Birlesik Dünya Arastirma
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Innovasyon ve Yayıncılık Merkezi

World Journal on Educational Technology: Current Issues

Volume 14, Issue 3, (2022) 927-939

www.wj-et.eu

Formation of research competence of future teacher educators based on the technology of project training

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Suggested Citation:

Mamytbayeva, Z., Kyakbayeva, U., Azimbayeva, D., Kerimbayeva, R., Sarybekova, Z. & Daurenbekov, K, (2022). Formation of research competence of future teacher educators based on the technology of project training. World Journal on Educational Technology: Current Issues. *14*(3), 927-939 https://doi.org/10.18844/wjet.v14i3.7319

Received from January 23, 2022; revised from March 01, 2022; accepted from May 15, 2022.
Selection and peer-review under responsibility of Prof. Dr. Servet Bayram, Yeditepe University, Turkey.

Abstract

In this study, it is aimed to establish the research competence of future teacher educators based on the project education technology. The research was conducted in the spring semester of 2021–2022. The study with the participation of 328 university students was conducted in a quantitative research model. In the research, a 3-week project training technology and research competence training was provided to university students. In the study, a data collection tool developed by the researchers was used to collect data. The scale used in the study was delivered and collected by the online method of university students. The analysis of the data was carried out using the SPSS programme; frequency analysis was carried out using the *t*-test; and the results obtained were added to the study accompanied by tables. As a result of the research, it was found that the project training technology and research competence values of the groups of participants participating in the study had high values.

Keywords: Project education technology, teacher candidates, distance education, university students;

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1. Introduction

It is known that various educational reforms are being carried out in many countries in order to train individuals and students in order to be capable of meeting the needs of the age with the change of the qualities that people are expected to have in today's technology age and to improve the quality of educational outcomes (Ramaraj & Selvaraj,2021). In studies and articles, it is also seen and expected that one of the strongest variables affecting the quality of educational data is the teacher's qualification, and that each positive value realised is primarily pregnant with highly qualified teachers to give successful results (Bagriyanik & Karahoca, 2016). It is seen that it is of great importance for teachers to acquire the qualities required by modern educational technologies, not only by the people who receive the education, so that they can educate the students of the future. As in most schools, various restructuring studies have been carried out related to the improvement of the teacher education system from the past to the present (Hamzaoui, 2021). In the years between the momentum of these reforms in the background, teacher training programmes, criticism and the pursuit of quality teacher education are rising as a result. In order to increase the quality of teachers, the teacher education system in our country has been transferred from institutes to universities as a result of the restructuring carried out from teacher training schools to educational institutes since the past years (Keser, Bicen, & Caliskan ,2016). In this context, it is known that the quality of teacher education based on scientific research results and contemporary approaches has created an important opportunity to improve the quality of teacher education on the basis of education. However, with the theory espoused in this process in the foreground with the dominance of increased shifting from the application perspective, the contributions concerning the nature of restructuring initiatives were discussed and the level of quality teacher training always had to remain in the background (Ukkonen-Mikkola & Varpanen, 2020). Similarly, there are frequent changes in teacher education programmes, as they are aimed to improve the educator education system and teacher qualification, especially through pre-service teacher education. On the other hand, it is criticised that these changes are usually made with a top-down approach and without continuity, regardless of a specific conceptual framework and without taking into account the approaches that guide teacher education and the results of scientific research (Gorur & Babadogan, 2018).

It is known that the developments of critical thinking, creativity, decision-making, project creation, cooperation, communication and research skills, which are increasingly important in teacher education today, are very important (Isotalo, 2017). Developments in the field of education and technology emphasise the necessity of educating individuals who research, question, analyse and draw conclusions, instead of individuals who store information only in their minds, and the importance of imparting basic knowledge, skills and attitude characteristics related to the scientific research process (Sergeeva et al., 2022).

In this context, the national and international literature on the Constitution and education-related laws emphasise that teachers are the main tasks other than teaching in education programmes, and in this regard the teachers should conduct research, especially on the knowledge, skills and attitudes. It is stated that it is one of the most important qualities that they should have acquired in the XVIII century (Mirzayeva Farokhat Odilzhonova, 2022). It is often criticised that the educational system in general is dominated by an approach that promotes the memorisation of information, rather than the popularisation of research culture. Studies show that pre-service teachers do not have the

knowledge, skills and attitudes to conduct high-level research, do not make sufficient use of educational research and do not participate in research activities (Vasiutina, Kondratiuk, Lukianchenko, Romanchuk, & Teslenko, 2021).

