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Mobile Learning Readiness in dental students of Zanjan University of Medical Sciences in 2018-2019

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Abstract

Background & Objective: One of the most important individual factors that affect the acceptance and effectiveness of mobile learning is readiness. The aim of this study is to assess the Mobile Learning Readiness in dental students of Zanjan University of Medical Sciences in 2018-2019.

Materials and Methods: In this descriptive cross-sectional study, a total of 355 dental students at Zanjan University of Medical Sciences completed 279 questionnaires. Data were collected using the standard translated version of Mobile Learning Readiness (MLR) questionnaire after determination of its validity and reliability. SPSS software was used for data analysis.

Results: The mean (±standard deviation) score of mobile learning readiness in three dimensions of self-efficacy, optimism, self-directed learning were 3.89±0.71, 3.82±0.71 and 3.57±0.81, respectively. Total mean (±standard deviation) score of mobile learning readiness was 3.80±0.65.

Conclusion: The results of this study showed that level of mobile learning readiness was higher than moderate and there is a positive attitude toward mobile learning in dental students. Mobile learning technology is very useful to enhance education of students.

Introduction

The learning process and access to information have transformed in the last decade. We are experiencing the global technology revolution, which is characterized by the transition from desktop computers to the widespread use of mobile systems, also known as mobile learning (m-learning) (1). As the information technology (IT) expands, traditional teaching methods alone cannot meet the needs of the new generation (2-4). It is imperative to migrate from traditional approaches to the application of new methods in order to promote the active participation of students in learning. The use of technology in education provides and presents new opportunities for inclusive learning (5, 6).

M-learning is one of the newest technological innovations that can be implemented in education, especially the medical field (7). M-learning emphasizes learning in different places and portable devices (such as mobile phones, personal digital assistants (PDA), iPods, and laptops). Therefore, m-learning reduces the limitations of location by the mobility of standard portable devices. Since most students have access to the Internet through a wide array of mobile devices, the m-learning leads to a change of behavior (8). Based on the studies, technologies such as e-learning and m- learning can facilitate the teaching and learning process, and by doing so, thus solving the limitation of education (9, 10). By explaining and deciphering how knowledge is constructed and shared, m-learning can activate the cognitive process of students (11).

Since medical students must update their knowledge of evidence-based health care during their studies and improve their long-term learning skills, it

is necessary to employ technologies in medical education (12).

A practical design of mobile learning first requires an understanding of human behavior towards the use of a specific technology, then regulates mobile learning systems according to the perception of students (13, 14). One of the most important individual factor that affects on acceptance and effectiveness of the mobile learning is readiness. Readiness is derived from individual action or experience related to the object. It is strongly affirmed concerning the occurrence of an action or the use of an object (15). In a Technology-Readiness Index (TRI) scale, this object can be defined as "technology"(14). In an Enterprise Resource Planning (ERP), action can be "change of management" for implementing the information system (16). This action can also be "learning" as in the context of readiness to learn (17).

From psychological point of view, mobile learning readiness is the intersection of TRI and learning readiness. Therefore, it can be defined as the willingness to use mobile technology in formal and informal learning activities (18).

Previous studies used the Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT) models to explain the acceptance of IT innovations in the "organizational" field of mobile learning (19, 20). Lin et al. proposed a model that prioritized readiness for the components of TAM model (21).

Readiness → Perceived Ease of Use → Perceived Use → Efficiency

It is impossible to justify the study of m-learning readiness from an individual psychological aspect by expanding the use of models that affect the organization, models not specific to m-learning, models related to e-learning or computer learning, and models not measure readiness and emphasize acceptance and attitude. Therefore, it is required to devise a specific tool to measure individual psychological readiness for mobile learning. Accordingly, Hiu Lin et al. have adopted self-efficacy and optimism from the TRI model and self-directed learning from Online Learning Readiness (OLR) (14, 22, 23).

They also have used the Mobile and Computer Anxiety (MCA) model, which is related to the individual psychological aspect (24) and selected 55 items. Then, evaluating the opinions of the panel of experts and results of exploratory, confirmatory, simultaneous, convergent, and predictive factor analysis, achieved a specific readiness model with three mobile factors and 19 questions. The present study uses the proposed three-factor model.

