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DOI

[10.17705/1CAIS.04825](https://doi.org/10.17705/1CAIS.04825)

Publication date

2021

Document Version

Final published version

Published in

Communications of the Association for Information Systems

License

Other

[Link to publication](#)

Citation for published version (APA):

Abcouwer, T., Takács, E., & Solymosy, J. (2021). Fine-tuning the Evaluation Focus in the University Cooperative Learning Model in Relation to the Pandemic. *Communications of the Association for Information Systems*, 48, 196-204. [25]. <https://doi.org/10.17705/1CAIS.04825>

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3-29-2021

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Recommended Citation

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Abstract:

Due to the coronavirus disease of 2019 (COVID-19) crisis, the University of Amsterdam faced a sudden need to shift our education to online learning. We experienced that radical impact given that we were amid efforts to restructure one of our courses in March, 2020. That restructuring, which focused on improved cooperative learning, would have required contact-based education. The sudden COVID-based shift to online learning limited the opportunities for cooperation, mutual knowledge sharing, and inspiration. Students needed more intensive stimulus to stay involved and active. We understood that more focus on evaluation helps educators to obtain better insight into the learning progress of students and to adapt the educational processes to improve students' learning outcomes and their learning journey. We realized that traditional end-of-course evaluation alone does not suffice the new requirements of online education. We saw a need for continuous evaluations during the course to monitor the learning trajectory that students followed. In this paper, we share our experience about the changing role of evaluation due to the COVID-19 pandemic, and describe how evaluating effectiveness, success, efficiency impacts the online work with students.

Keywords: Covid-19, Evaluation, Cooperative Learning.

This manuscript underwent editorial review. It was received 8/17/2020 and was with the authors for three months for two revisions. Craig Van Slyke served as Associate Editor.

1 Introduction

In contemporary reality, society and educational institutions broadly recognize the need for continuous, life-long learning. Experienced people can exchange their skills and knowledge, which can benefit society. Research has proven cooperative learning to be more efficient than traditional knowledge transfer from teacher to students. The imposed change to online learning due to the coronavirus disease of 2019 (COVID-19) pandemic partially obstructed the necessary development towards it. We experienced that evaluation can play an important role in overcoming the barrier between cooperative and online learning. We developed new mechanisms to fine-tune the evaluation process in a cooperative learning setting. In this paper, we share our experiences in switching a cooperative learning-based course to online.

2 Cooperative Learning

Learning refers to comprehending and using knowledge (Dandy & Bendersky, 2014). Modern views on learning stress that it does not only take place in formal education but in learners' broader environment. Understanding cooperative learning, in the sense that exchanging and experiencing knowledge between the members of the learning process leads to deeper and longer-lasting knowledge, assures that every participant in education gains deeper and longer-lasting knowledge. In this cooperation process, individuals can play different roles. In Figure 1, we present the main roles individuals can play (Abcouwer, Smit, & Takács, 2016). Besides the teachers and the students' roles, practitioners' and researchers' roles stress learning's societal relevance and new knowledge's development/co-creation/sharing. The figure also identifies the five crucial course elements in a cooperating learning process: 1) the subject and 2) the environment of the course and its 3) preparation, 4) process, and 5) assessment. Cooperation and learning together can help learners understand and use knowledge at a higher level.

Figure 1. Cooperative Learning and its Stakeholders

Cooperative learning refers to using small groups to instruct students both inside a course as in connection with the environment. Individuals who play the student role work together to maximize their own and each other's learning (Johnson & Johnson, 1999). Exchanging knowledge constitutes the initial phase in cooperative learning. We distinguish between passive and active learning as, in higher education, teachers commonly transfer knowledge to students (Ghilay & Ghilay, 2015) in a passive way. However, learning can become a process in which all participants work together as a team if they all research, study, teach, and practice. By comprehending and innovatively using knowledge, all members can engage actively in the learning process and, thus, maximize their own and each other's learning (Schilstra, Takács, & Abcouwer, 2019).

As the participants play an intricate role in cooperative learning, we have faced a significant challenge in determining how to facilitate cooperative learning online. When we had to shift to online instruction due to the COVID-19 pandemic in early 2020, we suddenly had to search for a solution by analyzing elements that make cooperative learning successful (Johnson, Johnson, & Smith, 1998) in a team setting.

