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Investigating Students' Self-Efficacy and Attitudes Towards the Use of Mobile Learning

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Abstract
Nowadays, mobile learning (m-learning) presents new and powerful opportunities for effective teaching and learning. Two significant factors that serve in understanding if students accept m-learning technology are self-efficacy and attitudes towards m-learning usage. For this purpose, the present study investigated vocational college students' self-efficacy and attitudes towards the use of m-learning. The study also examined how some core factors, including gender, prior mobile learning experience and academic major have played a role in students' self-efficacy and attitudes towards using m-learning. Researcher used two surveys that was completed by a sample of students at the Erzurum Vocational School, Ataturk University. The first scale, Computer Self-Efficacy Measure (CEM), was adapted Compeau and Higgins (1995) modified specifically in regards to mobile learning context. The second scale, m-learning attitudes scale, was adapted Al-Emran, Elsherif, and Shaalan (2015). The results revealed that students' level of self-efficacy, in general, had moderate and the majority of students had positive attitudes towards using m-learning. Statistically significant differences in students' self-efficacy towards m-learning based on prior mobile learning experience and academic majör were found. Gender differences existed only in the students' attitudes, with the male students having more positive perspectives towards m-learning usage than the female students.
Keywords: mobile learning, self-efficacy, attitudes, vocational school

1. Introduction

Over the last two decades, with the rapid development of mobile technology, a new concept has been added to the educational literature: mobile learning (m-learning). M-learning that presents new and powerful opportunities for effective teaching and learning makes it possible for students to access to multiple information sources and shift from an authority based learning environment to more flexible learning structure (Hamm, Saltsman, Jones, Baldridge, & Perkins, 2013).

Researchers have described m-learning as learning with mobile devices (Toteja & Kumar, 2013), learning across multiple contexts, through social and content interactions, using mobile devices (Crompton, 2013), the next generation of e-learning (Alzaza & Yaakub; 2011) and "a dynamic learning environment" through the use of handheld and palmtop devices in education (Keengwe & Bhargava, 2014).

According to Al-Emran, Elsherif and Shaalan (2015), m-learning makes it possible for students to communicate, interact, and behave among each other with the aid of mobile devices. Mobile devices that allow m-learning includes smart phones, MP3 and MP4 devices, personal digital assistants (PDAs), tablet computers and other portable devices. In the literature, mobile devices are characterized by three substantial properties: portability, instant connectivity and context sensitivity (Kearney, Burden, & Rai; 2015, Mac Callum, Jeffrey, & Kinshuk, 2014; Reychav, Dunaway, & Kobayashi; 2015). Therefore, m-learning has an increasingly important role in the improvement of teaching methods of learning (Miloševic, Zivkovic, Manasijevic, & Nikolic; 2015).

Two significant factors that serve in determining whether or not students are ready to use m-learning are self-efficacy and attitudes towards m-learning technology (Al-Emran et al., 2015; Bagozzi, Davis, & Warshaw; 1992). These factors will help to detect powerful and weaknesses and contribute the development of the technology infrastructure (Al-Emran et al., 2015). Self-efficacy which is defined as the belief that one has the capability to realize a special behavior (Compeau & Higgins, 1995) is an important research issue to consider in the discussion on mobile technology acceptance (Mahat, Ayub, & Wong; 2012). In addition, computer self-efficacy is defined as the decision of one's capability to use a computer (Compeau & Higgins, 1995). According to Compeau and Higgins (1995), computer self-efficacy refers to judgments of the capability to apply simple computer component skills to broader tasks such as preparing written reports or analyzing financial data. Attitude, on the other hand, refers to the habit of mind and feeling that affects how individual think and behave (Shih, Chu, Hwang, & Kinshuk, 2010).

Some studies analyzed individual background variables, including gender, grade, age, or years of computer usage with the self-efficacy and the attitudes toward m-learning for elementary school students (Tsai, Tsai, & Hwang, 2010) and college or advanced students (Al-Emran et al., 2015; Mahat et al., 2012; Yang, 2012). Besides, limited research has been conducted on self-efficacy and attitudes towards m-learning usage for vocational school students (Yorganci, 2016).

Therefore, the purpose of the present study is to assess students' self-efficacy and attitudes towards m-learning in vocational school. The study also examined how some core factors, including gender, prior mobile

learning experience and major have played a role in their self-efficacy and attitudes towards m-learning usage.

2. Methodology

Research Design

A descriptive research design was used to investigate the students' self-efficacy and attitudes towards the m-learning. Survey research model was used for collecting data in the study.