1.1. Related studies

Teachers and social workers/educators in educational institutions should provide distance education to protect the health of children of different ages by using innovative technologies. We are aiming to create the experience by using training methods, and as a result, future teachers, with the implementation of innovative methods in the education as social workers, can be among them the best ones, web research or web seminars, and have reached positive values.

Tocháček, Lapeš, and Fuglík (2016) in the year of the work have conducted to develop technological knowledge and training methods for students to practice their skills in programming educational robotics in education in secondary schools and to train teachers to determine their direction and the potential to benefit from the project meant, and as a result of the method, in the process of project benefits to the student groups participating in the survey, the benefits are achieved.

Petrovych et al. (2022) in the year of the foundation of future teachers in the work they have conducted scientific research for the organisation of the discipline examined the characteristics of individuals and group work intended to address the use of cloud technologies, and as a result of the research project, the students, and also the basic disciplines of the model of competence, observed benefits in their lives.

1.2. Purpose of the study

Based on the project training technology, it was aimed to establish the research competence of future teacher educators and answers to the following questions were sought for the general purpose of the study:

1. What is the educational technology use status of the group of participants participating in the study?

2. What is the situation of the group of participants participating in the study devoting time to live events?

3. What is the purpose of using project educational technologies of the group of participants participating in the research?

4. Is there a significant difference between the views of educational technologies according to the gender variable of the group of participants participating in the study?

5. What are the opinions of the group of participants participating in the study on educational technologies before and after the study?

2. Method

In this section, it is seen that information such as the materials used in the research, data, type of data, groups of participants, data collection tool, numerical data needed daily etc. are evaluated.

2.1. Research model

When the model of the research is considered, it is seen that the quantitative research method is used in this study. The quantitative research method, on the other hand, has become observable, and objectification of the events that have occurred has revealed the concept of quantitative research. In this sense, it is seen that the concept of quantitative research is among the subjects that are curious and researched among people. In addition, this method is used to decipher an event or facts and to evaluate and define the relationship between situations (Çelik & Uzunboylu, 2022).

2.2. Working group/participants

As for the study period, it is seen that it was implemented in the spring academic year 2021–2022, and the participants and data part of the study consists of 328 students, who are future educators and teachers in Kazakhstan. The group of participants participating in the study receive their education through a live course.

2.2.1. *Gender*

In this section, the differences among the group of participants included in the study according to their gender are given in Table 1.

Table 1. The distribution of the group of participants participating in the study according to gender

Gender	Male		Female	
	F	%	*F*	%
Variable	160	48.78	168	51.22

As can be seen from the research, gender values are presented in Table 1 and it is seen that these values are numerical. It is seen that 48.78% of the participants participating in the study (160 people) are male and 51.22% (168 people) are female. In the gender section, the findings reflect the actual gender distribution.

2.2.2. *Educational technology use cases of the group of participants participating in the study*

In this section, the daily use of educational technologies was investigated according to the project educational technologies situations of the participants participating in the research. In this context, the status of educational technologies according to the time periods of daily use of technology has been requested and investigated. Detailed information is given in Table 2.

Table 2. Distribution of educational technology use of the groups of participants participating in the study

Use of educational technologies	1 hour		2 hours		3 hours and above	
	F	%	*F*	%	*F*	%
Variable	35	10.67	135	41.16	158	48.17

When we compare the data by taking the research problem statement, participant of the group in relation to the research problem and state that examine time of information given in the use

of educational technology are seen. In this context, 10.67% (35 people) stated 1 hour for using educational technology, 41.16% (135 people) stated 2 hours for using educational technology and 48.17% (158) stated 3 hours and above for using educational technology. In this context, it is seen that the group of participants prefer to use technologies for 3 hours and more daily during the pandemic process.

2.2.3. Time spent on live events by the group of participants participating in the study

In this section, situations related to the situation of allocating time to live events by the group of participants included in the study according to daily usage time periods are investigated and examined. Detailed information is given in Table 3.

Table 3. Time spent on live events by the group of participants participating in the study

Do not waste time on live events	1 hour		2 hours		3 hours and above	
	F	%	*F*	%	*F*	%
Variable	42	12.80	117	35.67	169	51.52

When Table 3 is examined, the time spent on live events by the people participating in the study on a daily basis during their time off has been examined and detailed information is given. In this context, 12.80% (42 people) devoted 1 hour, 35.67% (117 people) devoted 2 hours and, finally, 51.52% (169 people) devoted over 3 hours. In this context, the research allocations and live events within a good time to use the pandemic in the process of daily activities of live and the amount of the participant up to 3 hours it is observed that the choice of the groups above as you prefer.

