Learners' Experiences of Mobile Learning in Vocational and Technical Education Courses

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Abstract

Background: Since mobile learning is emerging as an alternative approach to teaching, educational institutions have used this approach to improve the teaching and learning process. This paper aimed at exploring learners' experiences of mobile learning in vocational and technical education courses.
Methods: The research method in this study was phenomenology. In this method, researchers investigated learners' lived experiences of mobile learning in vocational and technical education courses by semi-structured interviews. Participants (two classrooms: 32 people) were all learners, who attended this course.
Results: According to theme analysis of interviews, nine basic themes were identified, two organizing themes and one global theme. Based on thematic analysis, the results showed that learners had a positive perception of mobile learning.
Conclusions: Using mobile learning, learners gain greater quality and in-depth learning and the opportunity to study anywhere and at any time.

Keywords: Mobile Applications, Training, Vocational Education, Life Experiences

1. Background

Recently, ICT is playing serious effects in personnel's daily lives. Therefore, it is not surprising that virtual learning is accepted as an important tool in teaching (1). In other words, emergence of revolutionary technologies has had a major role on instructional design. It has enhanced the potential of e-learning as a style of delivery in teaching (2). For example, mobile learning (M-learning), as an educational approach, is no longer a novelty. Thus a large number of educational institutions in schools, higher education, and workplace use this form of learning (3). For a long time, classrooms were used with non-dynamic communication tools to deliver content (4).

"M learning" is learning by means of wireless technological devices that can be pocketed and utilized wherever the learner's device is able to receive unbroken transmission signals (2). There is a need for a definition of mobile learning that includes all the aspects of the mobile learning process (4). Nyir argues that mobile devices are responsible for undermining and, usually, eliminating the fixity of traditional environments. M-learning is defined differently by researchers. In early views, M-learning was defined as the delivery of content by materials of mobile tools, such as phones, PDAs, and digital audio players, etc. (5). However, the term mobile refers to the possibility of taking place in multiple situations, multiple times, and addressing multiple texts using either static or portable equipment. The fastest developing and rising computing platform with an estimated 1.6 billion mobile device users by 2013 is smart phones, mobile devices, and PDAs (6). Currently, tablet PCs allow mobile internet access with equal or more functionality than computers. M-Learning enables teachers and students to expand beyond traditional classrooms. Mobile devices provide teachers and students enhanced flexibility and offer new interaction opportunities. The benefits of M-Learning are as follows:

- Increase in individualized learning
- Motivation of learners
- Anytime and anywhere access to text
- Support-rich learning setting
- Support distance learning
- Enhancement of higher-order thinking skills
- Enhancement of learner-based learning
- Increase in the interaction between students and teachers

- Reduction in cultural and communication barriers (3, 6-8)

Mobile learning through easy access to information leads to improvement in learner's performance. M-learning increases reciprocal interaction where it supports direct communication between learners and teachers. Also, teachers of large groups can use the direct interaction as a way of providing special teaching to all learners (6). In summary, since mobile learning is emerging as an alternative approach to teaching, educational centers have started to use this approach to improve teaching and learning processes (9). Therefore, this paper aimed at providing an application for the BMS course. Moreover, for evaluation of software, learner's perceptions were explored by in-depth interviews. The main concept of the article was to determine the learner's lived experience of their course by mobile learning.

2. Methods

The research method in this study was phenomenology. In the first step, researchers developed a mobile learning software and then implemented it for learners and explored learners' lived experiences of mobile learning. Semi-structured interviews were used for gathering the data.

The participants were Persian Gulf electronics and electrical training center students in Shiraz city. For this purpose, the researchers selected the building management system course (N = 32) and used purposeful sampling to select the sample. Overall, 27 learners, who had experience in a mobile learning course were selected. Therefore, the criterion for selecting participants was attendance to the Building Management System, based on mobile learning, course. The interviews lasted 20 to 40 minutes, and were then analyzed by two expert analyzers.

Thematic analysis was used for data analysis. Thematic analysis is an efficient method of qualitative analysis. In this research, 2 organizing themes and 9 basic themes were extracted.

Data validity in this study was addressed through use of an external auditor and clarification of researcher bias. Although results of the study are not generalizable to other populations, the uniqueness of the experiences provide rich detail for those, who want to understand the lived experiences and perception of students, who were taught by mobile learning.

For the interview, the researcher informed participants about the interview goal, and each participant provided their consent. Also, participants could drop out of the study at any time. In addition, all 27 interviews were kept confidential.

