

Implementing innovative teaching methods for asynchronous learning using Moodle LMS

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Abstract

Utilisation of innovative pedagogical technologies diversifies educational process, allows teachers to make learning more effective and boost students' motivation. At the same time, current learning conditions generate numerous challenges both for teachers and students. Under martial law distance education remains in priority due to the risks. In addition, forced migration, aircraft alerts and blackouts seriously influence the abilities of higher education institutions to arrange synchronous learning. Thus, the authors focus on the ways to ensure high quality of education when the learning process is predominantly asynchronous. Learning management systems remain the environment where all learning activities are gathered in one place and available for all teachers and students regardless of time and the participants' location. However, for high quality learning it is not enough just to upload materials for reading and watching. Interaction with peers and teachers is an important part of education. Considering that, the paper addresses the problems of interactive teaching and learning methods implementation in asynchronous mode. LMS Moodle activities which contribute to the organisation of communication and collaboration, formative assessment and problem-based learning are analysed. The results of Borys Grinchenko Kyiv Metropolitan University teachers' survey, presented in the article, has shown that although the e-learning system of the university is actively used to provide the educational process, the number of activities used by teachers is limited to Assignment, Lesson, and Quiz. The authors explore the possibilities of other Moodle activities such as Forum, Workshop and Wiki to arrange asynchronous learning and implementation of innovative teaching methods in particular. Teachers and students can significantly benefit from using various LMS Moodle activities and settings for different teaching and learning methods implementation. Under the conditions of war, when the access to educational resources can be limited or available not for all education process participants, it is important to broaden knowledge on existing tools and make the most of their resources to ensure the best possible quality of education.

Keywords

e-learning system, Moodle LMS, innovative teaching methods, asynchronous learning, project-based learning, formative assessment, collaboration, microlearning

1. Introduction

Working environment in the sphere of higher education has changed significantly over the last few years. However, the question of long-term perspective innovative technologies and approaches remains relevant. 2021 EDUCASE Horizon Report has named global trends in different spheres of life among which there are distant work and study, expanding digital barrier, wide use of hybrid study models, increase of teaching and learning technologies use, online faculties development, etc. Among the main technologies and methods that are going to influence the future development of higher education and have potential for further development artificial intelligence, blended and hybrid learning, educational analytics, microlearning, open educational resources and high-quality online learning are mentioned [1].

Ukrainian higher education institutions join the development and utilisation of leading educational technologies. At the same time, current realities require from Ukrainian educators maximum efficiency in utilisation of available resources. Under the conditions of war, distant learning remains of high

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importance [2]. In particular, asynchronous learning arrangement is gaining much more weight. Teachers are facing a challenge of maintaining a high level of education having limited access to various means of learning. Considering the above-mentioned factors, e-learning systems have to become educational centres which offer possibilities for utilisation of different methods and approaches. E-learning can gather materials from different sources including multimedia in one place. Moreover, e-learning platforms allow us to arrange constant support of students by teachers, regular feedback and assessment which is highly important in the educational process. Students are motivated to look for alternative methods of performing tasks, and innovative learning tools widen the intellectual horizon of students [3]. That is why the authors of the paper focus their attention on implementation of innovative teaching methods by means of an e-learning system.

Innovative teaching methods do not always mean utilisation of the newest information technologies. Instead, innovative learning is a process of proactive utilisation of new pedagogical approaches and methods. Among the methods that have shown the highest efficiency there are blended learning [4], problem-based learning [5], project-based learning [6], formative assessment [7], gamification [8], storytelling [9], case method [10], collaboration [11], etc. Taking into the consideration the current realities of Ukrainian education, the authors address some of the above-mentioned methods which are suitable for asynchronous learning and offer the ways of their implementation by means of the e-learning system Moodle.

The problem statement. Under the conditions of war, the educational process in Ukraine has changed a lot even considering the previous experience of distant learning during the covid pandemic. Several factors such as air raid alerts, blackouts and moving people to different time zones for safety reasons made it much more difficult to arrange synchronous online learning and boosted the importance of asynchronous learning. Thus, the need to provide high quality materials and tasks for asynchronous learning has become of high importance. To ensure the educational process effectiveness a diversity of methods and approaches should be used to deliver information to students. That leads us to the question of innovative teaching methods implementation for asynchronous learning and the search for the means of their fulfilment. Most higher education institutions use e-learning systems to provide students with access to learning materials and arrange educational process in general. Therefore, e-learning systems should be considered as the priority choice in the current situation as well. That is why the authors address the problem of innovative teaching methods implementation for asynchronous learning by means of LMS Moodle.

Analysis of recent studies and publications. COVID-19 pandemic has focused educators' attention on the ways and means of delivering learning materials and organising educational process online [12]. An important role in implementation of this task is played by e-learning systems, in particular Moodle as one of the most popular LMSs nowadays [13]. Organisation of different aspects of distance learning by means Moodle LMS is discussed in publications by many researchers. Spirin and Kolos [14], Spirin et al. [15] address the question of mass distance learning organisation during the COVID-19 pandemic. They analysed the ways of effective distance learning arrangement and e-learning platforms that can be used for the purpose. Kushnir et al. [16] researched the main problems associated with introduction of distance education and shared teacher training results on digital courses design and distance communication arrangement. Rudnitska and Drozdova [17] studied the aspects of self-study arrangement by means of Moodle. Attention is paid not only to resources for learners but also to settings that allow teachers to track students' activities and analyse the performance in an e-learning course. Romanovskiy et al. [18] compare different tools for distance learning arrangement including Moodle, Google applications, Zoom and others. According to their research Moodle alongside with Google Classroom were chosen by students as the best options for distance courses. Khoroshevska [19] offers a model of student-centred virtual learning environment based on Moodle LMS. The question of asynchronous learning implementation using Moodle is addressed by Baba et al. [20]. They compare synchronous and asynchronous learning during the pandemic. The conclusion on superiority of either mode cannot be done, says the article, as each of them can be beneficial depending on the situation.