The volunteer sample in this study included 480 freshman vocational school students from different 5 study programs of Erzurum Vocational College, Ataturk University. The students took the "Türk Dili-I", "English-I" and "Atatürk İlke ve İnkilaplari-I" courses in online learning environment. They use them mobile technology such as smart phones, MP3 and MP4 devices, personal digital assistants (PDAs), tablet computers and other portable devices. Students who agreed to attend in the study were asked to complete the survey using an online assessment tool at the end of the semester. After logging into the course management system (CMS), students viewed the invitation, consent form, and were redirected to the survey.

Instrument

Researcher used two surveys among students at the Erzurum Vocational School, Ataturk University. To measure mobile self-efficacy, Computer Self-efficacy Measure (Compeau and Higgins, 1995) which included 10 items with 11-point Likert scale ranging from 0 (not confident) to 10 (totally confident) was modified specifically in regards to mobile learning context. Therefore, the items stem from "I could complete the job using the software package . . ." to "I could use M-learning…" were changed for students. In the present study, the internal reliability of the scale was .86.

The second scale, m-learning attitudes scale Al-Emran et al. (2015), consisted of 10 items with 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The internal reliability of the scale was found .89 in this study.

Data analysis

The data analysis was carried out using descriptive statistics, independent samples t-test and analysis of variance. The descriptive statistics were used to see students' demographic profile. Independent t-test was used in comparing the difference between males and females. An analysis of variance was used to measure different effects of students' m-learning experience and majör.

3. Results

480 students completed the survey. After the data collection stage, 22 cases with missing data were deleted from the data. The examination of the data exposed eight outliers that were removed.

The majority of students was male (64%). Students were enrolled in courses offered in the following majors: Computer Technologies (18.7%), Machinery and Metal Technology (21.4%), Architecture and Urban Planning (18.8%), Electrical and Energy (19.5%), Construction Technology (21.6%).

Table 1 displays mean scores and standard deviations of students' mobile self-efficacy. The highest mean score corresponds to item 9 which states that they could use m-learning if someone showed them how to do it first (M= 8.25, SD= 1.00). Among the highest mean for mobile self-efficacy is the item 10, "I could use m-learning if I had used similar mobile devices before this one to do the same task." (M= 7.35, SD= 1.10), followed by the item 4, "I could use m-learning if I had seen someone else using it before trying it myself" (M= 7.24, SD= .44).

Table 1. Mobile self-efficacy.

Item	I could use m-learning…	M	SD
1	even if there was no one around to tell me what to do	5.90	1.20
2	even if I had never used a mobile device like it before	5.75	1.00
3	if I had only the mobil device manual for reference	6.05	.25
4	if I had seen someone else using it before trying it myself	7.24	.44
5	if I could call someone for help if I got stuck	6.12	.32
6	if someone else had helped me get started.	7.15	1.20
7	if I had a lot of time to complete the task for which the mobile device was provided	5.30	.95
8	if I had just the built-in help facility for assistance.	6.42	.25
9	if someone showed me how to do it first	8.25	1.00
10	if I had used similar mobile devices before this one to do the same task.	7.35	1.10

Mobile self-efficacy mean scores of female and male students were compared using independent samples t-test. Results imply that there were no significant differences in students' mobile self-efficacy based on gender ($t = 0.91$, $p = .20$) (Table 2).

Tablo 2. Gender differences in students' mobile self-efficacy.

	Gender	N	Mean	S.D.	t	p
Mobile self-efficacy	Female	162	6.16	19.84	.91	.20
	Male	288	6.08	20.23		

Students were divided into four groups (poor, moderate, good, and very good) based on their prior m-learning experiences. Results of the one-way ANOVA revealed that students' mobile self-efficacy based on prior m-learning experiences differed statistically significantly (p= .00, p <= .05). The F value is (3.49). Results of post hoc comparisons revealed a significant difference in the mean scores of students with moderate (M = 6.12, SD =1.12) and very good levels (M = 6.49, SD =1.32) of experience where the differences are in favor of very good level students.

One-way ANOVA was carried out to evaluate different effects of students' academic majör. Results revealed that students' mobile self-efficacy based on academic major did not differ statistically significantly (p= .20, p > .05). The F value is (3.14).

Table 3 shows descriptive statistics of students' attitudes scores. The lowest and highest scores on the m-learning attitudes scale are 10 and 50, respectively. The total scores of students ranged from 29 to 48 (M =39.6). The results imply that students, in general, had positive attitudes towards using m-learning.