2.1. Educational Software

In this part, a view of the software that was implemented for the BMS course is illustrated (Figure 1):

As indicated, this software has the ability of running on a smart phone. Since smart phones are more beneficial than computers, many educational software are designed for android systems. For example, in Iran more than 20 million people in 2015 used the Telegram application (http://www.ana.ir). It seems that the number of people is increasing and so this statistic is on the rise. It is obvious that these users use their smart phone to access Telegram, thus it could be assumed that Iranians more commonly use smart phones rather than computers. Therefore, it is recommended to IT experts to develop educational software for smart phones rather than computer software. In the following picture, topics of BMS course in the mobile learning software are portrayed (Figure 2).

As indicated, the table of contents is regulated in such a way that learners can select any learning unit by touching on the desired learning units. In other word, by selecting any of the units, the learners could go straight to the intended learning unit and study it. In addition, through online communication between trainers and learners, their interaction is easily achieved (Figure 3).

As indicated by Figure 3, a page is available on the software, from which users can view integration and interaction of photographer, IT Expert, and tutor in content arrangement. Also, in other slides and pages, it is possible to provide skills and conceptual knowledge in picture format and in a step by step manner. This format is appropriate for instructions based on constructivism theory and situated learning.

2.2. Course Implementation

After developing the mobile application, the mobile learning course was implemented. The duration of the BMS course as an experimental course was 5 weeks (including 32 hours of theoretical content and 10 hours of practical work). Since mobile phones were used as an e-learning tool in the educational course, 10 hours of course duration was provided in the mobile application, and during these hours, instructions were given through discussions and feedback on mobile social networks. Also, practical ambiguities were also discussed in the workshop. The final experiences of learners about the process of learning in mobile learning was extracted after the end of the course.

3. Results

According to theme analysis of interviews, there were 9 basic themes, 2 organizing themes, and a global theme.
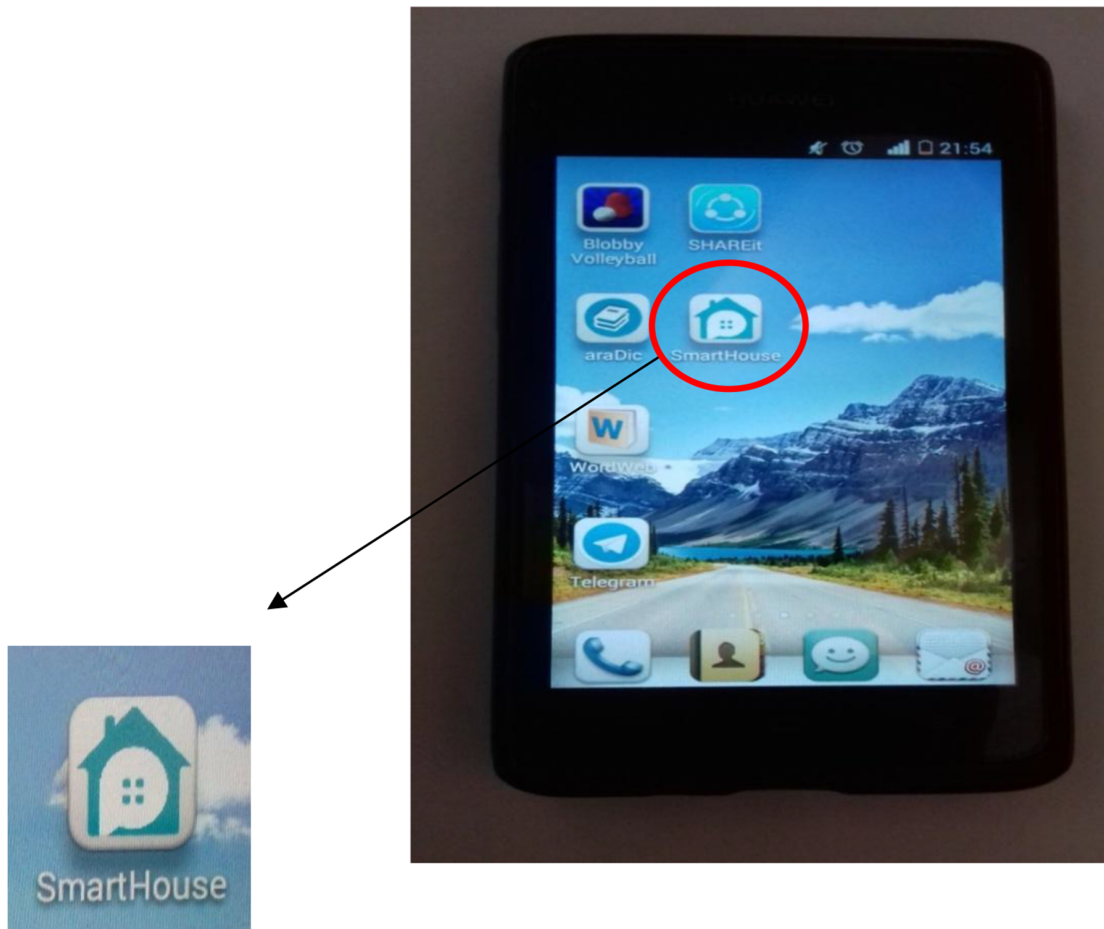
Figure 1. A View of the BMS Software on a Smart Phone

