

On the Effectiveness of the Training Programs in the Learning Process¹

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Abstract

One of the main problems of the education system is to improve the training quality of the younger generation for professional activities in the information society. At the present stage of higher education development, many methodological innovations are associated with the use of IT-based teaching. One of the areas of computer technology use in education is e-learning tools that help to better and more quickly master the most difficult sections of a particular subject. The use of computer-based teaching programs in the educational process, in particular, the Photoshop Graphic Editor program in the Delphi programming environment, allows the teaching process to differentiate, contributes to increasing the motivation and motivational readiness of students to apply acquired knowledge and skills in real life. The authors single out a comparative analysis of pedagogical literature as one of the leading methods in the study of this problem. It was revealed on its basis, that the study of the Adobe Photoshop graphics editor within the school curriculum is not considered, and attention should be paid to the pedagogical experiment that justified the use of the Photoshop Graphic Editor program in the Delphi programming environment when studying basic disciplines. The main result of the research is the development of the Photoshop Graphic Editor teaching program in the Delphi programming environment. The significance of the results obtained is in solving such a major scientific problem as the development of basic competence in the field of computer graphics by future teachers in the natural science cycle. The research results fill in the existing gaps in the theory of higher education and also contribute to the solution of questions on the motivation in learning computer sciences by students of pedagogical departments of universities.

Keywords: Computer-Based Teaching Program; Graphics Editor; Training Goals.

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1. Introduction

The rapid growth of information and communication technologies makes new demands on the education system which should prepare the younger generation for life and professional activities in the information society. Therefore, a modern teacher is faced with the task of teaching students the technologies of cognitive activity that contribute to the fast and high-quality processing of the information they receive, the mastering of new knowledge that they could apply in solving the set tasks (Akhmedova, 2015; Soleimani & Esfahani, 2018).

In modern conditions, where there is a constant decrease in the number of hours for lectures and practical classes leading to premature learning of many topics and the lack of interdisciplinary connections, computer technologies contribute to the effective organization of the educational process (Khabibullina, 2014; Khabibullina et al., 2018).

Effective training of future specialists involves the construction of an educational process based on a set of pedagogical approaches (integrative, differentiated, student-centred, and also competency-based and vocational-oriented), which is implemented in the e-learning process (Makletsov et al., 2016).

Using computer-based teaching programs in the educational process not only contributes to the mastering of educational material by students, but also allows the level of its mastery to assess freeing teachers from routine work, and maximizing their time for creative activity (Akhmedova & Khabibullina, 2014).

Thanks to research in the field of the theory and practice of professional education of such scholars as V.P. Bepalko, P.I. Halperin, T.I. Gergey, as well as works on general pedagogical problems of improving education (Betz, 2004; Khabibullina et al., 2016; Makletsov & Khabibullina, 2016; Zaripova et al., 2015), it became possible to develop issues on computerization of education. This is a logical continuation of the introduction into the educational process of computer-based teaching programs, the development of which was considered in the works of A.A. Andreev, L.I. Dalinger, Ts.Ts. Dorzhiev, V.M. Monakhov, E.I. Mashbits.

The following features of modern teaching programs can be distinguished: high-level paid teaching programs and free programs which mostly duplicate printed materials or are a simple presentation of theoretical material that is not adapted to the needs of a particular discipline. Therefore, we set out to analyze the existing teaching programs and to develop a teaching program “Graphic Photoshop Editor” in the Delphi programming environment (Villalobos, 2018)

At the initial stage of the study, the tasks of training that were solved using computer-based teaching programs were considered: tasks to check the level of acquisition by students of knowledge and skills; tasks related to the organization of educational activities; the task of preparing educational material (Dorzhiev, 2004).

A comparative analysis of study materials on the course of computer science has shown that the school program does not involve the study of the graphics editor Adobe Photoshop. Usually, this section is introduced at the initiative of the teacher (when studying graphic editors for the discipline program or optional) and is studied on the basis of the manuals developed by them.

We share the opinion of Sakkulina according to which the formation of basic competence in the field of computer graphics is based on the use of a limited number of basic graphics editor tools (Sakkulina & Rozhina, 2012).

2. Methods

It should be noted that when studying computer graphics, as well as working with graphics editors, it is advisable to use such teaching methods that will stimulate students to strive for an independent study of the material. The most effective method is to divide a complex and voluminous task into several simple ones, with a mandatory discussion of the results of solving each task. It is worthwhile to introduce a scoring assessment system and refuse to issue specific ratings, if possible.

