

COLLABORATIVE LEARNING AND ASSESSMENT IN E-LEARNING

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Abstract: *The article provides a summary of collaborative learning and assessment and presents their definition, basic elements, advantages and application. It is focused on the new role of the learners – who carry the responsibility for their own education and to their peers', in which they work together, during collaborative activities. Collaborative assessment can be regarded as an educational activity in the collaborative learning. Other advantages, besides the academic ones, are shown – social and psychological. Particular attention is paid to the use of this method in e-learning. E-learning environments that implement collaborative education and assessment are reviewed.*

Keywords: *collaborative learning, collaborative assessment, e-learning environments, collaborative learning in e-learning environments, collaborative assessment in e-learning environments, collaborative assessment environments, collaboration in e-learning*

1. Introduction

The traditional model for learning in middle schools and in universities supports individualism. After the face-to-face teaching, the learners need to prepare themselves, based on the study material, and solve tasks and problems alone. In all forms of assessment it is absolutely unacceptable to use another student's knowledge. But this individualistic nature is in full contradistinction with the reality the learners meet after completing education, in the work environment, where collaboration and team work is on a daily basis. More of the job offers now require skills like "team work".

Nowadays more and more importance is given to cooperation and collaboration in e-learning and in traditional education forms as well. Applying this approach to the education leads to advantages in many directions, according to [2], [6] и [13]. The learners acquire more lasting knowledge, social and communication skills, ability for critical thinking, confidence in communicating with others, etc.

2. Collaborative learning

Collaboration, according to [13], is a philosophy of interaction, in which the individual alone is responsible for his actions (and knowledge), while agreeing to the opinions of others and respecting their contribution to his work. **Collaborative learning** is a process, in which two or more students learn or try to learn something

together and during this, they share resources, skills, experience, so they can accomplish that objective.

The idea of collaborative learning originated from the concept for learning of Lev Vygotsky, called **zone of proximal development** [7]. According to this concept, there are two areas of development: one with tasks, that the learner can do and one with tasks, that the learner cannot do. Between those areas a third area is observed, which includes tasks that a learner would do, if there is someone to guide and help him. This third zone defines knowledge and skills that the student have potential to develop, but not on their own.

In collaborative learning the student is the center of the educational process and even takes responsibility for the learnt material [13]. In this approach, the learners are usually solving a common problem, while they rely on each other and account for their actions [7].

As opposed to the traditional learning, collaborative learning involves various activities like joint papers, group projects, cooperative practical assignments, discussions and collaborative assessment.

According to Gokal [7], learners manage to achieve higher levels of knowledge and remember information longer, when they work in a group.

Usually small groups of learners are formed in collaborative learning, which then have to work in constant interaction with each other to realize a set goal. The students in the group organize, manage and control their work; distribute, synchronize and evaluate the individual subtasks; advice and assist other members of the group and take responsibility as a whole for the achievements and failures of the group.

2.1. Basic elements of collaborative learning

Five elements should be present, so that a group exercise can be called collaborative learning:

1. **Positive interdependence** [8] [10] – the group has a clear goal and every member of it depends on the others for the achievement of that goal. The efforts of the learners contribute both for personal benefit and for other members' benefit as well. The goal is considered to be achieved only if every member has completed their part of the work successfully;
2. **Face-to-face promotive interaction** [10] [13] – students encourage learning between them by activating important cognitive activities and dynamics in their relationships (encouraging, supporting, helping and praising). Promotive interaction can be achieved when all of the learners explain to the others how they have reached their solution or when discussions are hold to help find the correct way of finishing the academic goal;

3. **Individual and group accountability** [10] [13] – the group as a whole should be responsible for the results, as well as each member should be responsible for their own work and participation into completing the group goal. Each single learner must have personal involvement in the group work;
4. **Interpersonal and small group skills** [10] [13] – students build and improve skills for: team work, effective leadership, making decisions, communication, building trust and managing conflicts;
5. **Group processing** [10] [13] [22] – to boost efficiency, the group reviews the work done, discusses the problems encountered and the important points in the work process of each member and offers ways to evade the problems and to improve future workflow. All of the learners comment their actions to the others and show which of them have helped towards the achievement of the common goal and which have not.

