

Make the Collaborative Learning Engaging: Guideline for Higher Education Teachers to Implement Effective Group Work

Xiaodan Yu

Center for Teaching Quality Supervision and Assessment, Zhaoqing University, Duanzhou District, Zhaoqing, Guangdong, 526061, China

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Abstract: The skill of collaboration has long been imperative for employees to thrive and excel in the complex working environment. To better equip college students with teamwork abilities and foster their smooth transition to the workplace, more and more faculty across all disciplines are reconstructing their classes to incorporate collaborative learning experiences. However, college teachers confront challenges in conducting effective collaborative learning due to students' misconceptions, low motivation, and unfair work-share. Previous studies have indicated that students' misperception of collaborative learning can lead to resistance to participation. Also, students have difficulties finding their motivations, which play an essential role in successful collaborative learning. Free-riding or social loafing is another barrier to effective collaborative learning. It occurs in teamwork when some members enjoy the benefits of group output without contributing. Therefore, teachers are seeking a well-developed framework for implementing collaborative learning. In response, this article created a guideline for college teachers to develop effective collaborative learning activities. The guideline has provided practical information teachers need to create an engaging collaborative learning experience in their classrooms. This article examines the educational need and demonstrates the rationale and details of the guideline, drawing on the literature on (1) student resistance to active learning, (2) learner's interest and motivation for collaborative learning, and (3) social loafing and free riding.

1. Introduction

Collaborative learning (CL) is a pedagogical approach that requires students to actively interact with others to complete a task [1]. Although more and more university teachers recognize the benefits of CL and introduce CL to their traditional classrooms, they encounter challenges in implementing effective CL.

CL is taking an increasingly central position in higher education [2] and greatly benefits the classroom. Research reveals that students who engage in student-centered classrooms learn more than in lecture-based contexts [3]. CL advances students' interpersonal skills such as communication, cooperation, conflict-mediating, and problem-solving [4]. Evidence shows that CL can foster

individual accountability by evaluating each individual's performance and identifying those who need support [5].

Despite the listed advantages, teachers confront barriers to replacing passive instruction with CL because of a series of challenges. First, CL is a relatively new instructional approach that may cause students' negative responses [3, 6]. Second, although motivation is supposed to be a significant component of successful CL, students face continuous challenges in developing their motivation [7]. Third, many educators are aware of the problem of *free-riding* [8, 9] that one or more members avoid taking a fair share of work, accounting for unsatisfactory experiences [10]. Educators need to investigate the underlying reasons for the negative perception of CL, insufficient motivation, and free-riding to shed light on guidance for future CL implementation in the college classroom.

2. Research on Student's Engagement in Collaborative Learning

Evidence indicates that students in active learning feel they learn less than they do in the lecture-based classroom, though they actually learn more [3]. This mismatch between the perception of learning experience and actual learning gains is due to the misconception about the value of active learning. Scholars define the students' negative attitudes towards the teaching practice as *student resistance* [11]. Both external and internal factors can contribute to student resistance. External factors, such as previous experience with CL, can influence how they anticipate the existing learning outcomes [4]. Those who experience disappointing CL are more likely to have higher resistance to current learning. Internal factors include how students view the source of knowledge. Students may refuse teamwork if they perceive knowledge should be taught by instructors instead of obtained through peer interaction [3]. The assumption that CL may require more effort and time can also cause internal resistance [11]. Research on student resistance highlights the need to establish students' positive anticipation in the early stages of CL.

Another challenge for teachers is facilitating students' motivation and interest in CL. Motivation is a critical component in learning that "activates and sustains" a learner's behavior to achieve their goals [12]. Students may not persist in CL without sufficient motivation, considering CL requires more time and effort than traditional learning. Students' motivation for a particular task highly depends on their faith in the capability of accomplishment, the possibility of achievement, and the profit of contribution [13]. To explain further, students tend to avoid extra effort and meet the minimum requirements when they think the goal is too out of reach or the contribution is meaningless. The researcher further notes that students have two primary sources of motivation: *intrinsic* and *extrinsic* [14]. With intrinsic motivation, one may feel internally pleasant and rewarded by performing the task. Extrinsic motivation refers to the behavior fostered by external incentives such as rewards, penalties, and grades. However, students may lack intrinsic motivation when unsure whether their efforts will yield desired outcomes. Besides, inappropriate assessment methods or the lack of rewards and penalties may decrease students' external motivation.

