REVISTA ESPACIOS

Innovative technologies of pedagogical diagnostics as a means of improving the quality of future specialists' education

Tecnologías innovadoras de diagnóstico pedagógico como medio para mejorar la calidad de la educación de futuros especialistas

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ABSTRACT:

Innovative technologies are considered as a process of changing the learning activities and product of this activity. Innovative technologies include: productive, game, design, multimedia technologies, as components of improving the quality of students' education in pedagogical universities. An analysis of scientific literature on the training of future teachers indicates that the issue raised has not received adequate coverage in the context of the professional training of future specialists. Productive learning technologies. The process is aimed at successful pedagogical activities, focused on the product, and comprehension of this activity. Considering the quality of education problem, it was suggested that using multimedia technologies is related to the creation of multedia products. The web quest method was used, and it was proposed for students undergoing pedagogical practice. The use of network technologies, which are intended for telecommunication of students with teachers, classmates, employees of libraries, educational

RESUMEN:

Las tecnologías innovadoras se consideran como un proceso de cambio de las actividades de aprendizaje y el producto de esta actividad. Las tecnologías innovadoras incluyen: tecnologías productivas, juegos, diseño, multimedia, como componentes para mejorar la calidad de la educación de los estudiantes en las universidades pedagógicas. Un análisis de la literatura científica sobre la formación de futuros docentes indica que la cuestión planteada no ha recibido una cobertura adecuada en el contexto de la formación profesional de futuros especialistas. Tecnologías de aprendizaje productivo. El proceso está dirigido a actividades pedagógicas exitosas, enfocadas en el producto y la comprensión de esta actividad. Teniendo en cuenta el problema de la calidad de la educación, se sugirió que el uso de tecnologías multimedia está relacionado con la creación de productos multimedia. Se utilizó el método de búsqueda web y se propuso para los estudiantes que se someten a la práctica pedagógica. Se propone el uso de tecnologías de red, que están destinadas a la

establishments, is proposed. The application of act-therapy, computer design-design, situations and various tasks is shown. The effectiveness of the proposed innovative technologies in the training of future specialists is shown.
Keywords: Innovative technologies, pedagogical diagnostics, the quality of education, media technology, efficient technologies.

telecomunicación de estudiantes con profesores, compañeros de clase, empleados de bibliotecas, establecimientos educativos. Se muestra la aplicación de la terapia de acción, diseño de computadora, situaciones y diversas tareas. Se muestra la efectividad de las tecnologías innovadoras propuestas en la formación de futuros especialistas.
Palabras clave: tecnologías innovadoras, diagnóstico pedagógico, calidad de la educación, tecnología de los medios, tecnologías eficientes.

1. Introduction

The quality of higher education plays a key role in the creation of a single European educational space, so it becomes central in the educational policy of Ukraine. The quality of education is determined not only by the scope of knowledge but also by the parameters of personal, ideological and civil development, in such case the problem of the quality of educational process is considered from the standpoint of universal and social values of education. These factors emphasize the problem of education quality management in higher education.

The education in new conditions must meet international standards and provide the opportunity to people to realize themselves as fully as possible. There is a change in the orientation of the education to the European standards in Ukraine today, which requires a reorientation of the educational process to the new principles of training and education. Therefore, the tasks to create the best conditions for disclosure and development of personality, who will be able not only to determine ways to further life, to treat consciously to its own future life, but also to represent itself fittingly, to realize in life, to become a specialist, whose knowledge and skills are required by the society.

The analysis of the scientific literature from the training of future teachers indicates that this problem is not adequately brought to light in the context of vocational training, that caused the contradiction between the social need to update all of the structural elements of the education system on the basis of the pedagogical diagnostics and the absence of such developments in the content of theoretical and practical training of future teachers in higher educational institutions (Philosophical Encyclopedic Dictionary, 1983).

1.1. Literature Review

The different aspects of the quality of general secondary education, which a teacher must reach in the process of his professional activity are proved: the level of students' knowledge, their competence; the characteristics of development of students' abilities (B. Bitinas, Yu. Vorenko, V. Kuznetsov, P. Pidkasystyi, I. Filonchuk, etc.); the quality of future teachers' training bring to light (A. Bogush, A. Kuzminsky, V. Lugovoi, N. Nychkalo); the effectiveness of pedagogical diagnostics (L. Bertalanfi, I. Blauberg, J.-M. Barbier, A. Bine, I. Podlasyi). A. Arlamov, N. Burgin, V. Zhuravlev, N. Usufbekova, A. Nichols, etc engaged pedagogical innovation theory.

