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About the preparation of teachers to use of digital technology training

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Abstract: The article studied: in research determination of readiness of teachers to use of digital technology training in which specifics of professional activity of the teachers are reflected is given. Complexes of criteria, indicators, levels of readiness of teachers to use of digital technology training, such as presence of steady motives to application of digital technology training at school are developed; width and stability of the academic knowledge of digital technology training and techniques of their application by the teachers at school; the content of mastering a technique of use of digital technology training for the solution of training tasks of the teachers. Levels of readiness of teachers to use of digital technology training are defined as high, average, low. The Model of readiness of teachers to use of digital technology training in which contents the essence of readiness of teachers to use of digital technology training is defined is pedagogically proved and almost developed.

Key words: *Professional activity; Digital technology training; Readiness of teachers for use of digital technology training; Model*

1. Introduction

The relevance of research. In recent years in Republic of Kazakhstan, and also in many other countries of the world community the increasing attention is paid to a problem of using of digital technology training in education which starts being considered as one of the most important strategic problems of development of a civilization. The processes happening in modern society at a crisis stage of development, are characterized by that many areas of human activity including education, promptly develop due to introduction of various innovations. The analysis works Husler, R. P. [1], Pomorov S.B., Prokhorov S.A., SidorovV.A., Stepanskaya T.M. [2], Timothy Ellis [3], Garrison, J. A., Schardt, C., & Kochi, J. K. [4], Rintala, J. [5], Aaron, M., Dicks, D., Ives, C. & Montgomery, B. [6], Magdy F. Iskander, J. Corey Catten, Rex Jameson, Antony Jones and Albert Balcells [7], Juniu, S. [8], Groth, R., Spickler, D., Bergner, J., Bardzell, M. [9], Wayne Burleson, Aura Ganz and Ian Harris [10], Ezziane, Z. [11], Parshina L. [12], Graziano K. J. [13], Sakenov, D. Zh, [14], Efimova, E.A. [15] allows us to claim that use of digital technology training can be understood as purposeful activities for development and deployment of information and communication and digital technologies:

1.- In educational process for training of teachers for activity in the conditions of modern information society;

2.- In management of an education system of teachers for increase of efficiency and quality of processes management;

3.- In methodical and scientific and pedagogical activity for improvement of quality of work of teachers; development and to introduction of new educational technologies on the basis of use of digital technology training. Thus, digital technology training - the information sources containing graphic, text, speech, musical, video, photo and other information, provided in the digital form, directed on realization of the purposes and problems of modern education of teachers.

The statement of the problem. In this regard the full solution of problems of quality of pedagogical education demands improvement of training of future teachers, training in their methods of work with modern digital technology training. The analysis researches of Husler, R. P. [1], Pomorov S.B., Prokhorov S.A., SidorovV.A., Stepanskaya T.M. [2], Timothy Ellis [3], Garrison, J. A., Schardt, C., & Kochi, J. K. [4], Rintala, J. [5], Aaron, M., Dicks, D., Ives, C. & Montgomery, B. [6], Magdy F. Iskander, J. Corey Catten, Rex Jameson, Antony Jones and Albert Balcells [7], Juniu, S. [8], Groth, R., Spickler, D., Bergner, J., Bardzell, M. [9], Wayne Burleson, Aura Ganz and Ian Harris [10], Ezziane, Z. [11], Parshina L. [12], Graziano K. J. [13], Sakenov, D. Zh, [14], Efimova, E.A. [15] showed that there is a significant amount of the researches devoted to questions of vocational training of future teachers. It should be noted that in specified works Husler, R. P. [1], Pomorov S.B., Prokhorov S.A., SidorovV.A., Stepanskaya T.M. [2], Timothy Ellis [3], Garrison, J.

