible influences of the utilization of mobile devices as assessments tools on learners' motivation?
2. What are the possible influences of the utilization of mobile devices as assessment tools on learners' self-efficacy?
3. What are the possible influences of the utilization of mobile devices as assessment tools on learners' academic performance?

The data were from eight participants through semistructured, face-to-face interviews. Then codes, categories, and themes were identified and analyzed through a thematic analysis design. In this chapter, the research setting and demographics are discussed. Then the data collection process, data analysis, and evidence of trustworthiness are addressed in separate sections. I also report the analysis of the collected data and the findings in alignment with research questions.

Setting

I recruited the participants through posting invitations on my Twitter, LinkedIn, and Instagram accounts between August 16 to 22, 2019. I was initially contacted by 12

candidates, and I selected eight of them who met the criteria of this study. The volunteer candidates contacted me via the contact information I provided within the invitation or sent me direct messages on the social media accounts used for posting the invitations. During an initial phone conversation, I provided more information, and I scheduled interview sessions within a week for those who expressed their interest to participate. I conducted six of the eight semistructured, face-to-face interviews in a safe and quite room in my personal office during the hours when my colleagues had already left the office. I conducted the remaining two interviews in a study room in a public library.

I scheduled interview dates during the first phone conversation and e-mailed participants the consent forms for them to sign and send back to me prior to their interview dates. Except for one of the participants who changed the date of her interview twice, the rest of the process went smoothly. The average time for interviews was about 35 minutes, where the shortest was 22 minutes and the longest 45 minutes. The entire data collection process took 7 days. Each participant was briefed about the process of the interview and I reviewed the content of the consent form with him or her before conducting the interview. At the end of each interview, I thanked the participants for participating in the interview and told them that I would send them a copy of the transcript of their interviews and ask them to confirm the accuracy of the content. I also informed them that I would provide them with a copy of the study after it is approved and published. The participants were all enthusiastic and fully engaged in the process of interviews; however, they were sometimes impatient with the process, which I addressed

by directing the process of the interview and providing them with a sense of purpose and motivation.

Demographics

The eight participants were from 21 to 27 years old and were college learners studying in five different colleges/universities in Tehran, the capital of Iran. Six of the eight participants were females, and two of them were male students studying different majors in one of Tehran's colleges. All the participants had the experience of using smartphones, tablets, or laptops as course/self-assessment tools in their learning process. Table 2 displays the demographic information of the participants.

Table 2

Demographics

Pseudonym	Age	Gender	Field of Study	College/University Name
P1	21	Female	Graphic Design	Islamic Azad University (CB)
P2	23	Male	International Relations	University of Tehran
P3	24	Female	Psychology	Allameh Tabataba'i University
P4	24	Female	Biochemical Engineering	Islamic Azad University (NB)
P5	27	Male	Business Management	Science & Technology University
P6	21	Female	Film Production	Islamic Azad University (CB)
P7	19	Female	Architecture	University of Tehran
P8	20	Female	Industrial Engineering	Islamic Azad University (NB)

Participants' Profile Narratives

The participants of this study were Iranian college learners studying in one of Tehran's universities. The participants provided information about their perceptions on the utilization of mobile devices as assessment tools in their educational journey for this

basic qualitative research. The following sections provide a brief description of each participant's history in using mobile devices as assessment tools.

Participant 1

Participant 1 in this study was a 21-year-old female student. She was studying graphic designs at Islamic Azad University Central Branch. She had used smartphones, tablets, and laptops for course and self-assessment about 10 times per semester. Participant 1 found smartphones and laptops as convenient devices to use for assessment purposes.

Participant 2

Participant 2 of this study was a 23-year-old male student. He was studying international relations at the University of Tehran. He had utilized both smartphones and laptops for assessment five times per semester. Participant 2 stated that he was more comfortable using laptop for his assessment because of its larger screen.

Participant 3

Participant 3 of this study was a 24-year-old female student. She was studying psychology at Allameh Tabataba'i University. She had used smartphones and laptops for assessment about four times per semester. Participant 3 found laptops to be more useful in the assessment of subjects such math and biology and written exams and smart phones in subjects like language and literature and multiple-choice questions.

Participant 4

Participant 4 of this study was a 24-year-old female student. She was studying biomedical engineering at Islamic Azad University North Branch. She had utilized

mobile phones and laptops for course and self-assessment about 10-12 times per semester. She stated that using laptops for assessment purposes was easier for her due to lack of user-friendly mobile applications for assessment.

Participant 5

Participant 5 of this study was a 27-year-old male student. He was studying business management at Science and Technology University. He had used smartphones, tablets, and laptops in his course and self-assessment process six to eight times per semester. He found using tablets and smartphones more convenient for assessment because they were touch-screen and application-based devices.

Participant 6

Participant 6 of this study was a 21-year-old female student. She was studying film production at Islamic Azad University Central Branch. She had used smartphones and laptops as educational assessment tools about four to six times per semester. Participant 6 stated that using smartphones for her assessment was easy because these devices were the ones that she usually used in her everyday life.

Participant 7

Participant 7 of this study was a 19-year-old female student. She was studying architecture at University of Tehran. She had used smartphones, tablets, and laptops as educational assessment tools about twice every week per each semester. Participant 7 stated that utilizing tablets and laptops for assessment was more convenient to her because these devices were user-friendly and had less technical issues.

Participant 8

Participant 8 of this study was a 20-year-old female student. She was studying industrial engineering at Islamic Azad University North Branch. She had used smartphones and tablets for assessment purposes about three to four times per semester. Participant 8 mentioned that she did not feel a significant difference between using her smartphone and tablet during assessment because both were equally easy to use.

Data Collection

Eight Iranian college students who had utilized mobile devices as assessment tools in their educational process were recruited in this study. The criteria for recruitment was for the candidates to be college students in Tehran and studying different majors. The participants were recruited through posting an invitation on my Twitter, LinkedIn, and Instagram account. In the posted invitation, I scheduled a short meeting on the phone with them, explained the study and the process, and answered their questions. All eight participants agreed to the conditions, so I scheduled an interview time with them and e-mailed them the consent form. I asked them to sign the form and return it to me within 2 days.

I conducted all the interviews in the duration of a week when I sometimes had to schedule more than two meetings a day. Seven of the eight participants came to the interview during their scheduled time frame, though I had to reschedule one interview twice due to an emergency that one of the participants had. Before each interview, I explained the entire process to each participant once more and reminded them that they could leave the interview or ask for withdrawal at any time. I also reviewed the consent

form and tried to build a friendly and respectful environment for each participant for him or her to feel safe and at ease. I used a spare iPhone and an iPad to record the interviews when the participants were ready to start the interview process. I also informed the participants that our conversation was recorded.

I conducted semistructured, face-to-face interviews where I asked the participants 10 open-ended interview questions about their perceptions on the utilization of mobile devices as assessment tools in their learning process and the possible influence on their motivation, self-efficacy, and academic performance. I also asked them some other relevant questions to gain more understanding of their opinions about using mobile devices as assessment tools and elaborate on any possible misunderstanding they had about my questions.