Gedera et al. [21] address the question of assistance in asynchronous activities in Moodle. The importance of structural design of an eLearning course is emphasised as a part of effective asynchronous

learning arrangement. Rodionova et al. [22] discuss effective implementation of innovative technology of distant learning using Moodle and offer a universal model of online education for student-centred learning.

At the same time, innovative teaching methods such as inquiry-based learning [23], project-based learning [24], formative assessment [25], flipped classroom [26], using virtual and augmented reality [27, 28], design thinking [29], etc. are getting much attention from the scientists. The authors have developed particular interest in the project-based learning and formative assessment because of the collaborative nature of the first and the need for regular feedback especially during asynchronous learning. Guo et al. [30] focus on students' outcomes in project-based learning. In particular, implementation of project-based learning by means of Moodle is studied by Cronin and Caria [31], Desnelita et al. [32]. Formative assessment has also been a topic of scientists' research interest in recent years. Leenknecht et al. [33] study the relationship between formative assessment and students' motivation. Kumar et al. [34] explore utilisation of workshop activity in Moodle for implementation of formative assessment. Other activities and resources of Moodle also get attention in terms of formative assessment arrangement. For example, quizzes are discussed in the works by Mintii et al. [35], Mintii [36], Fernando [37], Fester [38] and others.

The research goal. In the research we analysed the activities of Moodle LMS which are used by teachers for implementation of innovative teaching methods. We questioned whether a wider range of activities can be utilised to provide teachers with more options for communication and collaboration, formative assessment, and project-based learning and to provide students with more varied and effective learning experience. Considering the current situation in Ukraine, one more task was to analyse whether high quality asynchronous learning can be implemented by means of Moodle LMS and, in particular, how innovative teaching methods can be arranged asynchronously using available resources.

2. Methodology and theoretical background

Learning Management Systems (LMS) are used to develop, distribute, and manage learning materials among which there are tasks for individual performance, projects, group work tasks etc. LMS give users from different locations possibility to participate in the learning process via the Internet providing high level of interactivity and with the focus both on content and communication [39, 40]. One of the most popular LMS is Moodle as it is open source and free and customizable for the needs of an institution. Around 159 thousand sites in 242 countries of the world are created based on Moodle and over 366 million users are registered all over the world. In particular, there are 1091 sites based on Moodle registered on the territory of Ukraine which is the second biggest in Eastern Europe after Poland [41].

At Borys Grinchenko Kyiv Metropolitan University the e-learning system, which is built on Moodle LMS, plays an important role in the arrangement of the educational process. To define whether innovative teaching methods are used in the educational process and what Moodle activities are involved in implementing those methods, a survey of Borys Grinchenko Kyiv Metropolitan University teachers was conducted. 132 teachers from different faculties took part in the survey. The results of the survey have proved that teachers actively use the e-learning system for the university based on Moodle LMS for the educational process arrangement, are familiar with different teaching methods and a significant part of respondents uses them in their practice (table 1).

In Borys Grinchenko Kyiv Metropolitan University the e-learning system, which is built on Moodle LMS, plays an important role in the arrangement of the educational process. According to the results of the teachers survey 80.3% of the teachers constantly use the e-learning system of the university and 12.1% of respondents often use it (figure 1) which together makes 92.4% of frequent users who use e-learning courses (ELC) as the main place for their disciplines arrangement and delivery. The remaining percentage is formed by the arts teachers (mainly Musical Art and Choreography Faculty) whose disciplines require much more physical presence and less support in an e-learning environment.

The main advantages of an e-learning system utilisation are accessibility for students and teachers in any location and time zone if they have internet connection, possibility to gather all materials

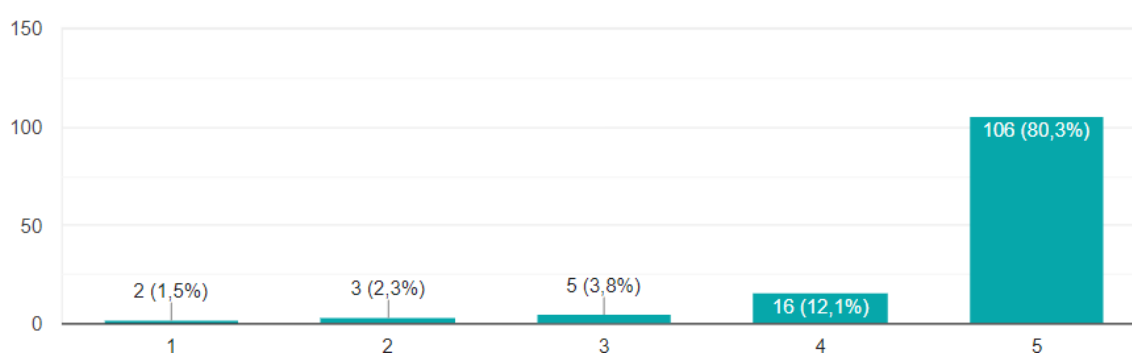
Table 1

Utilisation of innovative teaching methods at Borys Grinchenko Kyiv Metropolitan University.

Innovative teaching method	Number of teachers who know and use it	Number of teachers who know it, but do not use it	Number of teachers who are not familiar with it
Blended learning	69	32	31
Problem-based learning	90	26	16
Project-based learning	91	29	12
Formative assessment	56	56	20
Gamification	50	57	25
Storytelling	66	41	25
Case method	78	37	17

How often do you use the e-learning system of the university?