There have been studies on the knowledge, attitude, acceptance, and readiness of m-learning students in other countries (25-29). However, there are few studies on the readiness of m-learning by students in Iran, and the need for more studies in this field has been raised in the country (30).

Besides, the currentknowledge of the use of mobile technology by dental students for professional learning is limited. To use m-learning devices in universities, the level of understanding and readiness of students from this technology is a critical factor (25, 31).

Therefore, this study aims to determine the M-learning Readiness in Dental students of Zanjan University of Medical Sciences in 2018-2019. The results of this study will help faculty and teachers to create a context that facilitates the application of m-learning by specifying the readiness of students who are participants in the education system.

Materials and Methods

This is a descriptive-analytical study that used a questionnaire on demographic information and m-learning readiness for collecting data. The assessment of m-learning readiness was carried out with a valid and reliable questionnaire designed by Hiu Lin et al. It uses a 5 point Likert rating scale from strongly disagree to strongly agree, consisted of 19 items in

three domains of self-efficacy, optimism, and self-directed learning each with seven, seven, and five items, respectively (33).

The validity of the questionnaire was assessed by ten experts in the field of medical education and e-learning. Based on the Lawshe criteria, the content validity ratio (CVR) was above 075 for every 19 questions. The content validity index (CVI) was higher than 0.79 for the whole questionnaire. The reliability of the instrument was assessed by Cronbach's alpha of 0.943. A census sampling collected data, and the study population consisted of all dental students of Zanjan University of Medical Sciences. Of 355 dental students of Zanjan University of Medical Sciences in the academic year 2018-2019, 279 subjects completed the questionnaire with a response rate of 78.6%. Inclusion criteria included all the students from 2013 to 2018; the students studying before 2013 and those who were unwilling to participate excluded from the study.

The anonymity and confidentiality of the questionnaire were emphasized orally during the distribution of the questionnaire and mentioned at the top of the pages; subjects were excluded from the study upon their unwillingness.

This study has ethically confirmed the code of (IR.SBMU.SME.REC.1397.059) at the ethics committee of Shahid Beheshti University of Medical Sciences.

Results

Of 355 dental students of Zanjan University of Medical Sciences in the academic year 2018-2019, 279 subjects completed the questionnaire with a response rate of 78.6%. The minimum and maximum age of students were 18 and 36 years old, with a mean of 22.56 years. Table.1 presents the percentage and frequency of answers to the demographic questions.

Table 1: Demographic characteristics of dental students of Zanjan University of Medical Sciences in the academic year of 2018-2019

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Characteristics	Subgroup	Frequency(Percent)
Gender	Male	134(48%)
	Female	145(52%)
Marital status	Single	256(91.8%)
	Married	23(8.2%)
Residence	Dormitory	116(41.6%)
	Personal home	163(58.4%)
Academic year	1392	42(15.1%)
	1393	40(14.3%)
	1394	52(18.6%)
	1395	40(14.3%)
	1396	47(16.8%)
	1397	58(20.8%)
Average score	< 12	2(0.7%)
	12-14	23(8.2%)
	14-17	193(69.2%)
	17-20	61(21.9%)
Which one is your first preference of mobile learning systems?	Mobile phone	261(93.5%)
	Tablet	3(1.1%)
	Laptop	10(3.6%)
	Other (phablet,notebook,...)	5(1.8%)

How often do you have your mobile learning systems with you?	Almost Never	1(0.4%)
	Infrequently	1(0.4%)
	Sometimes	20(7.2%)
	Almost Always	152(54.5%)
	Always	105(37.6%)
Where do you most often use your mobile learning systems?	Home	243(87.1%)
	School	16(5.7%)
	In Transit	17(6.1%)
	At Work	1(0.4%)
	Other	2(0.7%)
Do you have internet access on your mobile learning systems?	Yes	275(98.6%)
	No	4(1.4%)

