


INVESTIGATING THE ACCEPTANCE OF MOBILE E-PORTFOLIO AS AN E-LEARNING TOOL BY PRE-SERVICE TEACHER EDUCATION PROGRAM STUDENTS

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ПРИНЯТИЯ МОБИЛЬНОГО ЭЛЕКТРОННОГО ПОРТФЕЛЯ В КАЧЕСТВЕ ЭЛЕКТРОННОГО УЧЕБНОГО ПОСОБИЯ СТУДЕНТАМИ ПЕДАГОГИЧЕСКИХ ВУЗОВ

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ABSTRACT

The aim of the research was to conduct quantitative analysis of mobile e-portfolio acceptance by pre-service teacher education program students. Technology Acceptance Model developed by Davis was used in the study to identify the influence of perceived ease of use, perceived usefulness, attitude towards the use of e-portfolio on the intention to use it. 136 respondents from three different higher education institutions took part in the survey. The data obtained in the survey was analyzed by applying linear regression analysis. Findings of the research suggest that perceived ease of use, perceived usefulness and attitude to the use of e-portfolio have a significant impact on
students’ intention to use the e-portfolio. Among them, attitude towards the use of e-portfolio was the most significant factor that influences the intention to use mobile e-portfolio.

АННОТАЦИЯ

Целью исследования явилось проведение количественного анализа принятия мобильного электронного портфолио студентами педагогического университета. Разработанная Дэвисом модель принятия технологии (TAM) была использована в исследовании для выявления влияния воспринимаемой простоты использования, воспринимаемой полезности, отношения к использованию электронного портфолио на намерение его использовать. В опросе приняли участие 136 респондентов из трех различных высших учебных заведений. Полученные в ходе опроса данные были проанализированы с применением линейного регрессионного анализа. Результаты исследования свидетельствуют о том, что воспринимаемая простота использования, воспринимаемая полезность и отношение к использованию электронного портфолио оказывают значительное влияние на намерение студентов использовать электронное портфолио. Среди них наиболее значимым фактором, влияющим на намерение использовать мобильный электронный портфель, было отношение к использованию электронного портфеля.

Key words: technology acceptance, e-portfolio, perceived ease of use, perceived usefulness, attitude, intention to use technology

Ключевые слова: принятие технологий, электронный портфель, воспринимаемая простота использования, отношение к использованию технологий, намерение использования технологии

INTRODUCTION

Paradigm shift in education and with the development of information technologies, portfolio technology moved from paper-based format to electronic format as a result of which features of portfolio were enhanced by adding interactivity, portability, shareability and less teacher workload opportunities. At present, due to recent developments in internet and smart technologies, integration of those technologies to education, electronic portfolios or e-portfolios are seen as an indispensable part of many courses and programs ranging from school to tertiary and professional education.

REVIEW OF LITERATURE

E-portfolios

Review of relevant literature on electronic portfolio use suggest flexibility of e-portfolio in terms of developing learning skills, feedback, reflection, assessment, accessibility, maintenance, cost efficiency, and privacy. According to Abrami and Barrett, e-portfolio enables students to hone their technology skills [1]. Students working with e-portfolios along with developing their self-directed learning, and self-assessment skills enhance their digital literacy skills. Miller and Packard [13] consider e-portfolios an excellent tool for developing users’ critical thinking and problem-solving skills. Ease of access to e-portfolios, add-ons embedded to e-portfolios, such as uploading and downloading multimedia files as images, learning artefacts and samples of student learning progress, offer wide variety of ways showcasing students’ learning as well as documenting their progress in learning. Many electronic portfolios created on the basis of an online platforms such as Google Sites, WordPress and independent websites suggest the use of forum discussions, where students share their experience of learning a foreign language and this offers students an opportunity to exchange ideas and peer-feedback on each other’s learning [6]. As in normal portfolios, which put reflection as a focal point and focus of their use, e-portfolios also enable students enhance reflective thinking skills. It can be facilitated by features such as connecting, tagging and creating meaning out of past learning experience [9, 14]. Another important aspect of portfolio is its function in documenting students’ learning. The function is grounded on socio-cultural perspective on learning which suggests that artefacts play an indispensable role in simplifying learning. Thus, e-portfolios allow users to collect artefacts of their learning in various formats ranging from audio, video files, typescripts and other multimedia elements [7].

