



# Modern educational technologies to arrange students' independent work at the university

## Tecnologías educativas modernas para organizar el trabajo independiente de los estudiantes en la universidad

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### Contents

1. Introduction

2. Methodology

3. Results

4. Conclusions

Bibliographic references

#### ABSTRACT:

The article discusses the problem of modern educational technologies implementation to arrange students' independent work at the university. The authors defined concepts "independent work" and "management of students' independent work". They also noted the great role of management in educational process and gave an example of electronic platform Moodle used by many universities. Moodle provides both teachers and students with a lot of tools to manage students' independent work. The authors conducted an experiment proving the effectiveness of electronic, project, problem-based learning technologies in arranging students' independent work. Besides, students were surveyed to identify their motivation to work independently.

**Keywords:** Independent work, students, educational technology, electronic tools

#### RESUMEN:

El artículo analiza el problema de la implementación de tecnologías educativas modernas para organizar el trabajo independiente de los estudiantes en la universidad. Los autores definen los conceptos "trabajo independiente" y "gestión del trabajo independiente de los estudiantes". También señalan el papel de la administración en el proceso educativo y dan un ejemplo de la plataforma electrónica Moodle utilizada por muchas universidades. Moodle le brinda a los maestros y estudiantes muchas herramientas para administrar el trabajo independiente de los estudiantes. Los autores llevaron a cabo un experimento que probó la efectividad de las tecnologías de aprendizaje basadas en problemas, electrónicas y de proyectos, para organizar el trabajo independiente de los estudiantes. Además, se realizó una encuesta entre los estudiantes para identificar su motivación para trabajar de forma independiente.

**Palabras clave:** Trabajo independiente, estudiantes, tecnología educativa, herramientas electrónicas.

## 1. Introduction

A few years ago there were global changes in the field of education affecting many of its aspects (Braine et al, 2013) including students' independent work. Today, students' independent work organization takes place within the framework of competence-based approach established by recent Federal State Standards. The emergence of this approach in the field of higher education in Russia marked the beginning of all changes. Universities use e-learning resources which are extremely effective if we aim at increasing the volume of independent work and reducing classroom load (Prokhorova et al, 2017). So, there was a need to find such technologies that would be effective within competence approach using electronic resources. It should be said that educational technologies themselves, while changing from traditional to mixed education (using distance learning technologies), have undergone a transformation (Tsyplakova et al, 2016).

### 1.1. Students' independent work under current educational conditions

An important aspect of modern higher education is the change of teachers' role in a student's life. In traditional educational system the teacher was the *transmitter* of basic theoretical information (Barber et al, 2013). Today, his task *is to help* students. The teacher is an advisor and mentor who helps the learner build