Interest is another crucial component of successful learning. Interest represents one's willingness to perform a behavior, such as learning certain content. Interest is a predictor for motivation as a learner with high interest is always motivating [13]. Interest is a malleable perception that can be provoked and supported in learning. However, according to the four-phase model of interest development, a learner's interest development can be at any phase but not stay at a specific stage [15]. An initial trigger for interest may not continually support one to establish a well-developed individual interest. Therefore, interest can remain static, fade away, or vanish without ongoing incentives and support. In short, it is imperative to facilitate students' interest and motivation to sustain their learning.

Free-riding is another problem commonly seen in CL. Free-riding occurs when one or more members acquire the benefits of group output without contributing [8]. It goes against CL's goal of

collecting shared efforts to solve problems. The presence of free-riding may also undermine the team's working efficiency since the members who contributed more may resent taking all the work [2]. The unpleasant experience with one CL activity may negatively affect students' perception of CL and result in more barriers to future CL.

The level of collaboration is negatively related to group size [16]. It means that the bigger the group is, the lower the collaborative level is. A mismatch between the task requirement and group size may cause low contributions from individuals, ultimately leading to free-riding. Besides, free-riding can occur when teachers neglect the individual's contribution but merely evaluate the group's overall performance [14]. The more difficult it is to identify "who did what" in CL, the greater the likelihood of free-riding by team members. In addition, particular tasks are more prone to free-riding than others. Researchers have found that free-riding tends to occur when the task is (1) *unitary*, (2) *optimizing*, and (3) *disjunctive* [8, 14]. A unitary task is the task that only one person at a time can participate, such as cutting a piece of paper, which does not create room for cooperation. An optimizing task evaluates success as how closely the product is to an ideal, often ambiguous expectation. These tasks encourage free-riding since the students aiming for perfection the most naturally put in more effort. In the disjunctive task, the group's productivity depends on the most capable member, such as coding an algorithm in the computer science class. Furthermore, scholars divide task types into *discretionary* and *nondiscretionary* tasks according to whether members can self-determine how to contribute effort. Specifically, a disjunctive and discretionary task may foster free-riding since the best group member can dominate [8]. In short, failing to design proper task dimensions can impair cooperation and work-share, undermining students' experience in CL.

3. Recommendations for Implementing Collaborative Learning

This article provides knowledge and strategies for instructors to resolve the discussed challenges and facilitate CL in their college classrooms. The proposing solution consists of 14 strategies (Table 1) that can fulfill the discussed educational need.

3.1. Reduce Student Resistance

Scholars established a systematic model called the *integrated model of student resistance* (IMSR) to explain student resistance in CL [4]. According to the IMSR, a student's perception of the learning activity is susceptible to four elements: *cognitive development*, *metacognition*, *negative classroom experience*, and *environmental forces*. Teachers can apply four strategies to solve the above four elements respectively. These strategies include (1) addressing students' cognition of learning, (2) sharing the benefits of CL, (3) providing necessary skills to become a productive member, and (4) creating a culturally responsive learning environment.

3.1.1. Address Students' Cognition of Learning

Students' cognition of learning is their beliefs about the resource of knowledge. Some students may resent CL because they believe learning is more effective in a teacher-centered classroom than in group work. Teachers may reduce student resistance by modifying their misconceptions of CL at an early stage. Teachers can present the value of collaboration as a source of learning, ensure that individuals make essential contributions, and adapt learning to situate students' need for knowledge self-construction.

3.1.2. Share the Benefits of CL

Another factor that can influence student resistance is metacognition. Metacognition measures how students perceive their cognition and if they can regulate their cognitive processes. Specifically, one’s metacognition is related to their view of self-competence. Dweck [17] defines students who believe their intelligence as static have a *fixed mindset*, while those who see their ability as malleable have a *growth mindset*. Students with a fixed mindset are more likely to resist CL because they are uncomfortable with displaying shortages in their intelligence and refuse to take risks. Thus, teachers can share research evidence on the benefits of CL so that students can develop a growth mindset to take advantage of the change.

Table 1: Strategies to Support Students’ Collaboration

Strategies	Corresponding Educational Need		
	Reduce students resistance	Stimulate motivation and interest	Eliminate free-riding
Address students’ cognition of learning	✓		
Share the benefits of CL	✓		
Provide necessary skills to become productive members	✓		
Create a culturally responsive learning environment	✓		
Use real-world problems		✓	
Set just-out-of-reach goals		✓	
Showcase the value of tasks		✓	
Provide new exposure		✓	
Establish positive intra-group social relations		✓	
Assign conjunctive and additive tasks			✓
Keep groups midsized			✓
Create group roles			✓
Establish group norms			✓
Keep track of students’ progress			✓
Use peer assessments			✓

3.1.3. Provide Necessary Skills to Become a Productive Member

Besides, students who have had an unpleasant experience with CL tend to resist active engagement in current learning. In order to make the learning environment more favorable and effective, teachers can equip students with the necessary skills to become productive members. For example, teachers can closely observe student interactions, illustrate and model collaboration skills, provide feedback to students, and lead them to reflect on growth. This strategy can ease students’ negative attitudes towards CL and increase their group work engagement.