In Figure 2, we identify the importance of individual behavior (elements 2 and 4) and cooperation (1, 3, and 5), which depend on team success factors such as trust, conflict management, commitment, accountability, and a focus on the result (Lencioni, 2002). Below, we work out this relationship in more detail with a focus on the unfortunate impact of the COVID-19 pandemic:

- 1) Positive interdependence requires strong cooperation and individuals to encourage one another to reach the group's goals. The COVID-19 pandemic obstructs such cooperation.
- 2) Individual accountability in cooperative learning became very important, just as the role of evaluation and sharing in the online learning setting. Working online requires new ways of evaluation.
- 3) Promotive interaction, engagement in dialogues, and knowledge exchanges to solve problems could be problematic, boring, and hard to stimulate in an online setting.
- 4) Interpersonal and social skills would be limited in an online setting; opportunities to include students in the teaching process required effective preferably in-person communication and conflict management.
- 5) Group processing online, with a particular focus on exchanging knowledge, requires motivation and understanding from all participants and self-discipline time and management skills from students, which is harder in an online setting.

Although team learning relies on interpersonal collaboration, we tried to ensure that we organized all the elements online. Still, one cannot underestimate the role that personal contact plays in education. We had to base the changes on different communication and cooperation activities. While one can easily monitor interpersonal influences on site, we needed to take evaluation measures to optimize cooperative learning when working online. In such a complex setting, end-of course evaluations alone cannot sufficiently reflect the results that students achieve as the learning process constitutes a continuous process.

Figure 2. Five Basic Elements of Cooperative Learning (Johnson et al., 1998)

3 Evaluation

We focused on designing a relevant course to students and organizing it to be as efficient, effective, and sustainable as possible. Accordingly, we needed to develop evaluation criteria to measure its targeted results.

Goals and objectives comprise the start of the cooperative learning process and form the base of traditional evaluation. They function as guidance throughout the learning process and a reference point to compare and evaluate expectations to actual results. Eventually, the results should reflect the goals and objectives. Pre-defining goals and objectives can increase students' motivation (Tombak & Altun, 2016). Hodges, Eames, and Coll (2014) state that educators generally assess students' performance or competence against some specified behavioral domain, standard, or criteria. This process requires careful planning. At the same time, students start from different points, which means that educators cannot use standardized goals and objectives to efficiently evaluate them. Hilliard (2012) argues that goals and objectives ensure a cooperative learning community's effectiveness. Still, educators should predetermine

them in a way such that they consider differences between students. Jackson and Evans (2017) and Sugiharto (2015) argue that such differentiation constitutes a crucial aspect of cooperative learning. Thus, educators need to evaluate students based on various aspects.

To develop the evaluation criteria, we identified the course's aims and goals (overall, program level, and operational objectives) based on the needs collected from the participants (alternating between their role as student, teacher, researcher, or practitioner) of the learning process, set measurements for evaluating performance and accomplishments, and defined the factors limiting success. We focused on evaluating the following aspects:

- Relevance: we measured relevance by looking at
 - Careful preparation
 - Continuous evaluation and feedback between those playing the teacher and student role
 - Climate that facilitated the needs and goals defined together with students.
- Efficiency: we measured efficiency by comparing the participants' (alternating as teacher, student, researcher, or practitioner) inputs and results reached both individually and as teams working together in the seminar groups. Well-defined tasks, roles, and responsibilities ensure and contribute to high-performing cooperative classes.
- Success: we measured success by comparing the course's goals/objectives set together with all participants and the effects or direct results and long-term impacts reached by delivering the course to those in a student role. It required:
 - Measuring if both the teachers and the students fulfilled all the agreements set in the beginning of the course
 - Verifying if the outcomes matched the objectives set together
 - Measuring whether the cooperative learning activities reached the desired outcomes.
- Effectiveness: we measured effectiveness by comparing the identified needs and effects. The long-term impacts are reached and balance the inputs, operation, needs, and impacts in line with the mission that is relevant in the actual context. Evaluating if the program reached the global objective also shows the course's effectiveness.
- Sustainability: we measured sustainability by comparing the measured needs of the students with the effects they reached during the course.

