How do Preservice Teachers’ Readiness and Attitudes towards Mobile Learning Affect their Acceptance of Mobile Learning Systems?

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Abstract – In this study, the aim is to examine the impact of teacher candidates' readiness and attitudes towards mobile learning on the acceptance of mobile learning systems. This is a quantitative research and the study group comprises of 195 prospective teachers who were studying at a university in Northern Cyprus in the 2017-2018 academic year. During the research, the mobile learning readiness scale, mobile learning attitude scale and acceptance of mobile learning systems scale developed by the researchers were used as data collection tools. The relationship between the readiness and attitude towards mobile learning with the acceptance of mobile learning systems was also examined. Based on the collected data, the relationship between readiness, attitude and acceptance has been demonstrated to be positive; it has been also observed that attitude and readiness towards mobile learning have a significant effect on the acceptance of mobile learning systems. According to the results obtained from this research, it can be said that as readiness and attitude levels are increasing in a positive sense, it is likely that the acceptance of mobile learning systems by the users will be increased accordingly.

Keywords – Readiness, Attitudes, Mobile Learning, Acceptance

1. Introduction

According to data from Global Digital Statistics 2014, 93 percent of the global population has a mobile device and 35 percent of these people have access to the Internet. According to EMarketer [15], there are 4.55 billion mobile telephone users around the world, while 1.75 billion have smartphones.

In 2013, Geng noted that the number of telephone users, which exceeds 1.5 billion, outnumber computer users three-fold. In the light of these data, it can be claimed that mobile devices are the technologies that are widely used by humankind [18].

As Weiser stated (1991), “The most profound technologies are those that disappear. They weave themselves into the fabric of everyday life until they are indistinguishable from it”. Now that mobile devices have become an ordinary part of our daily lives in a broader sense, this supports the prediction made by Weiser in 1991[31].

Through time, the most primitive phones have been developed by adding those properties that are more technical: Such as cameras, time, calculators, games, web browsers, video calling, wireless internet and various other functions (All in one devices). These represent the primary reasons why mobile phones have become the most frequently used and standard devices in daily life [8], [20].

These devices have become even more widespread as a result of operating systems such as Android, IOS and others, which are continually introducing upgraded technology [6], [27]. As they have become an integral part of people’s daily lives, it has been observed that smart devices are particularly attractive to the younger generation [32].

Due to the intense interest and demand for mobile devices, they have also been integrated into both education and work environments as much as they are integrated into every field of our lives [21], [22]. In addition to their portability, mobile devices can also provide numerous functions, such as quick access to data, camera functionality, media presentation, gaming, data storage [1], [20]. Apart
from their portability and other useful functions, their existence in our lives has become increasingly prominent, as they have removed the barriers of time and place when accessing data, which has resulted in them being intensively used in the field of education field; consequently, the term mobile learning is now commonly used [23].

In regard to the development of mobile device technologies and their continual improvement, it has become obligatory to add mobile learning systems to e-learning systems that are already in use in the academic community [6].

As a result of the increasingly widespread usage of mobile devices in educational fields, many universities around the world have recognised the changing trends have begun to develop mobile learning system infrastructure. Furthermore, many universities are benefiting from this technology for student registrations, course plans, grade declaration, course selection, and distance learning in addition to the inclusion of mobile learning systems in their curricula [20]. As mobile learning systems are becoming more popular then these systems represent the future and will become an inseparable part of education / learning [24].

**Mobile Learning**

As a result of the increased capacity of mobile devices being used in education, the concept of mobile learning has emerged as result of the growing interest in learner-centred teaching approaches with the change from computer-aided education to virtual education [2], [17].

There is no consensus among the education community regarding the definition of mobile learning [12], [24]. Therefore, it is not surprising that various different descriptions will be found for this term.

Mobile learning was described as a learning method executed by portable computers, tablets, notebooks etc., and it is any kind of learning method, which uses mobile devices [21]. On the other hand, Oran and Karadeniz (2013) acclaimed that it is a learning process realized by content or through social interaction independent from time and place by the use of mobile devices [12], [14], [29].

