

mathematics lessons significantly increases their effectiveness. In the future, it is planned to develop fragments of lessons using the GeoGebra application and test them in the educational process.

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RESEARCH OF AUTOMATED TRAINING SYSTEMS BASED ON SCORM STANDARD

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Activities of a modern person, organization or production cannot be imagined without learning processes. Due to the constant increase in the complexity and volume of the studied material, the question of partial or complete automation of the educational process is acute. Automation allows you to minimize training time without losing its effectiveness.

Information technologies which exist today make possible to organize training of specialists based on automated training systems.

The purpose of this article is to investigate automated training systems based on the SCORM standard.

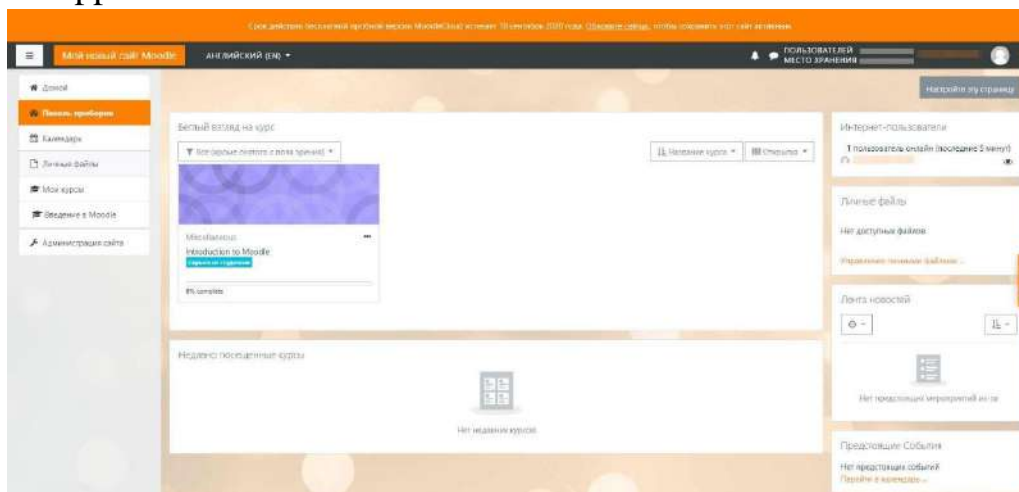
Material and methods. During the analysis, articles from Internet resources, as well as literary sources were used. Descriptive and comparative methods were used to achieve the purpose.

Findings and discussion. SCORM (Sharable Content Object Reference Model) is an international standard for eLearning courses. It specifies the requirements for transferring information from the course to the system itself. SCORM allows you to ensure the compatibility of components and the possibility of their reuse: the training material is presented in separate small blocks that

can be included in different training courses and used by the distance learning system, regardless of who, where and with what means they were created [1].

Moodle is a free open-source e-learning system. Moodle supports the most popular standards in e-learning: IMS, AICC and SCORM. The Moodle website provides support to platform users free of charge. This is facilitated by the large Russian-speaking community of users of this system. The system supports over 120 languages, including Russian [2].

The application interface is shown in Picture 1.



Picture 1 – Moodle

Main features of the system:

- adaptation for specific goals and objectives – setting up the platform through plugins;
- ample opportunities for communication: exchange of files of any format, mailing, forum, chat, the ability to review the work of students, internal mail and more;
- the ability to use any grading system;
- provides complete information about the work of students;
- creation of courses of various formats: forum, structure (training modules without reference to the calendar), calendar (training modules with reference to the calendar);
- user management: role assignments, grouping, mass assignment of courses and more;
- setting up the reporting system;
- integration with other services (Moodle can be combined with other platforms such as WordPress or Zoom webinars).