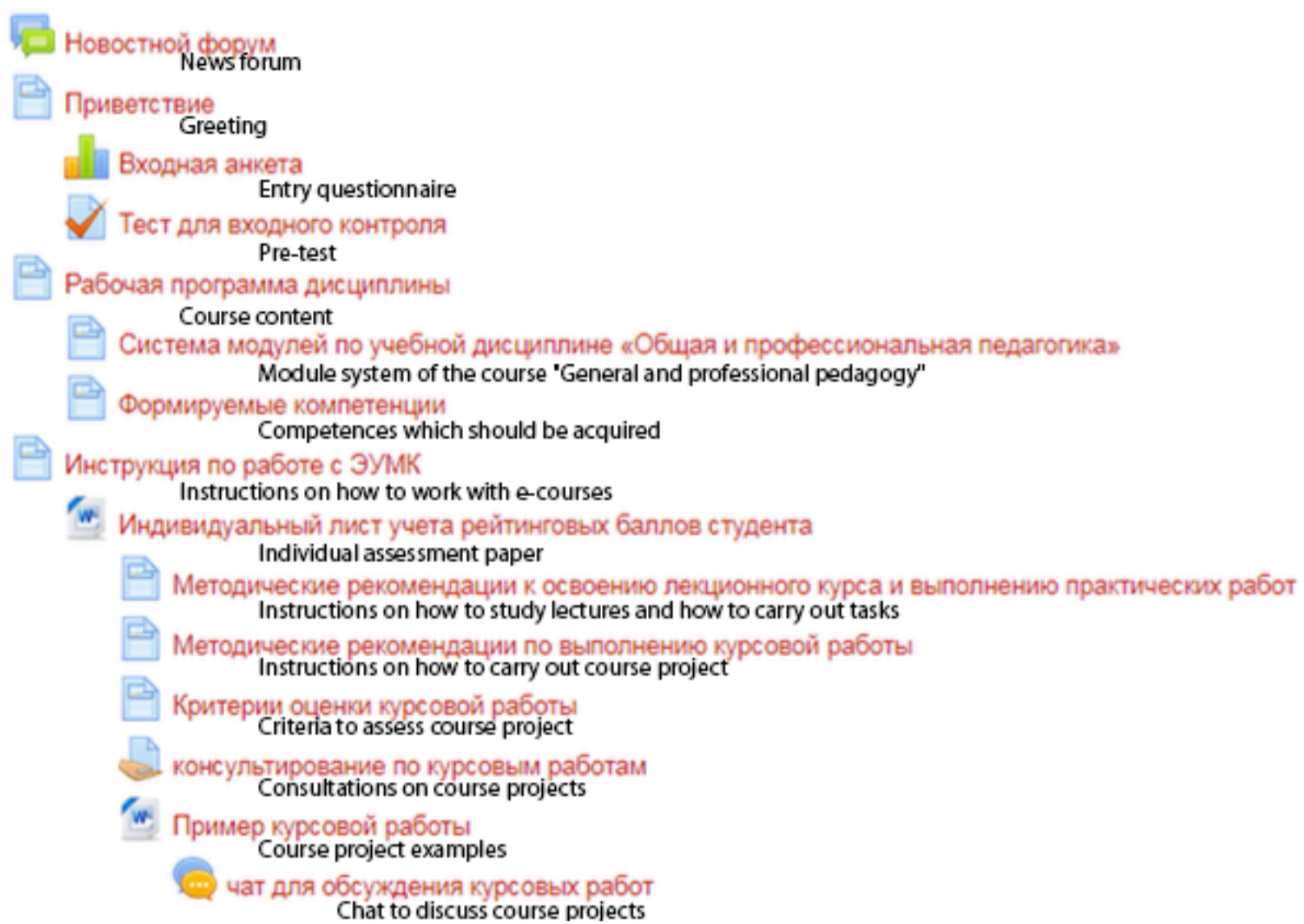
his educational path. Such changes occurred because there was a necessity to find a way to encourage students' creativity and independence in solving problems (Ilyashenko et al, 2018). There is more practice in a student's life, the more prepared they are for real professional life and the more independent they become. Independent work occupies an increasing part of educational process in higher education, thus, graduates' skills depend on its arrangement (Vaganova et al, 2017). Students' independent work is educational, research and socially significant activity aimed at the development of professional competencies and carried out without direct participation of a teacher or tutor (teacher-consultant is responsible for maintaining a holistic educational module, organizing students' group and individual work). Students' independent activity should always be managed to preserve and improve its quality (Smirnova et al, 2018). Managing independent work implies a set of processes implemented by university departments, research and teaching staff aimed at selecting and systematizing educational content, its transmission and control of development in terms of contact and extracurricular independent work ensuring effective competencies acquisition (Ilyashenko et al, 2018). A significant part of students' independent work, as we have already noted, is carried out electronically (Lubov et al, 2018). Many universities use electronic educational platform Moodle for this purpose. It provides students with freedom in performing tasks (tasks can be performed at a convenient time and place with the help of a gadget via the Internet). At the same time Moodle gives an adequate level of control by the teacher. Moodle offers many tools for independent work (Smirnova et al, 2017). Many of them provide active feedback to the teacher. Among the tools we highlight:

- forum (a tool that allows you to ask and answer questions, lead discussions on given topics. It is usually acts as the main means of communication between the teacher and students) (Myalkina et al, 2018);
- messaging (private messages among course users)(Pavlov et al 2016);
- chat (allows joint discussions in real time. It is more informal and is not a subject to a specific topic unlike forum. It can be used as a communicative tool and as educational one for discussing any task) (Markova et al, 2018);
- task (used for setting a task for students that requires preparing an answer in any format. The answer is uploaded either to the server in the file or the problem is solved out of the system during in-person meeting with the teacher) (Smirnova et al, 2018);
- lecture (the course developed by the teacher where content can be presented not only in text format but also contain video and audio elements) (Perova et al, 2017);
- test (the most common way to test students' knowledge. It allows the developer to create a database of questions both for students' self-checking and for arranging intermediate and final control) (Kutepov et al, 2017);
- glossary (collection of terms and concepts) (Ilyashenko et al, 2018);
- Wiki (a set of pages that students create independently. Such a tool can be used to write, for example, a book of reviews and suggestions on a particular subject) (Markova et al 2018);
- webinar (Moodle training tool that allows you to organize video communication with students for consultation purpose as well as for conducting seminars and video conferences online (Vaganova et al, 2017);
- questionnaire (helps to conduct surveys).