Definitions of m-learning are divided into four sub-titles, namely technology-based, about e-learning, supportive of formal learning and learner-based [23]. These sub-titles can be briefly described as follows:

1- Technology-based Definitions: Focuses on learning activities executed by various mobile devices.

2- E-learning definitions: These are the definitions that regard mobile learning as an extension of e-learning activities and focus on e-learning activities with the support of mobile devices.

3- Formal Learning Supportive Definitions: These are the definitions that emphasise that mobile learning should be applied to support and enrich ordinary lessons and courses by its multiple contributions.

4- Learner-Based Definitions: These definitions emphasise that learning methods should be personalized towards the interests, demands and needs of individuals without restrictions on time and place.

When these definitions are examined, it could be claimed that mobile learning is a concept with a broad perspective. According to Bozkurt (2015), mobile learning, which is a concept that is continually increasing in popularity in educational life, has the following characteristics in regard to the learning and teaching phases [6]:

While mobile learning enables the creation of formal, informal and non-formal learning platforms anywhere and at any time, it also increases educational equality in terms of opportunities, allows instant feedback, saves time, and provides the opportunity to continue education in dead time (such as travelling on public transportation or waiting at a bus stop). Also, it facilitates the use of mobile devices, makes it easy to access and share data, satisfies the learning requirements of people with special needs, and provides multimedia support. Furthermore, the fact that it can function without the necessity of having advanced technology is one of its most significant benefits.

Technology acceptance model (TAM), first introduced by Davis in 1989, is a model developed to explain and predict the behavior of computer users [12]. Today, TAM is widely used in order to anticipate individuals' information systems and to "use intentions". The perceived ease of use and the perceived benefits perceived by this model affect the behavior that users have developed against an information system [5].

Mobile technologies support individual and collaborative learning through fast-paced applications and easy network access, giving individuals the opportunity to conduct research, share information, and access information whenever they want.

The use of new technologies and software in education offers new learning opportunities for learners and teachers. This increases the importance of individuals being open to new technologies and adopting these technologies [28].
Purpose of the research

Mobile learning is becoming more popular day by day due to its increased usage in the educational field. There are various studies in the literature that highlight practical applications of mobile learning. These studies have focused on how mobile learning affects motivation, student achievement, self-sufficiency, attitude and readiness level from various different perspectives [25].

People are at the core of deep-rooted mobile learning activities, so the psychological readiness levels of individuals are regarded as the most important factor [19]. Readiness levels can be impacted if people experience difficulties when learning how to use a device. For this reason, if an individual is not satisfied by the technology that he/she is using, they will subsequently avoid using that technology [19]. According to Cheon, Lee, Croocks and Song, the most significant factor that affects the decision to invest mobile learning systems is the readiness levels of its users, namely teachers, students and administrative staff [11].

Cheon, Lee, Croocks and Song (2012) indicated that users at universities should be assessed in terms of their attitudes towards mobile learning before they use mobile learning devices and systems [11]. Bearing this in mind, the reactions of users should be taken into consideration during the creation of mobile learning systems.

Based on the information given above, it can be claimed that the readiness levels and attitudes of the users regarding mobile systems are influential variables in terms of the acceptance of these systems. For this reason, readiness and attitudes of users can be regarded as significant factors in the acceptance of mobile learning systems in the educational community [30].

A university or an institution should be aware of the readiness levels and attitude factors before making the decision to invest in mobile learning systems. If they disregard these factors, unexpected results could emerge if the users do not accept these systems and refuse to use them, thus leading to the expected efficiency not being obtained.

To minimize these types of risk and to create efficient and usable mobile learning systems for its users, the interrelations and effects of these functions to each other must be analysed. The method of designing efficient and usable mobile learning systems is the sole aim of this research by examining the readiness and attitude levels in regard to the acceptance of the use of the existing system.

