Adoption of Distance Education and Mobile Technology by University Students

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Abstract—The aim of this study is to determine the adoption of distance education and mobile technology by university students. Quantitative research method was used in the study. The research was conducted in the fall semester of 2021-2022. Volunteer 412 university students continuing their education in Kazakhstan participated in the research. In the research, 3-week online education mobile technology training was given to university students. "Mobile Technology in Education" measurement tool developed by the researchers and compiled by experts in the field was used in the research. The measurement tool was delivered and collected by university students via online method. The analysis of the data was made by using the SPSS program, frequency analysis, t-test, and the results were added to the research in the presence of tables. According to the results obtained from the research, it was concluded that there was a significant difference between the post-test mobile technology status of university students and that their mobile technology status was high.

Keywords—mobile technology, distance education, university students, quantitative research

1 Introduction

Today, mobile technology finds a lot of use, from communication to education and all. The importance of digitalization is increasing, especially because it provides advantages in many aspects such as speed, cost and time [1]. It is known that one of the usage areas in question is the field of education, it can be said that it has been the focus of attention in recent years because it provides the integration of education components by eliminating the space and time limit with mobile technology [2]. It is seen that with the improvement of mobile technology and internet, equivalent technologies and methods have emerged. It is seen that the use of mobile technology has increased intensively due to COVID-19 with distance education. In addition, it is estimated that the use of this and similar technology will continue, as there is still

uncertainty around the world about how long this time period will continue. The most important stakeholders of mobile technology application are actors taking part in educational activities [3]. With this method, it is an important issue whether the mobile application serves the determined purpose, and in which subjects it provides services. It is thought that the adoption level of the mobile application users and their expectations from the application are an important issue that should be emphasized [4]. Distance education, which serves this purpose, and whether the variables of ease of use of mobile technology and perceived pleasure have an effect on perceived usefulness and perceived intention are tested with the model created within the scope of the research [5]. While contributing to the development of mobile digital applications similar to distance education is among other purposes, it is thought that it will contribute to the literature in terms of perceived ease of use, functionality and perceived intention variables, determining the level of adoption of digital applications, and expanding the usage areas for the pandemic process and after [6].

It is essential to encounter various meanings related to distance education and e-learning in research articles. It is seen that distance education is defined as a type of education that students and teachers in different environments perform with communication technologies and postal services [7]. It is defined as "any learning, teaching or educational activity enabled by the use of well-known mobile technologies, especially internet technology-based applications" [8]. Distance education is a broad concept that includes applications and processes such as technology-based education, mobile-based education, online classroom models and digital collaboration. It is seen that distance education enables students to take responsibility for their own learning [9]. It is expected that students will be able to create equal opportunities in education and enable them to benefit from lifelong education, and course materials can be easily updated, when necessary, with mobile technology [10]. Students' perspectives and the integration of these technologies into the process are of great importance in order to include these advantages brought by distance education into the teaching process [11]. It is known that determining the key factors affecting the perspectives of learners on distance education and mobile technology together will create significant advantages for both universities and businesses [12].

1.1 Related studies

In their study, [13] aimed to evaluate the factors affecting university students' adoption of mobile technologies for mobile learning (m-learning) in their learning processes, and according to this, in their research, they found that students' adoption behaviours towards mobile technology adoption and students' benefit and perceived ease of use. It has been found that it has a direct positive effect on the structures.

In his planned studies, [14] aimed to investigate the factors that predict online students to use the mobile learning management system (m-LMS), and as a result, it is valid for low-income students with digital literacy skills and limited access and for many students, While institutions primarily teach in online modalities during the COVID-19 pandemic, it is seen that mobile technology is the only way for them to continue taking courses.

In the research conducted by [15], they aimed to investigate the perceptions of students about the Madrasa platform and also to determine the important factors that may affect the adoption of the Madrasa platform. and that it can help facilitate and encourage the use of the Medrasati platform among students.

As seen in the related research section, when distance education technologies and mobile applications are combined with the course, it is seen that they benefit the field and both the trainers and the people who take the course. Research will continue on distance education and mobile learning.