The need for these or other tools is determined by the teacher himself when he develops his course. For the discipline "General and Professional Pedagogy", implemented in Nizhny Novgorod State Pedagogical University, the tools were chosen as follows (Vaganova et al, 2018).

**Figure 1**

A set of Moodle tools for the course "General and professional pedagogy"



As you can see, there is a wide range of tools for students to perform high-quality independent work and for teachers to control this activity (Arkhipova et al, 2018). The tools are arranged in a sequence revealing goals and objectives of the course to students. There are necessary instructions for students and interaction opportunities with teachers in case students have some questions (Bulaeva et al, 2018). Moodle is a tool that vividly shows the active use of electronic technologies in educational environment. In addition, it allows implementing other technologies within its environment such as project and problem-based learning technologies (Bulaeva et al, 2018). Carrying out a project students perform tasks independently showing creativity in problem solving. They also develop an action plan, assign roles and get ready for presenting their own results (Aygul et al, 2018). Each of students assumes responsibility for performing part of a shared task, therefore all students, without exception, are involved in the activity since the final of task performance depends on individual results (Bicheva et al, 2017).

## 2. Methodology

A study was conducted in Nizhny Novgorod State Pedagogical University in which 30 students whose major is "Vocational training (in industry)" participated (Smirnova et al, 2017). The authors conducted a test of students' independence development according to several criteria. Development of general educational activities was measured through the implementation of project work. 70% of students coped with the work completely, not a single group showing negative results (Ajeenkya et al 2014).

Students' motivation was considered through a questionnaire. The trainees were asked to answer several questions: "Did you like the work on the project using electronic technologies?", "Would you like to work in such conditions again?", "Do you think electronic tools help with independent work?". A positive response was given by almost all students. There were no negative answers except for minor amendments proposed by the students themselves. 80% of students had high motivation.

### 2.1. Technologies used to arrange students' independent work effectiveness testing

The effectiveness assessment was carried out at the expense of the results of control measures in the course "General and professional pedagogy" (Abramova et al, 2018). During one semester students' independent work was based on a combination of electronic, design, and problem-based technology. Next, we will present assessment criteria to check students' independence development by checking their performance during test measures.

**Table 1**  
Criteria to assess students' independence development

Criterion	Criterion characteristic
Development of general educational activities (organizational, informational, educational and	0 level - the student does not own any action at all