Number of studies suggest that e-portfolios are cost-effective compared to hard copy portfolios, they are portable, easy to access. Furthermore, mobile technologies and widespread use of mobile phones, tablets and other portable devices paved the way for designing and developing mobile versions of e-portfolios. Portability of electronic portfolios allow their users to share with their portfolio with relevant stakeholders, potential employers and other stakeholders at a tip of their finger. Students working with their portfolios can share their works with their teachers at a distance and teachers can access, evaluate their progress and if needed feedback on it from distant locations. Therefore, e-portfolios apart from being effective tool for learning also saves time and reduces workload for teachers, who may cope with monitoring students’ progress without meeting them face to face.

At present many pre-service and in-service teacher education programs at higher education institutions and colleges across the world are employing and implementing portfolios to their programs in order to provide tool for documenting growth, fostering reflective thinking skills and self-assessment [12]. As a result, students and learners were given an effective tool for identifying and documenting their achievements in learning, personal development, motivating them towards learning and sustain their motivation, and identifying their capabilities and skills. This in turn, led to considerable improvements in delivering quality education.

Uzbek Model of European Language Portfolio (UzELP) electronic version 1.0 was developed with a view of providing interactivity to paper-based model of UzELP. E-portfolios unlike the paper-based versions
enable students to access, update, store and present their portfolios in various formats [2]. The e-version of UzELP unlike paper-based copy also provides such features as notifications on due dates of set goals according to Common European Framework (CEF) scales and descriptors given in self-assessment checklist, which enable students to be reminded of their goals set for language skills development. Additionally, reporting function of the portfolio was immensely elaborated in the e-version of the portfolio with such functionalities as downloading the portfolio in PDF format, sending the copy of portfolio to various stakeholders, ranging from teachers, parents, and potential employers. Moreover, given the complexity and time-consuming nature of selecting, recording and documenting relevant proofs or artefacts of language portfolio users’ language competence development, the e-version comes with an add-on that enables students to upload relevant documents that may go into Dossier section of the portfolio in image, or other multimedia file formats. Nevertheless, in order to ensure the efficiency of e-version of UzELP it was decided to study it in terms of its user-friendliness, ease of navigation, and performing the same functions as the hard-copy version of the ELP. In this regard, we consider that the electronic version of the Uzbek Model of ELP needs to be investigated within the Technology Acceptance Model (TAM).

TAM proposed by Davis [4] presents a genuine, straightforward, and widely studied model which rests on the Theory of Reasoned Action developed by Fishbein and Ajzen. TAM puts forward four important constructs that determine the acceptance of information communication technologies. They are perceived usefulness of technology, perceived ease of use, attitude towards the technology, and intention to use the technology (see Figure 1).

Acceptance of technology may be influenced by such factors as users’ competence in adopting and employing it, users’ perception of the usefulness of technology in accomplishing certain tasks and reaching certain goals, technology’s user friendliness as well as its convenience.

**Figure 1. Technology Acceptance Model by Davis**

Other significant variables that may influence the technology acceptance can be social norms accepted in terms of adopting and using the technology.

Analysis of relevant sources revealed that a great number of research studies used Technology Acceptance Model to evaluate the efficiency of e-portfolios. In the study by Shroff et al. [10] TAM was adapted with an aim of identifying students’ behavioral intention to use e-portfolio. According to the results of the study, perceived ease of use had a significant impact on students’ attitude to the use of e-portfolio. In the meantime, perceived ease of use had a significant influence on the perceived usefulness of the e-portfolio system.

A study conducted by Zainal-Abedin et al. [15] aimed at identifying the factors behind lower rate of e-portfolio use among students. Their findings suggest that users’ awareness of the system use, its importance, and usefulness in terms of attaining certain learning tasks influence students’ willingness to use the e-portfolio.

