IMPROVING THE METHODS OF TEACHING BOTANY IN HIGHER EDUCATION INSTITUTIONS USING A MOBILE APPLICATION

Farmonova Madina Azamovna Basic doctoral student, Bukhara State University

ABSTRACT

The development of mobile applied information technologies to improve the methodology of teaching subjects as an important theoretical and practical problem of higher education, experimental substantiation in the process of real learning is the main factor ensuring the development of the pedagogical sphere. The article discusses the current processes of the developing educational system, further improvement of the spectrum of distance learning, the opinions of scientists from European and Asian countries on improving the spectrum of learning using mobile applications, the theoretical foundations of the mobile application "Botany of Bukhdu" prepared by the researcher, the analysis of the results of changes using mathematical and statistical analysis of the results of the conducted.

Keywords: Mobile application, technology, remote training, information space, scientific program, module.

INTRODUCTION

Priorities are the main driving force of global development and the qualities of a person who independently copes with sustainable development, mobility, creativity, professional tasks, is able to constantly develop himself in the changing information space of the world space.

One of the priority areas is the improvement and qualitative organization of higher education, the introduction of technologies into the educational process that provide guaranteed knowledge to those who receive education. The process of informatization of the educational system is associated with the level of professional competence of teachers of natural sciences in the field of information and communication technologies in the system of higher education and, in turn, involves improving the methodology of teaching subjects.

Modernization of the organization of the educational process in higher educational institutions, electronic textbooks that prepare the ground for the target organization, improvement of teaching methods of subjects based on mobile application technologies, activation of cognitive activity of students, development and updating of methodological knowledge, skills and qualifications necessary to achieve the effectiveness of education, increasing their compliance with state requirements and international educational standards is one from

The variability of educational programs, the adaptability of educational processes in higher educational institutions to social conditions and customer requirements - reflects the main essence of the new paradigm of higher professional education in the global space. In recent years, the attitude to the organization of higher education has been radically changing. According to the conclusions of experts, the increasing role of electronic (distance) education in the conditions of orientation of modern education to information technology education and, in turn, the development of technological methods for the introduction of new digitized educational programs and the provision of knowledge in the form of electronic resources to students by developing alternative teaching methods in higher education institutions is mandatory. The first steps achieved in the practice of higher education in this direction prepare the basis for the intensification of the educational process of students with the help of mobile application technologies, the development of the resource base for teaching information technologies in educational institutions and improving the quality efficiency of teaching botany in the biological field of education. In this regard, research aimed at improving the methodology of teaching botany, which is considered one of the main subjects of biology in the higher education system, the curriculum for the implementation of education, educational programs are necessary to align qualification requirements with professional standards and achieve quality indicators.

Literature analysis and methodology

A. about the development processes, models of formation of distance learning in the higher education system of the Republic of Uzbekistan.D.Askarov[1], U. S. Begimkulov[2], O.J. Bobomurodov[3], pedagogical foundations of distance learning A.Kenzhaboev[4], J. F.Yoldashev, S.A.Usmanov[5]. About the introduction of information and mobile applications in the educational process in higher educational institutions.I.Olimov[6], T.Z.Teshaboev[9], S.S. Babajanov [7], methods of teaching botany in higher educational institutions based on pedagogical technologies A.E.Hollieva, H.K. Esanov conducted scientific research.

In the article Z.Rasulova discusses the issues of information communication and the use of Internet technologies in improving educational processes, as well as the concept of the topic related to the study of the problem of informatization of education. Considering the importance of information and communication technologies for improving the efficiency of the education system, the reasons were identified that the process of informatization of education and the use of modern information technologies not only changes organizational forms and methods in teaching, but also leads to the formation of new methods in it. studied[10].

H.Oybekova and Yu .Choriev's article analyzes the issues of effective use of computer technology in educational institutions of Uzbekistan, the current laws and other regulatory documents of our state in support of this issue. In the brief section of the article, the following questions are based on the need to solve them:

- first of all, its scientific support in the creation of educational and methodological support for e-learning;

- to achieve optimal proportionality of the formation of theoretical and practical knowledge;

- creation of specialized portals that systematize educational resources in all areas of the republic's economy;

- to ensure the mutual exchange of information, as well as interactivity; - to use the latest achievements and opportunities provided by telecommunications, video, audio, interactive tools to bring educational information to users [11].