1.2 Purpose of the study

The aim of this study is to determine university students' adoption of distance education and mobile technology. In order to achieve the aim of the research, answers to the following questions were sought:

1. What is the distance education performance status of the participant groups participating in the research?
2. What is the general level of acceptance of mobile technology by the participant groups participating in the research?
3. Is there a difference between the levels of acceptance of distance education by the participant groups participating in the research?
4. Is there a difference between the distance education and performance levels of the participant groups participating in the research?
5. Is there a difference between the levels of following the mobile technology and distance education of the participant groups participating in the research?

2 Method

Research method the research method used was in the hands in which the partial is being monitored when given information about if the numerical values in the type and source of the method section in research, data collection instruments and the information given is compiled according to the study, are arranged.

2.1 Research model

The model used in the research is seen as a quantitative research model, and it is known that with this model, the ideas and behaviors of the participant audience will be reached and benefited from. When the quantitative research model is considered, when we collect data about this model, it is seen that this method reveals the answers of numerical and statistical findings. In addition, since this method is based on numbers, the sample representing the event or phenomenon should be determined completely and the right questions should be asked [16]. In addition, the aim of the study was continued by patterning according to the determination of university students to adopt distance education and mobile technology.

2.2 Working group/participants

The research was carried out in the fall academic year of 2021-2022. It is seen that the data of the research consists of 412 participant groups randomly studying at the university in Kazakhstan. All of these students take their courses by linking distance education and mobile technologies.

Gender. In this section, the gender status of the participants participating in the research was examined and detailed information is given in Table 1.

Table 1. Distribution of University Students by Gender

Gender	Male		Female	
	F	***%***	***F***	***%***
Variable	207	50.24	205	49.76

As seen in Table 1, it is seen that the gender data of the participant groups participating in the research are included, in this context, it is stated that 50.24% (207 people) are male participants, while 49.76% (205 people) are female participants. In the gender section, the findings reflect the actual gender distribution.

Class. In this section, the class variable conditions of the population participating in the research were examined and detailed information is given in Table 2.

Table 2. Distribution of Students Participating in the Study by Class

Class	3.Class		4.Class	
	F	***%***	***F***	***%***
Variable	170	41.26	242	58.74

As can be seen on the Table 2 given in the research, it is seen that the class distributions of the study group participant groups are given and examined. It appears to be in the 4th grade range. In the Class division, the findings reflect the actual Division distribution.

Does encountering distance education in the classroom environment affect performance positively? An answer was sought to the question of whether seeing the participant groups included in the study in a classroom environment with distance education affects your performance, and their distribution is given in Table 3.

Table 3. Distance Education technologies performance status

Related Question	Yes		No	
	F	***%***	***F***	***%***
Variable	408	99.03	4	0.97

When Table 3 is examined, 99.03% (408 people) of the participants included in the study answered yes, while 0.97% (4 people) answered no, it can be said from this table that a positive result will be obtained if the participants of the study are processed in the classroom environment with distance education.

2.3 Data collection tools

In the data collection tool section, it is seen that first of all, information will be given about which type of data collection tool will be used in the study. Data collection instruments in research of mobile technology distance education and the views of the participants to get the dimensions to increase, it is known that in the course of preparing this technology also examined by experts from research and the data collection tool was prepared to be correct by subtracting sallastirilm unsuitable materials. The personal information form developed by the researchers, which is called the ”Mobile Technology in Education" data collection tool and applied to the groups of participants participating in the study, was used. The scope validity of the developed measurement tool was examined by experts with the title of 4 professors who work on distance education systems and mobile technology platforms, and unnecessary items were removed from the measurement tool and rearrangements were made.