2.2. Advantages and application of collaborative learning

Collaborative learning offers significant **advantages over the traditional education**, because not only it achieves knowledge and skills on the course content, but also other equally important results. The authors [3], [6], [13] and [18] highlight a number of benefits, which can be classified in the following three categories:

1. Social (builds social support system for students, increases tolerance, creates a positive atmosphere, creates learning communities, encourages social and academic contacts, builds teamwork, social, organizational, leadership, decision-making, debating and presenting skills);
2. Psychological (increases confidence and satisfaction of the learners, reduces anxiety from assessment, creates positive attitude towards teachers and the studied subject, builds responsibility to learning and time-management skills);
3. Academic (promotes critical and analytical thinking, active participation of students in the process of education, increases motivation, creates an environment of active participation and research, higher knowledge and achievement, alternate methods of assessment, involving the learners, more effective problem solving, develops communication and technology skills).

The application of collaborative learning does not depend on the level of the learners (pupil, undergraduate or PhD student) [7].

3. Collaborative assessment

The purpose of collaborative assessment [9] is to integrate learning in the assessment process and to encourage the involvement of the learners in it.

The collaborative assessment engages the learner, the peers and the lecturer to critically evaluate the assignments of each one of the learners. This assessment approach creates a **connection between them**. The process can involve: reviews and discussions on the work of the learner, recommendations, writing evaluations and argumentations and other related activities. The learners and their assignments take a central place in this type of assessment [14].

There are two criteria for assessing work – one of the students and one of the teacher. Students can participate in the criteria and the evaluation scheme selection. The active involvement in these decisions, according to [14], **changes the attitude of students towards their own education**. The different way of evaluation is taken as a positive and enjoyable experience and helps the students to further understand the assessment process [14].

The collaborative assessment can be used as **a learning activity** [19]. Students, reviewing and evaluating each other's' work, acquire new skills for understanding other perspectives, critical thinking, analyzing and assessing particular subject area.

3.1. Models for collaborative assessment

Standard collaborative assessment generally proceeds in the following steps [14]: discussion on the condition of the assignment with the other learners and the lecturer; discussion on the concept, problems and methods for solving the assignment; exchanging ideas and resources; uploading the assignment in an unfinished state in order to obtain feedback from the lecturer and the peers; submission of the final version of the assignment to be evaluated by the pre-agreed criteria; and assessment and feedback from the peers with reviews of how much the criteria was met and motivation for the set evaluation. In particular realizations some steps may be omitted.

Another collaborative assessment method is **the carousel brainstorming** [5], in which the learners are divided into small groups and each one of them is given a topic to discuss for a given time. After that the groups interchange the topics until they have gone thru all of the topics. The groups can see the ideas and thoughts of the groups that have worked earlier on the topic. They can approve or remove part of the others' answers, as well as add their own. Thus, the learners are acquainted with the opinions and the way other peers think and they can assess them.

360 degree feedback [9] is also a method for collaborative assessment, in which a group of 8-12 people complete an anonymous questionnaire evaluating a person. The assessed complete the same questionnaire, evaluating themselves. The inquiry consists of questions with a rating scale and fields to type in comments. This method is mostly used in companies to identify the strengths and weaknesses of employees.

3.2. Advantages and application of collaborative assessment

The ability to examine the assignment of other learners gives a wide number of **advantages** like: establishing the strengths and weaknesses of their work, awareness of one's own level of knowledge and skills, which is an incentive for further learning, seeing other perspectives on an issue and learning new study material and skills.

The collaboration during the assessment creates a sense of **group identity** in students. This assessment significantly increase interaction between the learners and promotes higher level education [21].

Knowing that not only the teacher, but your peers will see your assignment, further motivates students to do a better job. According to [14] collaborative assessment causes **students** to **set own goals** about what and how much they need to study, often exceeding the requirements of the teacher.

This method gives **a more comprehensive evaluation** than the traditional, because it assesses both the processes during the collaboration work and the results from it.

Collaborative assessment can be **applied** to any educational situation, but there will some restrictions to it like increasing the responsibilities of the teacher (the actions of the students must be reviewed), timely feedback to the learners (comments and evaluations of their work) and limitation of the time and place of the assessment. With the advent of ICT and the development of e-learning environments, these restrictions can be compensated [9].

4. Collaboration in e-learning environment

Modern ICT enable the modeling of a learning environment, close to the real one, with opportunities for education, assessment and communication and a potential for creating a sense for community.

Computer communications between the learners allow more complete communication than the face-to-face one, due to the lack of social tension, full freedom and equal field for the learners to express their ideas [20].