132 answers

**Figure 1:** Utilisation of e-learning system by Borys Grinchenko Kyiv Metropolitan University.

needed for successful completion of a discipline in one place, statistics on the students' progress and educational process results. An e-learning system of a university is not limited to being a storage place for learning materials. It is an essential element in the educational process arrangement, in particular, for communication of teachers and students, collaboration in tasks, database of various statistics which can be used to analyse the educational process to find out areas which require improvement. The results of the students' survey at Borys Grinchenko Kyiv Metropolitan University, where 171 students took part, have shown that students actively use materials in ELCs (figure 2): more than 80% of students regularly pass lectures and download materials and check their grades in ELCs, 94.7% upload assignments. However, when it comes to more interactive activities like online conferences, the utilisation of LMS drops significantly.

This correlates with the results of the teachers' survey where they indicated the purposes they use the e-learning system for (figure 3). Thus, ELCs are frequently used to provide students with materials, assignments, and information on grades. But less than a half of teachers consider them as a tool for communication and collaboration.

Moreover, if we deep dive into the activities used in the ELCs, we will see that some activities dominate over the rest, which leads to limitations in different teaching methods implementation within e-learning courses. Teachers prefer Assignments, Lessons, Quizzes, Pages, Files and URLs. At the same time, Workshops, Forums, Glossaries and other activities and resources are hardly ever used (figure 4).

That is why the authors see mastering tools that allow teachers to increase the percentage of communication and collaboration in the course, to arrange innovative teaching methods implementation as one of promising and important ways of university teachers' digital competence development. We widened possibilities for communication and collaboration by adding to Dashboard blocks "Communication" and "Collaboration" where the links to the tools offered by the university are gathered in one place and

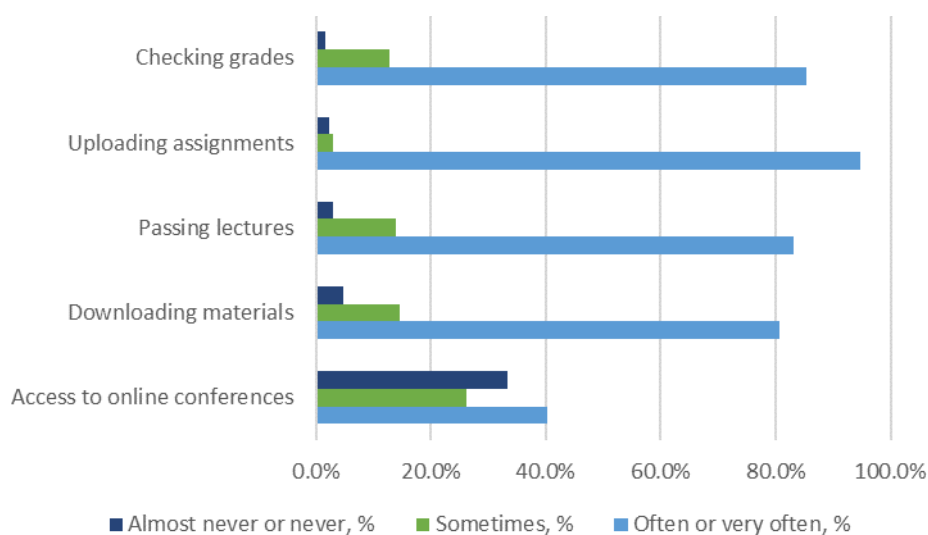


Figure 2: The aims of using e-learning courses by students.

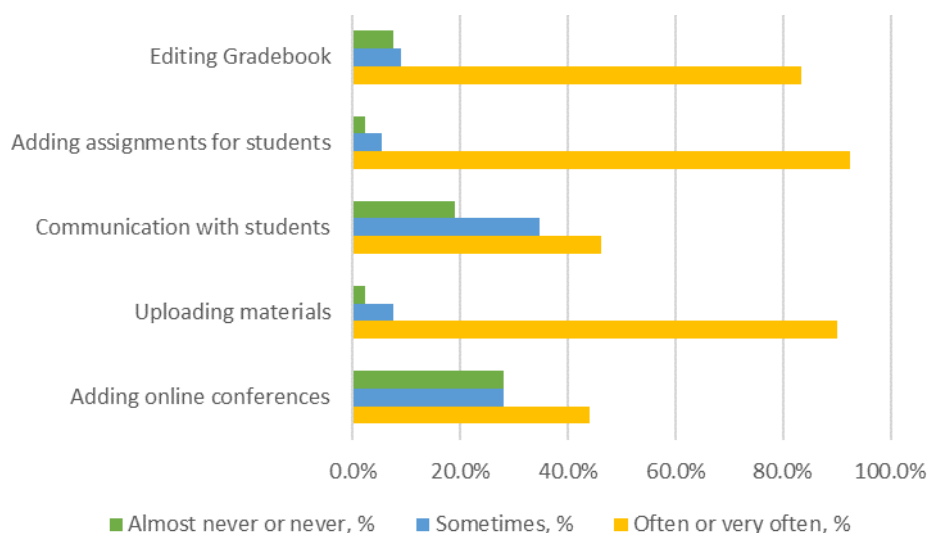


Figure 3: The aims of using e-learning courses by teachers.

added Google Meet for Moodle and Zoom meeting to simplify arrangement of different communicative and collaborative activities.

Current situation in Ukraine requires such approaches to educational process arrangement which will overcome main obstacles such as restricted possibilities to learn at physical campuses, different students and teachers' locations including various time zones, safety reasons during air raid alerts as well as for educational process participants who are on occupied territories or in active hostilities zones, blackouts, low quality of internet connection. All these reasons make it difficult to organise face-to-face training or even synchronous online learning for all students. Under these conditions asynchronous learning is becoming one of the main solutions to ensure students access to high quality education. The study case of Saudi Arabia medical college has shown that there is no significant difference between asynchronous and synchronous learning in students' satisfaction, comfort of learning and enhancement of knowledge [42]. Asynchronous learning appeared to be a better option for time management. However, synchronous learning is more beneficial in terms of interaction. Zhang et al. [43] also confirm that synchronous learning shows better social presence results than asynchronous learning. Communication and collaboration are important parts of the educational process. Teaching with focus on collaboration allows a teacher to shift focus from a teacher-centred model of work to student-centred