Before description of themes, participants' demographical information is presented. Participants in this study were male students of Persian Gulf electronics and electrical training center with their demographical information presented in the table below (Table 1).

3.1. Learners' Perceptions of the Mobile Learning Course

Based on analysis of interviews and open questionnaire, 9 basic themes were identified, 2 organizing themes and a global theme that was titled as "comparison to traditional teaching courses and positive perspective to this approach", "cost saving", "greater studying possibility and thus improvement in learning", "anytime and anyplace content", "readiness before introducing a new learning unit", "improving teaching quality", "interactive software", "paying attention to procedures with the help of films" and "recommended to be offered for similar courses".

3.1.1. Positive View Factors to the Mobile Learning Package

One of the organizing themes that were derived from the basic themes at the end of the learning process was positive view factors towards the mobile learning package. The basic themes of this organizing theme includes comparison to traditional teaching courses and positive perspective to this approach, cost saving, further study and further learning improvement, anytime and anyplace content, readiness before introducing a new learning unit, and improvement of teaching quality.

1-A. Comparison to traditional teaching courses and positive perspective towards this approach

One of the themes extracted from interviews at the end of the implementation of the mobile learning course was

Figure 2. A Picture of the Software Content

Table 1. Participants Demographic Information

Variable	No. (%)
Age	
20 - 25 years old	13 (48.14)
26 - 30 years old	7 (25.92)
31 - 35 years old	5 (18.52)
36-to up years old	2 (7.41)
Academic degree	
Associate degree	7 (25.92)
Bachelor degree	14 (51.85)
Master degree	6 (22.22)
Employment situation	
Employed	8 (29.62)
Unemployed	6 (22.22)
Student	13 (48.14)

the comparison of mobile learning with face to face learning and the positive sense of this approach. For example, one of the trainees said: "this method was very good and appropriate, because one of our educational system weaknesses is the lack of study of supplementary content out-
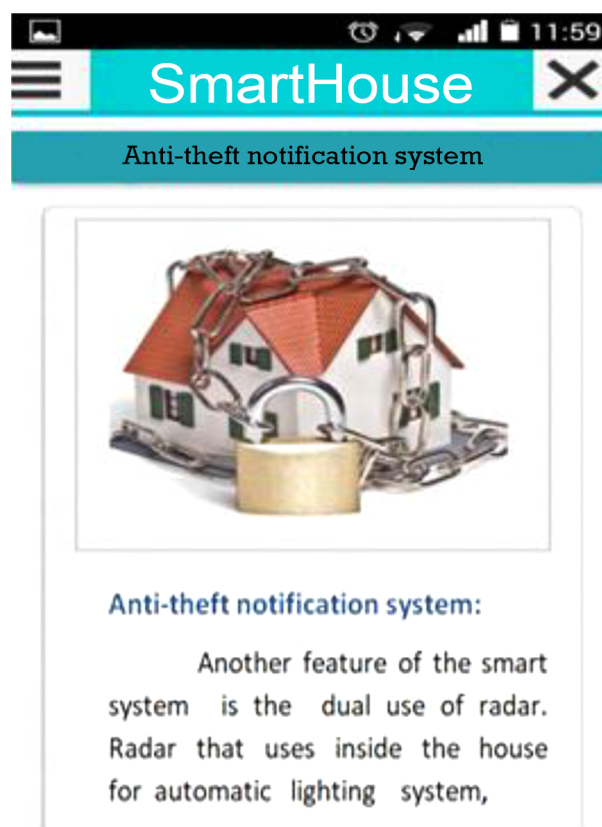

Figure 3. A View of an Available Page on the Software

side the textbooks, so learning material are converted only into a stereotypical preservation and can be erased from the students' mind. Many of the lessons are matched with a pamphlet, but this approach can encourage students to study more and create a mentality that only books and lessons provided, do not stand up". Another trainee said: "The mobile learning course was one of the best courses I have experienced so far, blending the presence at the workshop and studying with a smartphone and discussing topics that we read personally".