T.V.Katkova, P.K.Petrov, A.M. Scientific and methodological aspects of the use of computer technologies in the training of future specialists in the field of physical culture and sports were proved in an experiment by Abramyan and others[12]. Modern information technologies in education: didactic problems, prospects for the use of I.V. Studied by Robert, [13]. Z.H.Rakhimov, V.N.Plakhotey, A.B.Solovyov studied some issues of computerization of the educational process, the use of modern video technologies by A.P.Ploshchakova, V.N.Haspekov studied the highlighted in his methodological work. Computer animation as a tool of visual thinking N.P.The importance of modern information technologies (opportunities,

problems, prospects) in the training of specialists in the field of physical education and sports, studied by Petrov P.K., Petrov S.V. is revealed in the work of Gurev[14]. L.V. and Oreshkina, the importance of modern information technologies in improving quality of training of specialists[15].

Discussion

The MoLE project, funded by the federal government of America, is an important practical step, thanks to which the international project "Mobile Learning Environment" was able to unite 22 countries of the world. The methodological foundations of the direction were created by the project participants through the introduction of mobile devices in the process of teaching various subjects, the creation of electronic platforms for mobile learning resources, the development of methodological foundations for mobile learning.

In foreign pedagogical sources, the term "mobile learning" (M-Learning) has long become popular. The unanimous conclusions of researchers and educators have opinions on improving the quality of educational services through the development of mobile learning tools, large-scale educational applications and programs, a new type of Audi, mobile communication using visual communication technologies and cheaper wireless Internet services. Fundamental research on "mobile thinking" has been conducted in the world, aimed at studying the scope of technological means of communications (games, news, a geographical map, a social site) continues, along with the trend of growth of the population using mobile communications (77%), users of unlimited Internet services and unlimited definition services - an increase of 0.5 billion is planned. According to the results of the study, mobile communication tools are more likely to use the following functions: sending SMS messages (88%), image processing (85%), monitoring video and audio information (41%), listening to music (60%), using various emails (49%), using the development of documents in Word format[16].

Pedagogical universities a mobile application developed for the formation of knowledge, skills and competencies of students in the field of botany, which is taught in the direction of biological education, can be used in educational and extracurricular activities.

At the Daslbaki stage, based on the survey results, the level of use of Android phones by students was determined.

The survey is made up of structural questions about the goals and objectives of using mobile applications, advantages, the level of use of information technology, thoughtful means of communication that we currently use. The organizational work was organized by higher educational institutions of the Republic of Uzbekistan - Bukhara State Pedagogical Institute, Navoi State Pedagogical Institute and Jizzakh State Universities.

During the experiment, the mechanism of using mobile applications when mastering botany by students was monitored.

The students were explained the algorithm of working with the application created in science, downloading and using the international search engine "Google Play" (Fig. 1).

		2	5	
			6	
Goo	ogl	e F	Play	1
÷		0		
Mac	itanika lina Farmo	nova	J	
Удалить	$\mathbf{)}$	Открыть		
Оценить прил Поделитесь своим м	южение инением			
	☆			
Напишите отзыв				
Связь с разра	ботчико	м	~	
Описание			\rightarrow	
"Botanika" fanidan ilovasi	o'quv-uslu	biy majmuar	ning	
Образование				

Figure 1. Initial viewing of the application

Teaching subjects using mobile applications is the purposeful use of mobile devices (applications) in the processes of mastering subjects, provided that they have become an important component of the organization of the educational process for the training of specialists in higher education institutions, including future teachers, as well as the practical application and experimental justification of the developed software. mechanisms of technological management of the pedagogical process. One of the tasks of our dissertation work is the qualitative and effective organization of the process of mastering ICT by students and the subject of study by improving the methodology of teaching botany in the technological tool of a mobile application.

The application awards the student less points if he makes mistakes in the process of completing the task. In this case, the harakata algorithm for students includes recommendations such as focusing on the topic, the ability to correctly choose appropriate innovative pedagogical technologies at certain stages of the lesson (Table 1).

