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COOPERATIVE LEARNING AND BREAKOUT ROOMS IN ONLINE CLASSROOMS: INCREASING STUDENT ENGAGEMENT AND DEVELOPING CREATIVITY

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Abstract

Creativity plays an important part in innovation and invention and is important in professions such as business, economics, architecture, mathematics, music, science, and engineering and teaching. Cooperative learning can be defined as a range of concepts and techniques for enhancing the value of student-student interaction. The article begins with separate discussions of how cooperative learning promotes effective instruction of thinking skills and creativity, and of information technology. Thinking skills and creativity are promoted when students interact with their peers to brainstorm, explain, question, disagree, persuade, and problem-solve. Cooperative learning offers many tools for structuring this type of thinking interaction. Teachers can and should begin early in the school year facilitating discussions with students about cooperative learning alongside its use. Teachers may find that some students express a desire for a more heavy-handed lead from the teacher, consistent with their previous experiences. However, these early discussions offer an opportunity for students to learn how their input influences the practices of the classroom community and their co-regulated and self-regulated learning.

Introduction

Creativity is seen as any act, idea, or product that changes an existing domain or that transforms an existing domain into a new one. Therefore, creative individuals have the ability to view things in new ways or from different perspectives. Creativity is not a talent but a way of operating and it can be taught. It is also not restricted to the arts since it can be applied to any human endeavor. At the same time, intelligence quotient (IQ) is not related to creativity, but one requires a minimum level of IQ to be creative. Creativity plays an important part in innovation and invention and is important in professions such as business, economics, architecture, mathematics, music, science, engineering and teaching.

Creativity is a key prerequisite in any meaningful learning process. It enhances a learner's capacity to develop a deeper understanding of scientific phenomena. Science educators, therefore, need to develop approaches that can be used to enhance creativity in lessons. Information communication Technologies (ICTs) have become key features in the teaching and learning of science that can influence students' motivation to learn. A teacher may adopt a competitive, cooperative or an individualistic approach in teaching and hence motivate learners differently. Myths have developed about the virtues of competition and the evils of cooperation. For example, it is argued that since society is highly competitive, learners must be educated to succeed in a "survival for the fittest" world.

The term 'cooperative learning' has been used to cover a wide range of different strategies and approaches. Hundreds of studies have been undertaken to measure the success of cooperative learning as an instructional method regarding social skills, student learning, and achievement across all levels from primary grades through college. The general consensus is that cooperative learning can and usually does result in positive student outcomes in all domains (Johnson & Johnson, 1999). Sufficient studies had been conducted on eight of these for them to be included in a meta-analysis comparing their impact on student achievement with that of traditional methods. All eight cooperative learning approaches were found to have had a greater impact on achievement than competitive learning, but the biggest effects were found for 'Learning Together' and 'Academic Controversy' (Johnson and Johnson 1991), followed by 'Student Teams Achievement Divisions' and 'Team Games Tournaments' (Slavin 1999), then 'Group Investigation' (Sharan and Sharan 1992) and then 'Jigsaw' (Aronson and Patnoe 1997).

Johnson and Johnson (1991), Kagan (1990) and Slavin (1999) all define cooperative learning in terms which exclude mere contact and sharing in small groups. They insist that the term cooperative learning can only be applied to activities where there is individual accountability and positive interdependence linked to group rewards or goals. Individual accountability, 'exists when the performance of each individual student is assessed and the results given back to the group and the individual' (Johnson and Johnson 1991), whereas positive interdependence is present when, 'students perceive that they can reach their learning goals if and only if the other students in the learning group also reach their goals' (Johnson, Johnson, and Holubec 1993).

Cooperative learning can be defined as a range of concepts and techniques for enhancing the value of student-student interaction. The article begins with separate discussions of how cooperative learning promotes effective instruction of thinking skills and creativity, and of information technology. Thinking skills and creativity are promoted when students interact with their peers to brainstorm, explain, question, disagree, persuade and solving problems. Cooperative learning offers many tools for structuring this type of thinking interaction.

Educational applications of information technology are enhanced by peer interaction in cooperative learning groups, as students can engage in peer tutoring, model effective behaviours, communicate electronically, and take on a range of roles while working at the computer (Tan, G., P. B. Gallo, G. M. Jacobs., & C.K.E, Lee, 1998). Cooperative learning can be defined as a variety of concepts and techniques for enhancing the value of student-student interaction. In one well-known operationalization of cooperative learning (Johnson, Johnson, & Holubec, 1993), key concepts include:

1. **Positive interdependence** - the feeling among a group of students that they sink or swim together, i.e., that what helps one helps all, and that what hurts one hurts all.
2. **Individual accountability** - the feeling among a group that each member is responsible for their own learning as well as that of their groupmates.
3. **Collaborative skills** - these skills, that students need to cooperate successfully, often must be explicitly taught.
4. **Processing group interaction** - time spent for groups to think about how well they have collaborated and how to enhance their future collaboration.
5. **Heterogeneous grouping** - students working with groupmates who are different from them on such variables as sex, past achievement, ethnicity, and diligence.

