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| Research Article

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Methodology of Teaching Students of Informatics Education Based on Software Tools

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Abstract: This study examines the issue of organizing classes for students of mathematics and computer science at higher education institutions using software. Didactic functions aimed at stimulating students to active participation and developing independent thinking skills are analyzed. Ideas for the use of educational modules aimed at developing students' skills by implementing the functions of a test system using software are also presented.

Keywords: iSpring, software, iSpring Free, SCORM formats, iSpring Suite, QuizMaker software, electronic tests, iSpring DialogTrainer, LMS system, iSpring server platform, virtual learning environment.

INTRODUCTION

One of the programs widely used in the development of e-learning resources in our republic is iSpring, which is an ideal tool for creating presentations. Typically, Microsoft PowerPoint is widely used in the preparation of presentations. However, these presentations can only be in PowerPoint format (ppt, pptx)[1]. Nowadays, with the development of Internet technologies and the introduction of distance learning, presentation files must be in a format based on flash (swf) or HTML5 technologies for direct viewing online in Internet browsers. Currently, programs have been developed that allow you to create flash videos from presentations created in PowerPoint[2]. The use of software and the implementation of interactive technologies in the educational process today requires the formation of young people as highly qualified specialists, individuals who have the ability to think and analyze independently using modern innovations in the field of science. Currently, the rapid development of science and the widespread use of digital technologies, the constant updating of knowledge in various fields require students to independently and constantly acquire new knowledge[3].

Within the framework of the "National Personnel Training Program", special emphasis is placed on developing the knowledge and skills of students studying in higher education institutions, providing them with software and modern pedagogical technologies. This involves improving the teaching process, especially the effective organization of students' extracurricular activities using software tools[3].

The main part

A survey was conducted to study the aspects that need to be paid attention to in the development of software education, the state of students' use of software education and technologies. According to the results of the survey, 72.1 percent of the participants preferred to use smartphone devices, and 81.2 percent had knowledge about software education. Also, 82.7 percent of the participants emphasized the need to use digital technologies in education, and when asked about the importance of software education, 91.8 percent answered "necessary". Based on these results, the purpose of the study was determined[4]. The effectiveness of software education is that participants acquire holistic, systematic knowledge and develop independent and creative thinking skills. Therefore, software education is recognized as one of the effective methods of developmental education. The initiative and skills of teachers in organizing the independent work of their students outside the classroom are of great importance[5].

Studies have shown that increasing students' interest in software tools, using software tools and social networks in specialized subjects currently taught in the "Mathematics and Informatics" educational direction of higher education institutions, will allow students to spend their free time effectively and meaningfully, further strengthen their interest in science, as well as correctly form their worldview and achieve educational and moral maturity[6].

Research shows that increasing students' interest in software tools is currently being studied as one of the most pressing issues in the teacher training system.

According to independent experts, iSpring Free, iSpring PRO and iSpring Presenter are currently recognized as one of the best programs in terms of speed, quality of conversion from one format to another and the number of functions offered. iSpring is useful not only for creating flash presentations, but also for preparing videos that can be used in the educational process, including interactive communication, including various forms of surveys and electronic tests[7].

iSpring provides the following capabilities:

- Ability to convert presentation files to multiple formats (exe, swf, html);
- Ability to add external resources (audio, video or flash files) to presentation content;
- Presentation protection: password protection, "protect" the presentation, restrict the presentation to use only in authorized domains;
- Adding video and synchronizing it with animations;
- A tool for creating interactive texts (Quiz button) with the ability to create electronic tests (controls) and send their results to an e-mail or distance learning system (LMS);
- Creating courses in SCORMGAICC format for use in distance learning systems;
- ActionScript API capabilities for conversion in the presentation program;
- Recording video and synchronizing it with the presentation;
- Ability to include videos posted on YouTube in the presentation[8].

Monitoring, testing, and evaluating students' knowledge is crucial in preparing modern, competitive professionals. If this process is not properly organized, it will be difficult to achieve the expected results, regardless of the use of various methods, interesting lessons, or the

preparation of new tasks. Because in the human mind there is always a psychological process of evaluating the results of his work. If the results of his work are not evaluated or he is not properly rewarded, his activity may decrease, and as a result he is likely to become "disappointed". The teacher regularly checks and evaluates the knowledge of students, encourages them to study the subject in depth and improve their control methods[9].

When monitoring knowledge, skills, and abilities in the field of education, the testing system performs the following main functions: diagnostic, educational, organizational, educational, and management. The diagnostic function constitutes the main content of test control: it is aimed at determining the effectiveness of educational lessons, changes in the level of academic subjects, and achievements in the student's general professional training and their structure.

The educational function is based on demonstrating knowledge through tests or benchmark answers, expressing areas of study, and identifying gaps or errors. During the test lessons, knowledge is improved by making additions, clarifications, and corrections.

The educational function is associated with strengthening the student's educational foundations, developing responsibility for the results of cognitive activity, and self-management of the learning process. The educational and motivating effect of supervision is enhanced if its results are open and transparent. In general, monitoring academic achievement helps a person see their strengths and weaknesses. The managerial function of testing is associated with actions aimed at increasing the effectiveness of the educational process, as well as improving educational methodologies and technologies, based on test results. Compared to a traditional oral exam, a test exam is not only the most objective assessment method, but also the most psychologically comfortable and safe: the level of anxiety is low, attention is high, and the physiological state of the body is optimal.

In this case, the "subtle difference" of the oral exam is that the examiner's excessive strictness or, conversely, excessive indulgence does not affect the examiner's emotional assessment of the student. For a well-prepared group, the negative effect of reducing the marks disappears, since the examiner strives to create a scale for the fair distribution of his marks. The exam test will have a uniform assessment level for students, and uniform assessment criteria and standards will be developed, which will save time for students and teachers. Failure in the exam will not be related to the personal characteristics of the teacher.

Modern testing in the educational process is carried out on the basis of the theory of qualitative measurements and engineering pedagogy. Tests used in higher education institutions (HEIs) are divided into two main groups depending on their function:

- qualification (normative);
- certification (criterion-based).

The main requirements for test-based control of knowledge are:

- validity (correctness in function and content);
- accuracy (understandable for everyone);
- simplicity;
- expression of the same meaning (assessment based on answers);
- reliability.

When determining the validity of a test, it is important to distinguish between its content and functional validity.

The test's accuracy requirements are met, along with the student's correct understanding of the tasks, and it warns that incorrect answers should not be taken into account in addition to the correct answer.

The simplicity of the test means that each test should consist only of tasks of the same level of difficulty, that is, it should not consist of multiple tasks or complex tasks of different levels of difficulty.

The reliability of testing is related to ensuring that a given student completes the test task multiple times and the results show the same content.

While it is essential that test items meet the five requirements listed above when implementing a computer-based testing system, there are a number of unique challenges in assessing students through computer tools. This shows that effective monitoring using computer-based open source software in education often depends on cooperation between the monitor and the software author.

In conclusion, tests aimed at adaptive control of knowledge based on open source programs used in experimental groups have proven to be an effective testing methodology. The conducted experimental analyses show that this methodology can be widely used throughout our republic.

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