In their study of acceptance of e-portfolio, Chen et al. [3] found that students’ attitude towards e-portfolio is the strongest and the most important factor that determines their intention to use e-portfolio. Overall, the review of literature suggests that TAM seems to be the robust model to evaluate system acceptance by its prospective users.
A survey based on TAM proposed by Davis was designed to evaluate the acceptance of the electronic version of UzELP. The survey contained 18 Likert type scale questions divided into 4 sections: Perceived Usefulness of UzELP (PU), Perceived Ease of Use of UzELP (PEOU), attitude to the use of UzELP (ATT), and intention to use the UzELP (IU). The aim of the study was to determine which of the three factors influence the acceptance of UzELP. For this purpose, 3 hypotheses were formulated:

**Hypothesis 1**: attitude towards the use of UzELP has a significant effect on the intention to use UzELP.

**Hypothesis 2**: perceived usefulness (PU) has a significant effect on the intention to use the UzELP.

**Hypothesis 3**: perceived ease of use (PEOU) has a significant impact on the intention to use the UzELP.

**METHODS**

Initial model of TAM was used to determine the effect of PU, PEOU and ATT on student participants intention to use the e-version of UzELP. The findings of the analysis enabled to identify the pitfalls in the system and improve the user-friendliness of the e-portfolio. In order to address the acceptance of UzELP, a survey was designed that consisted of 18 items measured on five-point Likert type scale. All items in the survey were coded as 1 for “Strongly Disagree” and 5 for “Strongly Agree”. The instrument was divided into four sections. Statements from 1 to 4 addressed perceived usefulness (PU) of UzELP, statements from 5 to 10 aimed at determining perceived ease of use (PEOU) of UzELP, statements 11 to 14 focused on attitude towards the use (ATT) of UzELP, and final section, statements 15 to 18 addressed students’ intention to use e-version (IU) of UzELP.

After designing the survey tool, its reliability was assessed using Cronbach’s alpha test in SPSS v.17 statistical software. Cronbach alpha was employed to check the internal consistency of factor items and reliability of each scale was measured separately (see Table 1). Cronbach alpha of between 0.70 and 0.90 has been recommended for Likert type scales [11]. The overall reliability indicator of the survey tool was equal to 0.90 (α=0.90).

<table>
<thead>
<tr>
<th>Reliability Analysis of the Scale: Cronbach’s Alpha Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor</td>
</tr>
<tr>
<td>------------------------</td>
</tr>
<tr>
<td>Perceived Usefulness</td>
</tr>
<tr>
<td>Perceived Ease of Use</td>
</tr>
<tr>
<td>Attitude towards UzELP</td>
</tr>
<tr>
<td>Intention to Use</td>
</tr>
</tbody>
</table>

In order to provide access of the survey to a wider audience of participants it was decided to disseminate it through Google Forms platform. 142 students who downloaded the UzELP from Google Play and who had been using the UzELP electronic version for more than three weeks were asked to fill in the survey. Out of 142 students 136 (N=136) filled in the survey. The response rate was equal to 95.7%.

**RESULTS AND DISCUSSION**

The data obtained from the survey was manipulated using SPSS 17.0 statistical software, which allowed to calculate mean, standard deviation values for each item response in the survey (see Table 2). As shown in Table 2, mean value for questions in the first section of the survey ranged from 3.67 to 4.05 which indicates that majority of the respondents chose the answer “agree” and “strongly” agree in statements 1 to 4 (Mean value=3.84). High mean value shows that students appreciate usefulness of e-portfolio as an e-learning tool in their language learning. Mean value of the second section statements 5 to 10 was equal to 3.54, which indicates that the most common responses to these statements were “agree” and “strongly agree”. Mean value of the items addressing attitude towards the use of UzELP accounted for 3.57, statement 12 being with the lowest mean value (3.44). This is explained by the fact that not many students found using electronic version of UzELP to be enjoyable. This could be explained by the fact that initially when the mobile e-portfolio was launched, it initial version released on Google Play contained several bugs that hindered usability of the portfolio. Finally, the mean value of the responses that addressed intention to use UzELP was equal to 3.75, which is the second highest mean value after perceived usefulness (3,84).