2.2.3. Age status

In this section, the age information of the people participating in the study group study was examined and detailed information is given in Table 4.

Table 4. Distribution of primary school teachers according to their age

Age	22–24		25–27		28 and above	
	F	%	*F*	%	*F*	%
Variable	188	57.32	112	34.15	28	8.53

When Table 4 is examined, the distribution of the group of participants participating in the study according to their age is considered and the information related to this section is added to the table. 57.32% (188 people) are in the age range of 22–24 years, while 34.15% (112 people) are in the age range of 25–27 years and 8.53% (28 people) are 28 years and older. The findings in this section reflect the actual distribution.

2.3. Data collection tools

In this part of the study, it is seen that information about the data collection tool applied and accepted to the groups of participants in the research are included and provided. The data collection tool was created specifically for this study by the people who created the study, and the items that could not be suitable were examined by experts and simplified by removing them from the study. It is seen that a personal information form called 'project educational technologies' measurement tool is used, which is applied to the participants participating in the study and developed by the researchers. The validity and scope of the measurement tool developed was examined by four experts with the title of professor, who conducted studies on information technologies and distance education, 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, age, educational technology usage and live event time allocation usage environments are provided.

2. Project educational technologies data collection tool: In order to create some values in the groups of participants, a 5-point Likert-type data collection tool has been prepared to receive information about the project's educational technologies and their views on live events. 18 items of the measurement tool consisting of a total of 25 items were used and 7 items were removed from the measurement tool, thanks to experts' opinions. The opinions of primary school teachers were divided into two factorial dimensions: 'educational technologies' and 'live events', and applied to the participants participating in the study. The Cronbach ALPHA reliability coefficient of the measurement tool as a whole was calculated as 0.87. The measurement tool was in the range of 'strongly disagree' (1), 'disagree' (2), 'I'm undecided' (3), 'agree' (4) and 'strongly agree' (5). The measurement tool was also collected from primary school teachers in the form of an online environment.

2.4. Application

In this part of the research study, the size of the portion of the application by the researchers as future teachers who continue their education at various schools student volunteer is 328 in Kazakhstan designated through videoconferencing and distance education and MS Teams live events using programme-created activities, the project educational technology, use cases and live etknlik time, Microsoft Teams videoconferencing application programme has been prepared by the environment of the environment and this activity is organised by experts in the field of Live Events, Event studies when completed part of the surveyed groups of participants to groups created within the scope of the project activities and educational technology for performance practice examples were created. within 3 weeks of training, 'performance training methods', 'educational technologies' etc. are provided to the people participating in the research. Such information was transferred to the groups of participants in the form of a live event and they were expected to participate every week. After 3 weeks of training, an information form and a data collection tool were collected from the group of participants participating in the study using the online application method, and the data are given in the tables in the findings section. The training was distributed as five sections through the MS teams' videoconferencing application programme used by most schools. Each designated section was distributed and adjusted for weeks to be limited to a maximum of 68 participants, 25 minutes of each event, 15 minutes of the event were processed in a total of 40 minutes of question and answer time,

in a live event, participants in the study were expected to participate in training with images and microphones using smart devices. The measurement tool applied to the people participating in the study was collected through an online questionnaire and transferred to the SPSS programme by coding them in the environment of calculation programmes.

2.5. Analysis of the data

The operations carried out in the data analysis section are indicated here. The statistical data obtained from the people included in the study were analysed in the statistical programme using frequency (*f*), percentage (%), mean (*M*), standard deviation (SD) and *t*-test, respectively. The data obtained from the programme are given in tables accompanied by numerical values, findings and comments.

3. Findings

In this section, the findings of the participants participating in the research on the use of project educational technologies and live events education are given. Each finding of the research is presented in the form of numerical values and tables accompanied by values presented in this section.

3.1. Purpose of using project educational technologies by the group of participants participating in the research

In this section, the purpose of using project educational technologies by the group of participants participating in the study is investigated and detailed information is given in Table 5.

Table 5. Purpose of using project educational technologies of the group of participants participating in the research

Variable		*F*	%
Purpose of the project is to use educational technologies	Project preparation	185	56.40
	Creating project training	112	34.15
	Other	31	9.45
	Total	**328**	**100**

When Table 5 is examined, the purposes of using the project technologies by the group of participants participating in the study are investigated according to the problem situation of the study. In this context, 56.40% (185 people) chose project preparation, 34.15% (112 people) chose project creation area and, finally, 9.45% (31 people) chose the other area. In this context, it can be said, based on Table 5, that most of the participants prefer to prepare the project wherein most of the segments are oriented to the problem situation according to the problem situation.