I conducted all the interviews using Farsi, the native language of the participants and me. Accordingly, I had to transcribe all the interviews in the same language and to lose the authenticity of the participants' experiences, I did not translate the transcripts to English. After categorizing the data to codes, patterns, and themes, I translated them and the participant's quotes to English to able to report them. Then, I asked a person with knowledge of English and Farsi language to check these translated patterns, themes, and participants' quotes for accuracy.

I transcribed each interview the same day I conducted it, which took me 4 days. I did not need to contact any of the participants for inquiring any future information. I sent each participant a copy of the transcript of their interviews through e-mail and asked

them for confirmation. After receiving confirmation from the participants, I began the data analysis.

To ensure the safety and the confidentiality of the participants' identity and the data collected from them, all participants were assigned pseudonyms using an alphanumerical system and the recordings were secured in a safe in the office and were carried in a safe bag when required. I substituted each participant's name with the letter "P" and a number (e.g., P1).

I encountered no unusual circumstances while conducting the interviews and in the process of data collection. There was also no significant variation in data collection procedure as discussed in Chapter 3. The slight variation that can be named is that the period of data collection and transcription was less than what it was anticipated in Chapter 3. I also asked help from a person who is fluent both in English and Farsi language to check the translated documents (codes, patterns, themes, and participant codes) for accuracy.

Data Analysis

This study is a basic qualitative study, so I collected the data through conducting interviews and then analyzing the gathered data. Thematic analysis allows the researcher to go through the data set and search for repeated patterns, units of meaning, and themes (Braun & Clarke, 2006). After conducting the interviews and transcribing them, I used the thematic inductive analysis model introduced by Braun and Clarke (2006) to analyze the acquired data. I categorized the participants' responses to codes, patterns, and themes and analyzed the findings accordingly. I listened to the recordings and read the transcripts

multiple times. I also referred to my notes and reflective journal to gain a deeper understanding of the data set.

I had to hand-code the collected data because none of the existing coding applications and software could code the data in Farsi. I chose a paragraph as the unit of meaning and then allocated a different color to each emerging code to be able to identify initial codes. In the second round of reading the interview transcripts and through seeking help from my notes, I was able to identify emerging patterns of multiples codes. It was then that I could find patterns emerged from the participants' perceptions and experiences using mobile devices as assessment tools in their educational journey. After finding the patterns and then themes, I translated them to English to report and discuss them further. Table 3 displays initial code count from the initial coding phase.

Table 3

Initial Code Counts

Word	Phrase count
Convenient	113
Interaction	9
Examiner	8
Place	24
Location	5
Time	18
Free Time	8
Pressure	6
Accurate	8
Daily Use	17
Cost-efficient	5
Teacher	11
Productive	11
Beneficial	10
Exciting	9
Type of Questions	9
Motivation	14
Trustworthy	5
Review	13
Feedback	9
Technical Issues	13
Internet Connection	9
Environmental-friendly	2
Peer	6
Learning Environment	6
Setting	3
Positive Feeling	19
Negative Feeling	10
Anxiety	12
Attractive	5
New	4
Stress	27
Online	14
Support	4
Accessible	3
Skill Set	7

Patterns

After reviewing the initial codes, I combined these codes into patterns of emerged codes. I identified five patterns that are in general alignment with my research questions, interview questions, and conceptual framework. Table 4 shows the patterns that emerged from the initial codes.

Table 4

Patterns from Initial Code Counts

Pattern	Initial codes
Influential Internal Factors	Motivation
	Beneficial
	Productive
	Attractive
	Positive Feeling
	Exciting
	Stress
	Pressure
	Anxiety
	Negative Feeling
Influential Outside Factors/Environmental	Place
	Location
	Time
	Setting
	Learning Environment
	Free Time
	Accessible
Influential Outside Factors/Personal	Interaction
	Examiner
	Teacher
	Peer
	Feedback
	Support
Influential Outside Factors/Technical	Online
	Technical Issues
	Internet Connection
	Type of Questions
	Review
Influential Outside Factors/Economical	Cost-efficient
	Daily Use
	Environmental Friendly
	Skill Set
	Flexibility
Influential Outside Factors/ Reliability	Accurate
	Trustworthy

The identified patterns were emerged from the participants' perceptions and experiences of utilizing mobile devices as assessment tools in their learning process. The patterns were divided into two categories of internal and external influential factors. Internal factors were the ones that expressed the inner feelings and ideas of the participants regardless of their surroundings. External factors were the outside elements that affected the participants' perceptions of the utilization of mobile devices as assessment tools such as place, time, and their peers. Then the external factors were broken down to five categories of environmental, personal, technical, economical, and reliability.

Internal Factors

Convenience. All of the participants unanimously stated that using mobile devices as assessment tools is more convenient than using other forms of technologies and traditional methods of assessment because based on their experiences they can select the place, time, and the environment of the assessment. Participant 2 stated, "it is very convenient to use these devices because you don't need to interact with anyone and therefore, you won't be affected neither negatively nor positively by their presence." Participant 1 stated, "it's easier because you can take it when you have free time." Participant 4 stated, "using tablets for taking tests is more convenient because you can take them (exams) at your home, work place, or even when you are in a bus or subway." P6 stated, "it's more convenient because I use my smartphone 24/7 and use it for everything I do." Participant 8 stated, "it's very convenient to use mobile devices as assessment tools because they are very accessible and I know how to use them."

Stress. Six of the participants believed that using mobile devices for assessment is less stressful and causes less anxiety. Participant 8 stated, "because these devices are more accessible, you feel less pressured when taking exams." Participant 6 stated, "using your own mobile devices is less stressful than using other technologies or having to take paper tests." Participant 7 stated, " I always suffered from exam anxiety, but when I use mobile devices for assessment I have way less stress." Participant 4 stated, "I experience less stress when using my laptop or iPhone because I can be in a more convenient environment." However, participant 5 stated, "even though I like to use my laptop and tablet to take tests because they have many advantages for me, I get anxious when using them because I think what if they suddenly stop working or a technical problem occurs."

External Factors

The other identified patterns were external factors that had an impact on the participants' perceptions of the utilization of mobile devices as assessment tools. These external factors were environmental, personal, technical, economical, and reliability. Participant 2 stated, "I don't like paper-based assessment. They cause many restrictions to me; they limit me to a certain place and a specific time period." Participant 3 stated, "I can use my time in a smarter way when I have the option of taking a test with my smartphone or tablet." Participant 1 stated, "I can choose my own surrounding when using my phone for assessment." Participant 8 stated, "what I like the most about mobile devices as assessment tools is their accessibility."

Personal factors were also influential in the participants' opinions about using mobile devices as assessment tools. Participant 4 stated, "It makes me so anxious when a

teacher or another student talks in the middle of the exam. So I like to take an exam in presence of no one." Participant 6 stated, "I am more focused when using my mobile devices for assessment because no one stares at me or wants to cheat during the exam." However, Participant 2 stated, "not having teacher support and the fact that no one can answer my questions during the test make me nervous and lack of support is a disadvantage of mobile devices for evaluation." Participant 3 stated, "one of the advantages of using mobile phones for taking tests is that you normally receive feedback immediately." Participants 8 stated, "it's so good that you don't have to wait for your grades for a long time."