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A., Schardt, C., & Kochi, J. K. [4], Rintala, J. [5], Aaron, M., Dicks, D., Ives, C. & Montgomery, B. [6], Magdy F. Iskander, J. Corey Catten, Rex Jameson, Antony Jones and Albert Balcells [7], Juniu, S. [8], Groth, R., Spickler, D., Bergner, J., Bardzell, M. [9], Wayne Burleson, Aura Ganz and Ian Harris [10], Ezziane, Z. [11], Parshina L. [12], Graziano K. J. [13], Sakenov, D. Zh, [14], Efimova, E.A. [15] more the attention is paid to theoretical and methodical training of students on informatics that allows future teachers to use further digital technology training in pedagogical process. However in these researches questions of training of future teachers to use of modern means of educational appointment, in particular digital technology training weren't taken up. Thus, formation of readiness of future teachers to use of digital technology training wasn't so far object of studying that allows to speak about relevance of research of this direction. Relevance of research is defined by contradictions between: – need of society for the teachers capable effectively to carry out professional activity in the conditions of informatization of education and insufficient level of readiness of future teachers to use of digital technology training. In this regard the problem of research consists in need of disclosure of specifics of formation of readiness of future teachers to use of digital technology training. Thus, the research objective: development and check of a technique of formation of readiness of future teachers to use of digital technology training in the conditions of pedagogical education.

2. Methods

Methods of research:

- the analysis of psychology and pedagogical, scientific, scientific and technical and methodical literature both domestic, and foreign authors on a research problem;
- analysis of normative documents, including state educational standards of higher education;
- modeling;
- pedagogical experiment;
- questioning, testing, the analysis of products of activity of students, data processing of experimental work by means of methods of mathematical statistics.

3. Main part

Our scientific position. Introduction of digital technology training in various areas of a modern education system accepts more and more large-scale and complex character.

Digital technology training are understood as set of means and interaction methods between teachers and students teachers by means of information technologies and the interactive equipment which purpose is to help each student to the teachers to transform information of the general character to personal knowledge and abilities. It is possible to allocate the following kinds of digital technology training which are represented in Fig. 1. :

I- technologies of multimedia;

II- technologies of hypertext submission of information;

III- the technologies using the digital equipment (electronic boards);

IV- Technologies of creation of presentations;

V- Technologies of a video conferencing;

VI- Digital educational complexes.

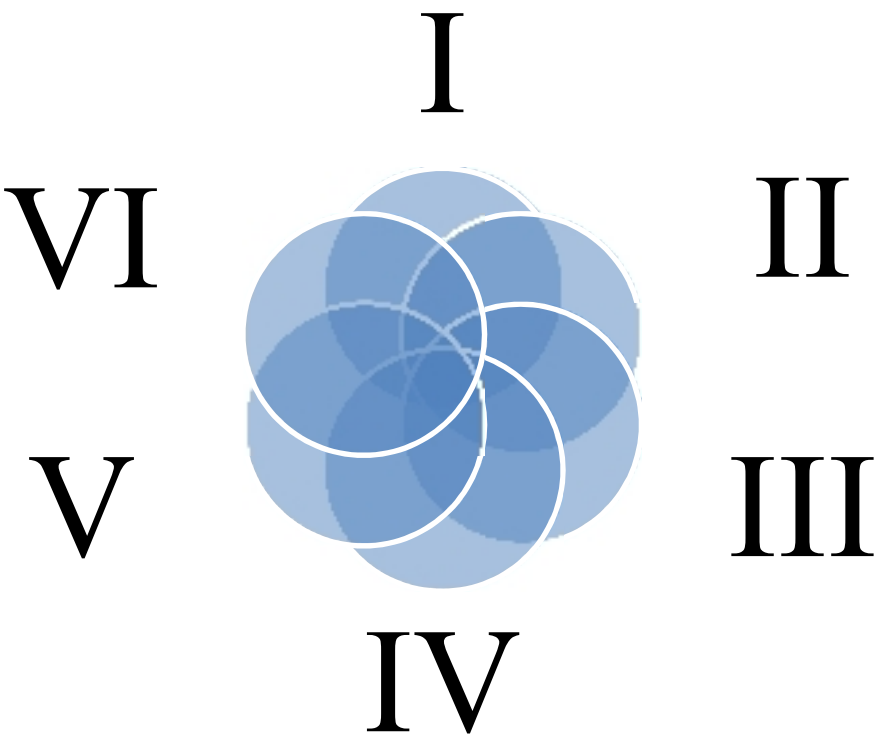

Fig. 1: Kinds of digital technology training

The explanation to Fig. 1 – Kinds of digital technology training:

I- Technologies of multimedia;

II- Technologies of hypertext submission of information;

III- The technologies using the digital equipment (electronic boards);

IV- Technologies of creation of presentations;

V- Technologies of a video conferencing;

VI- Digital educational complexes.