It is possible to control the mastering of the material when studying graphic editors by performing control tasks with obtaining a specific result (creation of a necessary image) and various creative tasks for creating various projects (Lapchik et al., 2008).

In our opinion, the additional use of computer-based teaching programs for teaching work with graphics editors allows teachers:

- to provide all the components of the educational process: obtaining information, practical exercises, certification (monitoring of educational achievements);
- expand opportunities for independent learning work through the use of active pragmatist forms of education (interactivity);
- get the opportunity for more comprehensive learning outside the classroom.

Based on the Internet sources and textbooks that we selected, a methodological material was prepared, consisting of the following items: Photoshop lessons, inspection tests, project work, video lessons.

The authors have elaborated laboratory works (28) with detailed instructions for performing tasks. 4 tests were developed for intermediate knowledge control. For the final knowledge control, a creative project work “Creating a Site Layout” was developed, during the implementation of which students should demonstrate all of their skills and abilities obtained during the performance of laboratory work. In addition, the teaching program included 10 video tutorials on the theme “PhotoShop Graphic Editor”.

The development of the training program was carried out in the Delphi programming environment. The program consists of the main form and a password request form. The main program menu located on the screen of the main form includes the following items: Photoshop tutorials, inspection tests, project work, video tutorials. A password request form is required to access a project work and inspection tests.

At the first stage of working with the teaching program, students become familiar with the theory. Further, students must perform laboratory work for the formation of their practical skills. Control tasks allow a teacher to control the current knowledge as a student progresses through the course. Upon completion of the training, students are invited to perform creative project work on preparing the site layout.

3. Results

To test the effectiveness of the use of the teaching program "Photoshop graphics editor", the program was tested in the study of the Computer Graphics and Design discipline by future teachers of physics and computer science at the Institute of Physics of KFU. With the help of the tutorial elaborated, an experimental group studied the graphics editor Photoshop. As the material was studied, the intermediate control of knowledge in the form of examinations was carried out. The final control of students' knowledge was carried out in the form of project work. On the basis of the control results and the project works, the degree of mastering the studied material was determined.

After completing the full course "Photoshop Graphics editor" using the teaching program a survey of students was conducted, on the basis of which the statistical processing of the appraisal results was carried out and the Pearson and Spearman correlation coefficients were calculated.

Statistical processing of the appraisal results is presented in Table 1.

Table 1.

	Mode	Median	Average	Dispersion	Standard deviation
Program interface	3	3	2.533	0.267	0.516
Conciseness of the material	2	2	2,400	0,257	0.507
Material content	2	2	2,333	0.381	0.617
Coherence of material	3	3	2,667	0.238	0.488
Skill training	3	3	2,667	0.238	0.488

Complexity of inspection tests	3	3	2.533	0.410	0.640
Project work	3	3	2.467	0.410	0.640
Skill maturity degree	3	3	2.467	0.410	0.640

Comparing the program interface mode, the coherence of material, the skill training, the complexity of inspection tests, the project work, and the maturity degree, we can say that students have marked these parameters with a high grade of "3". The median for the same parameters shows that the 50th percentile rank is also at a high level.

Dispersion and standard deviation in the evaluation of the coherence of the material and skill training are lower than for other parameters. This means that students' skills differ. The reason for this is that the students worked individually and did not depend on each other when performing practical tasks.

At a significance level of **0.99**, in the experimental group **there** are reliable relationships which depend on:

- *Content* (formed skills of working with the graphics editor $r = 0.844$);
- *Program interface* (sequence $r = 0.756$).

At a significance level of 0.95, in the experimental group there are reliable relationships which depend on:

- *Skill training* (project work $r = 0.570$, complexity of inspection tests $r = 0.534$).

The Pearson correlation analysis which determines the level of mastering the Photoshop graphics editor showed that the skills developed with this editor depend on the content of the material being studied, and the coherence of the material presentation depends on the program interface. It was also found that the complexity of the project and test works depend on the development of practical skills in studying this course.

In order to determine the nature of the relationship between the parameters identified above, Spearman's rank correlation analysis was performed, the results of which are presented in Table 2.

Table 2.