Technical factors is another dominant pattern that was found from the initial codes. Participants were concerned about technical issues and Internet connection problems the most when using mobile devices as assessment tools in Iran. Participant 7 stated, "the Internet connection is my major concerns" and participant 5 stated, "not being able to solve possible technical problems that I might have when using tablets and phones for assessment scares me so much." Participant 1 stated, "what if I lose all I wrote because of a technical issue?" Participant 5 stated, "it's very difficult to review what you have written when you are using your phone or tablet because something always goes wrong."

Economical factors is another key pattern that was identified. Participant 7 stated,

> I have to travel to other cities or even countries for work plenty of times during a month. So I enrolled in a program where I can take some courses online and take

> their tests using my tablet or laptop. I am so happy because my education doesn't stop me from doing my job and providing for my family.

Participant 1 stated, "I don't need to pay taxi or bus fares to go to a place and take a test, so it's very cost-efficient for me." Participant 3 stated, "I don't need to waste my time to go take an exam or get off from work." Participant 7 stated, "using these devices for taking tests is very environmental friendly because you don't need to commute or use papers and also very cost-efficient." Participant 6 stated, "everyone has either a phone or a tablet and use them everyday, so they don't need to pay any extra money for assessment." Participant 5 stated, "we are a generation who has a skillset to use these devices for almost everything, so we don't need to learn something new like how to work with a new technology to take a test, so you don't have to pay to learn a new skill."

The last identified pattern from codes is reliability. The participants have controversial opinions about the reliability of mobile devices for assessment tools. Participant 4 stated,

> I believe that the more you decrease human interference in the process of grading, the better results we might achieve. I think you can't trust human beings with grading or correcting your papers because if the person had a bad day or had a fight at home the other day, it would definitely affect your result. And because all the exams I took with a mobile phone or iPad were corrected immediately by the program itself, I like them better.

Participant 6 stated, "sometimes the teachers can't read my handwriting and I lose mark for that, but when I use these devices that never happens." Participant 1 stated,

"sometime when instructors draw shapes and tables by hand, they are not clear, so it causes a lot of confusion, but that doesn't happen with mobile phones or laptops." However, participant 3 stated, "when you use these devices, you can't go to anyone and make a complaint about the result if you are using an application that gives you immediate feedback." Participant 1 stated, "if something goes wrong during the exam, what am I going to do?" Participant 5 stated, "how do we know if the content that we get on applications are developed by reliable sources? Or the questions being asked are valid?"

The emerged initial codes and patterns helped me identify three main themes for that are all relevant to learners' perceptions and experiences of using mobile devices as assessment tools and how the utilization of these devices influenced their learning process. The identified themes are (a) ease of use, (b) tendency to use, and (c) price-value.

Ease of use. All of the participants of this study unanimously stated that they liked using mobile devices as assessment tools and they enjoyed the experience because it was very convenient to them. They stated these devices were very flexible and easy to use for assessment. However, they had some concerns about possible technical issues that could have occurred.

Participant 1 stated, "I like to use mobile devices to take tests because I can use them anywhere and anytime is convenient for me." Participant 4 stated, "it was a great experience because I could take the test at my workplace and I didn't need to commute." Participant 8 stated, "it was very easy for me because I was using my own devices and I

knew how to work with it." Participant 7 stated, "I loved it because my handwriting is not good and teachers normally can't read it easily, but I am so good at typing and working with my tablet and phone, so it was very easy for me." Participant 2 stated, "flexibility of these devices for taking tests is definitely a great advantage."

Some participants showed some concerns about using mobile devices as assessment tools even though they claimed it was an easy and convenient experience for them. Participant 2 stated, "I can't type fast; my typing skills are not good. So, if the questions are open-ended and I have to use my laptop, it will be difficult for me." Participant 3 stated, "I was worried what would have happened if my username/password hadn't worked!"

Tendency to use. All of the participants mentioned that they are more willing to use mobile devices as assessment tools in comparison to other forms of technologies used for assessment or traditional assessment approaches. The participants also expressed certain concerns and issues regarding using mobile devices as assessment tools, but they claimed that the existence of such issues would not stop them from selecting such devices for assessment purposes.

Participant 8 stated, "I am willing to use mobile devices for assessment because they are environmental-friendly." Participant 2 stated, "I like to use tablets and laptops for assessment because they are more user-friendly in comparison to other technologies and more convenient in comparison to other assessment methods." Participant 1 stated,

"I will use mobile phones and tablets for assessment again, and again because it's easier, especially because these devices are portable." Participant 4 stated, "I like using

mobile devices for assessment and I will use them again because they cause less stress and exam anxiety for me." Participant 3 stated, "waiting for feedback has always been so stressful for me, but when I use mobile devices for assessment, I usually get the feedback immediately and that's why I am willing to use these devices for assessment." Other participants stated that even though they have the tendency to use mobile devices as assessment tools in their educational journey, they would like to see some changes to take place in the design of assessments or applications used for assessment. Participant 5 stated, "sometimes I wonder what if the designers and developers of these tests and application are not trustworthy, especially when I am doing self-assessment."

Participant 7 also stated,

> Most of the assessments I have taken up to now using my mobile devices have been online, so my greatest concern is always to lose the Internet connection while taking a test. As you know the Internet connection in Iran is not so good and you may lose it anytime. Therefore, I advice the teachers and designers of tests or application developers to make tests and programs that are not only Internet-based or online

Participant 6 stated,

> It is difficult for me to review the test when using mobile phones or laptops because the design of applications and the test formats are in a way that don't allow you to move back and forth between the questions.

Everyday use. The Iranian college students who participated in this study recognized everyday use of mobile devices as one of the main reasons they had positive

opinions about using mobile devices as assessment tools in general. Participant 6 stated, "these are the devices we use everyday and that' why it is very easy to use them for assessment." Participant 1 stated, "all of us have a cell phone, so it is very cost-efficient to use them for taking tests too." Participant 2 stated, "I like using tables for assessment in comparison to other assessment tools because I work with them everyday and know how to use them." Participant 8 stated, "taking tests with mobile phone is very easy because you are carrying them with you all the time." Participant 4 stated, "working with mobile devices is in a skillset of the current generation, so it's more convenient to be assessed with them." Participant 7 stated,

> I love to take tests with mobile devices because I literally live with them, but I am not so sure how older people would feel about that. You know, because it's not very easy for them to work with smart phones or tablets, so they might not like to use for assessment.

Evidence of Trustworthiness

Credibility

Triangulation is known to be one of the most effective approaches to achieve credibility that occurs when multiple ways are utilized to collect data (Patton, 2015). In this study, I achieved triangulation through interviewing eight participants, journaling and taking notes throughout the entire process of data collection and data analysis as well as using different devices to record the interviews. I posted the invitation for recruitment on three different social media platforms that were Twitter, LinkedIn, and Instagram in order to recruit a more diverse population of learners with various backgrounds, interests, and

preferences. Asking follow-up and relevant questions in addition to the 10 originally designed interview questions also helped me to gain a deeper understanding of the perceptions of the participants on the utilization of mobile devices as assessment tool that added to the credibility of this study.

