

Exploring the link between digital literacy and readiness towards mobile learning among future teachers

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Abstract. This study investigates the relationship between digital literacy and mobile learning readiness among 250 prospective teachers at a state university in Ankara, Türkiye. Data were collected using the "Readiness Scale towards Mobile Learning," developed by Lin, Lin, Yeh, and Wang (2016) and adapted to Turkish by Gökçearsan, Solmaz, and Kulkul (2017), alongside the "Digital Literacy Scale" by Ng (2012), adapted by Hamutoğlu, Güngören, Kaya Uyanık, and Erdoğan (2017). Results indicated that prospective teachers possessed high digital literacy levels. Their attitudes and technical skills significantly predicted their readiness towards mobile learning. A Pearson Correlation analysis revealed a strong, significant linear relationship between digital literacy and mobile learning readiness ($r=.815$, $p=.000$). This suggests that higher digital literacy is closely associated with greater readiness towards mobile learning among prospective teachers.

1 Introduction

Social needs and on-going changes in information technologies (IT) and their impact on the process of learning and teaching with the changing paradigms in these processes accordingly form the basic determinants of needs in the field of education [16]. Besides that, educational processes started as distance teaching not face-to-face in a great many countries due to the COVID-19 pandemic all over the world [18] (IT) needs to be revealed in the teaching processes through what was experienced in distance education during the pandemic period. For that reason, the events realized throughout the world together with the developing technologies bring about professional development needs within the context of IT in teaching. In this context, future teachers must incorporate technological innovations into their careers to provide more effective guidance to their students and leverage digital resources for their own academic development in an ever-evolving technological environment.

Today's digital materials comprise the basic component of teaching processes and offer students an effective learning experience. Digital books, interactive simulations, online learning platforms, and digital tools allow teachers to offer various student-centered materials. These digital materials allow students to understand the topic in-depth and acquire interactive learning experiences. On the other hand, digital materials eliminate time and space

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limitations in teaching processes while allowing the learner to reach information rapidly and proceed depending on their own learning pace.

Development in IT comprises wireless communication technologies and improvements in mobile technologies and reaches to a point where the concept of mobility is integrated to e-learning settings. In this way, using e-learning settings heads towards mobile learning settings [13]. [17] define mobile learning as providing an education setting to learners through a mobile computer or phone outside of class and without the need for a classroom environment. Given that mobile devices have become an essential part of our daily lives and their usage is steadily increasing, it is likely that the number of mobile application users will continue to grow. Hereby, the interest in using mobile applications as a learning tool has increased day by day. In addition, new-generation learners today are always in mobility and their learning needs vary depending on different geographical locations and comprise learning environments with various technological infrastructures [2]. Mobile learning settings play a great role in facilitating intraclass experience [6]. These settings give important contributions to supporting learning since teacher and student interaction could be set, activity opportunities increase there, and it is focused on a student-centered approach [12]. With all these opportunities, the interaction between mobile devices and individuals and access to the source and transfer of information are affected positively [7].

With the combination of the fact that digital technologies become widespread, the intensity of information, the necessity of critical thinking, and the demands in both the education and professional world, the concept of “digital literacy” emerged. This concept emphasizes the importance that individuals have the skills of understanding digital technologies and using and evaluating them with a critical perspective [19]. “Digital literacy” comprises the skill of using digital devices effectively in various contexts and in the processes of accessing to information, evaluating, forming and communicating, and knowledge and attitudes [8]. Digital literacy particularly supports effective learning and teaching skills of educators and learners in digital settings [4]. For that reason, the digital literacy of prospective teachers is connected with their readiness for mobile learning.

It is a necessity that teachers of the future who would teach improving young generations within the technology which is an indispensable part of our daily life be individuals following technological developments closely, being able to use the knowledge they acquire in teaching processes and being able to be integrated [3]. In this sense, since prospective teachers learn the most correct information in the pre-service training processes and they shape their beliefs toward their profession in this period, it is of vital importance to investigate their digital literacy levels and determine their readiness towards mobile learning regarding how to use mobile devices which are digital devices to be used in teaching processes. Therefore, whether there was a significant correlation between the digital literacy of prospective teachers and their readiness toward mobile learning was investigated in the current study.