1. Personal Information Form (Demographic Data): In the personal information form, information such as gender, class, mobile technology performance effects are included.
2. Mobile Technology in Education Data Collection Tool: A 5-point likert-type questionnaire was prepared in order to get information about the opinions of the participant groups participating in the study about distance education and mobile technology situations and to adapt to this environment. 24 items of the measurement tool consisting of a total of 28 items were used and 4 items were removed from the measurement tool thanks to the expert opinion. The opinions of the participants participating in the research were consulted from two factorial dimensions, such as the situations of the participant groups participating in the study, such as “Distance Education” and “Mobile Technology”. The Cronbach Alpha reliability coefficient of the measurement tool as a whole was calculated as 0.81. Measurement tool; “strongly disagree” (1), “disagree” (2), “I'm undecided” (3), “agree” (4) and “strongly agree” (5) in the form of rated. The measurement tool was collected from the groups of participants who participated in the study in the form of an online environment with the MS teams questionnaire.

2.4 Application

Live courses have been prepared for 412 university students who continue their studies in Kazakhstan in the form of interactive online education consisting of a total of 7 sections. during the 3-week training, interactive distance education and online training courses were given to the participant groups included in the research on the occurrence and determination of mobile technology situations, these trainings; distance education, how to use the combination of mobile technology and professional activity, how to reconcile it with time, how to accept the use of distance education, what is its adaptation, etc., after 3 weeks of training, all of the data collection tools were applied to the participant groups participating in the study and the data were given in the findings section in tables. Education by many institutions and organizations meet over each section so it will be limited to 60 people, preferred Ms teams is

set to be distributed over weeks, and a 50-minute time frame that has been processed in each course participant groups in the environment of online education each week to be included in a case study was applied. The information received from the data collection tool applied to the participant groups was transferred to the analysis program in the form of numerical values.

2.5 Analysis of the data

The data collected together with the online survey were analyzed using the SPSS application. The percentage, frequency and descriptive, T-test (independent–samples t-test), Kruskal Wallis H-Test, one-way ANOVA methods of the analysis results were given. The data related to numerical developments were tabulated and Deciphered, and whether there is a significant difference between the independent variables was tested at the level of α =0.81. In addition, while analyzing the data, help was taken from the information on Table 4.

Table 4. Limitations

Weight	Limits	Choice
1	1.00 - 1.80	I strongly disagree
2	1.81 - 2.60	I do not agree
3	2.61 - 3.40	I'm undecided
4	3.41 - 4.20	I agree
5	4.21 - 5.00	Absolutely I agree

3 Findings

In this section, the findings related to the acceptance and determination of the participant groups participating in the research based on the dimensions of distance education and mobile technology and the findings related to the objectives are given

3.1 Descriptive statistical findings of the mobile technology acceptance levels of the participants participating in the research

Descriptive statistics regarding the determination of the mobile technology acceptance levels of the participants participating in the research are given in Table 5.

Table 5. Descriptive Statistical Findings of the Mobile Technology Acceptance Levels of the Participants Participating in the Research

Dimension	Cours Name	N	*M*	S
Accepting with Mobile Technology	Online and Distance Education events	412	4.42	.428
Using Mobile Technologies	Online and Distance Education events	412	4.39	.417
Mobile Technologies Evaluation	Online and Distance Education events	412	4.37	.434

As can be seen in Table 5, it is seen that the groups of participants participating in the study have an average of M= 4.42 according to their mobile technology acceptance status regarding the determination of their level of acceptance of mobile technologies. In addition, it is seen that the average of using mobile technologies is M=4.39, and finally, the assessment scores of mobile technologies are M=4.37. In the light of these findings, it can be said that the mobile technologies of the participant groups participating in the study and their acceptance and acceptance of this technology are high, and the dimensions of registration, technical support and evaluation are in place.

3.2 T-Test analysis findings of the participants participating in the study according to the gender variable of the acceptance levels of distance education

Of the participants surveyed levels of acceptance and use of distance education is a significant difference between the Sexes was applied in order to determine whether the independent - samples t-test on data findings are given.