4.1. Tools for collaborative learning in an e-learning environment

The collaborative learning in e-learning environments is achieved by using various learning activities:

- **Collaborative work on a group project** (wiki) – a group of learners create and edit document(s) in a common field of work;
- **Playing a group game** (serious game) – learners perform a collaborative practical assignment in the form of a game, sometimes in a simulated environment, similar to the real one;

- **Collaborative accumulation of information for shared use** (database) – every student can record information (single or multiple), which then accumulates in a common repository (database). The information can be of different type and meaning – solutions of similar problems, example sentences, illustrating the meaning of a given word, images of objects or events, hyperlinks of found web resources on a given topic and etc.;
- **Glossary** – the learners collaboratively create a dictionary of the terms;
- **Assessment of one learner's work by other learner(s)** (workshop) – the learners do an assignment, which then is evaluated by one or more peers, based on pre-defined criteria from the teacher (the learners can also participate in the selection of the criteria). It is possible to implement anonymous evaluation or self-assessment. The final mark of the learners is formed from the mark on the assignment and the mark from the evaluation of the peers' work(s);
- **Chat** – the students achieve synchronous communication between them (including with the teacher), so they can discuss, share ideas, analyze case studies, solve problems and share experience;
- **Videoconferencing** – the learners can see and hear what others do without the need to be in the same room;
- **Forum** – the students realize asynchronous communication;
- **White board** – a board is presented to all students, on which they can share their ideas, reflections, thoughts and information, open files, show presentations and share their screen with the others.

These activities can be used in different combinations between them to ensure the interaction required for collaborative learning.

4.2. Collaborative e-learning environments

There are multiple platforms, which support collaborative learning, and some of them are briefly reviewed below: Blackboard Collaborate, Desire2Learn BrightSpace, Instructure CANVAS, Moodle, Pearson's REVEL and Sakai.

Blackboard Collaborate [15] is an environment that provides videoconferencing, as long as some other functionalities, available during the actual videoconference. The learners can use a white board, where they can share visually their ideas and their screens to the other participants in the conference. They can send files and record the conference, which later can be used as a study material.

Desire2Learn BrightSpace [3] accomplishes collaborative learning by using groups, each one of them, having its' own space, in which the group members can hold discussions (discussion zones), send group tasks (dropbox tool) and to share files between them (locker). To encourage assessment and evaluation between the

members themselves the system offers the opportunity to vote for the best answer to a question from a given topic.

The system **Instructure CANVAS** [4] besides the basic tools for collaborative learning like chat and discussion forums, allows videoconferencing as well. Also every one of the learners can assess the tasks of the other peers.

Moodle [1] offers a wide range of learning activities to organize collaborative learning [19] – workshop, database, dictionary, wiki, forum, chat. Each one of them is focused on communication, cooperation and collaboration between the learners.

Pearson's REVEL [18] is an environment, which tries to engage learners in the process of education. The study material is structured in small segments and is represented thru interactive content. After every lesson there is a small quiz to reaffirm the acquired knowledge.

Sakai [16] is created to help the work on collaborative projects, including the cooperation between academic researchers. Sakai provides a rich set of communication, collaboration and sharing tools in a single e-learning environment – forum, chat, file sharing system, wiki, possibilities for group work and assessment of discussions.

4.3. Collaborative assessment environments

Some of the environments for collaborative assessment is specialized in this activity and do not provide means of collaborative learning.

NetPeas [13] is a web-based system for assessment, which allows anonymous uploading of tasks, passing thru several assessment cycles by the other learners, ability to give feedback and dispute the results by the assessed.

Peer Grader [8] is a web-based system for review and assessment by the learners themselves – from a randomly selected learner or one that has been selected by the tutor. The assessment takes place by answering questions, provided by the tutor, with brief commentary and guidance.

OASYS [8] is also a web-based system for self-assessment and collaborative assessment by the peers, which uses for feedback a questionnaire with preset questions or free text, filled by the assessor.

The web-based system **Group Support System** [8] is mainly intended to evaluate projects. It supports functions like discussions and negotiations by brainstorming the actual assessment criteria, voting for best proposed assessment scheme and defining the weight of selected criteria.

The environment for collaborative assessment **PECASSE** [16] is based on the adaptive learning environment SCALE and offers: self-assessment and collaborative assessment of tasks; up to three re-uploads of tasks, after commentary by the assessor; evaluation of the assessors and definition of the grading methods. The

assessment process [16] runs in three consequential phases with respective deadlines: task upload and a short self-assessment; review of the uploaded task and feedback by the assessor; collaborative work between the assessor and the assessed on the uploaded task, as well as assessment of the evaluators themselves and their reviews. The effectiveness of each one of the learners in the separate phases is recorded by the system and helps building a learning model of the student, which is then modified during the course of education.

In the e-learning environment **Moodle** [1] collaborative assessment is also realized by the so-called workshop, which is implemented in two phases (creating and sending of an assessment and receiving reviews and evaluations from one or more learners, according to predefined from the tutor criteria).