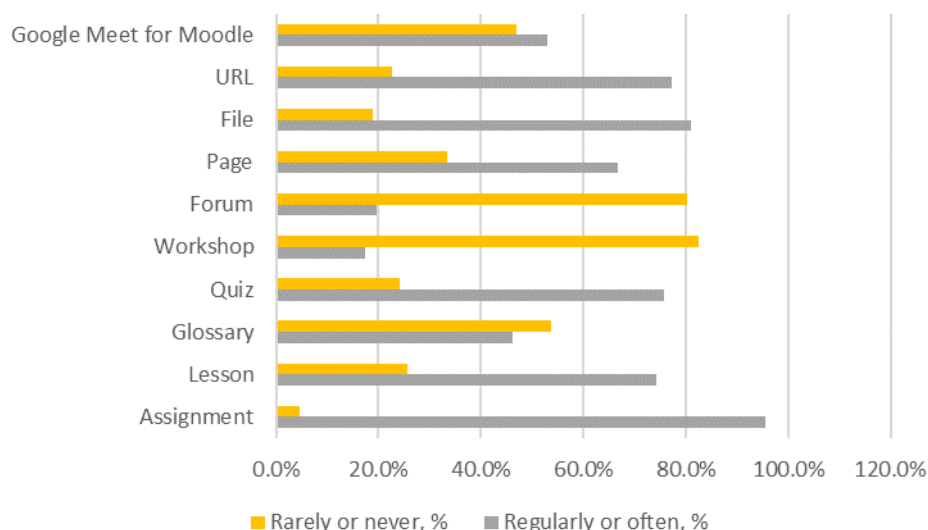


Figure 4: Frequency of different Moodle activities usage.

learning and act as a facilitator rather than just a lecturer. At the same time, such an approach allows students to gain knowledge not only from a teacher but also from the process of working with peers [44]. That is why the authors consider the ways to provide better communication, collaboration and peer-to-peer interaction while arranging asynchronous learning.

Another way to increase involvement of students in the course materials with a collaborative nature is to use project-based learning (PBL). PBL is a rather time-consuming technique as it is modelling a real professional situation and requires students to be involved at different stages from research to planning the solution and presenting selected strategy and steps. Al-Bahadli et al. [45] studied how this innovative teaching method would work and influence students' motivation, engagement, communication, and academic success being transferred online. Their study has indicated that PBL positively affects all above-mentioned aspects of education and can be successfully arranged online. Moreover, working on projects together with peers teaches students to concentrate on long-term perspectives, to take responsibility for their own part of the project, provides room for creativity and motivates participants to find a solution rather than get it from a teacher. Guo et al. [46] discuss the role of a teacher in online PBL courses. There are four main areas in PBL arrangement where a teacher's presence is essential: providing a task and instructions on it, managing groups and a task fulfilment, technical support and facilitating the process and assessing the result. Thus, in asynchronous PBL all these options must be considered in the process of the activity planning. A teacher should think in advance how communication with the teacher and among peers would be organised, what stages and terms of a project would be so that every student understood their roles and responsibilities, time gaps etc. Although problem-based learning is used by 69% of teachers at Borys Grinchenko Kyiv Metropolitan University according to the teachers' survey, the Moodle activities used for this purpose are predominantly limited to Assignment (figure 5). The same is applicable to formative assessment.

This shows that teachers either underestimate possibilities of other Moodle activities for project-based learning arrangement and formative assessment or are not familiar enough with options that can be used to improve and vary teaching and learning experience.

Formative assessment in asynchronous learning deepens engagement of both students and teachers with the content of a course in a meaningful way and enhances learning experiences [47]. With a shift to student-centred online learning, it has become even more crucial to define a student's strengths and weaknesses, and to provide them with control points to help with self-directed learning arrangement [48]. Formative assessment provides students with necessary feedback which allows them to adjust their learning path to their needs and academic program requirements to achieve the best learning outcomes. Formative assessment can be arranged in the form of self-assessment, teachers' feedback, automatic assessment, peer assessment. The authors see different forms of formative assessment as a

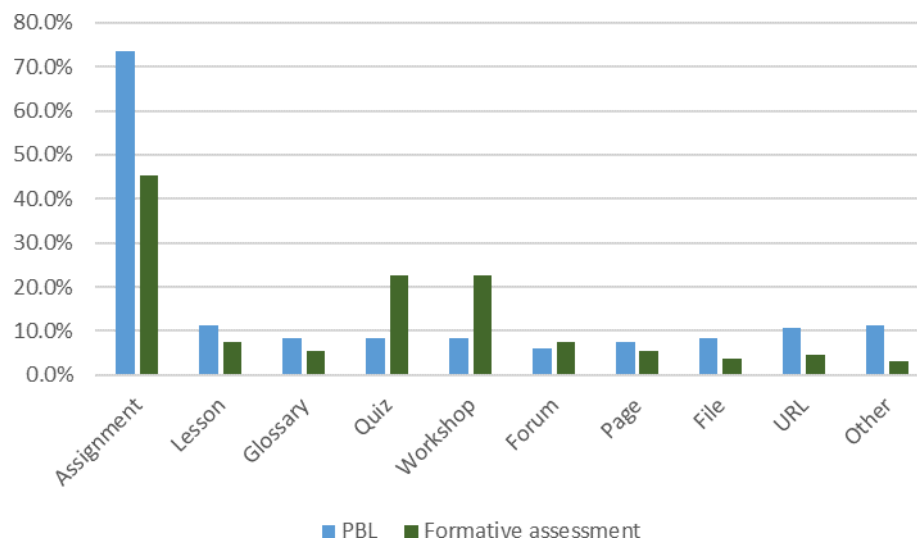


Figure 5: Percentage of teachers using different activities for PBL and formative assessment implementation.

must for an asynchronous e-learning course as they help students to feel connected to the subject of the discipline and not to lose the track while learning remotely.