For this purpose, the research questions were designed as follows:

1. At what level is the digital literacy of prospective teachers?
2. At what level is the readiness of prospective teachers toward mobile learning?
3. Is the digital literacy of prospective teachers a significant predictor of their readiness towards mobile learning?
4. Is there any correlation between the digital literacy of prospective teachers and their readiness towards mobile learning?

2 Method

In the current study, the descriptive survey model, one of the quantitative research methods, was used. The studies aiming at collecting data to determine certain features of a

group are called surveys. In survey research, data is collected from students through questionnaire techniques to find the answer to the research question, and the findings are obtained through data analysis [5].

2.1 Participants

The participants of the research were made up of 250 prospective teachers studying in the departments of German Language Teaching (12, 4.8%), Biology Teaching (27, 10.8%), Computer and Instructional Technologies Teaching (19, 7.6%), Primary Education Mathematics Teaching (15, 6.0%), Science Teaching (27, 10.8%), Classroom Teaching (23, 9.2%), French Language Teaching (10, 4.0%), Guidance and Psychological Counselling (14, 5.6%), Turkish Language Teaching (13, 5.2%), English Language Teaching (23, 9.2%), Chemistry Teaching (10, 4.0%), Physics Teaching (115, 6.0%), Secondary Education Mathematics Teaching (27, 10.8%) and Preschool Teaching (15, 6.0%) at the faculty of education of a state university in Ankara, Türkiye. As for the gender distribution of the working group, 60.8% of the participants were women and 39.2% were men.

2.2 Data Collection Tools

2.2.1 Readiness Scale towards Mobile Learning (RSTML)

Readiness Scale towards Mobile Learning, developed by [14] and adapted to Turkish by [9] is a 7-point Likert type and made up of 17 items. The scale has 3 sub-factors as “Self-efficacy”, “Optimism” and “Self-directed Learning”. Cronbach's Alpha value was found .95 in general at the scale. It was found as .95 for the “Self-efficacy” sub-factor, .94 for the “Optimism” sub-factor, and .89 for the “Self-directed Learning” sub-factor.

2.2.2 Digital Literacy Scale (DLS)

Digital Literacy Scale, developed by [15] and adapted to Turkish by [11] is a 5-point Likert type. In the scale a 5-point Likert type grading like Completely Agree (5), Completely Disagree (1) was used. There was no reverse-scored item in the scale. The scale has a four-sub-dimension structure as “attitude”, “technique”, “cognitive” and “social”. Since there were 7 items in the sub-dimension of attitude, the lowest score likely to be achieved is 7 and the highest score is 35. There were 6 items in the sub-dimension of techniques. For that reason, the lowest score likely to be achieved in this sub-dimension is 6 and the highest score is 30. There were 2 items in the sub-dimension of cognitive. For that reason, the lowest score likely to be achieved in this sub-dimension is 2 and the highest score is 10. Similarly, there were 2 items in the sub-dimension of techniques. Therefore, the lowest score likely to be achieved in this sub-dimension is 2 and the highest score is 10. The increase in the scores obtained from the sub-dimensions of DLS and in total of the scale points to a high digital literacy. In total of the scale, the Cronbach Alpha value was found as .93. It was found .88 for the attitude sub-dimension, .89 for the technique sub-dimension, .70 for cognitive sub-dimension, and .72 for the social sub-dimension.

2.3 Data Analysis

In the study, the data obtained from the Digital Literacy and Readiness towards Mobile Learning scales was analyzed using the SPSS 26.0 program. To find the answer to the 1st and 2nd research questions, a descriptive statistical method was used. To determine the normality

of the distribution of digital literacy and readiness toward mobile learning levels, the coefficient of skewness was calculated. Since these values were between -1 and +1 for both scales total and sub-factors, it was decided that the distribution was normal [5]. To find the answer for the third research question, multiple regression analysis was applied. To find the answers for the fourth and last research question, the Pearson Correlation coefficient was calculated.