1.2. The purpose of the article

To consider the problem of introduction of innovative technologies of pedagogical diagnostics as a means of improving the quality of future specialists' education. Innovative technologies are considered as a process of change in education and the product of this activity. Innovative technologies include: productive, actable, design, multimedia technologies, as a part of improving the quality of education of students in pedagogical higher education institutions.

1.3. Tasks of the article:

1. To clarify the concept of "innovative technologies", "pedagogical diagnostics", "quality of

education".

2. Show the use of innovative diagnostic techniques in the educational process.

3. Use of multimedia technologies as a diagnostic of the success of education.

2. Methods

To solve the research problems, theoretical analysis (retrospective, comparative) of psychological and pedagogical literature and generalization and classification of scientific data in philosophical, psychological, pedagogical, educational-methodical and instructive-methodological sources were used to elucidate the state and theoretical substantiation of key concepts and categories of research; empirical methods - for studying the state of introduction of innovative technologies of pedagogical diagnostics as a way of improving the quality of education, methods (questioning, surveys, testing) were applied; pedagogical experiment (reconnaissance and search, ascertaining, forming stages), analysis of products of students' activities; quantitative and qualitative analysis of empirical data.

3. The obtained results

The concept of quality education is broad enough, as it covers the quality of education, education and personality development as a result of educational activity. An analysis of modern literature suggests that the most widespread is the idea that the quality of education is compliance with a certain norm and standard. In other words, quality determines the usefulness, the value of objects, their ability to meet certain needs or to realize certain goals, norms, that is, expresses the adequacy of requirements, needs, norms ("Innovative technologies in education", 2017). Consequently, the category of "quality of education" is revised, depending on the conditions, requirements of society and time. The quality of education can be considered as a system of socially determined indicators of the level of knowledge, skills, value attitude to the world, which students must master (Savchenko, 2012).

One of the topical issues to be addressed by modern higher education is the selection of content that should reflect all the peculiarities of the professional activity of a graduate of a higher educational establishment. It is necessary to regulate innovative technologies which promote the quality of education (Bloom, Madaus, Hasting, 1971).

An innovation means a current development that improves the progress and the results of the educational process (Kovalenko and Glushnenkova, 2017). The innovation can be viewed as a process of change in education and the product of this activity. In our study, we consider the productive, actable, design, multimedia technologies, as a part of improving the quality of students' education in pedagogical higher education institutions. A productive training technology is a process aimed at the success in educational activities focused on a product and reflection of this activity in the group of students with the support of teachers in a real-life situation. Educational objectives of productive learning is having specific product as an independent subject of activity of the student in accordance with the general requirements of the training (Adam, 1981). (One of the important directions of development of education is interactivity, innovation of the learning process, which provides feedback, the benefits of these technologies, which have led to the need for their use in training.

Pedagogical diagnostics is a cut and analytical assessment of the statistical state of pedagogical phenomenon according to certain parameters, so the diagnosis of the professional educator requires knowledge and ability to use parametric data that characterize its state at different levels (Bower, 2008).

Targeting educational assessment depends on the degree of differentiation of its innovative forms and content in accordance with individual or group characteristics of teachers, due to the differences of gender, job status, subject and social orientation, level of education, and so on (Orozco-Gomez, 2006).

The study adopts a methodology that is used in art therapy. The art therapy provides a

variety of arts and crafts: drawing, modeling, burning, manufacture of articles of fabric, fur, natural material. In addition, any special training and talent of the performers and artistic value of the works is not so important, but actually a creative process, and features of the human inner world are important. According to the researches of A. Capita, the role of art therapists in the education has increased substantially abroad; they work in specialized and comprehensive schools, often with children with specific emotional and behavioral disorders and learning difficulties (Issing and Schaumburg, 2001).

It is worth emphasizing the spontaneous nature of the creative activities of art-therapy sessions, in contrast to the learning process. The study has differentiated a number of functions. First of all, we are talking about a correction function that helps to adjust the image "I", which previously could be deformed, improves self-esteem, neutralizes inadequate forms of behavior, and arranges interaction with other people. High results have been achieved while working with deviations in the development of emotional-volitional sphere of a personality. Each graphical image that can be studied as a nonverbal message to someone else has something specific individual. The difficulties of the methodological task, according to E. Romanova, O. Potemkina, are associated with the maximum contrast of distinction that belongs to the student, separation from the normative, "non-author" side of the image-canvas of the objective situation, the influence of standard objectives, and general content of the message (Romanova, 2002).