Problem of the study

Do the readiness levels and attitudes of preservice teachers towards mobile learning have an effect on their acceptance of mobile learning systems?

Sub-Problems
1. Is there a significant relationship between the mobile learning readiness and mobile learning attitude levels of the preservice teachers?
2. Is there a significant relationship between the readiness and acceptance of mobile learning levels of the preservice teachers?
3. Is there a significant relationship between the mobile learning attitude levels and the acceptance of mobile learning systems of the preservice teachers?
4. Are the gender, readiness and attitudes towards mobile learning significant predictors of acceptance of mobile learning systems?

2. Method

Research Design

In this research, the relational survey method, which is one of the quantitative research techniques, was used to detect the relationship between mobile learning readiness levels, attitudes towards mobile learning and the acceptance of mobile learning systems of preservice teachers. The studies in which the participants’ opinions, interests, abilities, attitudes, etc. regarding a situation are identified are known as survey research methods. The relational screening method is a research method that aims to determine whether there is a change between two or more variables and to determine the amount of this change at the same time [7], [9].

Study Group

In this study, 195 teacher candidates who were studying as bachelor students at the faculty of education at a private education in the 2017-2018 academic year comprised the study group of this research and they were selected using a random sampling method.

Data Collection Tools

During the research, three different scale tools were used to collect data from the teacher candidates. One of these tools was used to measure mobile learning readiness, while the other two were mobile learning attitude and acceptance of mobile learning systems scales.
The mobile learning readiness scale was designed by Lin, Lin, Yeh and Wang [27] and adapted into Turkish by Gökçelarslan, Solmaz and Kukul [19]. In this research, the Turkish scale was used to collect the data, because the study group members’ mother tongue is Turkish. At the adaption phase, the study group consisted of 658 students. The readiness scale includes 17 items in total and is divided into three sub-factors. The optimism sub-division of the scale includes 7 conditions, while m-learning self-efficacy has 6, self-directed learning has 4 and the total variance rate explained has been measured as 76.9%. The Cronbach’s alpha reliability coefficient that the scale obtains has been found as .95 by the test-retest method. The test-retest correlation coefficient has been found to be .68. The Readiness scale is 7-point Likert scale where the answers range from 1- ‘Absolutely disagree’ to 7 - ‘Absolutely agree’.

The mobile learning attitude scale was developed by Demir and Akpınar (2016), [13]. This study group comprised 326 education faculty students. As a result of the factor analysis conducted during the design of this scale, the KMO value has been calculated as 93.6 and it has been found that it can only explain 51.116% of the total variance. The Cronbach’s alpha reliability coefficient has been calculated as .95. Based on these findings, the test has proved to be highly reliable. The attitude towards mobile learning scale is a 5-point Likert type scale that ranges from 1 ‘strongly disagree’ to 5 ‘strongly agree’. The maximum score obtainable from this scale is 225 while the minimum is 45. In order to make use of this scale in this research, the required permission was obtained.

The acceptance of mobile learning systems scale has been developed during this research by the researchers. In the process of developing the scale, Davis’s [12] two indicative components in the technology acceptance model, namely the ‘perceived ease of use’ and ‘perceived usefulness’ factors, were taken into account while preparing the items of this scale. These items were presented to two field experts that have previously conducted research in a related field as well as a mobile software developer. Necessary modifications were applied in accordance with the opinions of the field experts.

After these phases, the scale consisting of 10 conditions took its final shape as a 7-point Likert type scale. The 7-point Likert type scale is classified as 1 ‘strongly disagree’, 2 ‘disagree’, 3 ‘partly disagree’, 4 ‘uncertain’, 5 ‘agree partly’, 6 ‘agree’, 7 ‘strongly agree’. The minimum possible score is calculated as 10, while the maximum score is 70. After the scale is ready to use then it has been applied to 195 teacher candidates studying at the university in 2017-2018 academic year.