Given our view on cooperative learning, we identify different areas for evaluation:

- 1) Preparation: evaluate stakeholders' individual goals and objectives
- 2) Learning process: continuously evaluate the learning process; understand, stimulate, and monitor stakeholders' individual learning journey (formative assessment)
- 3) Assessment: assess the performances of the course (summative assessment).
- 4) Course: evaluating the effectiveness and success of the course as a whole. Effective and efficient courses balance invested inputs and results in terms of goal orientation and minimal costs.
- 5) Context/environment: evaluate the relevancy and sustainability of the designed course from a societal/environmental perspective. Monitor the course's impact.

The overall complex evaluation system, which includes evaluation aspects and areas (see Figure 3), can help educators deliver cooperative learning courses in an online setting.

Figure 3. Complex Evaluation System: Relevance, Efficiency, Success, Effectiveness and Sustainability of the Cooperative Learning Course

4 The Effects of the Pandemic on Education

The COVID-19 pandemic caused a colossal influence on the whole world. As a result, we had to adapt to the different measures such as a lockdown and social distancing that the government imposed on society. The pandemic had an immeasurable economic and social impact, which includes the effects on education. Due to the pandemic, we faced the need to switch a cooperative learning course to online instruction. Face-to-face education constitutes a crucial element in cooperative learning, so we found teaching the course online a real challenge.

Being well prepared means involving students from an early stage. The teamwork assignments contributed to positive interdependence and continuous work encouraged individual accountability. We found that the most problematic element concerned developing and measuring (evaluating) students' interpersonal and social skills online.

By applying the evaluation approach to three bachelor courses during the pandemic, the course developers and lecturers better understood evaluation's critical role in education. After discussing the results with external experts in the field, we identified both positive and negative effects. In Table 1, we link these effects to the five basic elements of cooperative learning (see Figure 2).

5 Stakeholders in Education and Evaluation

Different views on cooperative learning appear when we monitor the educational processes:

- Individual perspective: learning process stakeholders' needs and roles
- Team perspective: competition can motivate individuals
- Subject/course content: available knowledge and skills, societal missions
- Surrounding environment: long-term and sustainable impact, societal relevance, invested input and results.

To balance different interests, we involve in the evaluation process (see Figure 4. below) the following stakeholders in the following ways:

- a) Students evaluate teachers
- b) Teachers check the progress that students make
- c) Students evaluate their own cooperative way of working, and
- d) Practitioners evaluate the course's relevance from a societal perspective.

Table 1. The Impacts of Online Cooperative Learning

Elements of cooperative learning	Positive impacts	Negative aspects	Role of evaluation
<i>Positive interdependence</i>	Trustworthiness and responsibility: dependency and the team's success are motivating	Different experiences, backgrounds, opinions, and ideas do not work without cooperation and sharing	Let students experience that cooperation is motivating
<i>Individual accountability</i>	Positive attitudes towards conflicts: focus on achievements and agreements, respect for other perspectives	Conflicting goals: individual or mutual goals to achieve? How about the benefits of healthy competition?	Make a clear baseline measurement to overcome conflicts due to differences in goals
	Critical thinking and reasoning strategies: dare to share different insights and perspectives, better decision making, problem solving and increased creativity	Different information, perceptions, opinions, theories, risk-taking do not always reach to one conclusion	Stimulate critical thinking with continuous reflections on the topics and satisfaction.
<i>Promotive interaction</i>	Willingness to take on more challenging tasks: personalised suitable workload share, less stress when performing in a group, increased achievement and productivity	Group work does not imply cooperation. The role of the teacher is to facilitate and promote collaboration activities	Ask for critical reflection on the process.
<i>Interpersonal and social skills</i>	Positive attitudes towards team members from different ethnic background, culture, language, social class, ability and gender groups	Computer-supported collaborative learning is hard to achieve. It is difficult to create shared understanding when people are distant and come from diverse backgrounds	Share backgrounds in the initial learning activities to create high performing cooperation teams
<i>Group processing</i>	Team cohesion: knowledge exchange is motivating	Social dependence. Who to blame in case of failure?	Evaluate the division of roles between students

Figure 4. Stakeholders and Evaluation

6 An Approach to Evaluation under Influence of the Pandemic

We integrate our insights on switching cooperative learning to online education and the role of evaluation in Table 2. Evaluation allows students, teachers, and external partners to monitor the learning process.

