

Digital Transformation in Education: Teacher Candidate Views on Mobile Learning

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Abstract—The number of technological tools used in education is increasing day by day. Studies on mobile learning have increased in recent years. Future teachers' views on mobile learning are very important. In line with this purpose, the opinions of teacher candidates on mobile learning were taken by using qualitative research method in order to determine in detail their views on mobile learning. The participants of the study consists of 61 teacher candidates studying at Plekhanov Russian University of Economics, I.M. Sechenov First Moscow State Medical University, Gubkin Russian State University of Oil and Gas, Kazan National Research Technological University and Kazan (Volga region) Federal University. The opinions of pre-service teachers selected on the basis of voluntarism were analysed by content analysis method. The research questions were prepared by the researchers by taking expert opinion. The findings obtained as a result of the research are given in detail in the findings and results section.

Keywords—trainee, digital transformation, technology, mobile learning, competence, university

1 Introduction

Knowledge development is carried out in some ways in the development processes. It is a situation where the production of knowledge consists of rapidly developing production processes, the completion of the diversification of the processes and the transition to the completion stage. Many things happen [38] in education, as in daily life, of the rapid use of skills and abilities. It is the use of information that needs to be benefited from the use of technology from social education. Integration processes of models and systems are the renewal process of tools [19]. Honey [5], along with the map of the

pace of life, mentioned about a short part of people's life and the time it takes to win, a need or even a completion of their game.

In order to catch up with today's age, it is necessary to be trained as a technology literate [34], who knows how to design and develop this skill. Readers are used when information technology is read from a production reader. We interact with society and the environment about it. Wireless technology is included in the education and training processes for mobile education [37]. Technologies that are useful and widespread have rapidly begun to meet the performance of computers with devices such as smartphones [25]. They have high performance, different formats such as time and space for the user, a wider range of application features and create the missing points in e-learning in the field of education with mobile devices. In this training, learning dissemination (mobile learning) was created.

Mobile learning enables people to learn wherever they are and in learning to learn by doing and seeing. Good tutorials for simple education are designed for education for learning [30].

Most of the new generation mobile devices (smartphones) are used in the world nowadays. Universities around the world use phones, tablets etc. as mobile technologies for mobile learning, communication with students, student notes, registration procedures and lecture notes can be taken [21]. Today, they live and grow with digital technology. The signs in these statistics show that our real world is rapidly digitising [32]. As with the transition to digital age that can take place in the industry, this event is conducted in a way that is thought to the children. It is natural that digitalisation has taken place in education as well as in daily life.

Its top-notch price and widespread technologies are geared towards meeting the glamor of smartphones that can also stand out with its toy design. Mobile phones in education have developed a 'new paradigm' called mobile learning [27] because it offers sales services in selling, disseminating and communicating from commercial mobile phones. Advanced mobile communication phones, which are also called smartphones, are included in the systems' applications of pocket computers apart from the simple classical phone feature [35], such as word processing, spread sheet, presentation, photo, audio, photo and video film, Internet access, e-mail, message etc. They have many transitions. The maintenance sections [18] [24] about the mobile application of learning has features such as mobile applications, personalisation and training, time-less and untrained training for practice [1] [3]. This will have a place in mobile education, which will shape our future.

When the literature is examined, Wang et al. [39] state that most of the research on the use of mobile technologies stems from the technical features of new devices. Hamidi and Chavoshi [12] examined the level of adoption of mobile learning in universities in their study. Mobile learning as an e-learning model means acquiring knowledge, skills and attitudes using mobile technologies. Study, 'What is the impact of mobile phone use in education?' with his research, he examines mobile learning approaches and theories in education. The study aimed to evaluate the basic factors necessary for the adoption and implementation of the educational information system created by the students. As a result of the study, it was emphasised that mobile learning is a promising

educational technology for development in educational environments and usage culture. According to the findings of Martin and Ertzberger [26], students who study a computer-based course and mobile learning environment show positive significant differences in terms of both success and attitude, while Elicicek and Bahceci [11] stated that the academic success of students who take courses with mobile learning management system increases and they develop a positive attitude towards mobile learning. Yildiz Yildirim et al. [41] stated that mobile learning offers various opportunities to the theory and practice of education beyond focusing on the mobility of learners. Mobile technologies only provide interactions between learners, instructors and learning material. The actual effective learning depends on the active and cognitive participation of the learner in learning activities [16]. The study by Wu et al. [40] analysed 164 studies on mobile learning published in English between 2003 and 2010. As a result of the study, it was stated that the researchers used quantitative methods more frequently than other methods. It has been reported that mobile devices and personal digital assistants are the most preferred mobile learning tools by users [35].