3.1.4. Create a Culturally Responsive Learning Environment

Environmental forces such as cultural background may influence students’ perception of CL. Students from rural or less developed areas may find it challenging to actively interact with others due to their lack of confidence. Teachers should create a culturally responsive learning environment that appreciates diversity. Specifically, teachers should reinforce the importance and benefits of

acknowledging different opinions, which usually arise from diversity in background knowledge with minority students [4, 18].

3.2. Stimulate Motivation and Interest

Interest and motivation can fuel active engagement in learning. The article proposes that teachers can stimulate students' motivation and interest by (1) using real-world problems, (2) setting just-out-of-reach goals, (3) showcasing the value of tasks, (4) providing new exposure, and (5) establishing positive intra-group social relations.

3.2.1. Use Real-World Problems

Research indicates that posing students to real-world problems with open-ended, novel, challenging, surprising, and complex features can trigger their interest and promote collaboration [19]. Rather than spending a lot of time designing a simulated scenario, using inspiration from the authentic world can encourage continuous discussions and explorations. Moreover, students participating in authentic work can profoundly appreciate knowledge and truth [20].

3.2.2. Set Just-Out-Of-Reach Goals

Besides, teachers should consider a reasonable goal for students—ideally a just-out-of-reach goal. The task cannot be too simple or too complex because students may lose interest in a simple task or get frustrated with a difficult task. The *expectancy-value theory* implies that students will only engage in a challenging task if they have faith in their ability to complete it. Teachers can strengthen students' confidence by setting appropriate objectives, breaking down challenging goals into accessible pieces, and informing students of their progress [12].

3.2.3. Showcase the Value of Tasks

Another element that the *expectancy-value theory* identifies includes students' recognition of the values of tasks. Tasks are valued for their usefulness, importance, and enjoyment. Students have higher motivation for a task if it contributes to students' goal attainment, identity recognition, and merely happiness [12]. Thus, teachers can showcase the value of tasks when supporting students to pursue their short- and long-term goals (e.g., successfully creating a learning application in a learning design class and becoming a learning designer in the future).

3.2.4. Provide New Exposure

Providing new exposure helps to evoke students' desire to engage in CL. Otherwise, students may show low interest due to limited knowledge or prior experiences with the topics [21]. Teachers should prepare students for CL with as much as new exposure. For example, in art projects, teachers can organize a field trip to public art sites and invite guest speakers to share their works, a method that opens up creative ideas for students to create their own projects.

3.2.5. Establish Positive Intra-Group Social Relations

Positive intra-group social relations allow open communication regarding intentions, conflict management, and other essential topics for groups. Better communication can promote individuals' engagement in group work. A method to ensure positive interpersonal relationships within the group is to make the group longer-term and reinforce the concept of "teams" rather than "groups" [14]. In

addition, teachers can include some occasional social events, encourage informal gatherings, and provide regular consultations to address concerns.

3.3. Eliminate Free-Riding

Based on the research on free-riding, the article suggests six strategies to address this issue: (1) assign conjunctive and additive tasks, (2) keep group midsized, (3) create group roles, (4) establish group norms, (5) keep track of students' progress, and (6) use peer assessments.

3.3.1. Assign Conjunctive and Additive Tasks

Free-riding is less likely to occur when the task is conjunctive and additive [14]. Conjunctive tasks demand all members' contributions to the goal completion, while additive tasks allow each individual to add something to the task [8]. For example, the teacher can require students to design a composting education workshop that requires efforts from each individual (e.g., collecting information, designing learning materials, and promoting and carrying out the activity). In this example, everyone's effort is indispensable, and everyone can make a unique contribution.

3.3.2. Keep Group Midsized

Group size is also significantly relevant to a group's success. When deciding on group size, teachers should balance diversity and working efficiency. As discussed, the level of collaboration is negatively related to group size because members in a big group are likely to reduce their effort. However, a too-small group may be too monotonous regarding experiences, perspectives, and skills. Thus, researchers believe a group size of 4-5 is usually ideal [14].

3.3.3. Create Group Roles

Roles represent responsibility. A team contract (see appendix 1) may facilitate role allocation. For example, the contract lists four typical roles that students can select (i.e., discussion facilitator, recorder, reporter, and progress manager) and clearly explains the responsibility of each role. Teachers can adjust the role settings according to the need for specific tasks.