The diagnostic functions of art therapy are motivated by the fact that it helps to get information about the development and individual needs of the student. This is a correct way of monitoring them in an individual activity that gives the opportunity to know their interests, values, to see the inner world, individuality, personal identity, and to fix the problems that need special correction. The nature of interpersonal relationships and the real situation of each team, the family situation manifest during the course. The art therapy identifies profound inner problems of the individual. Having multidimensional diagnostic capabilities, it can be enrolled to the projective tests. The existing constraint that is common to all age groups is caused by the lack of strict standardization, the predominance of the empirical approach in the art-therapy diagnosis and, therefore, subjective nature, depending on the level of training, intuition, personal experience of a psychologist (art therapist). The obtained data are descriptive in nature, they are difficult to measure and to present as a clear system of statistically objective, reliable, valid results (Savchenko, 2011).

Considering the problem of the quality of education, the use of multimedia technologies has been suggested, it is associated with the creation of multimedia products: electronic books, encyclopedias, computer movies, databases. These products will combine text, graphics, audio and video information, animation.

For example: 1. A teacher offers to find an interesting information advertisement of the higher educational institution at the Internet sites, in a newspaper or in a magazine. During a class, a student must prove to an opponent that his advertisement is really interesting and unusual. Students work in pairs, alternately defending their advertisement that they have chosen. They need to justify their choice clearly and convince others.

2. Each student receives a card with a detailed description of his "profession" that does not coincide with his youthful dream. On the principle of "Brownian motion", the students tell each other their pieces of information to identify exactly who has realized the "dream of youth". Having found a couple that is also not satisfied with the current work, the students criticize their contemporary life, using the term "quality", "diagnosis", "success", "career".

3. Students are acquainted with the rules of resume writing. Everyone gets a task to write a summary for applicants for various jobs.

4. The teacher announces the topic of the discussion and offers a movie about the terrible stress that a person has received at work. "Invited" express their opinions regarding the motivation to build a career (no more than 2 minutes). The lead and the experts ask questions to the speakers. The experts summarize the discussion in the content and the form.

To provide innovative technologies in the high school the course "Pedagogical diagnostics of

the quality of education" has been provided (the fourth course, 36 hours). During its teaching the business and role-playing games "Inspection and certification of schools", "Methodical Council of teachers of technological education" have been used; the pedagogical situations of varying difficulty, a variety of intellectual exercises (riddles, puzzles, crosswords, drawings, graphs), pedagogical tasks "Choose the diagnostic methods for studying of the quality of students' education", presentations "Rating of educator", web quests "Individual trajectory of future teachers", pedagogical situations with the "Methodological box of the teacher of technology and plotting," intelligent exercise, "Duncan", "Add a table", "Stages of control", "Understanding errors" have been suggested; presentations on the topic "Reorganization of methodical Association", "Creation of an advertising booklet"; business game "Evaluating of a candidate for proposals to the vacant post of Deputy Director of the school" have been introduced.

4. Discussions

In the course of scientific research, the method of web quest has been used and it has been offered to students who are at the school practice of the fifth year in high school (technology lessons). The purpose of the web quest is the formation of the motives of educational activity, the development of the skills of searching, processing and presentation of information in electronic format.

In the task to the web quest the groups and roles of project participants are noted; the forms of the final result representation are described. The pupils are proposed to divide in groups; each of them reflects one of the positions in their work, in the context of which they are studying the module "Technology of preparation and storage of food". Choosing a group, students can focus on their abilities, interests, tastes and tendencies or, conversely, to try themselves in "an unusual role". The sample of the web-quest instruction on the variable module "Technology of preparation and storage of food" is presented below. To help students the teacher gives guidelines on the formulation of a general concept, structure, scope and content of the website, and also template processing of electronic pages that must comply with the following requirements: to contain important information, to have good design; to provide convenient navigation, to be attractive and well-remembered. An annotated list of electronic information resources that are necessary to perform the tasks, should be presented in the form of electronic links in the Internet.

One of the factors of working with students has been the use of network technologies that are used for students' telecommunication with teachers, fellow students, employees, libraries, educational institutions and so on. Telecommunications access to databases is via the World Wide Web. The forms of network communication are email, teleconference, and computer design.

The students have performed design-focused tasks: "Doors Open Day", the signs: "Students' cafe", "Travel Agency", an advertising agency, a new library of educational institutions, development concepts of student theatre; a realistic composition in 3D Studio Max; a monogram of using simple forms, in which one or another emotional state of the person would be reflected.

The method of concrete situations (or case-method) is based on a situational approach; its main task is to develop students' practical skills and decision-making skills in their professional activities. Using the case-method in practical classes on disciplines "Computer Graphics and CAD", "Designing products by means of computer graphics", "Modeling of technological processes" involves students performing individual tasks included in the case "Interior design development". At the same time, the content of the tasks reflects the real problem that professional professionals may encounter. The independent tasks "Create an atlas of tree species used in interior design" were offered. It consisted in collecting and qualifying material from a theme and presenting it in the form of a scheme or a table showing a certain author concept of the research. Students did the work with the case "Battle of interior designers catering", "Battle of styles (loft and classics).