Transferability

I used two different audio recording devices to record the interviews to ensure that no data would be lost in the process. I also transcribed the interviews and then checked them once more and sent them to the participants for confirmation. The steps I took helped me to increase the precision of the data collection stage and contributed to this study's transferability.

Dependability

I kept reflective journals, memos, and precise notes throughout the data collection and data analysis process in order to carefully record all the stages so that the study could be replicated in the future. The feedback and insight of my committee together with the input of the Walden University IRB during all the phases created an internal audit to this study. The approaches used to record the procedures utilized in this study and the internal audit by the committee and the IRB increased the dependability of this research.

Confirmability

To achieve confirmability and keep my personal biases out of the study, I asked the participants open-ended questions where they could easily express their opinions and feelings without being affected by my thoughts or potential biases. I also kept a reflective journal and took precise notes before, during, and after the process of interviews,

analyzing, and synthesizing data in an attempt to report the authentic results and obtaining confirmability.

Results

In this study, I designed one research question followed by three subquestions enquiring about the perceptions of Iranian college learners of the utilization of mobile devices as assessment tools and the possible influence of such devices on their motivation, self-efficacy, and academic performance. I identified Ease of use, tendency to use, and everyday use as three major themes that provided deeper insight regarding the main research questions and the related sub-questions.

Main Research Question

What are the perceptions of Iranian college students on the utilization of mobile devices as assessment tools?

All three identified themes in this study provided more information about the general perceptions of Iranian college students of the utilization of mobile devices as assessment tools. Ease of use, tendency to use, and everyday use were identified as main factors affecting students' experiences and opinions about using mobile devices for assessment purposes. Below, I will discuss the alignment of each theme to college learners' perceptions of mobile-assessment.

Ease of use. Convenience, accessibility, and mobility were among the most influential factors that affected learners' perceptions on using mobile devices as assessment tools. When asked about the overall experience and opinions of Iranian college learners about using mobile devices as assessment tools, all the participants

mentioned convenience as the most important factor that contributed to their positive approach towards mobile-based assessment. Five of eight participants thought positively about mobile-based assessment because they could use their own devices at any time and any location. The participants stated that using mobile devices as assessment tools made it possible for them to take tests from their home or workplace, and they did not need to commute in traffic. Participant 6 mentioned that she works a fulltime job and she also goes to college and she no longer has to take time off from work for assessment because she can use her mobile devices. Participant 4 stated,

> I am left-handed and assessment was very difficult to me at high school because there was not an appropriate seat for me that I could write comfortably. However, I don't have such a problem when using mobile devices for assessment because I can easily use my devices and type and write with my left hand using my iPad.

However, one of the participants mentioned that even though she preferred mobile-based assessment in comparison to traditional methods of achievement, she needed more time to make the attitude change required for using mobile devices for assessment purposes. Participants 5 and 7 stated that using mobile devices for assessment is preferable when the Internet connection is reliable or when the assessment is offline. It can be concluded that the participants found mobile-based assessment very easy to use even though it might cause minor problems for the users.

Tendency to use. All of the participants of this study unanimously stated that not only they were willing to use mobile devices for assessment purposes in comparison to traditional forms of assessment, but they also advice other college students who had not

used these devices for assessment to try it. Participant 8 stated, “I love to use them (mobile devices for assessment), people who don’t use it should give it a chance. I bet they will love it too.” Seven of the eight participants believed that assessment through mobile devices causes them less stress and that was the reason why they were interested to use these devices for assessment purposes. Four of the participants mentioned that they were willing to use mobile devices as assessment tools because the assessment environment was more pleasant to them. Participants 1 and 3 mentioned that traditional assessment methods made them very anxious because during the assessment they had to interact with their teachers and peers; however, mobile-based assessment provided them with the freedom to select their desirable environment.

Even though Participants 6 and 8 had positive perceptions regarding the utilization of mobile devices as assessment tools and they expressed their tendencies to use these devices for taking tests, they showed concerns about lack of proper networks of support during the assessment period. Participant 6 stated,

> If I am given a chance to choose a method of assessment, it will definitely be mobile-based assessment. I also don’t like to be surrounded by teachers and invigilators when I am being assessed. But, I think a teacher should always be available to live chat with you when you are doing mobile-based assessment, so if something goes wrong, he can help you.

Iranian college students had positive experiences and perceptions on the utilization of mobile devices as assessment tools and therefore, they showed a tendency towards using mobile devices as assessment tool in their learning process as college

students and independent learners. They also expressed concerns about not having appropriate teacher and technical supports when using mobile devices for assessment purposes. However, such small issue did not affect their willingness to utilize mobile devices as assessment tools or change their positive approaches towards using such devices in their learning process.

Everyday use. The participants of this study stated that they had a positive approach towards using mobile devices as assessment tools because they use smart phone, tablets, and laptops on a daily basis. They mentioned that they knew how to use their mobile phones better than their previous generations and therefore, mobile-based assessment was their desirable method of assessment in comparison to their previous generations. Participant 1 mentioned that, "I basically live on my phone and tablet, so taking tests on them is more fun and less stressful". Participants 7 and 2 mentioned that they all possessed mobile devices and had appropriate skillset to work with them, so they could use their devices and previously gained knowledge to take a test and that was very cost-efficient to them. The only issue that was mentioned was the fact that if the learner was older, if would be very difficult for them to adapt to mobile-based assessment or using these devices effectively for assessment. Accordingly, participant 5 mentioned that, "it is important to consider the age of learners when you want to use mobile devices for assessment."

The findings of this study suggested that the Iranian college students who participated in this study all had a positive approach towards using mobile devices as assessment tools in their learning process. The participants claimed that the utilization of

mobile devices for assessment purposes was beneficial and productive to them. They also stated that even though the utilization of mobile devices for assessment could cause some concerns and problems for them, they were all willing and excited to use them in their learning process. They mentioned that they liked to use mobile devices as assessment tools because they (mobile devices) were very accessible and flexible.

Participant 3 stated, "using tablets and mobile phones have been an outstanding and productive experience for me because I didn't need to face the examiner, had less stress, and was provided with immediate feedback." Participant 8 stated, "I think using mobile devices for assessment has been very useful and pleasant to me because these devices are very accessible." Participant 2 stated, "I have a positive opinion about taking tests with tablets and phones because they are very user-friendly, easy to use, and cost-efficient. Mobile phones are a part of our everyday life; I know how to work with them." Participant 4 stated, "mobile-based assessment has been very beneficial to me because it's flexible, brings you more concentration, and the feedback you receive is more accurate and trustworthy." Participants 5 stated, "using phones, tablets, and laptops for assessment can be very exciting and productive because everyone knows how to use them. But sometimes you have to deal with technical problems."