<table>
<thead>
<tr>
<th>#</th>
<th>Item Description</th>
<th>GSU, UzSWLUI, SamSFLI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
</tr>
<tr>
<td>1</td>
<td>Elektron portfolio funksiyalaridan foydalanish men uchun foydali deb hisoblayman</td>
<td>4,05</td>
</tr>
<tr>
<td>2</td>
<td>Elektron portfoliodan foydalanish mening til o’rganishima ijobiy ta’lisir ko’rsatadi</td>
<td>3,82</td>
</tr>
<tr>
<td>3</td>
<td>Elektron portfoliodan foydalanish ta’lim olishim samaradorligi oshiradi</td>
<td>3,67</td>
</tr>
<tr>
<td>4</td>
<td>Umuman olganda, elektron portfolio foydali</td>
<td>3,85</td>
</tr>
<tr>
<td></td>
<td>Mean Value</td>
<td>3,84</td>
</tr>
<tr>
<td>5</td>
<td>Elektron portfoliodan foydalanish men uchun oson</td>
<td>3,55</td>
</tr>
</tbody>
</table>

Table 2
After analyzing the survey items, it was decided to identify which of the 3 factors (PU, PEOU, ATT) has the most effect or impact on students’ intention to use (IU) the e-version of UzELP.

Before conducting linear regression analysis, the data obtained in the survey was checked whether there is a linear relationship in the data. A scatterplot given in Figure 2 indicates that there is positive relationship between the variables.

### Participants N=136

<table>
<thead>
<tr>
<th></th>
<th>Statement</th>
<th>Mean Value</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Elektron portfolioning men istagan vazifani bajarishga moslashirish oson deb bilaman</td>
<td>3.61</td>
<td>1.26</td>
</tr>
<tr>
<td>7</td>
<td>Undan qanday foydalanish kerakligini eslab qolish oson</td>
<td>3.58</td>
<td>1.37</td>
</tr>
<tr>
<td>8</td>
<td>Mening elektron portfolio bilan muloqotim aniq va tushunarli</td>
<td>3.55</td>
<td>1.31</td>
</tr>
<tr>
<td>9</td>
<td>Hamma elektron portfoliodan qiyalmasdan foydalanishi mumkin</td>
<td>3.52</td>
<td>1.40</td>
</tr>
<tr>
<td>10</td>
<td>Umuman olganda elektron portfoliodan foydalanish oson</td>
<td>3.73</td>
<td>1.24</td>
</tr>
<tr>
<td>11</td>
<td>Mean Value</td>
<td>3.54</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Elektron portfoliodan til o’rganish jarayonida foydalanish yaxshi fikr</td>
<td>3.64</td>
<td>1.26</td>
</tr>
<tr>
<td>13</td>
<td>Elektron portfoliodan foydalanish maroqli</td>
<td>3.44</td>
<td>1.19</td>
</tr>
<tr>
<td>14</td>
<td>Elektron portfoliodan men uchun ijobiy ahamiyatga ega</td>
<td>3.67</td>
<td>1.08</td>
</tr>
<tr>
<td>15</td>
<td>Mean Value</td>
<td>3.55</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Elektron portfoliodan foydalanishda davom etishim ehtimoli yuqori</td>
<td>3.76</td>
<td>1.37</td>
</tr>
<tr>
<td>17</td>
<td>Til o’rganish jarayonida elektron portfolio imkoniyatlaridan foydalanishda davom etaman</td>
<td>3.73</td>
<td>1.36</td>
</tr>
<tr>
<td>18</td>
<td>Elektron portfoliodan foydalanishni boshqa til o’rganuvchilarga ham tavisya qilaman</td>
<td>3.73</td>
<td>1.40</td>
</tr>
<tr>
<td></td>
<td>Mean Value</td>
<td>3.75</td>
<td></td>
</tr>
</tbody>
</table>

![Figure 2. Linear Relationship between Variables](image)

The significance of each hypotheses was tested using regression test in SPSS 17.0 statistical software (See Table 3 for the summary of the hypotheses tests). ATT, PEOU, and PU were identified as independent variables and IU was taken as a dependent variable in linear regression test.  
Hypothesis 1: attitude towards the use of UzELP has a significant effect on the intention to use UzELP.
As shown in Table X, regression analysis was used to test the first hypothesis which is aimed at identifying whether students’ attitude towards the use of UzELP has an impact on their intention to use it. According to the test there is a strong relationship between the two variables ($p = 0.00$). Regression analysis results of the value of $R^2$ was equal to 0.779, which indicates that the predictor factor (ATT) explains 77% of intention to use (IU).