Lecture	Laboratory	The algorithm of mastering the			
(30 hours)	(30 hours)	mobile application			
1. introduction. Structure and	1. The structure of the	Step 1: Read the title.			
stages of plant cell development	microscope	Step 2:			
2. Plant tissue. Reaper.	2. The structure of the cells of	Quickly read the main text to			
	the epidermis of onion husk	understand its meaning and structure.			
3. Coating and mechanical	3. The meristem is the forming	Step 3: Reading the assignment			
textures	tissue. Stem Growth cone	Step 4: Checking the destination			
4. Conductive and primary	4. Covering fabric. Primary	Step 5:			
tissues	and secondary integumentary	Focus on reading this part using			
	tissue	Step 6: Answer the task			
5. Vegetative organs of plants.	5. Conductive fabrics.	by dividing the included sentence:			
Root structure	Tracheids. No. Cellular tubes.	Step 7: Correct Configuration response			
	Conductive Wedge fibers	Step 8:			
6. Arrangement of leaves on a	6. Primary and secondary	checking the correctness of the answer			
branch. Modification of the rod	anatomical structure of the root				
7. The structure of the stem	7. Anatomy of ildismevas.				
	Ildismevy type of phloem				
	xylem.				
8. Function, morphological and	8. Anatomical structure of the				
anatomical structure of the leaf	stem of one- and two-celled				
	herbivores				
9. Reproductive organs. The	9. Structure of the stem of				
structure of the flower	perennial plants.				
10. Guns. Pollination and	10. Anatomy of leaves.				
fertilization	Dorsoventral and insulating				
	sheet				
11. Pollination and fertilization	11. The structure of generative				
	organs. Flower. Microscopic				
	structure of the embryo. The				
	structure of pollinators and				
	female pollinators				
12. Seed structure	12. We study the structure of				
	the ball.				
13. The fetus - its definition	13. The seed. The structure of				
	seeds of one- and two-celled				
	plants				
	14. Structure of fruits				

Table 1. Algorithm for organizing (teaching) botany classes using a mobile application (botanical module of the 1st semester (Anatomy and morphology of plants))

Compliance with the algorithm execution stages is controlled by the mobile application in stages:

Step 1: Reading the title of the text.

The teacher reads the specified topics and selects the desired topic.

Step 2: Read quickly to understand the basic meaning and structure of the text.

The student devotes time to each stage of the lesson being developed, selects the appropriate one from the innovative methods of pedagogy proposed by the application, and also forms a list of mandatory questions and tasks.

Step 3: Review the assignment.

The student will look at the finished technological map of the lesson.

Step 4: Checking the destination:

You will see the finished technological map; analyze the assessment made by the application.

Step 5: Read this part carefully:

The teacher carefully reads this part, tries to choose the appropriate one from the recommended innovative pedagogical technologies and applies the necessary strategy.

Step 6: Highlight the sentence containing the answer to the task.

Step 7: Enter the correct answer.

Step 8::Checking the correctness of the answer, the student presses the check button. The pedagogical model project of improving the methodology of teaching botany based on modern approaches to the organization of education related to mobile application technologies, studied and generalized at the first stage of the study, was applied in the practice of higher education. The science teaching mobile application has created an electronic educational and methodological complex on botany (home page, management menu, semester lectures, addresses of Internet resources, individual, intermediate and final test questions on scientific topics, addresses of distance learning platforms, glossary interface on scientific topics, a list of used literature and the author's interface) and is posted on the Internet. The features of the object (Pedagogical Institute, educational direction biology) and the subject (justification of the effectiveness of the methodology of teaching botany using a mobile application) of comparative pedagogical experience based on parallelism are clarified.

Pedagogical experimental work covering the years 2020-2023, at the beginning of the experiment, a special test control was organized aimed at studying the structure of competencies related to knowledge of methods of working with mobile devices and mobile applications among students of educational directions 60110900 - biology of structured pedagogical institutes, and the results were analyzed. At the next stage, the theoretical and practical foundations of the process of mastering botanical science by students of the biology educational direction are considered, the composition of students' ability to use mobile applications in the process of mastering sciences, K.In in accordance with the Pearson criterion, a comparative analysis of the indicators was carried out. the evaluation of the second, third and final stages was carried out taking into account the final indicators of the first stage among students of the experimental and control groups. Table 2.

	Contingent of students	Evaluations								
group		ТБ	то	ТБ	то	ТБ	ТО	ТБ	ТО	
		"2"		"3"		"4"		"5"		
Bukhara State Pedagogical Institute										
Experience	30	13	0	7	5	6	10	4	15	
Control	46	18	4	15	12	10	20	3	10	
Jizzakh State Pedagogical Institute										
Experience	78	24	0	30	11	14	31	10	36	
Control	32	12	2	9	5	6	20	5	5	
]	Navoi Stat	e Pedago	ogical In	stitute					
Experience	58	22	0	21	12	8	20	7	26	
Control	80	27	10	33	17	15	38	5	15	
In three regions										
Experience	166	59	0	58	28	28	61	21	77	
Control	158	57	16	57	34	31	78	13	30	

Table 2: Preliminary and final results of students who took part in the pilot work

In the formed groups, the experiment was determined based on the results of the tests and tasks received for the effectiveness of teaching in subjects, and the results of the final analysis of the level of knowledge of students were expressed as follows (see Table 2). Based on these results, separate empirical values for all three vocational schools were verified and a mathematical and statistical analysis was carried out. Based on the results of tests and written assignments in the control and experimental groups formed from students based on the results of the research work, the use of mobile applications when teaching botany to students for 3 years served to form professional competence among future science teachers.