The result of the study proposed that all of the participants found the utilization of mobile devices very useful and interesting in their process of learning and were willing to use these devices as assessment purposes. However, certain concerns such as technical issues, Internet connection, assessment formats, and application/program design were identified that had to be taken under consideration when intending to use these devices

for assessment. The participants stated that they were all a little anxious when used mobile devices for online assessments because they thought the Internet might have been disconnected any time during the assessment. They mentioned that they mainly experienced their using mobile devices for online assessments and although their preference was to use these devices for assessment purpose, they thought they could do better if the assessments were conducted offline. Three of the participants were also concerned about the design of the application and the assessment format when they used mobile devices as assessment tools. They stated that sometimes the applications that were used for assessment were not user-friendly and the directions were hard to follow. They also claimed that some questions and instructions were vague and not appropriate to their knowledge level. They suggested that to facilitate the use of mobile devices as assessment tools for students, a network of teacher support had to be developed and provided support to students while taking tests or any other kind of assessment.

Although the Iranian college learners identified the mentioned issues as possible drawbacks of mobile-based assessment, their perception of the utilization of mobile devices as assessment tools had not changed. They all strongly stated that mobile devices had made assessment more convenient and pleasant to them and they preferred utilizing mobile devices for assessment in comparison to other forms of assessment in their learning process. The participants even took a step further and stated that they would recommend using mobile devices as assessment tools to their peers who had not used or refused to use these devices because they thought mobile devices were very beneficial to their overall learning process.

Subquestion 1

What are the possible influences of the utilization of mobile devices as assessments tools on learners' motivation?

I found ease of use and tendency to use as the relevant identified themes that provided information about the influence of the utilization of mobile devices on Iranian college students' motivation. Six of the eight participants stated that mobile-based assessment increased their motivation in their learning process in general and in the assessment in specific. However, two of the participants claimed that utilizing mobile devices as assessment tools had no significant influence in their motivation in learning and assessment.

Ease of use. Convenience and portability were among the main factors that shaped the positive perceptions of Iranian college students on the utilization of mobile devices as assessment tools. These factors also influenced their motivation indirectly. Participants 4 and 5 believed that because mobile devices were easy to carry, they could use them for assessment when they had an opportunity at their workplace or even when commuting in the city using public transportation. They added that because it had become very easy for them to use these devices for assessment, they started using them more often. The more they utilized these devices for assessment, the process of learning became more interesting to them and encouraged them to take more tests to assess themselves and learn more. Participant 6 stated that,

> I hated any form of assessment because I always found it hard to go to an unfamiliar and scary environment for assessment. I actually didn't like learning or

> going to school because I didn't like assessment. Since I am using my laptop and tablet for assessment, I am more interested and motivated to learn and I am not scared of assessments no longer.

Tendency to use. Participants of this study stated that they were more willing to use mobile devices as assessment tools because in comparison to other methods of assessment because it was less stressful and the results were more reliable and immediate. Some other participants showed tendencies towards using mobile devices for assessment purposes because they were new and less boring in comparison to other forms of assessment. Six participants of this study believed that the above-mentioned factors made the mobile-based assessment more exciting and motivating to them. They stated that when they used mobile devices for assessment they were more excited to see their results and do more tests to learn more and that motivated them to do more assessment and learn more about the subject-matter.

Participant 2 stated,

> It (using mobile devices as assessment tools) definitely puts less pressure on me in comparison to paper-based exams, so now I am more motivated to take various exams and even take more courses voluntarily without being scared of taking exams.

Participant 8 stated, "this kind of assessment has changed my motivation. I get the result immediately and then I can work on myself to get better at that topic." However, participant 6 and 7 claimed that mobile-based assessment did not affect their motivation. Participant 7 stated, "it doesn't necessarily affect my motivation. To me, motivation has

another source. Participant 6 stated, “no, it doesn’t affect my motivation of learning or assessment. I generally don’t like studying at all.”

Subquestion 2

What are the possible influences of the utilization of mobile devices as assessment tools on learners’ self-efficacy?

Ease of use, tendency to use, and daily use are the related themes found relevant to the influence of the utilization of mobile devices as assessment tools on Iranian college students’ self-efficacy. Six of the participants stated that using mobile devices as assessment tools positively affected their self-efficacy. They claimed that their experiences of utilizing smart phones, tablets, and laptops for assessment purposes caused them to be more willing to select these devices for assessment knowing that they were be more successful and gain better results. Two of the participants stated that they did not believe that their experiences of using mobile devices as assessment tools would necessarily increase their self-efficacy in learning.

Ease of use. Participant 3 of this study stated using mobile devices for assessment was easier and made her more confident when taking exams. Participant 2 stated that she had an accident in her third semester at college, and she thought she would fail the term because it was physically impossible for her to attend the end of the term assessments. However, she was able to use her mobile devices for assessment of that term and therefore, she could successfully pass that term. That experience increased her self-efficacy and made her realize that she could be more successful when using mobile devices for assessment tools because they made learning more accessible and easy.

Tendency to use. Participants of this study stated that facing less stress while assessment and being in a self-selected environment where no interaction with peers and teachers is mandatory were among the reasons that they were willing to use mobile devices as assessment tools. They also claimed that these factors had a positive impact on their self-efficacy and their perceptions of success in their learning process. They also mentioned that they were no longer very anxious when taking tests using mobile devices and that they had more positive feelings about exams and achieving better outcomes in their process of learning. Participant 5 stated that,

> Since the time I started using tablets for taking tests, I feel so much better about exams and I am more willing to take tests now. Because now I believe that I can do better in tests and get better result.

Participant 4 stated, "I have less stress during the exam time or even before that. I decided that I would use mobile devices for assessment anytime I can because I would gain better results and be more successful." Participant 6 stated that,

> Before having the experience of using mobile devices for assessment, I didn't take the courses that I was interested in, only because I was scared of their exams. But now, I willingly take the ones that I can take their test using mobile devices because I'm more confident and less anxious using these devices and I know I will probably pass the tests easily."

Everyday use. Four of the six participants who claimed that the utilization of mobile devices positively influenced their self-efficacy believed that everyday use was a reason for this positive change in the self-efficacy in their learning process. They stated

that because mobile devices were an inseparable part of their everyday life and they are the most proficient users of these devices in various aspects of their lives they know that they would be successful if these devices were used for assessment as well. They also mentioned that when they used their own devices, they felt more confident and that could result in an increase in their self-efficacy. Participant 3 stated, "it increases my self-efficacy a lot. When someone tells you that you can take your test using your own mobile device, something you use everyday, it is so exciting. Participant 2 stated, I learn better and even do better in my exams when I use my personal tablet or phone and that's because all of my material and learning documents are stored in my phone or tablet". Participant 7 and 8 stated, "we are more confident" when using mobile phones for taking because we use them every day.

However, two of the participants stated that using mobile devices as assessment tools made no significant difference on their self-efficacy. They believed that assessments were generally unfair and stressful. They claimed that even though mobile-based assessment was less stressful and more motivating than other forms of assessment, it did not change the scary nature of assessment in general. Accordingly, they felt that they could fail exams and courses even if they were assessed using their mobile devices. Participant 8 stated, "exams are exams. They ask you the same questions, you have to study the same material, and they make you anxious anyway." Participant 1 stated, "I don't do well at exams no matter how I take them."