As seen in Table 6, according to the gender variable, the arithmetic mean and standard deviation scores of male students to accept the system distance education M=4.42 female students with arithmetic average and standard deviation scores of records in the system distance education M=4.39, respectively. From the findings obtained, it can be said Decisively that there is no difference between male and female students. Also finding other when examined, the male arithmetic average and standard deviation scores of students of distance education adoption and use of M=4.38, but a female arithmetic average and standard deviation scores of students of distance education adoption and use of M=4.36, respectively. From the findings obtained, it can be said that there is no difference between male and female students according to the technical support department of the distance education system. Dec. Finally, Table 6 also arithmetic average and standard deviation of male students of distance education evaluation scores of the property M=arithmetic mean and standard deviation scores of female students with the assessment system 4.39 M=4.37, respectively. From the findings obtained, it can be said that there is no difference between male and female students according to the Decency of accepting and using distance education.

Table 6. T-Test Analysis Findings of the Participants' Acceptance Levels of Distance Education According to Gender Variable

Dimension	Gender	N	*M*	SS	Sd	t	p		Explanation
Acceptance to the Distance Education System	Male	207	4.42	.541	412	.218	.521		p>0.05 difference meaningless
	Female	205	4.39	.568					
Using and Implementing Distance Education	Male	207	4.38	.524	412	.232	.632		p>0.05 difference meaningless
	Female	205	4.36	.534					
Distance Education Evaluation	Male	207	4.39	.588	412	.288	.428		p>0.05 difference meaningless
	Female	205	4.37	.610					

3.3 T-Test Analysis findings among the distance education and performance levels of the participant groups participating in the decision

In this section, the Deficiency data of the independent-samples t-test findings applied to determine whether there is a difference between the distance education and performance levels of the participant groups participating in the research according to the distance education variable of university students are given.

As seen in Table 7, the variable distance education according to the arithmetic average and standard deviation scores of students who answered yes M= 4.38 distance education with arithmetic average and standard deviation scores of students who reported not according to the variable M=2.62, respectively. From the findings obtained, it can be Deciphered that there is a significant difference between students according to the distance education variable. Also as shown in Table 7, the variable performance according to the performance of distance education students who answered yes, the arithmetic average and standard deviation scores of the value of M= 4.41 distance education with arithmetic average and standard deviation scores of students who reported no performance according to the variable M= 2.37, respectively. From the findings obtained, it can be said based on Table 7 that there is a significant difference when both dimensions are considered.

Table 7. Results of T-Test Analysis of mobile technologies and performance levels participating in the research

Dimension	Criterion	N	*M*	SS	Sd	T	p	Explanation
Distance Education	Yes	408	4.38	.442	412	.-5.52	.000	P<0.05 difference significant
	No	4	2.62	.228				
Distance Education Performance	Yes	408	4.41	.521	412	.-8.41	.000	P<0.05 difference significant
	No	4	2.37	.233				

3.4 One way ANOVA results of the levels of mobile technology and distance education follow-up of the participant groups participating in the study

In order to determine whether there is a difference between the levels of following mobile technology and distance education technologies of the participant groups participating in the study, data on the values of One Way ANOVA results were given.

As shown in Table 8, the level of tracking groups of participants surveyed mobile technology "mobile technology" showed a statistically significant difference between. According to the findings obtained, it can be said that the groups of participants who participated in the study were more effective in the mobile technology tracking dimension according to their performance. Finally, as shown in Table 8, the surveyed groups of participants “Distance Education Technologies” showed a statistically significant difference between opinions of Don't follow. According to the findings obtained, it can be said that the size of the follow-up of distance education technologies of the participant groups participating in the research is effective.

Table 8. One Way ANOVA Results of the Mobile Device and Media Technology Tracking Levels of the Participant Groups Participating in the Study

Dimension	Source of Variance	Sum of Squares	Sd	Average of Squares	F	p	Description
Mobile technology	Intergroup	8.78	4	2.30	8.192	.000	p<0.05 difference significant
	Ingroups	38.689	408	.253			
	Total	47.477	412				
Distance Education Technologies	Intergroup	17.109	4	5.06	17.576	.000	p<0.05 difference significant
	Ingroups	33.367	408	.215			
		50.476	412				

4 Discussion

In the work they have done in the year as we bought the theoretical framework of technology acceptance Model and students, [17] sought to explore the factors that affect their intention to use an online education platform, business online course in research design and as a result, perceived system quality and perceived external variables such as enjoyment and education that is detected with the help of an extra variable (Perceived Interactivity), defined as predictors of intention to use the platform they achieved effective education of students. When this value is combined with the results of the research, it is seen that the results have been reached that the groups of participants who participated in the research accept and use distance education technologies while using them in the course. In this context, it can be said in the discussion section of the research that this method used in the research benefits both the participants and the next generation.

