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OPTIMIZATION OF THE USE OF SOME MODULES IN THE MOODLE SYSTEM

Halyna M. Hubal

Ph.D. in Physical and Mathematical Sciences, Associate Professor,
Associate Professor of Department of Physics and Higher Mathematics
Lutsk National Technical University, Ukraine

Summary. *In the article, it is considered the modular object-oriented dynamic learning environment Moodle which provides a full-fledged and modern study of disciplines, including mathematical ones, satisfying the various needs of teachers and students in the interactivity and effectiveness of learning technologies, developing the ability to work with a large amount of information. The task of creating assignments with variants, which the teacher must grade manually, is implemented. Flexible settings of creating and visibility of assignment variants for students are presented.*

Keywords. *Moodle, Google Classroom, mathematical disciplines, assignment, grouping.*

Introduction.

Modular Object-Oriented Dynamic Learning Environment Moodle is a modular, open-source software that allows users to use, modify and distribute it for free [1]-[3]. The Moodle system has a large number of tools for creating a variety of interactive elements, such as structured learning materials and control materials: assignments, tests to grade student knowledge. Various types of activity: forums, blogs, chats, surveys give students the opportunity to interact with each other and with teachers. Teachers can provide feedback to students through the Moodle system. This system improves access to education for all. Due to reports generated by the Moodle system, teachers can monitor students activity and grade learning progress, which optimizes the educational process.

The Moodle system simplifies the use of joint projects and tasks that is especially important in higher technical educational institutions, where the emphasis is on teamwork. The Moodle system is convenient to use when teaching mathematical disciplines with solving applied problems [4]-[12]. The Moodle system is also effective in blended learning [13], [14].

The Moodle system has a number of advantages over the Google Classroom system in the educational process when teaching mathematical disciplines:

- in the Moodle system, it is possible to more flexibly configure courses adding resources and grading students, including the ability to display and create complex mathematical formulas (using the LaTeX programming language [15]-[25]);
- the Moodle system has larger number of plugins available that can be used to add a variety of math tools;
- the Moodle system has more options for grading of students, including the ability to create tests with mathematical formulas (using the LaTeX programming language) and automated grading;

- the Moodle system has an active community of users and developers, providing access to support and resources for teaching and learning mathematical disciplines, while the Google Classroom system is integrated into the Google ecosystem with support for Google Education;

- the Moodle system can be installed and used locally (this gives greater control over data and security and is especially relevant in conditions of limited Internet access) or in the cloud, providing greater flexibility than Google Classroom in which cloud solutions are accessible through a browser;

- the Moodle system has built-in support for SCORM (Sharable Content Object Reference Model) and Tin Can API, which ensures compatibility with various e-learning systems;

- the Moodle system supports multilingualism, which is especially important for higher educational institutions with a multilingual audience.

Main part and results.

To optimize work with the Moodle system, it is necessary

- to use groups to divide students into teams and subgroups for more effective organization of joint work;

- to update the system by installing the latest versions of the system and plugins to get new features and improve performance;

- to enable caching in the Moodle system settings to speed up page access and reduce server load;

- to limit access to courses by connecting the required number of users and increasing security.

Let it be necessary to implement the task of creating assignments with variants in the Moodle system. A bank of assignments has been created and the teacher must perform grading manually. Several students from the group must solve one of the assignment variants from this bank of assignments.

To implement this task, two approaches can be implemented.

The first approach. We can use the Assignment module, in the text of which we can give all assignment variants, and we can add the Survey module to assign the assignment variants to students. Then the teacher sees which assignment variant the student chose and whether the selected assignment variant the student solved and sent for grading.

The second approach. We can automatically create groups (course administration – users – groups – auto-create groups), in each of which enroll, for example, one student and group the auto-created groups into groupings (Fig. 1).










Grouping	Groups	Activities	Edit
1	ID 1, ID 2, ID 3	0	  
2	ID 4, ID 5, ID 6	0	  
3	ID 7, ID 8, ID 9	0	  

Fig. 1

The grouping number indicates the number of the assignment variant which only the teacher can see in his course. The student only sees his group number, for instance ID 1, which is automatically generated, and does not see the grouping that shows his assignment variant number (Fig. 2).