There are many studies on the establishment of mobile learning in education. While most of the studies talk about their advantages, they are included in studies that defend their disadvantages. Besides the benefits of mobile learning tools, there are also some disadvantages. Kirkwood [22] mentions the possibility that after a certain period of time, the learner will be interested in the technology itself and tend to unintended applications rather than the convenience and learning content offered by mobile technology tools [23]. Another disadvantage related to mobile learning is in the field of content design. Content design is only one of the four features that mobile learning tools should have, and the design of mobile learning applications is a separate task that requires professional skills. Pre-service teachers have stated that they wanted to experience these new generation information and communication technology resources in courses such as special teaching methods in education faculties and be more ready for students. The formation of this awareness and the fact that the desire is from the bottom to the top shows that they have started to form a foresight about what they can do and what they cannot do [19]. Technology literacy of the teacher and learner is also one of the important issues [31] [32]. Technology literacy is unfortunately one of the biggest problems not only for learners but also for teachers [7] [8]. Mobile learning is becoming widespread, the number of studies on this subject is increasing every year; it is useful and can be used in learning and teaching processes [14] [10] [29]. The use of mobile learning in education is increasing rapidly. The techniques used in education are determined by those who teach the methods. In this context, the attitudes and opinions of pre-service teachers towards mobile learning are very important.

1.1 Purpose of the research

Considering factors such as the increasing prevalence of mobile devices, the increase in their use and the user base seems inevitable that mobile devices will continue to have an impact in all areas of life. It is seen that mobile devices, which have been effective in many areas of our lives, are used in various ways in the field of education. In this context, the opinions of pre-service teachers about mobile learning, which is becoming

increasingly important, are very important. The purpose of this research is to determine the opinions of teacher candidates about mobile learning. For this purpose, answers were sought for the following sub-objectives:

1. What are your views on the place of digitalisation in education?
2. What are your views on the advantages of mobile learning environments?
3. What are your views on the disadvantages of the mobile learning environment?
4. What are the basic skills and competencies that learners should have in mobile learning environments?
5. Do you intend to use mobile learning environments in the future?

2 Method

In this study, the interview method, which is one of the qualitative methods in descriptive research, was used. After their permission was obtained, the opinions of the students were obtained with a voice recorder. The answers taken from the voice recorders were written in a document and the confirmation of the students was obtained. Henink et al. [13] stated that the focus of qualitative research is a research model that helps us understand the participants.

2.1 Research group

The research was conducted at the Plekhanov Russian University of Economics, I.M. in the fall semester of the 2020–2021 academic year. The participants of the study were 61 prospective teachers from Sechenov First Moscow State Medical University, Gubkin Russian State University of Oil and Gas, Kazan National Research Technological University and Kazan (Volga region) Federal University. Demographic information of university students participating in the research is given in Table 1.

Table 1. Demographic information of the instructors

Gender	f
Female	32
Male	29
Total	61

2.2 Data collection tools

A demographic information form was developed by the researchers to determine the views of pre-service teachers on mobile learning in the digitalising age. In addition, semi-structured interview questions consisting of open-ended questions were used as data collection tool. The open-ended questions in the questionnaire were created using the literature and the researchers' own experiences. The questionnaire was first examined by six experts (two linguists and four computer teachers) experienced in qualitative research and necessary corrections were made according to their feedback. As a

result of expert opinions out of eight questions prepared at the first stage, five were included in the research.

3 Results

3.1 Opinions about the place of digitalisation in education

The answers given by the teacher candidates studying at the university to the question ‘What are your views on the place of digitalisation in education?’ were keeping up with the times (29), providing convenience and permanence in learning (21), enjoyable and productive lessons (15) and providing technology-supported education (7). It is seen that most of the students’ views on the place of digitalisation in education are ‘to keep up with the times’. It can be said that teacher candidates fully grasp the concept of a digital native. The inclusion of digitalisation in education with developing technology is important so that education does not remain in the background. There are 15 teacher candidates who say that digitalisation makes education enjoyable and ensures that it is efficient. Likewise, there are seven pre-service teachers who gave the answer ‘providing technology-supported education opportunities’.

Some of the students’ opinions are as follows:

“Technology represents the evolving age, new features and tools. The concept of digital native is included. Incorporating digital tools into education means keeping up with the times”.

“It is necessary to adapt to the new generation rather than learning the old style. We have a great job to be the teachers of the future. Our duty is to keep up with the times and to be included in the digital environments of the students, to use these tools in the lessons and to provide permanent and effective learning”.

“It is necessary to make education enjoyable without boring the learners. In this way, we can achieve our goals. We can achieve this by including digital tools in education for the new generation, called digital natives. Technological tools make lessons enjoyable and productive”.