3.2. Project educational technologies situations according to the gender variable of the group of participants participating in the study

In this section, the data obtained from the study and the project educational technology situations and detailed information according to the gender variable of the participant group participating in the study are given in Table 6.

Table 6. Project educational technology situations based on gender

Project training technology situations	Gender	*N*	*M*	SD	Df	*t*	*p*
	Male	160	4.41	0.17	328	0.290	0.372
	Female	168	4.46	0.19			

When Table 6 was examined, the project training technology situations of the group participating in the study are examined according to the gender variable and it was found that there was no significant difference according to the gender criterion [Df(328) = 0.290, $p < 0.05$]. When the project educational technologies situations of the groups of participants participating in the study are examined, it is seen that the average score of the male participant group in this field is $M = 4.41$, while the average score of the female participants in this field is $M = 4.46$. In this context, it can be said that there is no difference between the scores of male participants in this study compared to female participants, and that the findings of the study are high in the value of two categories also mentioned earlier.

3.3. Opinions of the group of participants participating in the study on educational technologies before and after the study

Table 7. Opinions of the group of participants participating in the study on educational technologies before and after the study (pre-test – final test)

No	Variable	Ön-Test-1		Son-Test-2				
		M	SD	*M*	SD	df	*t*	*p*
1	I use new technologies using project technologies	3.28	0.81	4.44	0.51	328	−4.74	0.000
2	Using project technologies increases my interest in the field of training new ideas.	3.32	0.72	4.52	0.67	328	−5.45	0.000
3	I found that my research curiosity increased with this method in my classes	3.52	0.78	4.46	0.57	328	−3.89	0.000
4	I understand project technology education better through live events	3.62	0.82	4.38	0.62	328	−4.38	0.000
5	I use project activity technologies and create a brainstorm for a more successful model	3.52	0.59	4.52	0.63	328	−4.01	0.000
6	I saw that there is an opportunity to teach and learn educational technologies	3.55	0.79	4.47	0.64	328	−5.67	0.000
7	I can express my ideas very easily with the help of educational	3.52	0.82	4.49	0.67	328	−4.3	0.000

	technology in project-oriented studies and education							
8	I watch live events training videos over and over again	3.68	0.91	4.53	0.59	328	−3.23	0.000
9	I would like to use these technologies and live events classes that I have learned in different courses	3.72	0.69	4.42	0.61	328	−3.5	0.000
10	I can connect to this research from the smart device I want	3.62	0.83	4.44	0.69	328	−3.62	0.000
11	The live events model gives me the opportunity to do it again during the day	3.69	0.79	4.48	0.71	328	−3.59	0.001
12	Live training with the project method The training I receive in the classrooms allows me to improve myself	3.72	0.93	4.43	0.67	328	−4.08	0.000
13	The project has changed my old habits towards the field with educational technology training	3.55	0.81	4.46	0.61	328	−5.77	0.000
14	I take more responsibility for being more successful in live education classes with educational technologies	3.79	1.02	4.58	0.54	328	−4.57	0.000
15	Using this training I received with the live event method allows me to better understand the lesson	3.81	0.81	4.47	0.63	328	−4.49	0.000
16	I believe that a positive bond has been formed between my students and me thanks to project Dec technology education	3.52	0.88	4.57	0.55	328	−6.48	0.000
17	I can easily get used to every idea with educational technologies	3.62	0.8	4.43	0.59	328	−4.2	0.000
18	I find these activities and models fun and recommend them to my other friends.	3.69	0.95	4.62	0.50	328	−5.85	0.000
	Overall average	3.59	0.81	4.48	0.6	328	−4.54	0.000

As shown in Table 7, a project of the group surveyed about their knowledge of educational technology katilic pre- and post-test results are given and pre-test and post-test scores on the last test between pre-test are higher with a significant difference ($p < 0.005$). Although it is seen that there is a significant value in all statements, according to the results of the last test, one of the most obvious statements of the groups of participants participating in the study is 'I use new technologies using project technologies', with $M = 3.28$ and the final test score of $M = 4.44$. In addition, the second most

obvious statements of the group of participants participating in the study forth preliminary test was 'I believe that a positive bond has been formed between me and my students thanks to project education technology education', with *M* = 3.52 and a final test score of *M* = 4.57. In addition, from the statements 'I take more responsibility for being more successful in live education classes with educational technologies', it is seen that the average score of the preliminary test is *M* = 3.79 and the average score of the final test is *M* = 4.58.