During the diagnostic testing of students the questionnaires, tests, interviews etc. have been used. The average index of the quality of the preparation of future teachers of technology is

shown in Fig. 1.

Fig. 1
The average index of the quality of future teachers of technologies' training
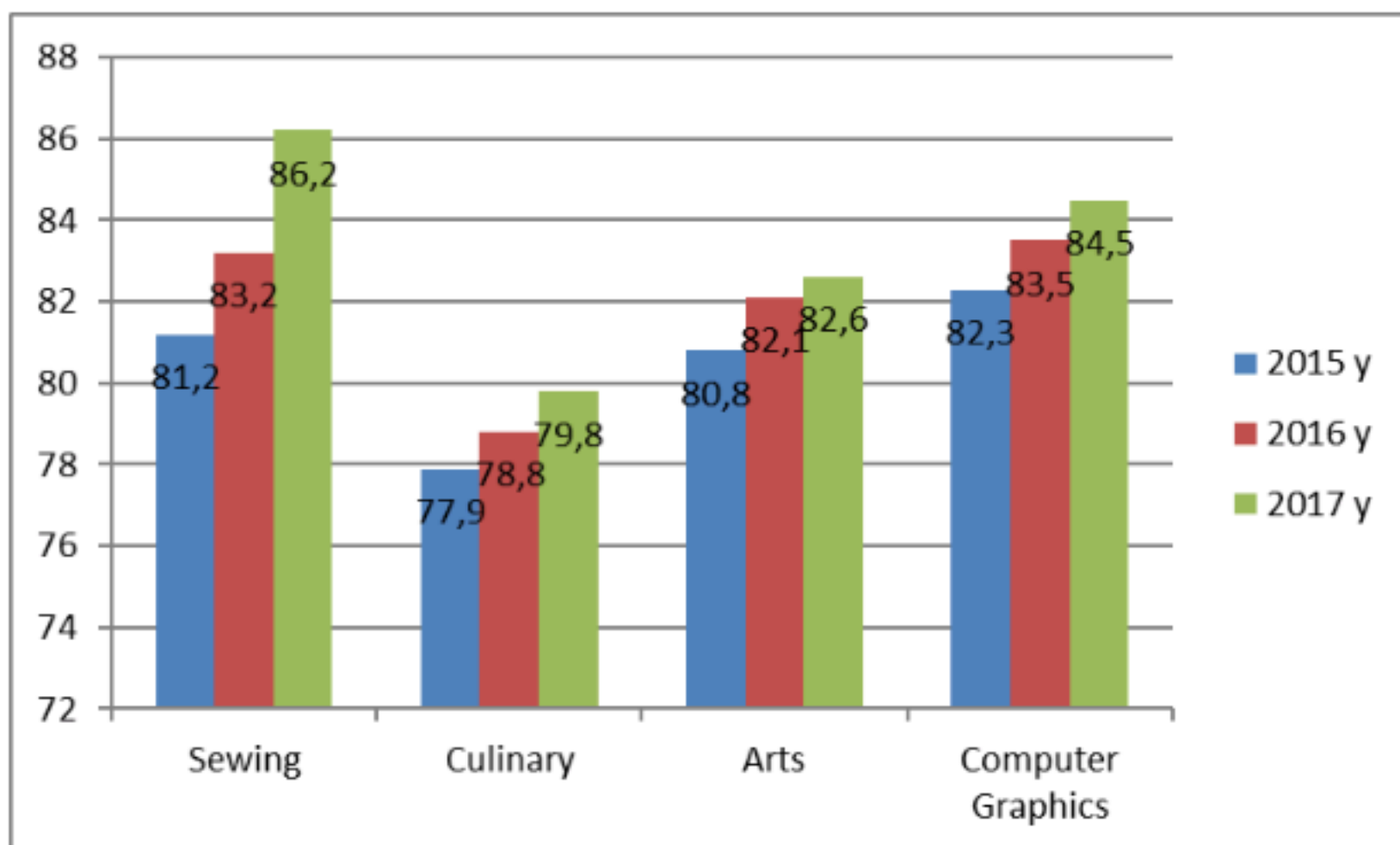
The average index of the quality of training has gradually changed in the course of the year. These results are related to the fact that in 2015 the traditional kinds of diagnostics of the quality of students' knowledge were used. In 2016 – 2017 a portfolio of students, individual-group work, technology of web quest, group work, simulations and others were implemented in the educational process, in addition to the described types of the control.