Cooperative learning is believed to promote thinking and creativity in many ways (Hythecker, Dansereau, & Rocklin, 1988; Qin, Johnson, & Johnson, 1995; Webb, 1989), including:

1. Compared to a whole class format, in cooperative learning, students have more opportunities to talk and to share ideas. This interaction with group mates encourages students to restructure their ideas. For instance, they may need to summarize, elaborate, exemplify, defend, and explain their ideas.
2. Disagreement, if carried out constructively, pushes students to clarify and rethink their ideas, potentially leading to cognitive restructuring.
3. By working in groups, students enjoy more opportunity to see how their peers think and create new ideas. Witnessing this process can provide useful models.
4. Discussing, creating, and thinking in a group, rather than in a whole class context, can provide a less anxiety-producing context. If groupmates feel positively interdependent with one another, a supportive atmosphere can develop. In such an atmosphere, students may feel more free to try out new ideas.
5. The multiple perspectives of others in their heterogeneous groups may spark new ideas in students' minds.
6. The greater achievement that cooperative learning can foster provides students with a stronger knowledge base from which to explore concepts.

The methodological approach includes: Think-Pair-Share; Reciprocal Teaching; Think-Aloud Pair Problem Solving (TAPPS); Group Grid; Group Writing Assignments; Brainstorming; Story-Boarding; Problem Reversal; Lateral thinking tasks; Asking questions; Group discussion; Group survey; Critical debates; Three-Step Interview. Cooperative Learning, which will be the primary focus of this workshop, is a specific kind of Collaborative Learning. Students will work together in groups on a structured activity. They will be individually accountable for their work, and the work of the group as a whole will be also assessed. Cooperative groups will work face-to-face and learn to work as a team. In small groups, students will have a chance to share strengths and also to develop their weaker skills. They will develop their interpersonal skills and will learn to deal with conflict.

Breakout rooms in online teaching and Learning

Breakout rooms are increasingly used within online learning environments. For example, Martin and Parker (2014) found that 25% of the surveyed online educators used breakout rooms. In general, the use of breakout rooms encourages "learner-learner interaction," which as noted by Moore (1993), is a valuable resource for learning. Chandler (2016) found that breakout rooms are useful for facilitating collaborative learning and interaction. Chandler noted that breakout rooms provide distance-learning students with the opportunity for peer-to-peer contact, which can be invaluable in building relationships and confidence. Some have argued that the effectiveness of active learning techniques such as breakout rooms lies as much in the enhancement of engagement as in the ability to generate in-depth exploration of the topic (Redish, Saul, & Steinberg, 1997). Martin and Parker (2014) noted that using breakout rooms could enhance interaction and build a sense of community. Ellingson and Notbohm (2012) also discussed the use of breakout rooms and described breakout rooms as appealing feature.

Cooperative learning structures online using breakout rooms

- Breakout rooms give students in online courses an opportunity to collaborate and work in smaller groups. Students report feeling engaged in breakout room activities, and confident speaking in a small group. Breakout rooms also allow instructors an opportunity to check-in with students in smaller groups. Breakout rooms can be implemented using Courselink's Virtual Classroom tool or Zoom.
- Set up breakout rooms in advance Plan activities for students to work on in breakout room (activities may be different than in a face-to-face tutorial).
- Provide clear guidance and all necessary tools (e.g., online whiteboard, link to Google doc, discussion questions, etc.) to students to complete activity.
- Aim for groups of 3 to 5 students in each breakout room, and ensure that each student has a task to complete.
- Practice using the breakout room tool and become comfortable with the technology before the class.
  https://ctl.columbia.edu/resources-and-technology/teaching-with-technology/teaching-online/active-learning/

Active learning

Bonwell and Eison describe active learning strategies as "instructional activities involving students in **doing things and thinking about what they are doing**[1]." In Creating Significant Learning Experiences, L. Dee Fink builds upon Bonwell and Eison's definition by describing a holistic view of active learning that includes all of the following components: Information and Ideas, Experience, and Reflective Dialogue[2]. This framework can be a helpful tool to consider how your students…

- **encounter** (new) information and ideas
  - e.g., by watching videos or reading PDFs in advance, or from a short presentation you give using Zoom's Share Screen feature
- **engage** with information and ideas
  - e.g., through discussions with their peers using Zoom's Breakout Rooms feature and documenting their conversations in collaborative Google Docs

- **reflect** on their learning
  - e.g., by spending the last five minutes of the online class session engaging in reflective writing and sharing their thoughts through an open-ended poll on Poll Everywhere.

Active Learning Strategies

The active learning strategies you select should serve the course learning objectives for your students. Remember, the goal of active learning is not simply for your students to do things, but to also think about what they are doing. As you learn more about the following strategies, consider how effective each would be in promoting the learning you desire from your students.

- Zoom—video conferencing, including the following features*:
- Share Screen—share your screen, your student's screen, or a virtual whiteboard
- Breakout Rooms—divide the main virtual room into smaller virtual rooms
- Polling—launch multiple choice polls
- Nonverbal Feedback—allow students to express opinions by clicking on icons
- Poll Everywhere—audience response system for polling
- LionMail (Google) Docs, Sheets, Slides—collaborative documents

Conclusion

Cooperative learning still appears to be a promising approach to create a learning environment that helps enhance the interpersonal relationships among students. Discussions within the classroom about the purpose and methods of cooperative learning help to establish practices in a particular class. Teachers can and should begin early in the school year facilitating discussions with students about cooperative learning alongside its use. Teachers may find that some students express a desire for a more heavy-handed lead from the teacher, consistent with their previous experiences. However, these early discussions offer an opportunity for students to learn how their input influences the practices of the classroom community and their co-regulated and self-regulated learning. If the teacher designs the task as one problem with enough complexity that discussion among group members is necessary for progress, then more collaboration is built into the task and the cooperative benefits are more likely to occur. Students need to teach and learn from one another. While a community that balances interdependence and individuality is central to cooperation.

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