After its application, ‘Cronbach Alpha’ analysis has been conducted with exploratory factor analysis in order to determine the validity and reliability of the scale. According to values received from exploratory factor analysis, measure of sampling adequacy, the KMO value has been calculated as .893. Generally, KMO values of 0.7 or over are regarded as good, depending on this sample sufficiency of the scale claimed to be good. Furthermore, the Bartlett’s test is found to be significant (p<.05). When examining the load rates of the scale after rotation it has been found that it has two factors. While the 1st, 2nd, 3rd, 4th, 5th and 6th items of the scale comprise “Factor 1”, the 7 th, 8 th, 9th and 10th comprise “Factor 2”. Based on the results of the factor analysis, it is demonstrated that there are two factors, with “Factor 1” named with the sub-factors of ‘perceived usefulness’ and Factor 2 ‘perceived ease of use’. While the total variance is found to be 70.471% by means of exploratory factor analysis, it is also determined that the scale can explain 41.31% of the first factor and 29.16% of the second factor.

According to the results of Cronbach’s alpha reliability analysis, which has been executed to determine the level of acceptance of mobile learning systems, the Cronbach’s alpha value is found as .92 for all the scale, Factor 1’s Cronbach’s alpha value is .92 and for Factor 2 it is .85. When we look at both factor analysis and reliability analysis of the acceptance of mobile learning systems scale, it can be stated that the reliability level is high and valid.

**Data Analysis**

All collected data obtained from the ‘Mobile Learning Readiness’, ‘Mobile Learning Attitude’ and ‘Acceptance of Mobile Learning Systems’ scales have been examined using the IBM SPSS 24 statistical program. Firstly, to designate whether the data shows a normal distribution or not, the obtained data was analysed by the normal-distribution tests of Kolmogorov-Smirnov and Shapiro-Wilks. As a result of the normal distribution tests, it has been observed that while some data groups show normal distribution, some do not. The square root transformation has been used in order to obtain abnormal data sets close to normal data.

A square root transformation was made to the Acceptance of Mobile Learning Systems Scale’s total in order to normalize the data. Since the data showed a normal distribution (p>.05) it is possible to apply parametric tests. Pearson Correlation Analysis has been used for paired relations between variables. Furthermore, to determine if the gender factor affects the paired relations between variables and to compare the Female/Male preservice teacher’s
correlation values, the standardised correlation coefficients difference formula of Field (2013) has been applied [16]. In order to apply this formula, Z values have been calculated using Microsoft Excel. To calculate the Z value, the following formula has been used: \((1/2)^n \ln((1+A_1)/(1-A_1))\).

Correlation value according to gender has been entered into cell A1. In this way, Z value according to gender has been calculated. After calculating the Z value according to gender, the differences among Z values have been calculated by using Field’s (2013) correlation coefficient difference formula: \(Z_r = \frac{Z_{r1} - Z_{r2}}{\sqrt{\frac{1}{N_1}-1}}\). To determine its common effect on readiness and attitudes towards mobile learning, multiple regression analysis has been applied.

Findings

Table 1, presents the results of the Acceptance of Mobile Learning Systems Scale validity and reliability analysis that were developed during the research. According to the factor analysis, the KMO values of sample sufficiency have been calculated as .893. Generally, KMO values over 0.7 are considered good and therefore it can be claimed that the sample sufficiency of the scale is good. Bartlett’s test, on the other hand, has found to be significant \((p<0.05)\). When we examine the scale’s post-rotation load values, we can see that the scale is 2-pointed. Articles 1, 2, 3, 4, 5 and 6 of the scale comprise Factor 1, and articles 7, 8, 9 and 10 comprise Factor 2.

The total variance obtained after Exploratory Factor Analysis is 70.471% for the scale. It has been detected that it explains 41.31% of Factor 1 and 29.16% of Factor 2. As a result of the Cronbach’s alpha reliability analysis that was conducted for reliability of the acceptance of mobile learning systems scale, it has been calculated that the total Cronbach’s alpha value is .924, the Cronbach’s alpha value for Factor 1 is .917 and for Factor 2 it is .846. According to these levels shown in Table 1., it can be stated that the mobile learning reliability scale is highly valid and reliable.