Subquestion 3

What are the possible influences of the utilization of mobile devices as assessment tools on learners' academic performance?

Tendency to use and everyday use can be named as the relevant themes to the influence of the utilization of mobile devices as assessment tools on Iranian college students' academic performance. Immediate feedback, lack of human interaction, reliability, and stress-free environment were identified as influential factors on students' willingness to use mobile devices as assessment tool. The mentioned factors were also named by the participants as the parameters that could improve their academic performance. Five of the eight participants stated that the utilization of mobile devices as assessment tools helped them achieve better results in their exams and positively influenced their academic performance. They stated that because of the everyday use of these devices and the less stressful environment these devices could establish they could achieve more satisfying results in their learning process. Three of the participants stated that using mobile devices for assessment purposes did not improve their academic performance and even if it did, the difference was not noticeable.

Tendency to use. Four of the five participants believed that the utilization of mobile devices as assessment tools had positive effects on their academic performance because these devices made the assessment process less stressful and more engaging and reliable. Participant 3 stated, "it (using mobile devices as assessment tools) improved my academic performance because it decreases the anxiety and stress aspects of assessment and learning." Participant 6 stated, "It increased my grades and helped me improve my

academic performance because it increased my concentration." Participant 4 stated, "it increased my grades between 20-30% because the environment was calmer, fairer, and more motivating." Participant 5 stated, "you will achieve better grades and make academic advancements."

Everyday use. Participant 2 was the only participant who thought mobile-based assessment contributed to her academic performance because she was able to use her own devices for assessment. She stated,

> I know how my own mobile devices work because I use them every day for everything I do. I even study using my phone and sometimes tablet, so when the method of assessment is the same as the method of learning, I can achieve better results, and improve my academic performance.

Participant 1, 8, and 7 believed that mobile-based assessment does not significantly influence their academic performance. Two of the participants who believed that mobile-based assessment had no significant effect on their academic performance were the same participants who mentioned that this method of assessment had no impact on their self-efficacy either. These participants mentioned that they generally had problems with assessment and they did not feel good about them. These participants experienced better feelings when using mobile devices as assessment tools, but this method of assessment did not change their overall perceptions of assessment. Participant 8 stated, "it doesn't change my academic performance; it stays the same." Participant 7 stated, "It didn't have a major effect; maybe a little."

In conclusion, the results suggested that the participants of this study had positive perceptions on the utilization of mobile devices as assessment tools. The majority of participants also believed that mobile-based assessment positively affected their motivation, self-efficacy, and academic performance. The following table provides detailed information about the existing connections among the participants' responses, research question and sub-questions, and the study's identified themes.

Table 5

Participants' Responses in Relation to Research Questions and Themes

Participant	P1	P2	P3	P4	P5	P6	P7	P8
Perception	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Positive
Related Theme(s)	EE TU	EE TU EU	EE TU	EE TU	EE TU EU	EE TU	EE EU	EE TU
Motivation	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Related Theme(s)	EU	TU	TU EU	EU	EU	EU	N/A	N/A
Self-Efficacy	No	Yes	Yes	Yes	Yes	Yes	Yes	No
Related Theme(s)	N/A	EE EU	EU	TU	TU	TU	TU EU	EU
Academic Performance	No	Yes	Yes	Yes	Yes	Yes	No	No
Related Theme(s)	N/A	EU	TU	TU	TU	TU	N/A	N/A

Note. EE=Ease of Use, TU=Tendency to Use, EU=Everyday Use, N/A= not applicable

Summary

The findings of this study proposed that all of the eight participants had positive approaches towards mobile-based learning. They believed that the utilization of mobile devices as assessment tools was beneficial to them and contributed to their learning process. The eight participants who were the Iranian college students stated that using mobile devices as assessment tools was more convenient and less stressful to them even though they had certain concerns such as technical issues, the Internet connection, and

the format of the assessments. Most of the participants claimed that mobile-based assessment positively influenced their motivation, self-efficacy, and academic performance. A few students mentioned that the utilization of mobile devices as assessment tools did not significantly influence their learning process. They stated that they did not generally have good feelings about assessment and the process of learning. They claimed that they liked mobile-based assessment better than the other existing forms of assessment, but they did not think it could make a noticeable difference in their motivation, self-efficacy, and academic performance.

In the next chapter, I will compare the significance of the findings of this study to the peer-reviewed studies discussed in chapter 2 and will explain how the discoveries of this study are aligned with the conceptual frameworks of this study. I will also discuss the limitations of this study and state recommendations for further research within the scope of this study. Finally, I will explore the social change aspect of this research and how the findings of this study can possibly contribute to positive social change.

Chapter 5: Discussion, Conclusion, and Recommendations

Introduction

The purpose of this basic qualitative study was to explore the perceptions of Iranian college learners on mobile devices as assessment tools and their motivation, self-efficacy, and academic performance, which the research questions addressed. I recruited participants through Twitter, LinkedIn, and Instagram. The participants of this study were eight college students who were studying at one of Tehran's universities at the time of data collection. I conducted semistructured, face-to-face interviews in Farsi, which was the native language of the participants and me. To lose authenticity, I transcribed the data in Farsi and hand-coded the gathered data. Then I translated the identified codes, patterns, themes, and the selected quotes from the participants to report and discuss the findings of the study. I also sought the help of another individual who was fluent both in Farsi and English to check the translated sections for accuracy.

The findings of this study suggested that all participants had positive approaches toward utilizing mobile devices as assessment tools in their learning process. Most of them also believed that the utilization of mobile devices as assessment tools had a positive influence on their motivation, self-efficacy, and academic performance. The participants stated that using mobile devices as assessment tools was more convenient, beneficial, and cost-efficient in comparison to other forms of assessment. However, they also had concerns about technical issues, poor Internet connection, types of questions, and format and designs of applications when using mobile devices as assessment tools.

Six of the participants stated that using mobile devices for assessment purposes increased their motivation to be engaged in more assessments and learning activities, though two participants noticed no or little influence. Six participants also claimed that mobile-based assessment positively influenced their self-efficacy and confidence in various forms of assessment, especially in test-taking, whereas two participants suggested that utilizing mobile devices as assessment tools did not significantly affect their self-efficacy. Finally, five of the participants believed that the utilization of mobile devices as assessment tools had a positive influence on their academic performance. They claimed that it helped them achieve better results in assessments and their overall learning process. Three of the participants, however, stated that they did not notice a significant difference in their academic performance as a result of using mobile devices for assessment purposes.

Interpretation of the Findings

Interpretation of the Findings in Relation to the Literature

The results of this study have varying alignment with the literature. For example, the findings supported Nikou and Economides's (2016a, 2016b) suggestion that the utilization of mobile devices as assessment tools could enhance students' motivation, self-efficacy, and academic performance. This study's results indicated found that using mobile devices for assessment purposes had a positive influence on learners' motivation, self-efficacy, and academic performance. Nikou and Economides (2018) also recommended conducting more research on the topic in different cultures, countries, and among different age groups, which this study addressed.