Table2: Frequency (Percent) of mobile learning readiness in dental students of Zanjan University of Medical Sciences in the academic year of 2018-2019

Items	Frequency(Percent) Strongly disagree	Disagree	No comments	Agree	Strongly agree
Self-Efficacy					
1.I feel confident in performing the basic functions of mobile learning systems	5(1.8%)	18(6.5%)	48(17.2%)	119(42.7%)	89(31.9%)
2. I feel confident in my knowledge and skills of mobile learning systems	3(1.1%)	9(25%)	54(19.4%)	131(47%)	66(23.7%)
3. I feel confident in using mobile learning systems to effectively communicate with others	1(0.4%)	18(6.5%)	48(17.2%)	128(45.9%)	84(30.1%)
4. I feel confident in using the internet (Google, Yahoo) to find or gather information for mobile learning	2(0.7%)	8(2.9%)	12(4.3%)	114(40.9%)	143(51.3%)
5. I feel confident in studying to operate mobile learning systems	4(1.4%)	12(4.3%)	49(17.6%)	126(45.2%)	88(31.5%)
6. I feel confident in knowing all the special keys and functions contained in a mobile learning system	8(2.9%)	54(19.4%)	64(22.9%)	113(40.5%)	40(14.3%)
7. I feel confident in knowing how a mobile learning system works	3(1.1%)	29(10.4%)	73(26.2%)	129(46.2%)	45(16.1%)
Optimism					
8. I like studying via mobile learning systems because I am able to study anytime	3(1.1%)	36(12.9%)	56(20.1%)	118(42.3%)	66(23.7%)
9. Mobile learning systems make me more efficient in my studying	2(0.7%)	28(10%)	53(19%)	130(46.6%)	66(23.7%)
10. I like mobile learning systems that allow me to tailor things to fit my own needs	5(1.8%)	19(6.8%)	21(7.5%)	150(53.8%)	84(30.1%)
11. I like mobile learning systems	4(1.4%)	24(8.6%)	40(14.3%)	139(49.8%)	72(25.8%)
12. Mobile learning systems give people more control over their studying time	3(1.1%)	32(11.5%)	58(20.8%)	134(48%)	52(18.6%)
13. The newest mobile learning system is much more convenient to use	3(1.1%)	16(5.7%)	47(16.8%)	141(50.5%)	72(25.8%)
14. Mobile learning systems give me more freedom of studying	3(1.1%)	21(7.5%)	34(12.2%)	133(47.7%)	88(31.5%)
Self- Directed Learning					
15. I can direct my own learning progress	2(0.7%)	23(8.2%)	63(22.6%)	131(47%)	60(21.5%)
16. I carry out my own study plan	8(2.9%)	24(8.6%)	73(26.2%)	115(41.2%)	59(21.1%)
17. In my studies, I set goals and have a high degree of initiative	5(1.8%)	36(12.9%)	88(31.5%)	104(37.3%)	46(16.5%)
18. I manage time well	7(2.5%)	52(18.6%)	74(26.5%)	107(38.4%)	39(14%)
19. In my learning, studying, or working, I am self-disciplined and find it easy to set aside learning time	7(2.5%)	60(21.5%)	66(23.7%)	106(38%)	40(14.3%)

The Mann–Whitney U test examined the relationship between gender and students' readiness for m-learning concerning the three areas of the questionnaire. Given the significance level of the test was higher than 0.05 in all three areas, it is concluded that there is no difference between approaches of male and female students.

The Mann–Whitney U test examined the relationship between the academic year (before/after the basic sciences) and students' m-learning readiness for the three areas of the questionnaire. Given the significance level of the test was higher than 0.05 in all three areas, it is concluded that there is no difference between the academic year of male and female students and three areas of approach.

The Mann–Whitney U test examined the relationship between marital status and students' readiness for m-learning concerning the three areas of the questionnaire. Given the significance level of the test was higher than 0.05 in all three areas, it is concluded that there is no difference between the marital status of male and female students and the three areas of approach.