An intermediate level significant relationship has been detected in a positive direction \((p<.01)\) between the readiness for mobile learning and the attitude towards mobile learning \((r=0.515; p<.01)\). According to these results, it could be claimed that as the readiness levels of preservice teachers increase, their attitude towards mobile learning also increases.

According to the values shown in Table 3., there is a low level relationship in a positive respect \((p<.01)\) between readiness level towards mobile learning and the attitude towards mobile learning in terms of the female preservice teachers \((r=0.422; p<.01)\). In terms of the male preservice teachers, there is an intermediate level significant relationship in a positive respect \((r=0.685; p<.01)\). Based on these findings, it can be seen that when the readiness levels of female preservice teachers increase, their attitudes also increase. A similar observation is made for the male teachers, as their readiness levels increase in line with their attitude. While the Z value of the males is 0.83 and their total number was \(N=69\), the Z value of the female teachers is 0.45 and their total number was \(N=126\).

The Z value difference has been calculated as \(0.83-0.45/\sqrt{1/69+1/126} = 0.18\) and its variance is found to be 2.54. Nonetheless, based on the 1.96 critical value, the calculation has been done as 1.96< \(Z< 2.54\). As a result of these calculations, the Z level is greater than Z value, it has been observed that there is a significant difference between the female teacher’s readiness levels towards mobile learning and their attitude in comparison to the men’s and therefore the gender variable has a significant effect on the relationship between readiness and attitude levels. As a result of these calculations, it could be claimed that male candidates have a higher level of readiness and attitude relationship than women have.

According to the values in Table 4., an intermediate, significant relationship has been detected in a positive direction in terms of the Readiness towards Mobile Learning and the Acceptance of Mobile Learning Systems \((r=0.524; p<.01)\). According to these results, it has been observed that when readiness level to mobile learning increases, the acceptance of the mobile learning systems level also increases.

According to the values in Table 5. a low level, significant relationship has been detected in a positive way \((p<.01)\) concerning the relationship between the female preservice teacher’s readiness and acceptance levels \((r=0.392; p<.01)\). For the male candidates, an intermediate level, significant relation in a positive way has been detected \((r=0.697; p<.01)\). In the light of these findings, while the readiness of female preservice teacher candidates increases their acceptance is also likely to increase. The same fact has been observed for the male preservice teachers.
Table 1. Results of acceptance of mobile learning systems scale exploratory factor analysis and reliability analysis

<table>
<thead>
<tr>
<th>Item Numbers</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>Common Variances</th>
<th>Factor Load Values</th>
<th>Load Values after Rotation</th>
<th>Cronbach’s Alpha if Item Deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5.30</td>
<td>1.46</td>
<td>.753</td>
<td>.819</td>
<td>.824</td>
<td>.914</td>
</tr>
<tr>
<td>2</td>
<td>5.04</td>
<td>1.62</td>
<td>.645</td>
<td>.794</td>
<td>.702</td>
<td>.915</td>
</tr>
<tr>
<td>3</td>
<td>5.11</td>
<td>1.61</td>
<td>.742</td>
<td>.827</td>
<td>.801</td>
<td>.913</td>
</tr>
<tr>
<td>4</td>
<td>5.05</td>
<td>1.55</td>
<td>.793</td>
<td>.837</td>
<td>.848</td>
<td>.912</td>
</tr>
<tr>
<td>5</td>
<td>5.35</td>
<td>1.54</td>
<td>.715</td>
<td>.807</td>
<td>.793</td>
<td>.914</td>
</tr>
<tr>
<td>6</td>
<td>5.51</td>
<td>1.53</td>
<td>.609</td>
<td>.750</td>
<td>.724</td>
<td>.918</td>
</tr>
<tr>
<td>7</td>
<td>5.35</td>
<td>1.62</td>
<td>.533</td>
<td>.676</td>
<td>.632</td>
<td>.922</td>
</tr>
<tr>
<td>8</td>
<td>5.40</td>
<td>1.57</td>
<td>.825</td>
<td>.680</td>
<td>.893</td>
<td>.921</td>
</tr>
<tr>
<td>9</td>
<td>5.43</td>
<td>1.53</td>
<td>.778</td>
<td>.772</td>
<td>.810</td>
<td>.916</td>
</tr>
<tr>
<td>10</td>
<td>5.61</td>
<td>1.44</td>
<td>.653</td>
<td>.749</td>
<td>.699</td>
<td>.917</td>
</tr>
</tbody>
</table>