It has been widely adopted to address the educational chaos created by the Covid-19 pandemic in the work of [18]. Reports on its limitations and difficulties are published daily in the global media. However, explanations for the experiences of teachers and students regarding this sudden change in the pedagogical modality are conspicuously absent in the current literature. This article in the context of higher education in Bangladesh and Nepal during the epidemic, teachers and students was undertaken to investigate their experiences of online learning and tailored to the local context and the action potentials of digital artifacts as a result of their using them in the best possible way to facilitate communication and improve student learning, they showed that they achieved. In this context, when this value is combined with the results of the research, it is seen that the dimensions of using mobile technology are high in the study and it is also concluded that they use this technology very well with distance education technologies. Even if it is seen that both values in the research are high, it can be said that more beautiful studies about the concept of distance education should be included in the studies.

In the year to continue their journey in facilitating students ' learning conditions and the work they have done for using this interactive resources interactive conferencing software, [19] aims to investigate the perceptions and attitudes towards and perceptions as a result facilitator and also emphasized the importance of providing ap-

propriate conditions to develop a COVID-19 digital transformation in education is inevitably the speed reaches values it is seen that these results reflect the most recent developments. In this context, when this value is combined with the results of the research, it is seen that the values that benefit the participant groups by using distance education and mobile technology dimensions in an interactive way have been reached in the study.

If it is to be said that all the work in the discussion section has a meaning integrity, it can be said that while distance education and technology benefit people and people, a different dimension will always develop in the field article. While each value in the research is ahead of the previous one, it is among the expectations to be made again in the future periods within this research.

5 Conclusion

If the result section of the research is to be discussed, it is seen that the number of people who were included and formed from the participant groups came first. If the results of these people are considered by creating a semantic integrity, it is seen that 412 people voluntarily participated in the research. If another value of the research is to be discussed, does the encounter in the classroom environment with distance education positively affect the performance of the groups of participants included in the study from their distribution, it is seen that most people answer yes and reach the value that there is a positive result if it is processed in the classroom environment with distance education. Also participating in the survey research of the participating groups alinack to get another value if the level of acceptance of mobile technologies mobile technology has achieved high results for the determination of acceptance durumlarinnin also adopt mobile technology to accept their status and high levels of registration, technical support and evaluation, it is seen that reached higher values of the dimension.

When another value of the research is considered, it is seen that there is no difference between the arithmetic mean and standard deviation scores of male students for admission to the distance education system and the scores of female students according to the gender variable Decisively. Also, the other finding is examined, the remote training system according to the Technical Support section, reached the conclusion that there was not any significant difference between male and female students, it is seen that distance education is also the ability to accept that there was not any significant difference between male and female students according to the conclusion reached is that it is seen. Another result of the research is that it has been Decisively concluded that there is a significant difference between students according to the distance education variable. From the findings obtained in this context, it can be seen that there is a significant difference when both dimensions are considered. Finally, the level of tracking groups of participants surveyed mobile technology "mobile technology", it is seen that the conclusion is reached that there is a statistically significant difference between. According to the obtained results, the surveyed groups of participants according to the performance of the track size of mobile technology is more effective

and also the "distance education technologies" that there is a statistically significant difference between the opinions of Don't follow, it is seen that conclusion is reached. According to the findings obtained, it can be said that it has been concluded that the follow-up dimension of distance education technologies of the participant groups participating in the research is effective.

According to the results obtained from the research, it has been concluded that there is a significant difference between the last test mobile technology Decencies of university students and that their mobile technology statuses are high.

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