The repeated questioning was held to determine the significance of the use of diagnostic techniques in the learning process and the levels were differentiated: high, medium, low.

The results of the study on the criterion "The importance of the use of diagnostic techniques in the learning process" at the ascertaining and forming stages of the experiment are mapped in the Table. 1.

Table 1
The results of the study

Levels	The ascertaining stage		The forming stage	
	The control group	**The experimental group**	**The control group**	**The experimenting group**
	%	%	%	%
High	16	15	16	38
Medium	42	38	50	54
Low	42	47	34	8

The obtained results for the criterion "The importance of the use of diagnostic techniques in

the learning process" are shown in Fig. 1

By comparing the results of studies on the criterion "The importance of the use of diagnostic techniques in the learning process", it is summarized that the parameters changed in the control and experimental groups. In the control group a there is a marked increase in the number of students with average level (8 %), decreasing with low (6 %), and the number of respondents with a high level remained unchanged. In the experimental group, there is an increased number of students with high (23 %) and secondary (16 %) levels decreased from low (39 %), but these figures are significantly higher than in the control group, which gives reason to believe the experimental work is efficient and effective.

5. Conclusions

Therefore, the use of different diagnostic techniques in the classroom in high school as in secondary school should be integral to the learning process. The diagnosis should be performed objectively, systematically, clearly, in the logic of conformity, in which the training in educational institution happens. In high school diagnosis takes a new meaning for the subjects of the educational process, appearing not as the forced training and the tight control by the administration and teachers over students, but as a means of rational and objectively determine a student's personal rating, a means of self-stimulation to learning. The diagnosis must contain the usual elements of the traditional control of knowledge, abilities and skills of students and to outline the trends, the dynamics of formation of products of training, to perform the functions of the statistical accumulation of information, analysis and prognosis of the educational process. An innovation is a specific and quite complex; requires special knowledge, skills, and abilities. The innovation is impossible without the implementation of pedagogical diagnosis by the teacher at high school, who has a system thinking, developed ability to be creative, formed and conscious commitment to innovation. We see our further work in the development of media technologies rising of the quality of higher education of students.

References

Adam R, Chen D. (1981). *The Process of Educational Innovation.* Lnd, 84.

Bloom, B. S., Madaus, G. F. & Hasting, J. T. (1971). *Handbook on Formative and Summative Evaluation of Student Learning.* New York, NY: McGraw-Hill.

Bower, E. (2008). *A Barriers to Innovation in Continuing Medical Education Journal of continuing education in the health professions*, 28(3), 148–156.

Edmuller, A., Wilhelm, T. (2007). Moderation: the art of holding meetings, conferences, seminars. Moscow: SmartBook, 119.

Fitz-Gibbon, C.T. (1996). *Monitoring Education* (London: Cassell), 259.

Furst-Bowe J. A., Bauer R. A. (2007). *Application of the Baldrige Model for Innovation in Higher New directions for higher education*, 137.

Guillermo Orozco-Gomez. (2006). *Can we be more creative in thinking about how to scale up educational innovation?* Journal of Educational Change.

Il'ichev, L. F. (1983). *Philosophical Encyclopedic Dictionary.* Moscow: Sov. Encyclopedia, 840.

Issing, Ludwig J., Schaumburg Heike. (2001). *Educational Technology as a Key to Educational Innovation*: State of the Art Report from Germany Tech Trends, v.45, no 6, 23-28.

Moor, S. M. (2017). *Innovative technologies in education:* Materials of the IV International scientific-practical video-conference (Tyumen, November 30, 2016). Tyumen: IUT, 216.

Kinser, K. (2007). *Innovation in Higher Education: A Case Study of the Western Governors University.* New Directions for Higher Education. 137.

Kovalenko, S. V., Glushnenkova, L.T. (2017). *Innovative technologies in education: foreign experience.* Scientific and methodical electronic journal "Concept". No. S3. Retrieved from http://e-koncept.ru/2017/470045.htm.

Romanova, E. S., Potemkina O.F. (2002). *Graphical methods in psychological diagnosis*. St. Petersburg: Speech, 416.

Savchenko, K. Yu. (2012). *Information-communicative approach to solving of pedagogical situations.* Materials of the International Science and Technology Conference Sustainable development of industry and societies. Kriviy Rig, V. 2, 77-78.

Savchenko, L. O. Volkova, N. V., Kulinka, Yu. S. (2011). *Games and game technologies in the lessons of labor education: a teaching manual*. Kryviy Rih: Publishing House, 284.

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