Our scientific statement It would be desirable to note especially a role of the digital technology training, using the interactive equipment, namely – electronic boards which represent the modern multimedia means possessing all qualities of a traditional educational board, but having more ample opportunities of graphic commenting of screen images, control and monitoring of work of all trained teachers at the same time, and also ensuring ergonomics of training and creation of new motivational prerequisites to training and training of teachers. Among methods and receptions of the organization of activity of teachers the special place is taken by electronic educational complexes which help more visually and to present defiantly a training material, and also by means of interactive testing, to check as far as the student the teachers mastered a material. Electronic textbooks – the strong technology, allowing to store and transfer the main volume of a studied material to use the text, graphics, a photo, video. Individual work of teachers with them provides deep understanding and material development.

We have the scientific claim that: readiness of future teachers for using of digital technology training is the steady characteristic of the identity of the teachers, defining ability to solve the main professional pedagogical objectives means of digital technology training in the conditions of pedagogical education. Readiness of future teachers for using of digital technology training includes the following structural components:

1. – Pedagogical, presented by the motives expressed by interests and requirements to use of digital technology training;

2. – Methodical, assuming methodical knowledge which integrate knowledge in the field of use of digital technology training;

3. – Technological, expressed by a complex of abilities on the organization of pedagogical education with use of digital technology training.

In this way: formation of readiness of future teachers to use of digital technology training assumes application of modern technical and information tutorials, such as computers, a projector, Internet resources. In the course of development of a technique of future teachers readiness formation to use of digital technology training specific features of professional activity of the teachers are considered. Levels of future teachers readiness formation to use of digital technology training: I. High; II. Average; III. Low. Diagnostics of levels of formation of readiness of future teachers to use of digital technology training assumes studying of a condition of its structural components and is carried out on the basis of the following criteria and indicators: I.existence of steady motives to application of digital technology training; II. depth and durability of methodical knowledge of digital technology training and techniques of their application; III. extent of mastering technologies of use of digital technology training for the solution of standard tasks of the teachers.

In this way: readiness of future teachers for using of digital technology training will help to solve the following pedagogical problems:

- formation of interest to psychology;
- optimum assimilation of a pedagogical material;
- development of pedagogical independence as teachers need to look for individually ways and options of a solution;
- training in work in team, tolerance to foreign point of view;
- training in respect of the right of everyone on own opinion, its advantages;
- interaction establishment in team of the being trained;
- formation at teachers of opinions, the relations, professional and life skills.
- We during research defined the principles of work of teachers with digital technology training on interactive occupation:
- occupation – not lecture, and the general work;
- total experience of group is more than experience of the teachers;
- all participants are equal irrespective of age, the social status, experience, a work place;
- each participant has the right for own opinion on any question;
- there is no place to direct criticism of the personality (the idea can undergo criticism only);
- all told on occupation – not the guide to action, and information to pedagogical reflection.

Research results: we allocated the following components of professional competence of the teachers as expert in the field of use of digital technology training: competences of the area of educational activity assume: to own professional activity in the field of pedagogical education, ability to project the professional development; to project and organize pedagogical process in the organization; it is rational to use digital technology training. The following tasks enter competences of the area of experimental and research activity: pedagogically to watch educational and methodical process, to analyze and establish relationships of cause and effect of observed pedagogical factors and the phenomena, to predict their development; to analyze a pedagogical material and tutorials, to predict expected pedagogical results; to correlate reached and due, to predict prospect of its development on defined to a pedagogical basis; to select and critically to use pedagogical information; to own pedagogical methods of knowledge, to plan

and make simple pedagogical experiment; to introduce pedagogically effective results of research in the professional activity. Organizational and administrative activity includes following competences: mastering competences on formation of specific goals and problems of pedagogical consultation, on planning of a training pedagogical material; by definition of the pedagogical purposes of control; on allocation of objects of pedagogical control and establishment their compliance to the level provided by the program. And actuality the competences entering social and pedagogical activity which treat are very important: mastering competences on psychology maintenance the relation in a professional unity, on formation of the polycultural personality, on formation of social interaction. Today the teachers needs to own modern digital technology training information technologies which are realized in competences of the area of educational and technological activity which means: to own digital technology training, information technologies, to work with all types of pedagogical information; to be able to look for, analyze and select independently necessary pedagogical information, to organize, transform, keep and transfer it; to analyze professional incidents; to own a method of development of professional and situational tasks; to reflex, using methods of pedagogical introspection, a self-assessment; analytically to think and in a complex to approach to performance of the pedagogical duties; to own methods of personal self-expression and self-development, means of opposition to professional deformations of the personality; to make the group decision on the basis of methods of group discussion, the solution of problem pedagogical tasks, design.