3 Results and Discussions

3.1 Results

The descriptive analysis results carried out to determine the digital literacy levels of prospective teachers for the purpose of finding an answer for the 1st and 2nd research questions were given in Table 1 and their readiness towards mobile learning levels was given in Table 2.

Table 1. Digital literacy levels of prospective teachers

Sub-factors of the scale	N	Min	Max	X	SD	Level
Attitude	250	1.43	5.00	4.05	.810	Completely Agree
Technique	250	1.67	5.00	4.03	.830	Completely Agree
Cognitive	250	2.00	5.00	4.03	.734	Completely Agree

As given in Table 1, it is likely to say as a result of the investigation of the literacy levels of prospective teachers in terms of the factors of the score and their average scores that their digital literacy levels were at a high level in total scale and in all sub-factors of the scale.

Table 2. Readiness towards mobile learning levels of prospective teachers

Sub-factors of the scale	N	Min	Max	X	SD	Level
Self-efficacy	250	1.67	7.00	5.34	1.05	Medium High
Optimism	250	1.43	7.00	5.20	1.18	Medium High
Self-directed learning	250	2.75	7.00	5.24	.953	Medium High

As is given in Table 2, it is likely to say as a result of the investigation of the readiness towards mobile learning levels of prospective teachers that their readiness towards mobile learning levels was at a medium-high level in the total scale and in all sub-factors of the scale and that they answered the scale between “I somewhat agree” and “I agree”.

Multiple linear regression analysis was applied to find an answer to the 3rd research question. The data regarding the results of the analysis were given in Table 3.

Table 3. Multiple linear regression analysis was carried out to determine the readiness behavior intents of prospective teachers toward mobile learning

Variable	B	SH	t	P	R	R ²	F	p
Attitude	1.515	.153	9892	.000	.823	.678	129	.000
Technique	1.063	.169	6300	.000				
Cognitive	.196	.550	.356	.722				
Socio-emotional	.229	.404	.568	.570				

As is given in Table 3, as a result of the multiple regression analysis, it is likely to say that the regression model is statistically significant ($F(492)=129, p<.05$) and independent variables reveal that the change at the readiness toward mobile learning levels is 67.8%. As a result of this analysis, while attitude and technique were significant, cognitive and socio-emotional variables were insignificant. The relation has a positive direction. It was found that attitude and technique variables were important predictors for the readiness behavior intent of prospective teachers toward mobile learning ($R=.823$). The relation was at a high level and at $p<.001$ significance level ($R=.823$).

The Pearson Correlation Test was applied to find the answer to 4th and last research question. The analysis results carried out to determine the relationship between the digital literacy of prospective teachers and their readiness towards mobile learning was given in the table below (Table 4).

Table 4. Digital literacy levels of prospective teachers

Scale	N	r	p
Digital literacy	250	.815	.000
Readiness towards Mobile Learning			

As is given in Table 4, depending on the Pearson Correlation Test results, positive and linear relations were found between the digital literacy of prospective teachers and their readiness toward mobile learning ($r=.815, p=.000$).

3.2 Discussion

The purpose of this study was to explore the connection between digital literacy among prospective teachers and their readiness for mobile learning. Initially, an assessment of participants' digital literacy levels was conducted. It was discovered that participants exhibited medium-high digital literacy across all sub-factors, including attitude, technique, cognitive, and socio-emotional aspects (Table 1). These outcomes are likely influenced by the global pandemic and the catastrophic earthquake on February 6, 2023, which led to a

prolonged period of remote education, requiring participants to frequently engage in classes through digital platforms before they commenced their professional careers. Additionally, prospective teachers may have enrolled in courses like Informatics Technologies and Technology in Education offered by faculties of education.