The disadvantages of the system include:

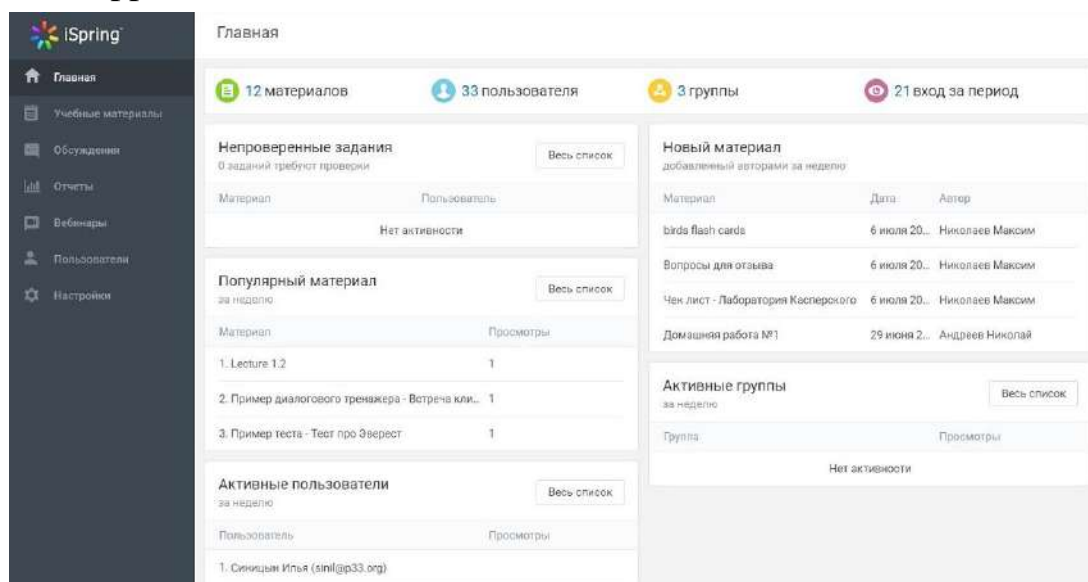
- complexity of customization;
- the need to purchase a server or hosting to install the system;
- many functions, some of which are not used (it is necessary to involve an IT specialist);

– the system focuses on universities, colleges and other educational institutions; for the commercial sphere, Moodle lacks flexibility and scalability [3].

In terms of a set of functions and a free distribution scheme, the Moodle learning management system is optimal for universities and companies with a small budget. Small businesses and startups can create quick skills courses in Moodle. But for medium and large businesses, Moodle's capabilities are not enough. The system is not suitable for rapid implementation: it will take time for untrained users to master it. To install Moodle you need a server or hosting. Since Moodle does not provide technical support, you will have to hire an IT specialist and pay him a salary to maintain the server.

iSpring Learn is a cloud-based distance learning system from iSpring, one of the leaders in the global eLearning software market. This system is a paid commercial solution. iSpring Learn supports eLearning in SCORM format [4].

The application interface is shown in Picture 2.



Picture 2 – iSpring Learn

Main advantages of the system:

- course builder: you can create various educational content - courses, tests, interactive simulators and screencast;
- unlimited storage: you can upload an unlimited number of files;
- integration with other services through an open API;
- user management;
- reporting system;
- flexibility of settings;
- availability of information: the iSpring website has a knowledge base with detailed information about the capabilities of the system;
- ease of use;

– quick launch of the platform: no need to set up for a long time, just register, download courses, and invite users.

The limitations of the system include:

– inflexibility of settings: it is impossible to add new functionality to the cloud LMS on your own; this can be done only privately, by ordering an individual solution for a fee;

– the need to purchase an annual subscription [5].

The iSpring Suite Course Designer is responsible for creating educational content. It is a PowerPoint add-in that allows you to create e-courses from presentations. The Suite includes six modules that allow you to create interactive courses, quizzes, interactive simulators, video courses and books.

Spring Learn is suitable when it is planned that courses will be created by internal experts, and the system will be administered by a staff member who is not a technical specialist. With iSpring Learn, you can organize distance learning and employee testing in no time.

Conclusion. The article reveals the concept of the SCORM standard, and also conducted a study of popular systems based on this standard. To choose a suitable automated training system, first of all, you need to determine the specific goals that need to be achieved as a result of the implementation of the system. It is also important to be clear about who, where and how will use the platform for learning. After that, you can move on to finding the most suitable solution.

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