Correlation		Spearman coefficient r_s
Program interface	Coherence of material	0.8259
Material content	Skill maturity	0.85

Skill training	Complexity of inspection tests	0.7513
Skill training	Complexity of project work	0.6464
Complexity of inspection tests	Complexity of project work	0.6349

4. Discussion

Based on the calculated Spearman correlation ranking coefficients, it was found that:

- the program interface directly depends on the sequence of the presented material;
- the skills formed in students depend on the content of the material (the more complete and detailed the material is, the higher the level of skills formed);
- the implementation of project and control works posed troubles to the students who have not mastered practical skills. At the same time, after executing the inspection tests, the missing skills were developed, and the implementation of project work became less difficult.

Upon completion of the appraisal and analyzing the results of the experiment, the teaching program was debugged: spelling errors in the text of laboratory works were corrected, semantic errors were corrected, i.e. errors during the execution of the program. At the request of students, new labs were added.

Upon completion of the appraisal, the students noted that:

- compared to traditional methods, studying the course with the help of the teaching program is much more interesting;
- the teaching program interface allows students to quickly adapt to work with it;
- the teaching program can be used not only in the classroom but also during homework;
- the possibility of multiple repetitions of the material with the help of the teaching program improves the learning quality and level.

5. Summary

The authors substantiated with this paper the effectiveness of using the Photoshop Graphic Editor program in the Delphi programming environment when studying natural science disciplines. It is proved that the use of computer-based teaching programs in the educational process contributes to the acquisition of deeper and higher-quality knowledge by students, the satisfaction of their individual needs and the development of creative potential, the formation of students' motivational readiness to apply acquired knowledge and skills in real life.

6. Conclusion

The study showed that the use of the program "Graphic Editor Photoshop" in the Delphi programming environment is appropriate when studying the individual basic sections of future teachers of natural sciences.

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References

- Akhmedova, A. M. (2015). The use of modern e-learning tools in the educational process. *Science Time*, 1(13), 36-39.
- Akhmedova, A. M., & Khabibullina, G. Z. (2014). Preparation of teachers in physics and computer science to the use of electronic teaching aids. *Proceedings of Institute of Social and Humanistic Knowledge*, 1(12), 130-134.
- Betz, N. (2004). Contributions of self-efficacy theory to career counselling: a personal perspective. N. Betz. *The Career Development Quarterly*, 52, 340 – 353.
- Dorzhiyev, Ts.Ts. (2004). *Development and methodological recommendations for the use of an automated learning system for descriptive geometry in the educational process*. Ulan-Ude: VSSTU Publishing House.
- Khabibullina, G. Z. (2014). The main problems of using computer technology in the teaching of mathematics in universities. *Kazan Pedagogical Journal*, 1(102), 75-80.
- Khabibullina, G. Z., Makletsov, S. V., & Khairullina, L. E. (2018). Application of information technologies to improve the quality of mathematical training teachers of natural-science disciplines. *International Journal of Engineering and Technology (UAE)*, 7(4), 74-77.

- Khabibullina, G. Z., Shigapova, E. D., & Rusanova, I. A. (2016). The Development of Academic Mobility of Students of Pedagogical Departments in Universities. *The European Proceedings of Social & Behavioural Science EpSBS*, 12, 83-88.
- Lapchik, M. P., Semakin, I. G., Henner, E. K., & Ragulina, M. I. (2008). *Theory and methods of teaching computer science: A textbook*. Moscow: "Academy".
- Makletsov, S. V., & Khabibullina, G. Z. (2016). E-learning model for bachelors, specializing in Mathematics and IT. *The European Proceedings of Social & Behavioural Science EpSBS*, 12, 115-119
- Makletsov, S. V., Starshinova, T. A., & Khabibullina, G. Z. (2016). Formation model of information competence of bachelors specializing in mathematics & computer sciences. *Journal of Organizational Culture Communications and Conflict*, 20(2), 173-179.
- Sakkulina, Yu. V., & Rozhina, I. V. (2012). Computer graphics as a means of forming professional competences. *Pedagogical Education in Russia*, 6, 76-80.
- Zaripova, I. M., Akhmedova, A. M., & Chernova, Y. A. (2015). Selecting and Structuring teaching content algorithm for physical and mathematical disciplines, aimed at students' project-technical competence-formation. *Review of European Studies*, 7(4), 6-12.
- Soleimani, M., & Esfahani, M. K. (2018). The impact of network of social relationships effective in drug addiction and crime in connection with the it. *UCT Journal of Social Sciences and Humanities Research*, 6(4), 1-5.
- Villalobos, J. V. (2018). Politics as a requirement. On the concept of Human Rights and the right to an autobiography as an ethical category. *Opción*, 34(85-2), 9-19.