Table 2. Insights on Switching to Online Education

Preparation...	
<ul style="list-style-type: none"> Assesses individual and collaborative achievements as an integral part of the process based on transparent and accepted criteria and ensures students reflect during the whole educational process. Results in transparent and agreed methodology, verified needs and common agreement on cooperation, and a transparent approach for trust and cooperation. 	
Evaluation...	Switching to online learning
Focuses on understanding the goals and objectives and on a baseline measurement.	Appropriate tools, methods and facilities are way more important than in on-site education. Evaluation must pay attention to the (lacking) social interaction due to lockdown measures, social distancing, etc.
Process...	
<ul style="list-style-type: none"> Includes continuous guidance, communication and immediate feedbacks, IT support for individual and group performance, knowledge exchange and cooperation, follow the group performance and active involvement. It facilitates decision-making via knowledge and information and practical assignments, dedicating roles and simulating life cases to practice cooperation, supporting assignments and tasks to practice critical thinking, monitoring the learning process and facilitating information exchange between teachers and students, strong group dynamics, and more time to perform and cooperate. Results in transparent and agreed working methodology, trust and cooperation, involvement in knowledge exchange, co-creation and critical thinking. 	
Evaluation...	Switching to online learning
Takes place on a permanent basis and forms an integrated part of the feedback mechanisms.	The distance between participants resulting from lacking personal contact complicates the cooperative learning process. For this reason, evaluation needs to be intensified. Monitoring the learning process and the information and knowledge exchange on online media is way more complex than in class: it requires weekly evaluation or evaluation directly after every learning activity.
Assessment...	
<ul style="list-style-type: none"> Assesses individual and collaborative achievements as an integral part of the process based on transparent and accepted criteria and ensures student reflection during the whole educational process. Results in transparent and agreed methodology, verified needs and common agreement on cooperation, and a transparent approach for trust and cooperation. 	
Evaluation...	Switching to online learning
Is based on formal formative and summative assessments to monitor everyone's learning progress. The alignment of the educational program and the evaluation process is developed in the preparation phase, but supporting monitoring requires permanent attention.	Highly influences the process and the learning journey of the participants. The importance of final end-of-course evaluation declines because the permanent attention ensures good insights.
Environment...	
<ul style="list-style-type: none"> Is a complex aspect that ensures open communication and interaction between different participants; encourages students; and fosters mutual respect, trust, agreement, acceptance, active engagement, and cooperation. Results in a student-centered educational climate that encourages high-performing cooperative learning and safety feelings during the learning experience. 	
Evaluating...	Switching to online learning
The environment/climate translates the mission of education into goals, objectives, and the choice of course subjects.	Affects the choice of subjects for lacking personal contacts.
Course/subject...	
<ul style="list-style-type: none"> Focuses on the course's effectiveness and success as a whole. Results in effective and efficient balance between invested inputs and results. 	
Evaluation...	Switching to online learning
Focuses on a traditional end-of-course evaluation that takes place based on accreditation and other requirements.	Since the focus lies in reaching the learning objectives and fulfilling the agreed requirements, the switch does not influence the evaluation heavily.

7 Concluding Remarks

Being able to survive when facing a challenge such as the COVID-19 pandemic highly depends on one's ability to adapt to dynamically changing circumstances. Similarly, such challenges have a significant impact on the need for flexibility to organize a course successfully. According to our experience good preparation and interaction between stakeholders ensures success. In our current education, we are implementing an evaluation method based on the one view on learning we describe in this paper. It means that we cannot yet prove our findings, so we finalize this paper by making some concluding remarks based on our first experiences:

- The pandemic showed that the assumption “context is leading” is just as important as a course's content and internal organization. Only focusing on content and organization will negatively impact the learning trajectory's quality.
- Dealing with the crisis shows that high-quality education requires one to introduce internally and externally integrated course-evaluation processes. The external aspect comes forward when focusing on the role and requirements of the educational programs in society.
- Evaluation does not only focus on helping teachers understand the level to which stakeholders reach learning objectives but also leads to improved programs quality due to the improved insights gain from our proposed integrated evaluation approach.
- Universities may relapse to old patterns and, thus, block efforts to innovate education.

Whatever solutions stakeholders choose, they need to pay attention to securing high levels of cooperation. In doing so, they will ensure they disseminate knowledge, skills, a changing attitude, and optimal advantage of the learning activities in the different roles they play. Improved evaluation helps in determining how this dissemination can occur.

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