One more educational trend that is worth special attention under current circumstances in Ukrainian education is microlearning. Information divided into smaller parts is easier to download or consume with both slow and unstable internet connection and unpredictable studying schedule influenced by external factors. Microlearning meets the needs of modern students who were brought up in a rapidly changing and heavily multitasking information environment. They need to split attention between different sources of information and can hardly focus on the same thing or activity for a long time [49]. Teachers also benefit from dividing materials into smaller parts, as data on most subjects have to be modernised, and it is easier to change a micro module, small video or a page of a lecture than a big solid piece of information. Therefore, planning activities in an e-learning course, we rely on microlearning to make it effective and suitable for all educational process participants.

3. Implementation of innovative teaching methods in Moodle

Activities and resources of LMS Moodle allow teachers to use various teaching methods for asynchronous mode including communication and collaboration, formative assessment, project-based learning, etc. Although with asynchronous learning students rely much more on themselves and organise their own learning schedule and activities up to their possibilities and other factors, teachers still must remain moderators of the educational process, set up goals, provide feedback and support when required. For this purpose, different settings are helpful.

3.1. Communication and collaboration

When talking about online communication in the educational process, different directions should be considered:

- Teacher-students communication (group communication)
- Teacher-student communication (individual communication)
- Communication within a group of students
- Student-student communication

We do not include communication with administration as it is outside of the research theme. There also can be one-way communication, when a message is directed from a sender to a receiver and does

not require an answer, for example, a teacher makes an announcement for students, and two-way (multi-way) communication when a message receives feedback. The direction of the communication influences the choice of activities, resources, and settings in Moodle (figure 6). Namely, for one-way communication with a group of students a news forum can be used. Different types of forums can be used for different directions of communication. Moodle messaging can be used both for group and individual communication, that is a teacher can address a message to a group of students or an individual student and the same options are available for students. Feedback activity can be used to get information from students on previously defined questions.

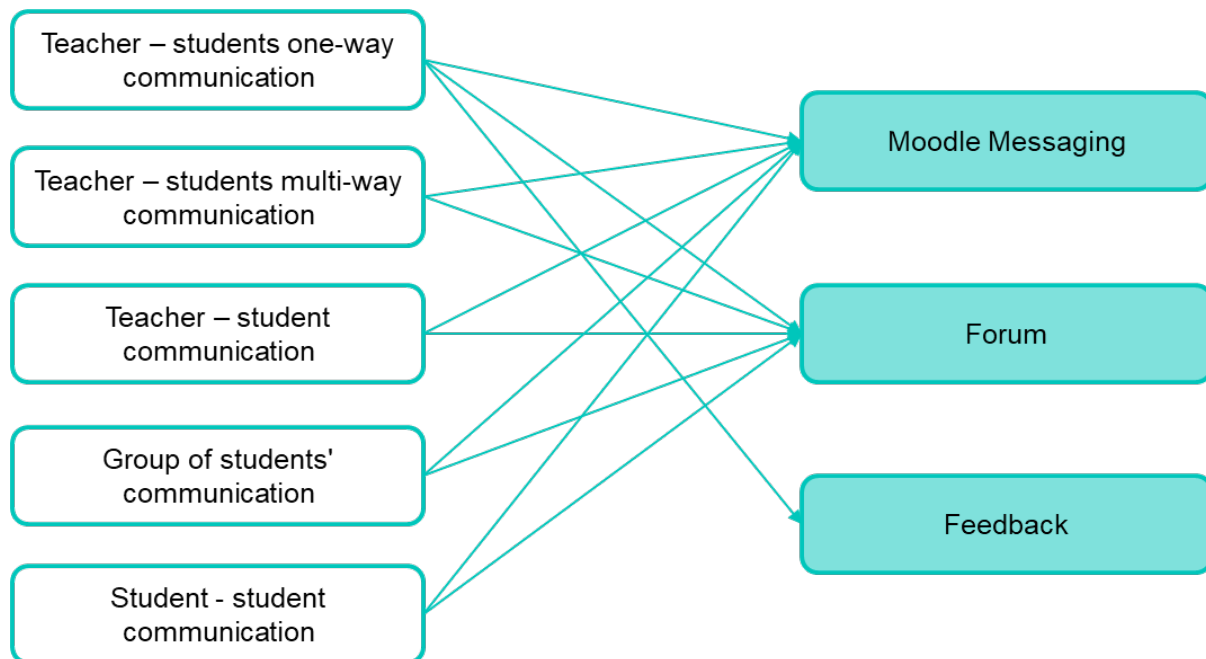


Figure 6: Options for different communication directions in Moodle.

The activity Forum requires more precise attention as a means of asynchronous communication in Moodle LMS. There are different types of forums which serve different purposes: news forum, standard forum for general use, a single simple discussion, each person posts one discussion, Q&A forum, standard forum displayed in a blog-like format. News forum is aimed at one-way communication of a teacher with a group of students. The main features of this type of forum are that it has forced subscription, i.e., students get a notification on their emails every time a new message appears, and students cannot create new topics or comments which assures that a teacher's message does not get lost among the other messages. A single simple discussion is also a teacher-led forum, but with a possibility for students to comment on the given topic and to discuss it among themselves by giving answers to comments. This type of forum is equally good for getting students' feedback, directed discussions, and assessed activities. The problem with assessed forum tasks is that a student can see answers of peers before submitting their own answer. On one hand, this might be beneficial for their studies as they get familiar with different points of view on a subject and learn more about the topic. On the other hand, there are situations when a student has to show their own research and conclusions. In this case Q&A forum is helpful as the answers of peers become visible only after submitting an answer. Standard forum for general use, each person posts one discussion, standard forum displayed in a blog-like format can be used for communication and collaboration within groups of students, to provide help and support with materials and tasks in the e-learning course. To encourage students to interact more, a teacher can set a minimal number of topics and comments each student must publish in a forum. The rating assessment settings allow a teacher to assess an individual topic or comment. At the same time, post threshold for blocking settings help to limit the number of messages which should improve the quality of the discussion and warn students against unthoughtful overproducing messages. The group modes allow a