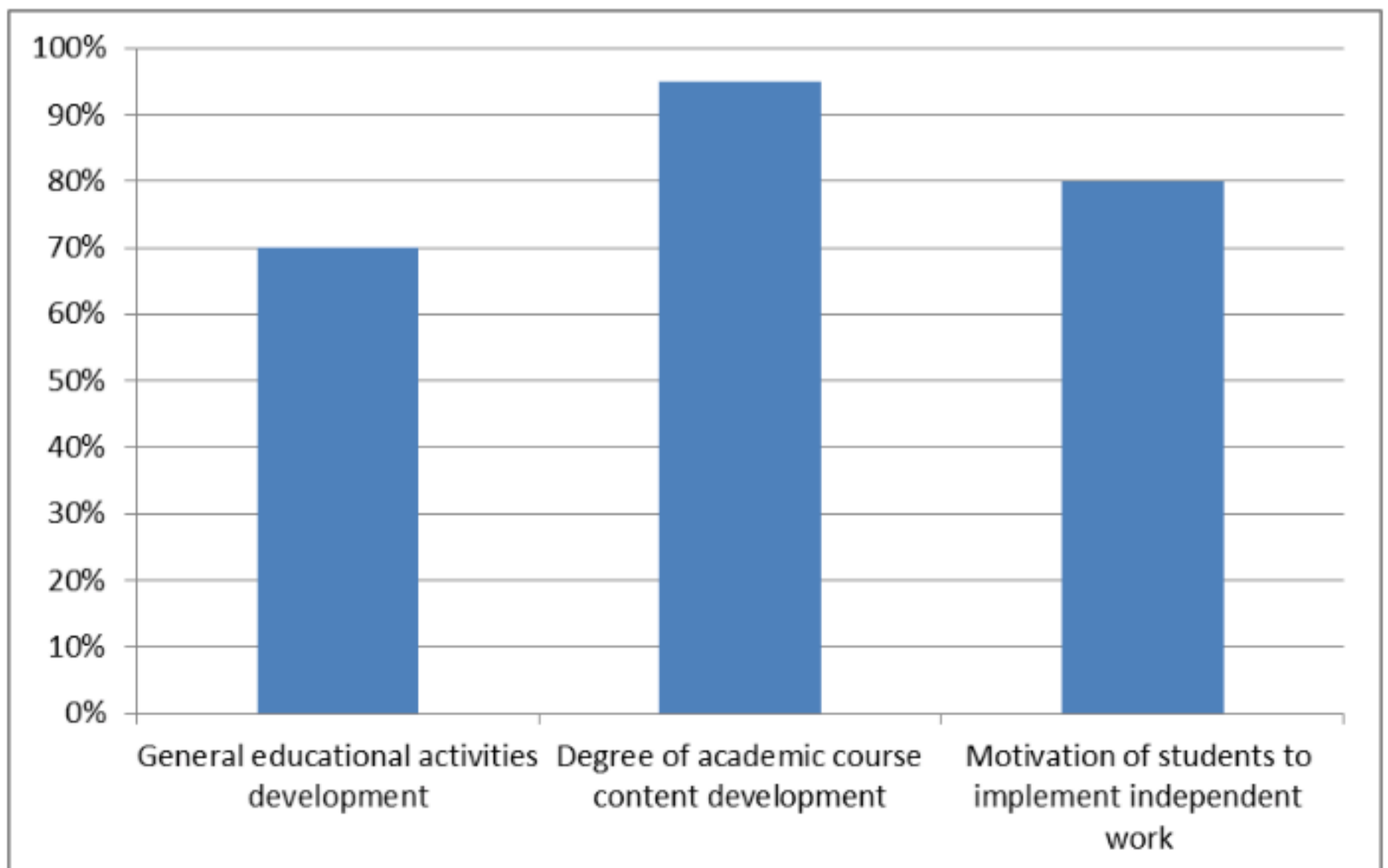
intellectual)	<p>Level 1 - the student is not capable of self-acting</p> <p>Level 2 - the student quietly performs the required actions consulting with the teacher and being provided with some correction by the tutor</p> <p>Level 3 - the student performs actions independently and objectively assesses his own achievements.</p>
The degree of academic course content development	Installed in accordance with the score-rating system used at the university (rating for each course is calculated within 100 points). The student must complete all required activities under the rating plan and receive points for each topic (section, test) (the interval from minimum to maximum stated by the teacher)
Motivation of students to implement independent work	Evaluated by questionnaire

### 3. Results

The development of general educational activities was determined by carrying out project work which was attended by 30 people enrolled whose major is "Vocational training (in industry)". The project was carried out throughout one semester. The group of students was divided into subgroups of 5 people. In each subgroup a leader was chosen. He was primarily responsible for the implementation of the project. With the help of a tutor, roles were assigned to each team and an action plan was drawn up. In the process of work students were engaged in search independently. They selected and analyzed information and got ready to present their project. At the same time, students had an opportunity to interact in electronic format. A teacher was always ready to answer any questions that might arise.

As a result, each team showed good results. The teams approached the assignment responsibly. Thus, overall results of the whole group reached higher levels. These figures are shown in Figure 1.

**Figure 1**  
The results of students' independence development testing



The degree of course development is also shown in Figure 1.

Students' motivation was assessed with the help of a questionnaire. The trainees were asked to answer

several questions: "Did you like the work on the project using electronic technologies?", "Would you like to work in such conditions again?", "Do you think electronic tools help with independent work?". The survey involved 30 people. 30 students answered "yes, I liked" to the first question. 19 respondents answered "yes" to the second one, the remaining 11 people would like to do the entire work online. We got affirmative answers from 30 people.

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## 4. Conclusions

After the study, we found that the use of the discussed technologies shows positive results. In addition, a survey of students showed a high level of motivation to work independently with the use of electronic, design and problem-based learning technologies.

### 4.1. Suggestions

We propose to conduct surveys for students of all groups to identify their motivation to study courses independently on annual basis. It will help to arrange students' individual work development in future. Such a survey will contribute to identify students' needs and shortcomings, add new electronic tools and conduct new design work in the work arrangement. It is possible to attract new partners who could provide new platforms for students internships to improve their training quality.

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