One of employed trainees said: "We had identified some of the sessions and instead of going to the educational center, we were reading pages ourselves, and usually we discussed it on WhatsApp on the same night. So, not spoiling one day at an educational center, it would save you time and money; especially for that part of the course, which was theoretical, it could be read by ourselves". Another trainee said: "It's all a waste of paper and books, and traffic because of the traditional teaching method. So what? I think that all technical and vocational educating courses should be held in the workshop for practical

work and with application software for theoretical learning. If we want to learn practical work, it is only possible through face to face sessions, and the rest of theoretical units could be taught with new technologies like the smartphone, which is a lot easier".

1-C. Further study and further learning improvement

One of the trainees said: "Apps that are installed on Smartphones though Android and IOS are more useful than other software that work on a computer, because they are always available and more time could be spent on them. For this course, this was helpful because if the software was in the form of CD, the students would not spend their time on it, but as it was available on our phone, sometimes we had a glimpse of it ". Another trainee said: "I fully agree with this method, because in this way, you can review the content before the face to face class, with this difference, which is that the application is always accessible for students, and can be easily searched by key words in the title of the application pages, while this is not possible for pamphlets and books. Therefore, when we entered the classroom, we were fully prepared to discuss the topics that were taught, and we had to review these before the start of the class". Another trainee said: "It was a very interesting and influential idea that led to BMS course not just ending up in a face to face class, and every time had extra time, we were studying using our mobile phone and so one of the benefits of the software was that there was no need to go to the classroom, and when we could not be present in face to face classrooms due to problems, we could learn the lesson with a mobile phone, because in fact you know what part you will be taught, so you cannot get back".

1-D. Anytime and anyplace content

One of the trainees said: Generally, using software and learning with a smartphone is useful for better learning and better performance because mobile phone is a widely used and is an always available device that allows learners to use it whenever and wherever. Almost everyone has a smart phone. It is natural that mobile phones are more accessible rather than other resources, such as books and pamphlets, and are always with the learner. In fact, the content of the course was with us anywhere, and at any time we had some issue about the course, we could go back to the software". One of learners said "smart phones and IOS programs are more useful than computer software, as they are more evaluable. In this course, this issue was effective, because if this software was in the form of a CD rum, I think the students would not use it".

1-E. Readiness before introducing a new learning unit

An MA student said: "The benefit of the software was to prepare trainees for further learning and self-confidence in future classroom sessions, because the person, who is supposed to learn the next topic has at least a glimpse at

its content in the application and has a positive feel for the class, which I thought was one of the benefits of this software in the course". Another student said: I fully agree with this method, because in this way you can review the content before the face to face class, with the difference being that the application is always accessible for students, and can be easily searched by key words in the title of the application pages, while this is not possible in pamphlets and books. Therefore, when we entered the classroom we were fully prepared to discuss what topics were to be taught, and we had to review these before the start of the class. Another trainee said: "Learning through mobile phones in combination with face to face classroom works in a complementary manner, and it was a good idea because the student could use it before the classroom meetings with a pre-class study through the software and can use the class room to ask questions and solve problems, while this is not the case for face to face courses and students attend the class without the readiness".

1-F. Improving Teaching Quality

One of trainees said: "Look at other courses. Both in technical and vocational courses as well as in university courses, the teacher and trainer transfers their knowledge and students write notes and, in the end of the course, the learner repeats the reservations on an exam paper. Of course, a part may also be practical learning. But in this course, our attention was to class debates". This led to reflection and discussion about provided contents in the classroom. Another trainee said: "I think that in this method, the real time of the class increases and the teacher can be taught more easily, and as a result, the student's ability to learn is increased because he is not supposed to note all the introduced theoretical material in the classroom, because he has already read the content before the start of class". Another trainee said: "I learned a lot in this instructional course; the combination of classrooms and mobile application increased the amount of information and practical work. The mobile learning course reduced costs and waste of time spent to travel to the institute and led to effectiveness of the course

2. Focus on suggestions for improving the software and providing similar technical and vocational courses.

Although almost all trainees had a positive opinion about the instructional process at end of the course, the data analysis showed that some participants suggested the use of a more effective application such as an interactive software and use of videos, while others recommended the use of such software for similar technical and vocational courses.