Research results: the maintenance of components of training of future teachers to use of interactive tutorials allowed us to design Model of readiness of teachers to use of digital technology training which is presented in Fig. 2.

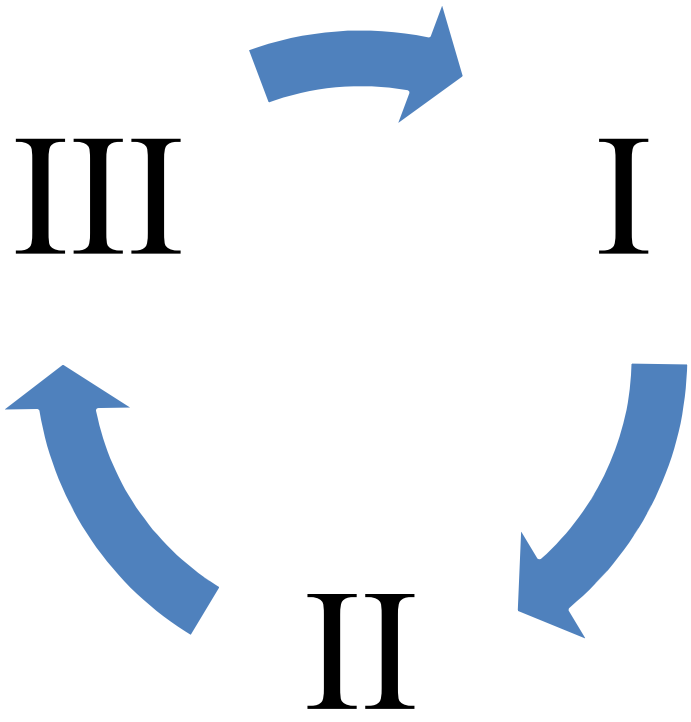

Fig. 2: Model of readiness of teachers to use of digital technology training.

The explanation to figure 1 Model of readiness of teachers to use of digital technology training:

I. – Components of readiness of teachers to use of digital technology training.

II. – Criteria, indicators, levels of readiness of teachers to use of digital technology training.

III. – Professional competences of readiness of teachers to use of digital technology training.

Skilled and experimental work was carried out under natural conditions pedagogical process during training of students (control group – a traditional technique, experimental group – an experimental technique). The purpose of experiment was approbation of the developed Model of readiness of teachers to use of interactive tutorials taking into account specifics of activity of the teachers. At the final stage of experimental work total levels of teachers readiness formation to use of digital technology training taking into account specifics of activity of the teachers were defined. Dynamics of teachers readiness formation levels to use of interactive tutorials taking into account specifics of activity of the teachers is presented in Table 1.

Table 1: Dynamics of teachers readiness formation levels to use of digital technology training taking into account specifics of activity of the teachers (in %)

Levels of readiness formation	Control group		Experimental group	
	Before experiment	After experiment	Before experiment	After experiment
High	4	6	3	54
Average	17	19	16	37
Low	79	75	81	9

Research results: comparison of teachers readiness formation levels to use of digital technology training taking into account specifics of activity of the teachers before carrying out experiment showed that in experimental group of 54% of examinees reached high level of readiness whereas in control group of this level reached only 6% of examinees. Thus, realization of the Model of readiness of teachers developed by us to use of digital technology training taking into account specifics of activity of the teachers, allowed to raise considerably level of readiness of teachers to use of digital technology training.

4. Conclusion

Thus, as a result of the conducted research, on the basis of the theoretical analysis of sources determination of readiness of teachers to use of digital technology training in which specifics of professional activity of the teachers are reflected is given. In the course of the organization of experimental work complexes of criteria, indicators, levels of readiness of teachers to use of digital technology training, such as presence of steady motives to application of multimedia tutorials at school were developed; width and stability of the academic knowledge of digital technology training and techniques of their application by the teachers at school; the content of mastering a technique of use of digital technology training for the solution of training tasks of the teachers.

Levels of readiness of teachers to use of digital technology training are defined as high, average, low. In the course of research the Model of readiness of teachers to use of digital technology training in which contents the essence of readiness of teachers to use of digital technology training is defined was pedagogically proved and almost developed and approved. The model of readiness of teachers to use of digital technology training allows to optimize process of professional training of teachers and it is recommended to use in high school process.

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