teacher to separate or unite students into different groups for different activities. If the group mode is not forced at the level of the course, a teacher can choose in forum settings which group mode suits a chosen task the best. “Separate groups” mode can be helpful in courses with many groups or different tasks aimed at different groups of students, for example, if students work in groups on different projects and a forum is aimed at communication to support the project, or there are groups of students with different level of knowledge and a separate task is addressed to the students of a definite level. Students do not see the topics which are not addressed to their group, and it simplifies navigation through the tasks they have to perform. “Visible groups” mode allows students to read topics of other groups in the forum, but they cannot comment on them. This mode leaves all information open to view, but still organises learning process in groups and is especially helpful when several teachers work together in the same course but with different groups. “No groups” mode would be the best choice for information (help) forums, as anybody in the course would be able to look for an answer on any question about the course or provide it if they have the corresponding knowledge. Such forums might improve students’ experience under the conditions of limited internet access as they can gain knowledge from peers and receive answers faster than if there was only a teacher’s answer available.

3.2. Formative assessment

Formative assessment is characterised by the following features [50]:

- The focus is on the learning process with all its components.
- Estimated learning outcomes are used to form assessment criteria.
- Active learners’ participation in the assessment process.
- Assessment is seen as a continuous process.
- Digitisation of the assessment process.

The assessment results reveal the progress of a student in comparison with their previous achievements and not compared to other students’ results. The methods of formative assessment are shown in figure 7.

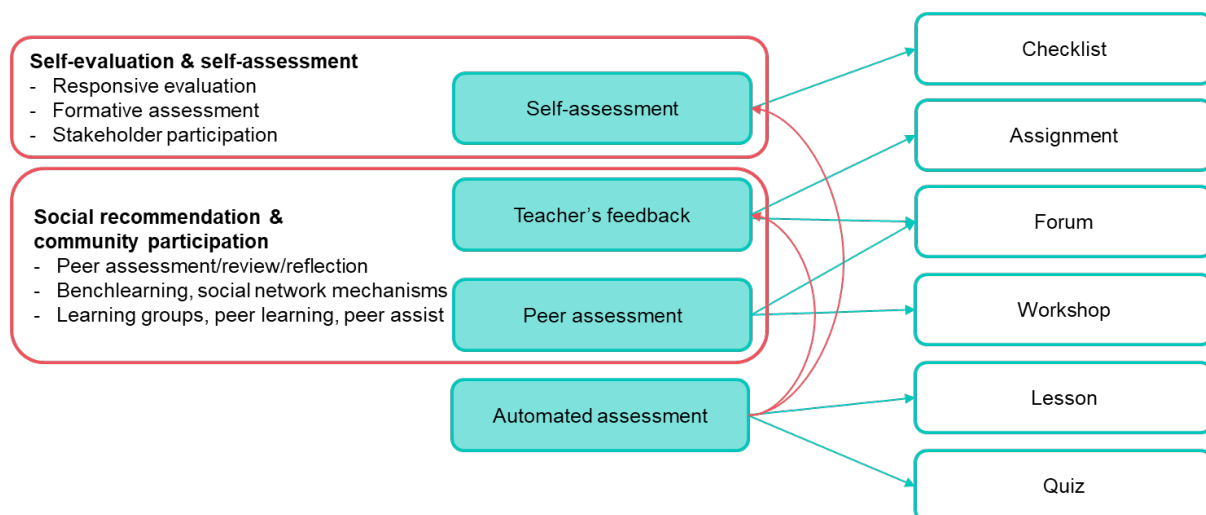


Figure 7: Formative assessment methods and means of their implementation in Moodle.

Self-evaluation and self-assessment include evaluating a student’s own achievements through a prism of expectation. There belongs formative assessment of academic achievements (the program fulfilment, the course progress, gained knowledge and skills, and knowledge gaps coverage); responsive evaluation when students evaluate their results according to the needs, practicality, and individual peculiarities; stakeholder participation (using stakeholders’ experience to provide the learning process and learning

outcomes with real value). The most suitable activity in Moodle to arrange self-assessment is Checklist. It is an editable activity where both teachers and students can add items depending on the settings. The main advantage is that a teacher can automatically import into a checklist all assessed activities in the section or in the whole course and students tick obligatory tasks when fulfilled and adapt the list for their own requirements at the same time.

Automated assessment can be performed in Quizzes and Lessons when there are no open questions, which require a teacher's participation, added. The results of automated assessment can be used by a teacher to provide feedback and by a student to analyse their achievements and gaps and to correct their learning paths accordingly.

A teacher's feedback includes not only a mark on the performed task, but also comments, directives and meaningful discussions which can improve students' understanding of the topic, direct academic journey and widen horizons. In the activity Assignment a teacher can add comments to the provided mark which is going to be personal feedback whereas in activities with built-in questions such as Quiz and Lesson feedback is added to a specific question or test in general and is impersonal. The Forum activity allows a teacher to provide students with more extended feedback and clarify any moments if additional questions arise.

The peculiarities of peer assessment include detailed description of the task aimed at self-study, thoroughly defined, unambiguous assessment criteria, the process of assessing performance of each other by learners; feedback provided by several peers to ensure objectiveness of assessment; marks for assessment fulfilment in addition to marks for the task. Peer review or peer reflection can be easily provided using Forum activity. However, for peer assessment Moodle also offers the activity Workshop which better implements all the requirements to such kind of assessment. Utilisation of Workshop activity has several stages (figure 8): setup phase, submission phase, assessment phase, grading evaluation phase and closing. While arranging asynchronous learning, the first phase might include materials for self-study: video lectures/instructions prepared by a teacher in advance if online conferences are not available or not all students can attend, graphic and text materials, audio explanations, etc. The other phases can be performed asynchronously as well under the moderation of a teacher. It is extremely important that due dates are set up and discussed with students as once the activity is switched to the next phase, students cannot return to the previous phase unless a teacher switches the activity back.