2-A. Interactive software

According to participant's statements, an interactive software is needed in the information and communica-

tion world. An interactive software leads to greater learner participation in the learning process. For example, one of trainees said: "I think the software should have chat functionality. [The user will say] Hey guys I did it here. Really, go there, sign in. I think the application must have chat functionality, group chat, and individual chat and upload of movie. [For example] Yesterday, I was surfing the internet, I found a PDF, let's upload it, and have it available for other students as well ..." Another trainee said: "If the software made it possible to provide messaging and online chat, it would probably be better, because in this situation it would help resolve issues".

2-B. Paying attention to procedures with the help of videos

Some participants acknowledged the need for some of the work procedures in the technical and professional field to be presented in a visual manner. For example, one of the trainees, with an associate degree, who was 23 years old and unemployed said: "In my opinion, while the software was attractive, it should have a professional and user-friendly design, and use video, audio, photo and other types of media alongside the text. Because sometimes work procedures are of great importance and should be taught with the help of videos". "Another trainee said:" A professional software should have attractive and appealing graphics, so that the user is not tired when using it and, on the contrary be interested in continuing to use it. Thus, aesthetic issues in software and photography and videos should also be taken into consideration. If this software also made it possible to view the videos, it might have been better. "Another trainee said: "... For example, you can upload movies. Yesterday, I was on the Internet. I found a PDF file, I thought it would be good if I could upload it and share it with my classmates...". One of trainees said: "In general, if the software is designed with a variety of professional features and user friendly and attractive form, it could attract everyone. Exactly like games that often have hidden educational goals, but because of their user-friendly environments and the simplicity of working with them attract a lot of people with any level of information and education. In this software, I was dealing mostly with text that was comprehensive, but it would be better if it was written in a text-movie based mode".

2-C. Recommendation to offer similar technical and vocational courses

One of the trainees regarding his positive opinion about the mobile learning process said: "The classroom was great, and support by Whatsapp and Telegram groups along with the software was excellent. I think, this is the best way of learning, because combination of both the practical work in workshops and mobile application can be attractive". Another trainee said: "I think this

method should become a routine method, and over time, its strengths and weaknesses will be identified, also implementers of the technical and vocational education limited this approach for this course. I will make such software, it is not costly. Developing a software can be used at any time". Another trainee pointed out that "the use of this teaching method for other courses could also be useful".

4. Discussion and Conclusion

Mobile learning has become an important field of research. In this study for evaluation of mobile learning, a phenomenology by interview of participants was conducted. The results showed that participants had a positive view of mobile learning. Therefore, teachers should adopt technology in their teaching strategies. Also, learners should be prepared to develop a more active role in learning processes. Mobile technologies have started to make compelling contributions to mobile learning within training institutes in developing countries, such as Iran. Similar to other studies by Kumar et al. (10) and Bilos et al. (11), learners stated mostly positive attitudes towards use of mobile devices for various activities, including mobile learning. This situation suggests a vast space for improvement of the classroom experience with mobile devices, such as smart phones.

The findings of the research regarding learning experiences showed that the design of this software will have many benefits and as a result, the learners expressed a positive attitude towards the mobile-learning process and software. The results of the current research are in agreement with the results of Billy and Morris (12), Chen and Jones (13), Pereira et al. (14), and Akiounella and Yilmaz Soyla (15), on students' satisfaction with the combination of teaching-learning. In general, the results of the current study suggests the use of different methods of learning, online and software resources, as well as classroom and face-to-face interactions, as part of education courses for better learning of students. Furthermore, this work also suggests that people do not learn in the same way. Therefore, the use of different methods for training is considered necessary. Consequently, it could be said that learners, who are interested in e-learning and attracting electronic resources through their mobile software learn more through the study of software content, while learners, who are interested in learning in-person prefer classroom learning and this diversity of training leads to a significant increase in learners' performance in a combined learning process than in other courses, such as in-person training. Accordingly, the suggestions of this study for policymakers and managers in the field of vocational training are as follows:

- Developing curriculum for vocational training courses with emphasis on mobile apps

- The use of mobile education (mobile-based) rather than using computers due to the flexibility and capacity in vocational training courses.

Footnote

Conflicts of Interest: None declared.

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