Conclusion

Collaborative learning and assessment puts the learners at a central place in the educational processes, making them the active side of it. They get numerous advantages in comparison to the traditional method of learning, not only academic, but social and psychological as well. A connection between the learners and group identity is build thru the collaborative work.

Most of the e-learning environments provide collaborative education and assessment in various forms. From one side the collaborative assessment is used as an opportunity to gain a more complex evaluation of the learners, and from another it is used as a general educational activity. With the different communication tools in the e-learning environment, collaboration in the study group eliminates many barriers to students and enables them to fulfill their potential.

Bibliography

1. *About Moodle - MoodleDocs*. https://docs.moodle.org/30/en/About_Moodle
2. *Best Practice: Group Collaboration*. https://en-us.help.blackboard.com/Learn/9.1_2014_04/Instructor/080_Collaboration/050_Course_Groups/100_Best_Practices_Groups/010_Best_Practice_Group_Collaboration
3. *Brightspace - Collaboration*. https://trial.brightspace.com/shared/TA-Tool/QualityPlus/_doc/Level1_Collaboration.pdf
4. *Canvas Learning Management System*. <https://www.canvaslms.com/higher-education>
5. *Classroom Techniques: Formative Assessment - Carousel Brainstorming*. <https://www.nwea.org/blog/2013/classroom-techniques-formative-assessment-idea-number-seven>
6. *Collaborative Learning – 44 benefits of collaborative learning*. <http://www.gdrc.org/kmgmt/c-learn/44.html>
7. *Collaborative learning*. https://en.wikipedia.org/wiki/Collaborative_learning
8. *Cooperative Learning Classroom Research*. http://alumni.media.mit.edu/~andyd/mindset/design/clc_rsch.html

9. Custom Insight, <http://www.custominsight.com/360-degree-feedback/what-is-360-degree-feedback.asp>
10. *Five basic elements of collaborative learning*. <http://tutorials.istudy.psu.edu/cooperativelearning/cooperativelearning4.html>
11. Gouli E., A. G.. *Supporting Self- Peer- and Collaborative -Assessment through a Web-based Environment*. *Jl. Of Interactive Learning Research* 19 (4), 615 – 647, 2008.
12. Laal M., M. L. *21st century learning; learning in collaboration*. *Procedia - Social and Behavioral Sciences* 47, 2012.
13. Lin S. S.-J., E. Z.-F. Liu, S.-M. Yuan. *Web Based Peer Assessment: Attitude and Achievement*, <http://www.ewh.ieee.org/soc/es/May2001/05/Begin.htm>
14. McConnell, D. *The Experience of Collaborative Assessment in e-Learning*. *Studies in Continuing Education*, Vol. 24, No. 1, 2002.
15. *Online Collaborative Learning Solutions | Blackboard*. <http://www.blackboard.com/online-collaborative-learning/blackboard-collaborate.aspx>
16. PECASSE. <http://hermes.di.uoa.gr/pecasseeng.htm>
17. *Research Collaboration | Sakai*. <https://sakaiproject.org/research-collaboration>
18. REVEL™. <https://www.pearsonhighered.com/products-and-services/course-content-and-digital-resources/interactive-learning-and-assessment/revel.html>
19. Somova E., *An attempt for using collaborative work of students as an approach for learning and evaluation*, V national conference of e-Learning in higher schools, 16-17 May 2014, Ruse, Bulgaria. (in Bulgarian)
20. Stacey E. Collaborative Learning in an Online Environment. *Journal of Distance Education*. http://web.mit.edu/acs/faq/Online-collaboration/collab-learning_files/stacey.htm, 1999.
21. Swan K. J., Shen, S. R. Hiltz. *Assessment and Collaboration in Online Learning*, *Journal of Asynchronous Learning Networks* 10.1, p. 45-62, 2006.
22. *Technologies and strategies of learning*. http://educationvisions.blogspot.bg/2014/07/blog-post_7662.html (in Bulgarian)

СЪВМЕСТНО УЧЕНЕ И ОЦЕНЯВАНЕ В Е-ОБУЧЕНИЕТО

Мартин Такев, Елена Сомова

Резюме: В статията се прави обзор на съвместното обучение и оценяване, като се представя тяхната същност, основни елементи, предимства и приложение. Акцентира се върху новата роля на обучаемия – носещ отговорност за своето обучение и пред другите обучаеми от своята група, в която осъществява сътрудничество при реализиране на съвместните дейности. Съвместното оценяване се разглежда и като обучителна дейност при съвместното обучение. Показват се и други предимства на сътрудничеството освен академичните – социални и психологически. Специално внимание се отделя на използването на този подход в е-обучението. Представят се среди за е-обучение, които прилагат съвместно обучение и/или оценяване.