Variance Explained
- Total= 70.47
- Factor 1= 41.31
- Factor 2= 29.16

Kaiser-Meyer-Olkin
- KMO= .893

Bartlett’s Test of Sphericity
- Approx. Chi-Square= 1336.165
- df= 45, Sig= .000

Cronbach’s Alpha
- Total=.924
- Factor 1=.917
- Factor 2=.846

Table 2. Pearson correlation results of analysis to determine the relationship between readinesses for mobile learning with mobile learning attitude

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>R</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Readiness Level</td>
<td>195</td>
<td>.515</td>
<td>.000</td>
</tr>
<tr>
<td>Attitude</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3. Pearson correlation analysis results to detect whether the gender factor affects the readiness levels attitudes towards mobile learning

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>r</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female- Readiness</td>
<td>126</td>
<td>.422</td>
<td>.000</td>
</tr>
<tr>
<td>Attitude</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male- Readiness</td>
<td>69</td>
<td>.685</td>
<td>.000</td>
</tr>
<tr>
<td>Attitude</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4. Pearson correlation analysis results to determine the relationship between readiness level to mobile learning and acceptance of mobile learning systems

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>r</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Readiness-Acceptance</td>
<td>195</td>
<td>.524</td>
<td>.000</td>
</tr>
</tbody>
</table>
Table 5. Pearson correlation analysis results to determine whether the gender factor has an effect on the relationship between the readiness level to mobile learning and the acceptance of mobile learning systems

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>r</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Woman- Readiness</td>
<td>126</td>
<td>.392</td>
<td>.000</td>
</tr>
<tr>
<td>Acceptance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Man- Readiness</td>
<td>69</td>
<td>.697</td>
<td>.000</td>
</tr>
<tr>
<td>Acceptance</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

While the Z value for the male teachers is $Z=0.86$ and their numbers are $N=69$, the female teachers’ Z value is $Z=0.41$ and their numbers are $N=126$. The Z value variation has been calculated as $0.86 - 0.41 = 0.45$. According to these calculations, the Z value difference is 0.45. Based on the critical rate of 1.96, it has been found that $1.96 < Z < 2.93$. Based on these calculations, as the Z value variation is greater than the Z value, it has been detected that there is a meaningful difference between the readiness and acceptance relationship levels and the gender factor has a significant effect on these levels.

Based on these results, it could be claimed that male preservice teachers have even more powerful relationship rates than women relating to the readiness level to mobile learning and the acceptance of mobile learning systems.

According to the values in Table 6., there is an intermediate significant relationship in a positive direction between attitude and acceptance ($p<.01$), ($r=.670$; $p<.01$). Based on these results, it could be claimed that when the preservice teachers’ attitudes towards mobile learning increase, their acceptance levels also increase.

According to the values in Table 7., an intermediate significant relationship has been determined ($r=.614$; $p<.01$) in a positive way concerning the relationship between attitude and acceptance ($p<.01$) levels. In regard to the male candidates, a powerful significant relationship in a positive way ($r=.762$; $p<.01$) has been detected. Based on this finding, when the female preservice teachers’ attitude levels increase, their acceptance levels also increase.