Researchers have also claimed that the perceptions of learners with different cultural and social backgrounds vary from developed to developing countries on the utilization of mobile devices as educational tools (Chavoshi & Hamidi, 2018; El-Masri & Tarhini, 2017; Mohammadi, 2015b; Tarhini et al., 2015). However, the findings of this study were similar to Nikou and Economides's (2016a) study, which was conducted in a developed country where learners had different social and cultural backgrounds in comparison to Iranian students. Therefore, within its current scope, the outcome of this study did not support the findings of Tarhini et al. (2015), Mohammadi (2015b), El-Masri and Tarhini (2017), and Chavoshi and Hamidi (2018).

This study's findings also differed from research on learners' feelings toward using mobile decives as assessment tools. Tarighat and Khodabakhsh (2016) proposed that Iranian students had mixed feelings toward the utilization of mobile devices as assessment tools in their language learning process. Accordingly, they called for further research to gain more insight into Iranian students' perceptions of mobile-based learning (Tarighat & Khodabakhsh, 2016). However, all the participants of this research stated that they prefer to use mobile devices as assessment tools because they thought using these devices for assessment purposes was more convenient and cost-efficient to them.

Researchers have also suggested that using various forms of technology as educational tools increases learners' self-efficacy and academic performance (Lai & Hwang, 2016; Prior et al., 2016; Venkatesh et al., 2016), which this study's findings partially supported. Six of the participants of this study stated that the utilization of mobile devices as assessment tools had a positive impact on their self-efficacy, and five

of the participants claimed that using these devices for assessment purposes positively affected their academic performance.

Interpretation of the Findings in Relation to the Conceptual Framework

This study was developed based on a modified version of the UTAUT2 and Bandura's self-efficacy theory. Venkatesh et al. introduced the modified UTUAT theory in 2012. They identified performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value, and habit as the core constructs and gender, age, and experience as mediating factors.

Unified theory of acceptance and use of technology.

Academic performance. In this study, *academic performance* is defined as the extent in which individuals are able to achieve their educational goals measured through assessments (Rattan et al., 2015). The third subquestion of this study addressed the possible influence of mobile devices as assessment tools on Iranian college learners' academic performance, which is in alignment with the first core construct of the UTAUT2. Six of the participants believed that using mobile devices had a positive impact on their performance in assessments and their overall academic performance. However, two of the participants stated that even though utilizing mobile devices for assessment purposes might have slightly changed their performance, it did not significantly affect their performance.

Effort expectancy. In this study, *effort expectancy* is defined as the degree to which individuals can easily use various forms of technologies (Venkatesh et al., 2003). Ease of use and everyday use were two themes as part of effort expectancy, which refers

to the patterns and codes relevant to participants' perceptions of how convenient and accessible mobile devices were when used for assessment. All the participants in this study claimed that the utilization of mobile devices was beneficial to them because using these devices was convenient, accessible, and flexible. Participant 8 stated, "I think using mobile devices for assessment has been very useful and pleasant to me because these devices are very accessible." Participant 1 stated, "I like to use mobile devices to take tests because I can use them anywhere and anytime is convenient for me." Participant 7 claimed, "I still think mobile phones and tablets are the best tools for assessment because they are very accessible and easy to use." The participants also believed that because they used mobile devices in their everyday life and carried them almost all the time, using these devices as assessment tools were easy, accessible, and stress-free for them.

Facilitating condition. In this study, *facilitating condition* is defined as the degree to which individuals who use certain technologies believe that a reliable and well-funded support system is established to help them with the technology (Venkatesh et al., 2003). Tendency to use was identified as another theme in this study and was aligned with facilitating conditions as the fourth core construct of the UTAUT2 theory. Participants of this study identified some problems regarding the reliability and support systems when using mobile devices as assessment tools in their learning process. They claimed that even though they were willing to use mobile-based devices for assessments, they needed to learn more about the development process and the reliability of the applications, programs, and the content and questions designed by experts. Participant 5 stated, "I still

want to use my smartphone or tablet for assessment, but I have my concerns about who developed the application and questions and how reliable they are."

Some other participants expressed concerns about the lack of a support system of teachers and educators when using mobile devices as assessment tools. Participant 4 stated, "I would like to have a teacher who answers my question if I have any even when I am using my mobile devices as assessment tools." Participants also found lack of sufficient and reliable technical support as another possible issue. Participant 7 stated, "I like using mobile devices as assessment tools, but I am always worried about facing technical issues and not having anyone to help me during the assessment."

Hedonic motivation. Hedonic motivation is the joy and pleasure that utilizing various forms of technology bring to the individuals who use different forms of technology in their everyday lives (Venkatesh et al., 2012), which the first subquestion addressed and aligned with as another core constructs of the UTAUT2. Six of the participants of this study believed that using mobile devices as assessment tools increased their motivation for assessment and learning in general. They claimed that utilizing mobile devices for assessment purposes was more exciting and encouraging in comparison to other forms of assessment. Participant 3 stated, "I am more attracted to tests and am more motivated to learn," and Participant 1 stated, "I am not scared of assessments anymore and because of that I am willing to take courses that I wouldn't before because I was terrified of assessments." However, two of the participants stated that even though they felt a little better about assessment because of using mobile devices, utilizing these devices had no significant influence on their motivation.

Price value. In this study, *price value* is defined as the relationship between the benefits that individuals may receive from using certain technology and the price they have to pay for either buying that technology or using it (Venkatesh et al., 2012). Participants of this study claimed that another reason why they were willing to use mobile devices as assessment tools was that using them is cost-efficient. They stated that they did not need to spend money to commute to a certain place for assessment or they did not need to take time off from work to able to take a test. They also stated they had a skillset that allowed them to work easily with mobile devices for assessment, so they did not need to spend money or time on learning a new skill for assessment.

Bandura's self-efficacy theory. Bandura (1977) defined *self-efficacy* as individual's perception of their abilities that can affect life events and experiences. Mastery experiences, vicarious experiences, social persuasion, and physiological responses are four sources of self-efficacy beliefs (Bandura, 1997). Mastery experiences and physiological responses are the factors identified in this study that affected learners' self-efficacy as a result of the utilization of mobile devices as assessment tools.

Mastery experience. Mastery experience refers to the insight individuals find and experiences they gain during learning how to fulfill a task successfully or to overcome obstacles (Bandura, 1977). Mastery experiences can build confidence and self- belief when achieving success and develop a sense of resilience when failing a task (Bandura, 1991). In this study, the previous successful and pleasant learners' experiences of the utilization of mobile devices as assessment tools helped them gain self-efficacy and boosted their confidence. Six of the participants stated that they believed that if they used

mobile devices as assessment tools, they would achieve more satisfying results in their assessments and would be more successful in their learning process. They claimed that utilizing mobile devices for assessment purposes made them more confident and skillful in assessment. Two of the participants stated that even though they were more confident in taking tests when using mobile devices as assessment tools in comparison to other forms of assessment, they still thought they would not be entirely successful in their learning and assessment processes.