The highest mean score corresponds to item 5 which states that mobile technology can help the students to access the course-material anytime anywhere. (M= 4.44, SD= .23). However the lowest mean score corresponds to item 2 which states that mobile technology offer opportunities for communication and team-working.

Table 3. M-learning attitudes.

Item		M	SD
1	Mobile technology is a useful tool for my study.	3.45	.08
2	Mobile technology can offer opportunities for communication and team-working.	3.21	.12
3	Mobile technology can help me in finding resources related to my study.	3.52	.35
4	Mobile technology can bring many opportunities to the learning process.	4.32	.44
5	Mobile technology can help me to access the course-material anytime anywhere.	4.44	.23
6	Mobile technology can be an easy way to get feedback and notifications from my instructors.	3.48	.11
7	Mobile technology can help me to exchange the course-material with my friends.	3.55	.05
8	Mobile Apps can help me to manage my study.	3.46	.25
9	Mobile technology can help me to do my coursework.	4.23	.30
10	Mobile technology can help me to develop my learning skills.	3.36	.10

Attitudes mean scores of female and male students were compared using independent samples t-test. Results revealed that students' attitudes based on gender differed significantly (t = .36, p =.00) (Table 4). Male students had higher means (M = 3.68, SD = .83) on the m-learning attitudes scale when compared to females (M = 3.21, SD = 1.04). The 95% confidence intervals for the difference in mean between groups was small for the scale. The Bonferroni adjustment procedure was used to avoid inflation of Type I error due to multiple testing. The level of significance was confirmed on the scale.

Tablo 4. Gender differences in students' mobile attitudes.

	Gender	N	Mean	S.D.	t	p
Mobile attitudes	Female	162	3.21	1.04	.36	.00
	Male	288	3.68	.83		

One-way ANOVA was carried out to determine the differences in students' attitudes towards the use of m-learning based on prior m-learning experiences. Results showed that there were no significant differences (p= .32, p > .05) in students' attitudes based on prior m-learning experiences where the F value is (3.21). In addition, results of the one-way ANOVA revealed that there were no significant differences (p= .15, p > .05) in students' attitudes based on academic major where the F value is (2.14).

4. Discussion and conclusion

The study was aimed to examine students' self-efficacy and attitudes towards m-learning at the Erzurum Vocational School, Ataturk University. The results revealed that students' level of self-efficacy, in general, had moderate. Most of students believed that they have the capability to use mobile technology in m-learning environments. These results replicate the findings obtained by Mahat et al., (2012) and Tsai, Tsai and Hwang (2010). For example, Tsai et al. (2010) indicated that the elementary school students had positive attitudes and adequate self-efficacy in terms of using PDAs (personal digital assistants) for u-learning (ubiquitous learning) context. They noted that students' attitudes and self-efficacy in u-learning context should become a major focus, just as they are in other learning environments.

The majority of students had positive attitudes towards the use of m-learning in this study. This coincides with Heflin, Shewmaker and Nguyen's (2012) beliefs that any use of technology for learning presents the chance for student distraction, and therefore, disengagement.

The study also examined how some core variables, including gender, prior mobile learning experience and academic major have played a role in their self-efficacy and attitudes towards m-learning usage. Statistically significant differences in students' self-efficacy towards m-learning based on prior m-learning experience were found. However, there were no significant differences in students' attitudes based on prior m-learning experiences and academic major. This result is consistent with the result of Al-Emran et al. (2015). Al-Emran et al. (2015) targeted students and educators in higher education institutions in their works. They reported no significant difference in students' attitudes towards using m-learning based on academic majors.

Gender differences existed only in the students' attitudes, with the male students having more positive perspectives towards the use of m-learning than the female students. According to the results, attitudes towards the use of m-learning seems to be related to gender. This result contradicts with the findings of Al-Emran et al. (2015) and Yang (2012). Yang (2012), for example, investigated the attitudes and self-efficacy of using mobile learning devices for college students in a language class and noted that gender was not a main factor which affected the self-efficacy and attitudes toward m-learning but their perceptions of the purposes of m-learning were slightly differently. Research on gender differences has so far produced mixed results. Therefore, future study is suggested to investigate under which conditions gender differences occur.

Although the study will contribute to the current knowledge base, further studies can design qualitatively and core factors which influenced the performance of m-learning can be probed. Future study is suggested to explore possible relationships between the individual differences and self-efficacy and attitudes towards m-learning.

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