The same has also been observed for the male preservice teachers. The Z value for the male teachers is $Z=1.00$ and numbers are $N=69$ while the female teachers’ Z value is $Z=0.71$ and numbers are $N=126$. After each gender’s Z value has been calculated, the Z value difference has been calculated as $1.00 - 0.71 = 0.29$. Consequently, it has been found that the Z difference is 0.29. Accordingly, based on the critical value of 1.96, it has been found that $1.96 > Z > 0.29$. As a result of these calculations, as the Z difference rate is smaller than the Z critical rate, a significant difference between the attitudes and acceptance levels of the male and female preservice teachers was not found.

According to these results, it could be said that there is not a significant difference between the relationship of acceptance and attitude levels of male or female preservice teachers.

According to the values in Table 8., in order to determine the extent to which the variables of readiness, attitude levels and gender factors affect the usage of mobile learning systems’ usage in educational fields, Multiple Regression Analysis has been applied. According to the results, a noteworthy relationship has been detected ($R=.707$, $R^2=.500$) concerning their acceptance of mobile learning systems ($F= 63.384$, $p<.01$).

The gender, readiness level and attitude variables, which are considered to be influential on the acceptance of mobile learning systems, explain 50% of the fact. According to the standardised regression coefficient of the predictor variables that affect the acceptance of mobile learning systems, the order of importance is attitude ($β=.568$), readiness ($β=.219$) and gender ($β=.021$). When significance tests are analysed, it is observed that only the readiness and attitude ($p<.01$) variables from the predictor variables are significant/noteworthy variables in terms of the acceptance of mobile learning systems.
Table 6. Pearson correlation analysis results to determine the relationship between attitude towards mobile learning and acceptance of mobile learning systems

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>r</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude-Acceptance</td>
<td>195</td>
<td>.670</td>
<td>.000</td>
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</tbody>
</table>

Table 7. Pearson correlation analysis results in order to determine whether the gender factor has an effect on the relationship between attitude towards mobile learning and the acceptance of mobile learning systems

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>r</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Woman-Acceptance</td>
<td>126</td>
<td>.614</td>
<td>.000</td>
</tr>
<tr>
<td>Man-Acceptance</td>
<td>69</td>
<td>.762</td>
<td>.000</td>
</tr>
</tbody>
</table>

Table 8. Multiple regression analysis results to determine whether the readiness level towards mobile learning and attitude towards mobile learning of preservice teachers have an effect on their acceptance of mobile learning systems

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>β</th>
<th>t</th>
<th>p</th>
<th>Paired r</th>
<th>Partial r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-.529</td>
<td>.232</td>
<td>-2.280</td>
<td>.024</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Readiness</td>
<td>.400</td>
<td>.112</td>
<td>.219</td>
<td>3.578</td>
<td>.000</td>
<td>.524</td>
</tr>
<tr>
<td>Attitude</td>
<td>.971</td>
<td>.106</td>
<td>.568</td>
<td>9.122</td>
<td>.000</td>
<td>.682</td>
</tr>
<tr>
<td>Gender</td>
<td>-.012</td>
<td>.031</td>
<td>-.021</td>
<td>-.398</td>
<td>.691</td>
<td>.099</td>
</tr>
</tbody>
</table>

r = .707  r² = .500
F = 63.384  p = .000

According to the results of this analysis, the gender variable has not been determined to be a predictor (p > .01). When the relationship between predictor variables and the acceptance of mobile learning systems correlations have been detected, in examination of attitude with r = .682, with readiness r = .524 and with gender r = .099. The regression equation that predicts the acceptance of mobile learning systems is shown below:

Acceptance of Mobile Learning Systems = (.971 * attitude scale point) + (.400 * readiness scale point) + (-.012 gender [men]) + (-.529).

3. Discussion and Conclusion

Discussion

Mobile devices are now becoming as popular in the work and education communities as they are in our daily lives. Nowadays, universities from different countries around the world have been developing various mobile learning systems to integrate the mobile devices that are now widely used in our daily lives in educational programs.