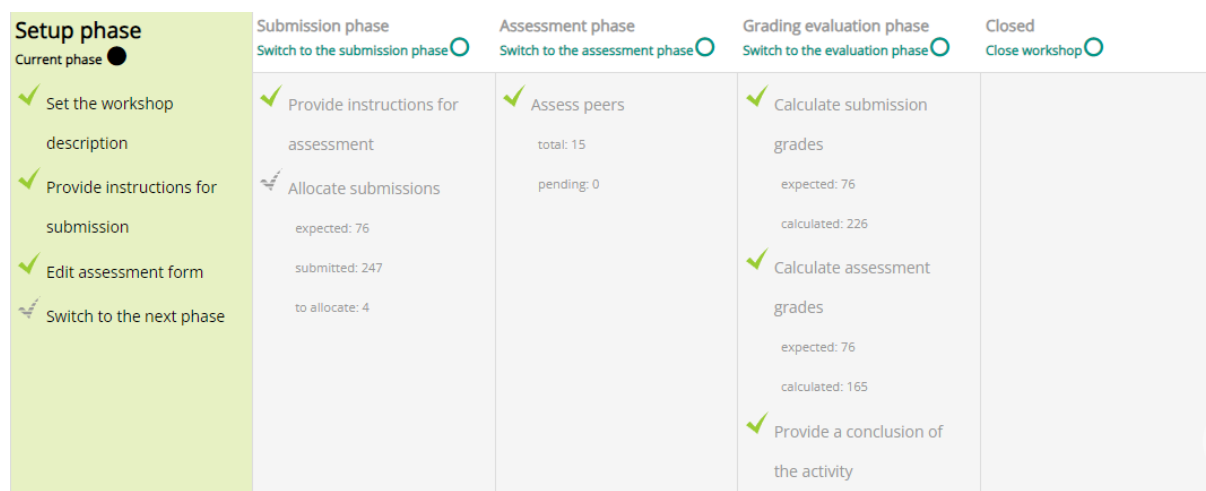


Figure 8: Phases of Workshop.

At the setup phase the task must be thoroughly described including the following information: the aim of the task, the task description, due dates, assessment criteria. This phase must provide students with all the information required for successful completion and with understanding how it will be assessed. The instructions and the assessment criteria must be understandable, easy to follow, transparent, unambiguous, and objective. It is advisable at this stage to arrange some form of

communication with a teacher so that students could ask any questions on the task. If face-to-face or synchronous online communication is not possible for some reason, a forum can serve a purpose.

After a teacher switches the phase to submission phase, students get an option to upload their works into the task. A teacher can define the time for this phase and the way the task is going to switch to the next phase - automatically or manually. Before switching to the assessment phase, a teacher must set up how submissions will be allocated for assessment. A teacher can manually choose an evaluator for each submission using manual allocation. However, with a large number of students it would be time consuming. Random allocation (figure 9) allows a teacher to choose the number of reviews per submission. Several reviews per a submission make peer feedback more objective and precise and provide an author of a submission with more information to think over. Depending on the chosen group mode, the submissions can be assessed by students within the same group or by any enrolled student in the course.

Manual allocation Random allocation Scheduled allocation

▼ Allocation settings

Group mode Separate groups

Number of reviews 5 per submission

Remove current allocations

Participants can assess without having submitted anything

Add self-assessments Self-assessment disabled

Save changes Cancel

Figure 9: Allocation settings in a workshop activity.

After allocation according to the settings chosen by a teacher each student receives a definite number of submissions for assessment and a number of reviews on their own work. The activity allows a teacher to set up anonymous feedback which together with several reviewers gives a more objective picture. One more advantage of peer assessment is that by assessing the work of other people they get a different view on their own work and obtain critical assessment skills. In the workshop activity in Moodle students have a form of assessment (figure 10) with clearly defined criteria, which is very helpful especially for those who are new to peer assessment.

All reviews and marks are displayed in the activity (figure 11). Thus, a teacher can monitor the situation and provide corrections if needed. After all submissions are assessed, a teacher switches activity to the next phase.

At the grading evaluation phase, the e-learning system compares marks given by different students to the same assignment and based on the comparison provides the marks for the assessment (figure 12). Being assessed for reviews objectiveness stimulates students to take it more seriously. At the same time, grading evaluation stage gives a chance to receive some marks even those students who for some reason could not submit their own work.

After all phases are completed, marks are transferred to the gradebook of the e-learning course.

Assessment form

Aspect 1

General description of the issue. The results are presented on the slide.

Grade for Aspect 1

2 / 2

Comment for Aspect 1

The problem is clearly defined.

Aspect 2

Including the results of the survey. The results are presented on the slides.

Grade for Aspect 2

2 / 2

Comment for Aspect 2

The slides present all survey data with explanations.

Aspect 3

The personality of the client is defined, their peculiarities are described (age, gender, interests). The results are presented on the slides.

Grade for Aspect 3

4 / 4

Comment for Aspect 3

All peculiarities are includes. The personality od a client is described in details.

Figure 10: Assessment form in a workshop activity in Moodle.

First name / Surname	Submission / Last modified	Grades received	Grades given
	Як виявити потреби клієнта у створенні реклами? modified on Monday, 19 April 2021, 4:51 PM	22 (3) 22 (3) 22 (3) 22 (3)	22 (3) 22 (3) 19 (3)
	Потреби в рекламі modified on Tuesday, 20 April 2021, 10:54 PM	22 (3) 22 (3) 17 (2)	17 (3) 17 (3) 19 (3)
	Модульна робота modified on Monday, 19 April 2021, 1:20 PM	6 (2) 15 (-) 13 (3) 22 (2)	22 (3) 22 (3) 22 (3)

Figure 11: The results of peer assessment in a workshop activity.