In terms of readiness towards mobile learning, a moderate level of preparedness was observed across the sub-factors of self-efficacy, optimism, and self-directed learning (Table 2). These findings indicate that participants favored mobile learning systems for facilitating effective communication, offering flexible working conditions, and supporting self-directed learning processes.

The multiple linear regression analysis (Table 3) identified attitude and technical skills as significant predictors of mobile learning readiness, explaining 67.8% of the variance in readiness levels. In line with these results, a study involving 370 university students [1] examined the role of mobile phones in education through the lens of the technology acceptance model, revealing that all factors significantly predicted the acceptance and use of technology. Similarly, another study [10] explored the intricate relationship between self-efficacy beliefs and technological pedagogical knowledge, finding a moderate positive correlation between self-efficacy and technological pedagogical knowledge.

A further aim of the research was to determine whether a correlation exists between prospective teachers' digital literacy and their readiness towards mobile learning. This study revealed a strong positive correlation between digital literacy and mobile learning readiness (Table 4). Thus, it can be concluded that digital literacy significantly impacts mobile learning readiness. This result suggests that with evolving educational technologies, prospective teachers—who are frequently engaged in mobile learning environments—reported having high levels of digital literacy.

3.3 Conclusion

In conclusion, the digital literacy and readiness towards mobile learning of prospective teachers are critically important for their successful engagement in modern educational environments. In this context, it is of paramount importance for educational programs to focus on strategies that strengthen the digital literacy of prospective teachers and enhance their readiness toward mobile learning. Emphasizing these strategies will play a pivotal role in effectively preparing future teachers for the dynamic educational landscape.

Furthermore, the positive relationship between technological pedagogical content knowledge and the self-efficacy beliefs of prospective teachers, as indicated in the literature, aligns with the importance of understanding the complexity of interaction on student engagement. In this context, educational programs targeting prospective teachers should focus on strategies aimed at enhancing student participation related to technology use. Such strategies have the potential to positively impact classroom interactions and student achievements.

The findings of this study indicate that strengthening the digital literacy and readiness towards mobile learning of prospective teachers will enhance their competence in adapting to modern educational environments. This holds significant importance for future educators, enabling them to guide students more effectively and manage technology-driven learning environments proficiently.

Considering the findings of the study, the following recommendations can be suggested.

- Strategies focusing on how prospective teachers can utilize the theoretical and practical knowledge gained during their education to increase their digital literacy and adapt to mobile learning are crucial. Accordingly, courses designed based on the use of technological devices should be integrated into teacher training programs,

particularly within the scope of field education and vocational education. This integration will empower prospective teachers to strengthen their digital skills and integrate them into their teaching processes, allowing them to deliver their future teachings with a more compatible and innovative perspective.

- In light of these considerations, further research is necessary to better integrate technology across all educational levels and reevaluate curricula accordingly. Conducting more studies with different problem questions concerning digital literacy and readiness towards mobile learning will provide a broader perspective on the challenges encountered and potential solutions in these areas. Such research will contribute to a more comprehensive understanding of effective technology utilization in education. Therefore, prioritizing such studies is crucial to better equip prospective teachers and enable them to manage learning environments more effectively.
- Prospective teachers can benefit from integrated practical studies and internship programs to enhance their digital literacy and readiness toward mobile learning. These initiatives provide real-world experiences, aiding prospective teachers in translating theoretical knowledge into practical skills.
- Prospective teachers can collaborate by establishing a platform where they can share their digital practices and learning experiences. These platforms can assist them in creating a community centered around sharing experiences and learning.
- Opportunities for prospective teachers to enhance their skills in effectively using digital tools can be provided through regular workshop sessions. These workshops can enable prospective teachers to stay updated on technological innovations and gain practical experience in implementation.
- Various seminar programs can be organized for prospective teachers to enhance their digital skills and increase their readiness towards mobile learning. Led by experts in the field, these seminars provide insights into classroom integration and effective utilization of digital technologies, allowing prospective teachers to acquire knowledge that can be integrated into their future teachings.

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