First name [▲] / Surname	Roles	Groups	Last access to course
PP Petro Petrenko	Student	ID 1	14 sec

Fig. 2

After that, we need to use the Assignment module in which we can configure access restrictions (Fig. 3).

Restrict access

Access restrictions

Student match the following

Fig. 3

Thus, assignments will be created with variants marked with grouping numbers (Fig. 4).

Each assignment variant will be solved by several students who are in the corresponding grouping.

If the teacher allows the student to see his assignment variant, then we can automatically create groups of students, each of which will be named by the number of the assignment variant. Then the student will see the number of his assignment variant.

Note that the Random Assignment plugin was created for Moodle version 1.9 and for later Moodle versions with the Assignment module version 2.2. This plugin allows the teacher to specify one or more files with assignments and (optionally) files with answers that have the same names. Each student gets one of these files randomly. On the Random Assignment feedback page, the teacher sees the assignment file and (if necessary) the file with answers. In Moodle 2.3 and in later Moodle versions, the Assignment module version 2.2 and the Random Assignment plugin are not supported.

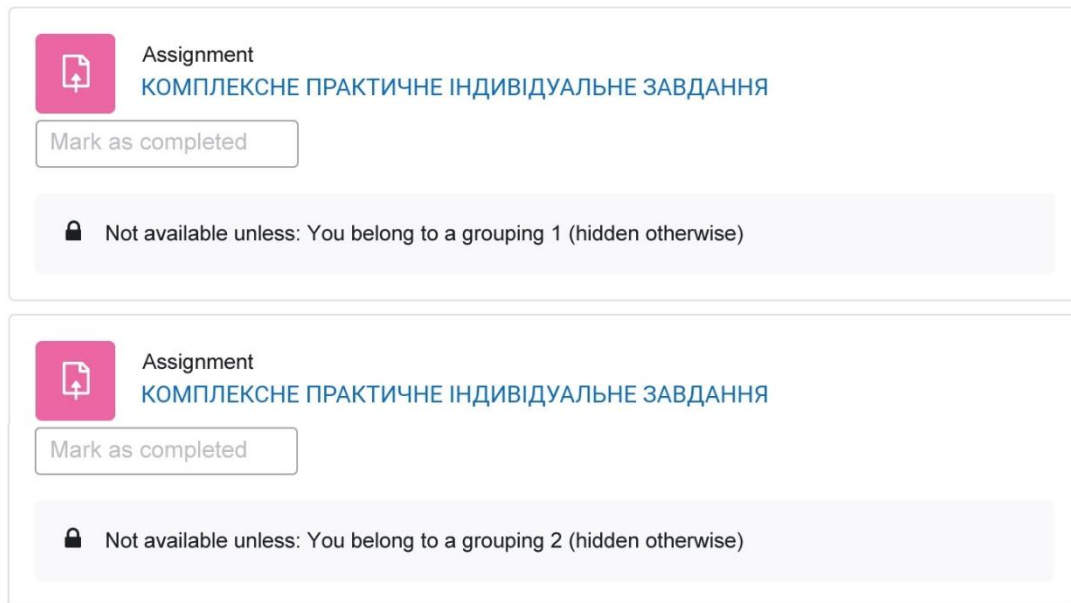


Fig. 4

This plugin is used to create assignments if it is necessary that the student gets a random assignment variant. In this case, repetition of the same assignment variants is possible. To solve this problem, it is necessary to create groups of students and assign assignment variants to groups manually, as we considered above.

Conclusions.

In the article, it is considered the Moodle system which provides a full-fledged and modern study of disciplines, including mathematical ones satisfying the various needs of teachers and students in the interactivity and effectiveness of learning technologies, developing the ability to work with a large amount of information.

The task of creating assignments with variants, which the teacher must grade manually, is implemented. Groups and grouping of students are used, flexible settings of creating and visibility of assignment variants for students are presented.

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