3.3.4. Establish Group Norms

Group norms reflect a group's preference for the working process and expectations for favorable behavior. Group norms can discourage free-riding by reinforcing the idea of fair contributions and *anti-free-riding* [8]. Group norms can generate a sense of common goals, encourage open communication within groups, and increase altruistic behavior that can benefit the group's interests. Teachers can involve critical components of the group norms (e.g., team goals, work allocation, meeting schedule, dispute resolution, and team pride) in the team contract (see appendix 1).

3.3.5. Keep Track of Students' Progress

Teachers can identify potential risks and offer timely support by keeping track of students' progress. It is helpful to walk around the room and listen carefully to students' discussions, set up regular check-in meetings with groups, and hold reflection and sharing sections for the whole class [6]. Another benefit of doing so is when tasks are too easy for students and they seem to be losing interest, teachers can immediately recognize and adjust the tasks' complexity to re-engage students. Teachers can use a teamwork checklist (see appendix 2) to examine critical aspects of collaboration and discover crises in advance.

3.3.6. Use Peer Assessments

Peer evaluations can diminish the chance of free-riding because students can improve their performance based on their peers' feedback [10]. Peer assessment can also promote students' autonomous learning and encourage them to think deeper and be more critical [2]. Besides, the early implementation, multiple access, and specific criteria of peer assessments are crucial to decreasing free-riding [22]. Groups should conduct peer evaluations (see appendix 3) on a regular basis during the project.

4. Conclusions

To address the emerging problems with collaborative learning, this article has provided a guideline for college teachers in various disciplines to implement effective CL in their classrooms. Dividing students into a group does not necessarily contribute to an ideal level of interaction, while assigning them tasks does not guarantee sufficient communication between individuals. The guideline offers practical information teachers need to support CL, ranging from important characteristics, major benefits, and common challenges to useful CL strategies. The suggested 14 strategies can benefit teachers in promoting the effectiveness of CL by reducing student resistance, averting free-riding, and triggering interest and motivation. Teachers incorporating the suggested strategies in their CL implementation can construct a learning environment that promotes students' skills of problem-solving, communication, collaboration, and discipline knowledge acquirement.

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Appendix

See Table 2.

Table 2 Peer Evaluation Form				
Evaluation Questions	Team member skill level			
	Excellent	Good	Average	Below Average
Contribution of Time to overall project effort				
Attendance at team Meetings				
Comes to team meetings on time, prepared & ready to contribute				
Willingness to listen to and consider the ideas of others				
Made thoughtful contributions of ideas/suggestions.				
Was a team player. Worked well with other team members and the third parties				
Displayed individual effort over and above team effort to get things done as needed				
Complete the assigned work on time and with high quality				
Overall contribution to the project				
Additional comments:				

See Table 3.

Table 3 Team Contract		
Goals	Write 3-5 team goals. What's your expectation for the project's outcome? What do you hope to learn from this project?	
Roles	Options	Name
	Discussion Facilitator - Responsible for facilitating team discussions and ensuring everyone's voice is heard.	
	Progress Manager - Responsible for tracking the team's progress in completing team deliverables.	
	Recorder - Responsible for taking notes during team meetings and making sure everything is documented.	
	Reporter – Responsible for presenting the team's progress to the instructor and external audiences	
	Additional Role of your choice	
Allocation of work	The allocation of work for the project shall be [insert description of how the team will carry out the task, the division of research, generating, editing].	
Meetings	The team will meet to discuss the progress of the project on the following dates [create a schedule attached to the contract of the days that you will meet].	
Disputes	Where a dispute arises as to the following matters [*for example, workload, quality of work, input/emergency/contribution] The dispute will be resolved in the following manner [insert dispute resolution strategies—you may find some awards and open communications helpful].	
Pride	The team will have fun and take pride in your work by [insert description of how the team will celebrate progress and your desired ways to meet informally].	
Optional	In this cell, include any other matter that you think is important for the completion of the contract and project.	
Signature	Student 1 _____ Student 2 _____ Student 3 _____ Student 4 _____ Date _____	

See Table 4.

Table 4 Teamwork Checklist			
Are you?	Instructor	Team	Comments
Effectively clarifying your task or objective at each stage?			
Checking on progress?			
Clarifying and documenting what your group decides?			
Clarifying who is going to do what?			
Clarifying when each task is due?			
Establishing procedures for handling meetings?			
Keeping to agreed procedures?			
Listening to each other?			
Dominating/allowing some members to dominate?			
Compromising individual's wants for the sake of the team?			
Recognizing the feelings of other members?			
Contributing equally to team progress?			
Following agreed procedures for task completion?			