Although positive results are seen for each item of the survey, the opinions of the students who participated in the research showed that the statement 'I watch live events training videos over and over again' had an average pre-test score of *M* = 3.68 and a last test score of *M* = 4.53. ' Using this training I received with the live event method allows me to better understand the lesson' had a pre-test score of *M* = 3.81 and last test average of *M* = 4.47. Finally, it is seen that the pre-test average score of the people participating in the study is *M* = 3.59, while the final average test score is *M* = 4.48. In this context, it is seen in Table 7 shows the ideas of the people participating in the study with project education technologies that have developed positively.

4. Discussion

Sergeeva et al. (2019), in the year of the work on modern society and life, solved new problems by adapting quickly to changing conditions, professional interested in increasing the efficiency of activities, socially competent professionals who are ready to take responsibility for the future planning and decisions by saying that this is in need of a method that has been systematised and educational research in this context meant to do a simulation of a person, their values and what they see as a set of methods for effective socialisation and competence. In this context, when the results of the research and this value are combined, it is seen that the people participating in the research have made a difference and created results by creating a successful brainstorm with project training technologies. In this context, it can be said based on the two categories that these technology concepts benefit the field and people.

Khuziakhmetov (2016) in his study aimed to briefly explain the conditions of experimental studies and results aimed at establishing the social competence of students in the education of students, and as a result, secondary school students and teachers who are responsible for the formation of the competence of students for refresher courses within the framework of the project, their values, which is useful for studying the problem of competence between educators have reached this result, when combined with the value of research in this context that research groups participating in the project of educational technology in the days of more time in their day they separated and they want to use. In this context, it is seen that the values are reached in the research results show that the two positive trainings are useful and helpful.

Tarasenko, Rasskazova, et al. (2021) and Tarasenko, Shevchenko, et al. (2021) in the year of the work they have done in children from different age groups and educational institutions to protect the health of future teachers in their professional activity with the execution of COVID-19 in the context of the epidemic of Social Services was undertaken to investigate the experience of using innovative methods and technologies of distance education and as a result (if any), innovative teaching methods, the author's classification and information and communication technologies (Online Test, Cloud, online tools, quizzes, tests, crosswords, anagram, working to create QR codes, comics, etc.) the

values that it is an indispensable data source for teachers who will become future professionals have been reached. In this context, when this value is combined with the results of the research, it is seen that the values that the groups of participants like and cover the educational technologies in the research have been reached.

It is seen that each value given in the discussion section provides individual benefits to each participant and success in their education by considering the data related to the problem situation for the research. But in addition to each positive value, when considering the universe of your research, the fact that the study is conducted in a different place at a different time, as well as its implementation, is among the expectations of the research.

5. Conclusion

When the results part of the study is considered, it is seen that the group of participants came first and numerical values were given. In this context, it is seen that 328 participants participated in the study. This value in the research is selflessly given to the participants and it is seen that the values in which they are involved are also reached. A result of the research is that the information about the educational technology usage times of the groups of participants regarding the problem state of the research was investigated and it was concluded that it was used for a maximum of 3 hours and above. Another value of the research is that they use live events during the day and the use cases they use on a daily basis during the time allotted to them have been studied, and as a result, it is seen that they devote time to live events for 3 hours and more and their results have been reached. In this context, it is seen that the groups of participants choose and prefer to devote a good amount of time to live events within the research and that the amounts of use to live events per day during the pandemic process are mostly 3 hours and above.

Another value of the research is that the purposes of using project technologies of the groups of participants participating in the study were investigated according to the problem situation of the study. And as a result, it is seen that the values that they chose and preferred to prepare the most projects were reached. In addition to these positive values, another result is that, according to the concept of gender, the project educational technology situations have been investigated in the research, and as a result, it can be seen that there is no significant difference between the sexes. In addition to these values, it is seen that the values of both male and female participants are high and significant. Finally, working in research groups have been consulted and received values both before and after participating in the study that there is a significant difference between participants before the value of the group is seen as a positive development, but the study in research participant after it has reached the conclusion that it is seen that the high value of the groups. In addition, they stated that these activities, in which the project educational technologies benefit and benefit the groups of participants, create privileges for them and that they spend a pleasant time in this environment and receive education. As a result of the research, it was found that the project training technology and research competence values of the groups of participants participating in the study had high values.

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