Physiological responses. Psychological, physiological, and emotional states of individuals are some other effective factors that can influence the perception of individuals of their capabilities (Bandura, 1977). The feelings and psychological states of learners towards various concepts and educational subject matters have an impact on their perceived abilities and academic success as well as their level of motivation and engagement in their learning process (Martin & Rimm-Kaufman, 2015; Skaalvil et al., 2015). The participants of this study believed that their self-efficacy increased as a result of using mobile devices for assessment purposes. They claimed that when using these devices for assessment, they had a better feeling about themselves and taking tests; therefore, they could do better in their assessments. They stated that using mobile devices as assessment tools was more pleasant and less stressful to them and that was the reason they could achieve more successful results, and they would be able to perform better in their assessments.

Limitations of the Study

The participants of this study were eight Iranian college learners who were studying in various universities in Tehran, the country's political, financial, and academic capital and Iran's most privileged and modern city of the country. The perceptions and experiences of these participants living and studying in the most privileged city of the country might not have been the same as the perceptions and experiences of the college learners studying in less privileged and remote areas. Therefore, the findings of this study could not be generalized to the other college students of the country who had utilized mobile devices as assessment tools in their educational process.

I recruited the eight participants of this study through posting invitations on my Twitter, LinkedIn, and Instagram accounts. The discoveries of this study were not generalizable because college learners who did not have access to the mentioned social media platforms did not have the opportunity to take part in the study. Accordingly, even though the participants were all recruited from college students studying in Tehran universities, I could not recruit students who did not have access to LinkedIn, Twitter, and Instagram because of the recruitment process selected for this study.

The other identified limitation of this study was the number of participants. Eight participants took part in this study and expressed their opinions on the utilization of mobile devices as assessment tools. Six of the participants were females and the other two were male college students. The results could not be generalized because of the number of participants and lack balance between the number of male and female students.

Recommendations

The purpose of this study was to gain more insight into Iranian college students' perceptions on the utilization of mobile devices as assessment tools. Eight Iranian college students (six females and two males) who were studying at one of Tehran's universities during the data collection process participated in this study. A recommendation within the scope and area of this study is to collect data from a larger population of participants through conducting another in-depth qualitative or quantitative study.

In this study, I collected data from college learners studying in various Tehran universities as the most privileged city of the country. Another recommendation for further research is to replicate this study in the less privileged areas of the country. Data should be collected from Iranian college learners studying in various colleges and areas of the country to obtain more insight into the perceptions and experiences of Iranian college learners on the utilization of mobile devices as assessment tools.

UTAUT2 was used as one of the conceptual frameworks of this study. Venkatesh et al. (2012) identified performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value, and habit as the core construct and gender, age, and experience as mediating factors. The themes and findings of this study could address some of the core constructs of UTAUT2; however, provided no information on age and gender as mediating factors. Further studies can be conducted including age and gender as criteria for recruitment to gain a deeper understanding of college learners' perceptions on the utilization of mobile devices as assessment tools.

Implications

This basic qualitative study provided the perceptions of Iranian college students on the utilization of mobile devices as assessment tools and how using these devices as assessment tools influenced their motivation, self-efficacy, and academic performance. The findings of this study can help educators, curriculum designers, and policy makers to design and adopt new teaching and learning approaches in blended learning environments and bring-your-own-device settings. The discoveries of this study could also help program and application developers to develop productive educational mobile applications considering both instructional and assessment aspects of mobile learning.

Social Change

Iran is a developing country with a young population of learners who are seeking higher education to gain better social and financial status and become more active members of the global community. However, due to some existing social, cultural, and economic issues in the country, equal and quality higher education is neither accessible nor affordable to the younger generation in less privileged and remote areas. The lack of proper infrastructure and sufficient budgeting in smaller cities has made it difficult for many students to enter college and pursue education after graduating from high school.

Mohammadi (2015b) states that Iranian youth has a growing tendency to use mobile devices in their learning process. In order to design productive mobile applications and develop innovative pedagogies using mobile devices, application developers and educators need to have a comprehensive understanding of how instructional and assessment aspects of mobile learning work together. The existing body

of literature mainly focused on the instructional aspect of mobile learning, and more research had to be conducted to shed light on the assessment aspect of mobile learning. This study provided information about the assessment aspect of mobile learning within its scope and therefore, its findings can be used for developing innovative pedagogies and applications for educational purposes.

Designing and developing new and practical mobile applications as well as teaching and learning approaches could provide college education to students in remote areas through the utilization of mobile devices as learning tools. Concentrating on both instructional and assessment aspects of mobile learning, Iranian application developers and educators can work together to develop useful programs and application that can offer college courses to students living in the less privileged and isolated areas of the country. Most of the learners all over the country can use their smartphones, tablets, or laptops to gain access to programs and applications designed for college education. It can be concluded that the utilization of mobile devices for both instructional and assessment purposes can make college education more accessible and affordable to Iranian students and bring equal and quality education to the learners.

Conclusion

The invention of mobile devices and the utilization of smartphones, tablets, and laptops as learning tools have made a significant impact on the world of education. Mobile devices have made education accessible and affordable to a larger population of learners. The youth population of Iran has shown a tendency towards receiving college education to advance their financial and social status. However, college education is

neither accessible nor affordable to the ones living in the remote areas of the country. Developing mobile-based pedagogies and mobile applications that can offer college courses could make college education more affordable and accessible to students seeking higher education in less privileged areas of Iran.

In order to effectively design and adopt mobile-based teaching and learning approaches inside and outside of the learning environments and develop innovative programs and applications, Iranian educators and app developers needed to gain a comprehensive understanding of how both instructional and assessment aspects of mobile learning work collaboratively. The findings of this research revealed that a small group of Iranian college learners expressed willingness to utilize mobile devices as assessment tools in comparison to any other form of assessment. The participants of this study stated that they prefer to use mobile devices for assessment purposes because they were more accessible, affordable, convenient, and less stressful.

The findings of this study cannot be generalized to college learners in other cultures and age groups because of its design and scope. However, this result can be used as a first step for Iranian educators and app developers to gain more knowledge on the significance of assessment aspect of mobile learning together with its instructional aspect when designing mobile-based applications for college learners. Further research is needed to gain more insight into the perceptions of more college learners, especially Iranian college learners living in remote areas on the utilization of mobile devices as assessment tools. Other researchers should conduct quantitative research to collect data from a larger population of college learners. More research should also be conducted

concentrating on college instructors' perceptions on the utilization of mobile devices as assessment tools.

Above all, educators and policy makers need to make a change to their mindsets. They should become more aware of the impact of technology and mobile-based learning on learners' academic achievements and start integrating these technologies in their classrooms and teaching approaches. Mobile devices should not be considered as distractions but rather as tools that can facilitate the process of learning to students. They need to alter the higher education system in a manner that individuals are given equal educational opportunities. Equal and quality education is the right of every individual and educators, curriculum designers, and education policy makers should do everything within their power to help students become active society members through receiving proper education.

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