Table 2. Students’ views on technology

	f
Keep up with the times	29
Easy and permanent	21
Enjoyable and efficient	15
Technology-supported	7

3.2 Opinions about the advantages of mobile learning environments

The answers given by the teacher candidates studying at the university to the question ‘What are your views on the advantages of mobile learning environments?’ were that mobile learning environments provide technology integration in education (31),

contribute to the development of research skills (21), provide quick access to information (13), provide sharing rich content (12) and provide every opportunity that is appealing to the senses (8).

Some of the students' opinions are as follows:

“We are in an age where technology is developing rapidly. Mobile learning environments are at the forefront of the tools that provide technology integration in education”.

“I think that mobile learning environments contribute to the development of research skills for learners. It encourages learners to research”.

“Mobile learning environments allow us to access information quickly. Access to information accelerates thanks to the tools used for mobile learning environments. Classroom activities and information exchange are increasing”.

“Mobile learning; It has many advantages such as storing data, allowing all kinds of sharing, providing easy access to course documents outside of the classroom, providing the opportunity to learn according to individual speed, preventing paper waste and accessing information in a short way”.

Table 3. Students' views on the advantages of the mobile learning environment

	N
Technology integration into education	31
Developing research skills	21
Quick access to information	13
Sharing wealth	12
Appealing to all senses	8

3.3 Views on the disadvantages of the mobile learning environment

The answers given by the university teacher candidates to the question ‘What are your views on the disadvantages of mobile learning environments?’ were that the competencies of teachers and learners who use mobile learning environments in this area are very important. There are many tools in mobile learning environments. In order to be able to use these tools, teachers are expected to have sufficient knowledge about technology-supported tools. Likewise, they should have sufficient equipment to use the tools and equipment used in mobile learning environments. This can be expensive in terms of cost (21). Technical problems may be a problem when using mobile learning environments in education (13). Likewise, 12 pre-service teachers argued that mobile learning environments can accustom people to laziness as information can be accessed quickly and easily.

Some of the students' opinions are as follows:

“To be able to use mobile learning environments, it is necessary to have sufficient knowledge and skills. We need to be able to use the device we will use, we need to know the training application we want to apply. It is very important for both teachers and students to use technological tools”.

“Mobile devices can be expensive. There may be a problem of not having a device or not having the Internet for both the teacher and the student. I think it is expensive in terms of cost. Not everyone uses smart devices”.

“We may encounter technical problems when using mobile devices in education. These are device corruption, application not working, application error.....”

“Every good thing has its bad side. For example, while it is nice that the mobile environments we use in education provide us with information in an easy way, it can make us get used to laziness as we quickly reach the right information in an easy way”.

Table 4. Students’ views on the disadvantages of the mobile learning environment

	N
Qualifications	31
Cost	21
Technical issues	13
Laziness	12

3.4 Skills and competencies required in mobile learning environments

Considering the answers given by the university teacher candidates to the question *“What are your views on the skills and competencies that should be possessed for mobile learning environments?”*, most people stated that they should have the necessary competence and skills in technological knowledge and skills. Likewise, there are 14 pre-service teachers who stated that those who learn and teach for mobile learning environments should be individuals who are open to learning. Opinions have emerged stating that mobile learning environments should be curious (8), have a research spirit (5), developed problem-solving skills (3) and be open to collaborative learning approach (3).

Some of the students’ opinions are as follows:

“Mobile learning environments require many skills and competencies. If I had to give examples, first of all, our technological knowledge should be sufficient. Our technological knowledge must be sufficient so that we know how to use mobile devices, how to research in practice, and how to teach this to students”.

“Curiosity should come at the beginning of learning. In cases where learning takes place with new approaches, individuals must have a desire for curiosity. Again, in addition to being curious, our researcher spirit should be developed. The desire for research and the sense of curiosity are the most basic factors that trigger learning”.

“In mobile learning environments, we have to interact in order to do research, make applications, and do activities. In mobile learning environments, there are teacher–student interactions, student–student interactions, student–tool interactions, teacher–tool interactions. We can achieve these situations if we take a collaborative approach”.

Table 5. Students’ views on skills and competencies required in mobile learning environments

	N
Technological knowledge and skills	28
Open to learning	14
Ability to use mobile phone	11
Wonder	8
Researcher	5
Problem-solving skill	3
Cooperation	3

3.5 Using mobile learning environments

When the prospective university teachers were asked whether they would use mobile learning environments or not, almost all of the teachers stated that they were considering using it. Six teacher candidates are undecided. It is seen that there are teacher candidates who are undecided about using mobile learning environments.

Some of the students’ opinions are as follows:

“I use mobile devices effectively in communication in daily life. Of course, I consider using mobile devices in education”.

“I use mobile environments in many of my project courses at university. When I become a teacher in the future, I will use mobile environments in my lessons so that my students can do their research”.

“I have concerns about the content and images shared on mobile media. That’s why I’m undecided whether to use it or not”.