RESULTS

The results of pedagogical experiments in the experimental and control groups were statistically processed based on the formulas presented above. These statistics were defined as follows.

The overall result of the analysis of experimental and test work carried out in selected educational institutions

3-table								
	Experimental group T=166			Control group H=158				
Price value	2	3	4	5	2	3	4	5
Number of suitable grades		28	61	77	16	34	78	30
Middle arithmetic value of grades		$\overline{x} =$	4,30			$\overline{y} = 3$	3,77	
Efficiency coefficient		$\eta = \frac{\overline{x}}{\overline{y}} = \frac{4,30}{3,77} \approx 1,14.$						
Reliability probability range	$4,19 \le a_x \le 4,41; \qquad 3,63 \le a_y \le 3,91$							

Thus, it was proved that the effectiveness of the result obtained at the final stage of experimental and testing work was new, and the general ideas of the study were outlined in the dissertation.

CONCLUSION

The use of information technologies for mobile support of the educational process leads to an improvement in the academic performance of students in educational institutions, since it allows them to accumulate, accumulate and disseminate information about the educational process. Performs the main monitoring and control functions, such as registering information about educational materials, monitoring students' knowledge, as well as identifying learning deficiencies and analyzing weaknesses at the level of knowledge.

The developed technology of mobile support of the educational process and the mobile information system supporting this technology have made it possible to increase the level of knowledge of students in the educational institution.

The mobile information system is used to communicate with students, store educational materials and information about the educational process, register information about knowledge control, as well as perform the main functions of monitoring and tracking the educational process.

REFERENCES

1. Askarov A.D. Stages and models of the development of distance learning. // Modern education. Scientific-theoretical and methodological journal. 2015. No. 10. – pp. 59-65.

2. Begimkulov U.S. Theory and practice of organization and management of informatization of pedagogical educational processes. Candidate of Pedagogical Sciencesdiss - T.: 2007. -305 p.

3. Babomurodov O.Yu. Methods and models of presentation of electronic textbooks in the knowledge base and management of the educational process based on them. Tech.f.n. ...diss. - T.: 2006. -130 p.

4. Kenzhaboev.A. Pedagogical foundations of distance learning. // Modern education. Scientific-theoretical and methodological journal. 2014. No.10. - C. 3-7.

5. Yessidev J.F., Usmanov S.A. Fundamentals of pedagogical technology. // Tashkent, 2004. Textbook.-p.104.

6. Olimov A.I. Improving the methods of using mobile applications by future teachers of physical culture (on the example of the subject "Theory and methodology of physical culture"). Diss. of pedagogical sciences. - T.: 2021.-59 p

7. Babadzhanov S.S. Pedagogical technology of development of media competence of students of higher educational institutions. Doctoral dissertation for the degree of Candidate of Sciences. - Vol.: 2018. - p.48.

8. Sattarov A. The use of a mobile learning system in the organization of independent learning of students based on innovative methodological projects. The dissertation was written for the degree of Doctor of Philosophy (PhD) in pedagogical sciences. - Jizzakh, 2021. – 195 p.

9. T.Z.Teshaboev. Ways to improve innovation activity in the system of higher education based on information technologies. // Economics and Innovative technologies. Scientific electronic journal. 2018. No.3. –p. 3-11.

10. Rasulova Z. Up-to-date information-communication technologies are an important quality factor. - "Science and Education" Scientific Journal / ISSN 2181-0842. - October 2021 / Volume 2 Issue

11. Petrov P.K. Theoretical and methodological foundations of training specialists in physical culture and sports using modern information and communication technologies.//Russia. Monograph. 2003. pp.-473.

12. Robert I.V. Modern information technologies in education: didactic problems, prospects of use. //Russia. Monograph. 2010. Pp. -141.

13. Petrov P.K. Modern information technologies in the training of specialists in physical culture and sports (opportunities, problems, prospects) // Theory and practice of physical culture. - 1999. - No. 10. - pp.5-10.

14. Oreshkina L.V. Modern information technologies as a means of improving the quality of training specialists // Secondary special education. - 1997. - № 5-6. 16-p

. 15. T.A. Boronenko, A.V. Kaisina, I.N. Palchikova, E.V. Fedorkevich, V.S. Fedotova. Fundamentals of Digital Literacy and Cybersecurity: Russia. studies. manual / LSU named after A.S. Pushkin, 2021. – 431 p.