The Kruskal-Wallis test examined the relationship between total GPA and students' readiness for m-learning concerning the three areas of the questionnaire. Given the significance level of the test was higher than 0.05 in all three areas, it is concluded that there is no difference between the total GPA of male and female students and three areas of approach.

The mean and standard deviation (SD) of m-learning readiness of students in all three areas of self-efficacy (3.89±0.71), optimism (3.82±0.71), and self-directed learning (3.57±0.81) were above average. The general m-learning readiness of students was above average with a mean and SD of (3.80±0.65).

Discussion

Based on the results of the study, most of the participants were agreed on the fourth question, which is associated with the skill of students in using Internet browsers such as Google Chrome. Although these skills are required for the student, it is not enough to find evidence-based educational materials.

Since it is required to use specialized sites in this area, in terms of self-efficacy, the student familiarity with all the specific keys and functions of the m-learning system gained the least agreement response. Although this skill is not necessary for students who are not enrolling in e-learning, it will be essential for those participating in virtual education. Contrary to the study of Hiu Lin et al., which targeted e-learning students only, the current includes a regular educational system; it should contribute to the poor skills of students in this field (33).

The highest rate of agreement in the area of optimism belonged to the interest in m-learning per needs. This was also predictable since the interest of individuals is generally determined by their needs. The 12th question in the area of optimism, the possibility of organized control of study by the learning system, gained the lowest percentage of agreement by students, which might be due to the students' lack of experience with face-to-face education. However, nearly two-thirds of respondents agreed.

The least positive responses were related to the field of self-directed learning in general. This might be because of the way the education system of Iran is passive and teacher-centered. While the experience of professors is helpful for learning, students need to learn from available resources outside the academic context. This requires the focus of educational policymakers for the application of evidence-based education. According to the results, mobile cellphones were the priority of the majority of participants, which is in line with the study of Manakil and Goarge, with a rate of 93.2%. New generations of mobile phones have many capabilities that can meet the general needs of

people, even for educational purposes. They are portable and deliver more accessible communication (25).

The Hamat indicated that only 65% of Malaysian participants had a smartphone; 79% had never used a mobile phone for learning purposes. While nearly 86% of them have expressed a positive opinion about using it in the future, low educational usage might be associated with time. A period of eight years in the communication age can have a tremendous impact on how mobile devices are used. In 2019, this study was conducted, the use of mobile electronic devices equipped with the Internet was over 98.6% for the present study (34).

Nourian et al. investigated the study skills of medical students in 2010. They indicated evenings and nights as their most common study hours, so due to its portability, m-learning can be of practical benefit to the students (35).

Bas et al. have used a standard m-learning readiness questionnaire in Turkey in 2018, similar to the present study. Although, unlike the present study, they examined teachers' opinions. The results of the study reported a high readiness rate in all three areas of self-efficacy, optimism, and self-directed learning, which was in line with the present study. Besides, there was no difference between male and female teachers in terms of views on three areas, which was in line with the present study (36). According to Eltayeb et al., students consider m-learning technology as a useful tool to promote learning in developing countries, the attitude of both teachers and students toward m-learining readiness is positive, which is consistent with the results of the present study. (21). Kenny et al. indicated a high level of confidence among students and teachers towards m-learning technology, which confirms the results of the present study, except that they only assessed the self-efficacy area (compared to all three areas of the present study) (28). According to Patil et al., most medical students have a positive attitude towards m-learning, which is consistent with the present study. However, this study aims to determine the rate of m-learning among students (29).

Beak et al. examined the attitude of teachers. They indicated a low interest in m-learning, which is in contrast with the present study. The study of Beak et al. reported a more positive attitude in female teachers than males, which is in contrast with the present study (37).

The incomplete questionnaires and refusal to cooperate in some cases were the main limitations of this study. The authors recommend conducting multidisciplinary studies in different fields and the community of teachers comparing by the results by the present questionnaire to assess the m-learning readiness.

Conclusion

The present study evaluated the m-learning readiness in students as above average, which indicated a positive attitude towards m-learning among dental students and it is recommended to use m-learning to improve student's education.

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Conflicts of Interest: The authors declare that there are no conflicts of interest.

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