“I think whether I will use the mobile application in the lessons according to the readiness level of my students and whether they have a mobile phone or not”.

Table 6. Students’ views on using mobile learning environments

	N
Yes	56
Unstable	5

4 Conclusion and discussion

The answers given by the teacher candidates studying at the university to the question *“What are your views on the place of digitalisation in education?”* were keeping up with the times (29), providing convenience and permanence in learning (21), enjoyable and productive lessons (15) and providing technology-supported education (7). It is seen that most of the students’ views on the place of digitalisation in education are ‘to keep up with the times’. It can be said that teacher candidates fully grasp the concept of a digital native. The inclusion of digitalisation in education with developing technology is important so that education does not remain in the background. There are 15 teacher candidates who say that digitalisation makes education enjoyable and to

ensure that it is efficient. Likewise, there are seven pre-service teachers who gave the answer ‘providing technology-supported education opportunities’.

Among the answers given by the university teacher candidates regarding the place of digitalisation in education, the theme of keeping up with the age is in the first place since education changes with the developing age. It is very pleasing that the teachers of the future are thinking of keeping up with the digitalising age. Likewise, they stated that digitalisation facilitates learning in education and is important for ensuring permanent learning. When the answers given are examined, it can be concluded that the prospective teachers do not have a perspective on classical education and that important developments have been achieved in education with digitalisation. It is concluded that the inclusion of digitalisation in education processes has positive views on adapting to technology [6]. With the enormous development of interest and communication technologies, e-learning and learning technologies together with the Internet, it is more ready than before to serve every layer of education at a high level [2]. New learning and educational technologies obviously have the capacity to offer new possibilities and opportunities that will change our lives. Adaptation can be achieved as long as the pedagogical, technical, financial, administrative and sociocultural dimensions of the issue are well resolved [28].

When the findings of the pre-service teachers studying at the university regarding the ‘Advantages of mobile learning environments’ are examined, the results revealed that they think that mobile learning environments provide technology integration in education, contribute to the development of research skills with mobile learning environments and are more effective in terms of the speed of accessing information. The advantage of mobile learning environments to offer rich content to users is among the results obtained from teacher candidates. It has been observed that there are studies showing that mobile learning is effective in increasing the academic achievement of learners [15] [11]. Martin and Ertzberger [26] emphasised that mobile learning removes limitations such as time and place dependency [33]. This result also supports the results obtained from these studies. The result of the study by Chen et al. [10] is similar to the conclusion that mobile devices have a positive effect on accessing and transferring resources. Regarding the disadvantages, it was stated that it requires Internet connection, charging, suitable phone, does not offer face-to-face questioning, increases addiction to the phone and strains the eyes.

When the results of the disadvantages of mobile learning environments are examined, it is concluded that proficiency is very important. There are many tools used in mobile learning environments. In order to be able to use these tools, teachers are expected to have sufficient knowledge about technology-supported tools. In the same way, it has been concluded that they should have sufficient equipment to use the tools and equipment used in mobile learning environments. It is concluded that this situation may be expensive in terms of cost for purchasing a mobile vehicle. It has been counted as a disadvantage since technical problems may arise when using mobile environments, which may cause problems. Likewise, 12 pre-service teachers argued that mobile learning environments can accustom people to laziness as information can be accessed quickly and easily. Kirkwood [22] talks about the possibility of the emergence of fea-

tures such as the learner's interest in technology itself and tending to unintended applications rather than the convenience and learning content offered by mobile technology tools after a certain period of time (technological determinism). Another problem encountered in mobile learning is content design [3]. Content design is only one of the four features that mobile learning tools should have, and the design of mobile learning applications is a separate task that requires professional skills. Technology literacy of the teacher and learner is also one of the important issues. It can also be said that technology literacy takes precedence over other important aspects in mobile learning [31]. A mobile learning tool and content that will be successfully developed and presented to the learner is difficult to be effective and efficient, unless it is used well by the learner. Technology literacy is unfortunately one of the biggest problems not only for learners but also for teachers [7].

When the results regarding the skills and competencies in mobile learning environments are examined, it can be concluded that most of the pre-service teachers should have the necessary competence and skills in technological knowledge and skills. Likewise, there are 14 pre-service teachers who stated that those who learn and teach for mobile learning environments should be individuals who are open to learning. It is concluded that people who will use mobile learning environments should have curious and collaborative approaches. It can be said that this is important because the concept of curiosity is important in learning, and everything that is curious will be learned more easily and quickly. Looking at another finding, almost all of the results obtained from the pre-service teachers studying at university, whether they use mobile learning environments or not, stated that they intend to use it. Six teacher candidates were undecided. It was seen that there are no teacher candidates who do not think of using it. This result is pleasing. The place of technology in our lives is an indisputable fact. It is pleasing that the use of technological tools and mobile learning environments have increased during the education period.

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