### Linear Regression Test Summary of Hypotheses

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Dependent Variable</th>
<th>Unstandardized Coefficients</th>
<th>$F$</th>
<th>$t$</th>
<th>$P$</th>
<th>$R^2$</th>
<th>Hypothesis supported</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude to Use UzELP</td>
<td>Intention to Use UzELP</td>
<td>1.119 0.051</td>
<td>472</td>
<td>21.7</td>
<td>0.00</td>
<td>0.779</td>
<td>Yes</td>
</tr>
<tr>
<td>Perceived Usefulness of UzELP</td>
<td>Intention to Use UzELP</td>
<td>0.957 0.071</td>
<td>182.2</td>
<td>13.5</td>
<td>0.00</td>
<td>0.759</td>
<td>Yes</td>
</tr>
<tr>
<td>Perceived Ease of Use of UzELP</td>
<td>Intention to Use UzELP</td>
<td>0.792 0.061</td>
<td>170.4</td>
<td>13.0</td>
<td>0.00</td>
<td>0.748</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Hypothesis 2**: perceived usefulness (PU) has a significant effect on the intention to use the UzELP.

Next hypothesis was aimed at checking the extent to which perceived usefulness factor influences students’ intention to use the electronic version of UzELP, perceived usefulness (PU) being independent variable and intention to use being dependent variable. The $p$-value shows a significant relationship between the two factors ($p=0.00$). The results of linear regression analysis have shown that $R^2$ equation was equal to 0.75, which indicates that the contribution of the factor (PU) to students’ intention to use (IU) the UzELP accounts for 75%.

**Hypothesis 3**: perceived ease of use (PEOU) has a significant impact on the intention to use the UzELP.

The third hypothesis was intended to test the extent to which perceived ease of use contributes to students’ intention to use the UzELP. For this purpose, PEOU was determined as independent variable, while IU was identified as a dependent variable. The $p$-value shown in table X indicates that there is significant relationship between the two variables. Linear regression analysis results show that $R^2$ is equal to 0.74 which indicates that the contribution of the perceived ease of use factor to students’ intention to use the UzELP is equal to 74%.

In summary among all the factors that contribute to students’ intention to use the electronic version of UzELP, the most significant factor was found to be attitude to use UzELP ($R^2=0.779$). However, the study also indicates that there is a significant relationship between PU, PEOU, ATT, and IU. The findings of our research in terms of acceptance of UzELP as an e-portfolio tool are consistent with the findings of Chen et al. [3], who found that attitude (ATT) is the most significant predictor of the intention to use (IU) e-portfolio.

**CONCLUSION**

Successful integration of electronic portfolio also depends on its acceptance by users. A number of factors
influence users’ acceptance of new technology and understanding underpinning factors enable developers and curriculum designers to effectively implement new e-learning technologies into educational settings. Therefore, based on the previous empirical research and secondary data it was decided to evaluate the students’ acceptance of e-learning technology in portfolio format. The aim of evaluating qualities of electronic version of UzELP was to estimate lapses and logs, estimate student users’ perception of e-portfolio and their attitude towards it as well as their further intention to use it. For the purpose of the present study constructs of Technology Acceptance Model (TAM) proposed by Davis were taken as variables.

The findings of the research suggest that pre-service teacher education program students’ attitude towards the use of UzELP mobile version significantly influence their intention to use the UzELP. It was concluded that in order to improve students’ attitude towards the e-portfolio, its value in terms of developing students’ self-assessment skills, autonomous language learning, and self-monitoring, self-management skills should be discussed. Moreover, integration of the portfolio to the curriculum of the course perhaps will improve their willingness to use it as an additional learning tool and as a result lead to develop their positive attitude towards its use.

REFERENCES