First name / Surname	Submission / Last modified	Grades received	Grade for submission (of 22)	Grades given	Grade for assessment (of 3)
	Потреби в рекламі modified on Tuesday, 20 April 2021, 10:54 PM	22 (3) 22 (3) 17 (2)	20	17 (3) 17 (3) 19 (3)	3

Figure 12: Grading evaluation.

3.3. Project-based learning

Buck Institute for Education defines project-based learning as a method that makes students research and react to real, interesting, and difficult tasks and gain knowledge and skills in the process of solving the problems [51]. Utilisation of project-based learning contributes to development of cultural and global competencies and also plays an important role in the formation of the student-centred environment [52]. The project-based learning method requires a use of a variety of approaches, learning instruments and integration of knowledge, skills from different spheres. Project-based learning relies both on individual independent work of a student and teamwork at the same time, the results of which have to be presented. The method develops cognitive and creative skills, critical thinking, the ability to search, research, process and analyse information and come to conclusions on the basis of it [53]. The result of effective project-based learning is development and presentation of students' own project which can further be implemented in real life. The final stage of project-based learning is receiving feedback on the project from peers and a teacher. Considering the above-mentioned, the implementation of project-based learning during asynchronous learning requires space for mutual work on the project, discussion within the project team and feedback. Moodle has different options for project-learning arrangement including activities Wiki, Forum, Assignment, etc. The authors want to pay more attention to the Wiki activity to fulfil the task as it gets less attention than other Moodle activities, although it has good potential for project-based learning implementation (figure 13).

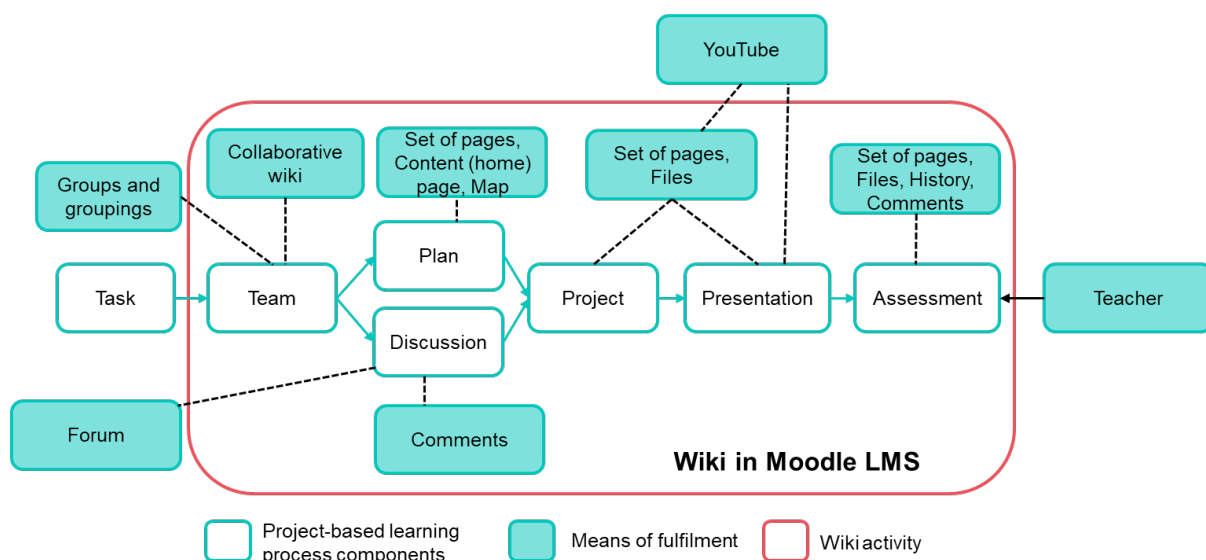


Figure 13: Implementation of project-based learning in Wiki activity in Moodle.

Wiki is a standard Moodle activity which allows the e-learning course participants to add and edit a set of pages. Wiki can be individual or collaborative, which means it can be used for individual and team projects. Collaborative wiki can be edited by all team members. Accessibility by different groups can be defined by group mode. History allows us to track the involvement of participants in the work on the project. The comments tab makes it easy to arrange discussion in the same activity. In the wiki mode “individual wiki” each student has their own wiki they can fill in and edit to present an individual project.

4. Conclusions and prospects for further research

An e-learning system is nowadays an integral part of the education process of a university. That is why its effective utilisation for different teaching and learning activities is a logical step for providing high quality education even under the conditions of limited access to educational resources. The analysis of Borys Grinchenko Kyiv Metropolitan University teachers' survey results has shown that the activities

and settings of Moodle LMS are not fully used. Teachers tend to choose the activities they are the most familiar with and avoid activities that require further exploration. The authors explored such activities as Forum, Workshop, Wiki, etc. for implementation of communication and collaboration, formative assessment, and project-based learning. The chosen activities and teaching methods can be used for asynchronous learning which is not only important under current conditions in Ukraine but also can be widely used for educational activities with a worldwide audience. It was discovered that teachers require additional training to be encouraged to use a wider range of Moodle activities. The results of the survey and the study of Moodle activities possibilities were used as a background for teacher training sessions planning. The first internal training named “Forum as a tool for active learning activity” has already been arranged for Borys Grinchenko Kyiv Metropolitan University teachers in 2023 with 242 participants, which shows that the topic is highly relevant. Further trainings and teacher training learning materials for asynchronous mode are being planned.

The materials of the article can be used as an example of innovative teaching methods implementation by means of Moodle. The Moodle activities and innovative teaching methods are not limited to those described by the authors, and the topic requires further research and practical implementation. Additionally, Moodle plugins which contribute to the arrangement of high-quality asynchronous learning can be considered in further research.

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