When the related literature is examined, various research that has been conducted towards mobile learning has shown that it increases student motivation, develops problem solving skills, promotes lifelong learning, and reflects positively on academic success [3], [4], [10], [14], [15], [20], and [32].

The people factor is the foundation of an efficient mobile learning activity and physiological readiness is considered as a significant variable in terms of benefiting from these activities properly [22]. Bearing in mind that the readiness level is an important factor in the acceptance levels of mobile learning systems, the relationship between readiness, the attitude to mobile learning and acceptance levels of teacher candidates has been examined, and it has been found that there is a significant relation in a positive respect. According to these results, it has
been observed that as teacher candidates’ readiness levels are increasing, their attitude towards mobile learning and their acceptance levels are also increasing.

Cheon, Lee, Crooks and Song (2012) advocated it is important to consider attitude before implementing mobile learning [12]. According to Liaw and Huang (2011), determining the attitude towards mobile learning not only provides the opportunity to develop a suitable environment for mobile learning, but also has a prominent role in the acceptance of mobile learning systems to be used in educational activities [26]. Based on all these reasons, the attitudes of people towards mobile learning is an influential factor on the usage of mobile learning systems, therefore the relationship between attitudes and the acceptance level of teacher candidates has been examined. As a result of these findings, a positive relationship has been determined between attitude and acceptance levels, which leads to the conclusion that as the attitude towards mobile learning is increasing then the acceptance is also increasing.

Conclusion

It has been concluded that an intermediate positive relationship exists according to the paired correlation relations; when one increases, the other also increases in a positive direction. Furthermore, the gender factor has a significant effect on readiness and attitude level relations as well as readiness and acceptance level relations and, according to these calculations, it has also been observed that male candidates have higher levels of variable interrelation than female preservice teachers.

However, no difference has been found concerning the relationship between the attitude and acceptance levels of female and male preservice teachers. At the end of multiple regression analysis, which was conducted in order to determine the effects of readiness and attitude levels that were assumed to be effective in the acceptance of mobile learning, it has been found that each variable (readiness and attitude) affects the acceptance level at a significant level (as a predictor). According to the multiple regression analysis results, the gender variable is not a predictor. Based on the findings obtained during this research, it could be claimed that as the readiness and attitude levels increase, the acceptance of mobile learning system by users would also increase.

Recommendations

Mobile learning systems could be designed based on the potential user profile by considering the level readiness and attitude levels regarding the acceptance of mobile learning systems.

With this research, it has been examined how the gender factor predicates the acceptance of mobile learning by means of readiness and attitude levels. Alternatively, different variables could be used, such as technology acceptance, attitude towards distance learning, social media usage status etc. to determine the extent to which these variables are suitable predictors of the acceptance of mobile learning systems. Considering the predication levels of these variables on the acceptance level, designs could be developed accordingly.

Similarly, research could be conducted to determine the satisfaction, attitude and acceptance rates of students in universities regarding the use of mobile learning systems. Such research could be beneficial in increasing the present mobile learning systems to a more efficient and productive level, thus encouraging greater acceptance of mobile learning systems.

References

## Attachment

<table>
<thead>
<tr>
<th>Mobile Learning Systems Acceptance Scale</th>
<th>1= Strongly Disagree</th>
<th>2= Disagree</th>
<th>3= Partly Disagree</th>
<th>4= Uncertain</th>
<th>5= Partly Agree</th>
<th>6= Agree</th>
<th>7= Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 I think mobile learning systems are very useful.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Using mobile learning systems increases my course performance/level of success.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Using Mobile Learning Systems helps me to learn faster.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Using Mobile Learning Systems increases my productivity in courses.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 I think Mobile Learning systems are functional.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 I will be glad Mobile Learning Systems to be included at my department.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 I have no difficulty in using Mobile Learning Systems.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 Using Mobile Learning Systems is pretty easy for me to learn.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 Mobile Learning Systems is quite easy to use.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>10 I can make use of Mobile Learning systems in any time of the day without place and time limitation.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>