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Strategies Promoting Dialogic Talk during Cooperative Learning

The role of talk in the construction of knowledge and learning has gathered interest in recent years as studies have been published that demonstrate the importance of social interaction in promoting cognitive development and academic learning. While there is a large volume of research that attests to the benefits that students derive when they work cooperatively together, it is only in the last 30 years that studies have been published that demonstrate how students learn by interacting with others and how teachers can utilise this information to create classroom experiences to ensure these benefits are realised. This article discusses the role of dialogic talk during cooperative learning and its capacity to promote students' thinking and learning. The article provides insights into how one teacher used dialogic talk in her classroom to promote student interactions, thinking and learning. It also provides an example of how students in one small group listened to each other, asked questions, sought clarifications, and provided reasons and justifications for their suggestions as they considered the perspectives of others on how to construct an earthquake proof building.

Keywords: Cooperative Learning; dialogic talk; pedagogical practice; teacher's role

Introduction

Cooperative learning is a pedagogical practice that has been used extensively in classrooms to promote student engagement and learning. When children cooperate, they learn to attend to what others have to say, seek clarification on issues and, in turn, provide explanations for points that need further clarification. In so doing, they learn to develop mutual understandings of the topics that are being discussed (Johnson & Johnson, 1990). In fact, talk is so important that it recognised not only as a means of sharing thoughts but also as a social mode of thinking; essentially a tool for the joint construction of knowledge and the development of new understandings (Mercer, 1996).

Students who cooperate demonstrate increased participation in group discussions, engage in more useful helping behaviours to assist understandings, and demonstrate higher levels of thinking and discourse than students who do not have these experiences (Gillies, 2003; Webb, 2009). The outcome is that students who cooperate on tasks that challenge their thinking tend to perform better academically and are more motivated to achieve than children who have not had these experiences (Johnson & Johnson, 2002).

However, while cooperative learning provides opportunities for students to interact, concern has been expressed about the quality of the discourse that often emerges if students are left to engage in discussions without training in how to interact appropriately. In fact, it is argued that teachers need to be active in challenging students thinking if students

are to learn how to think analytically about what they are learning and relate it to their current understandings (KING, 2008). When this happens, students learn to construct new knowledge, solve new problems, and address new issues (GILLIES, 2011).

Chinn and Clark (2013) noted that collaborative argumentation is one form of discourse where students learn to make claims and support them with reasons and explore the perspectives of others and evidence for their perspectives before deciding on the best solution to a problem. When students learn to engage in collaborative argumentation, students are more motivated to learn, they develop a better understanding of the content they are learning, they demonstrate more general and specific argumentation skills to solve problems, and, in so doing, they learn to work with others to create new knowledge and understandings.

However, although children do not initially use talk to explore and investigate issues when they work collaboratively together, Rojas-Drummond and Mercer (2003) found that they can be taught to do so and this has a positive effect on their thinking and reasoning. More recent research by Mercer, Hennessy and Warwick (2019) that built on previous research on Exploratory Talk (MERCER, 1996) and the Thinking Together approach (DAWES et al., 2006) have argued that a dialogic pedagogy can be established in classrooms where "teaching is predicated on the active, extended involvement of students as well as teachers in the spoken interaction of the classroom" (p. 189).

Dialogic pedagogy is more likely to emerge when teachers establish conditions that encourage students to share information; be actively involved in the group discussion; listen attentively to what others have to say and consider different suggestions; provide reasons and explanations for ideas; discuss alternative propositions; and work constructively with the group to reach a decision (MERCER et al., 1999). Dialoguing with others is critically important because Meloth and Deering (1999), Webb et al. (2013) and Topping and Trickey (2014) found that the cognitive and metacognitive levels of the groups' discussions are positively correlated with students' cognitive and metacognitive outcomes.

Training teachers in how to teach appropriate interactional skills appears to be critically important if children are to engage in effective dialogic interactions with their peers (WEBB, 2009). Gillies (2011) argued that teaching children how to ask and answer questions and provide feedback to their peers during small group discussions required a concerted effort on the part of the teacher to teach and model these skills during dialogic exchanges. Topping and Trickey (2014) found that when teachers engaged in dialogic interactions with their students where they asked open questions, as they did when they used Philosophy for Children (a dialogic approach to learning), students were more likely to participate in classroom dialogues and this, in turn, led to improved student reasoning and justification of opinions. Furthermore, Topping and Trickey found gains in cognition which were maintained from primary school to high school even when the students were in classes where the teachers had not been engaging in dialogic interactions with their students.

Ways in which teachers can promote dialogic interactions in classrooms

One of the key researchers on how to promote dialogic interactions in classrooms is Robin Alexander (2008). Alexander proposed that teachers need a repertoire of approaches which enables them to select what is best for the learner, subject matter, and the context in which learning occurs. In short, pedagogical interaction is dependent on how teachers organise the interaction to occur; the types of talk that they use to teach; and, how the children learn to use different ways of talking when they interact with others.

Organising classroom interaction involves not only engaging in direct teaching, often referred to as authoritative teaching (SCOTT et al., 2006) where teachers present specific in-

formation and perspectives on a topic while also engaging in dialogic interaction with the class on the topic being discussed. In this type of interaction, teachers tend to maintain control of the dialogue that occurs. Guided group work is another way in which teachers interact with the children to scaffold and guide their thinking. This usually involves teachers interacting with students to ensure that they work towards achieving a specific goal or completing a task that the teacher has set (Gillies, 2013). In contrast, cooperative group work involves children accepting responsibility to work together to accomplish a specific goal or complete a task (Gillies, 2016a). In this type of situation, children tend to exercise more autonomy over how they will interact and manage the group task. Effective teachers tend to organise classroom interactions that involve all three approaches in their teaching.

Teaching talk, the second key element in pedagogical interaction (Alexander, 2008), involves using a variety of different types of talk that are common in many classrooms. These include the more traditional styles of drilling facts and routines through constant repetition and recall to the more contemporary styles involving discussion and dialogue where teachers and students exchange information and ideas to clarify understandings and solve problems together. Alexander maintained that while discussion and dialogue are more likely to occur in classrooms where children work cooperatively together on tasks, discussion and dialogue can also emerge in classrooms where teachers engage in direct teaching and guided group work.

Gillies and Khan (2008, 2009) found that when teachers are taught to use specific questioning strategies that challenge and scaffold children's thinking, this not only leads to students providing more elaborative responses and better help-giving explanations but also demonstrating better reasoning and problem-solving skills. Reznitskaya et al. (2012) noted that students' thinking is enhanced when teachers participate in dialogic exchanges with students, ask questions that are open and explorative, and provide feedback that students perceive as meaningful. When this happens, students examine both the product and processes of their discussions and elaborate on their thinking, and, in so doing, learn to co-construct new knowledge and understandings.

Learning talk is the third key element in pedagogical interaction, proposed by Alexander (2008) which involves children learning to use talk when they interact with others. In classrooms, students listen attentively to how teachers model different ways of talking such as asking questions, seeking additional information, acknowledging students' attempts, and encouraging their contributions to the topic under discussion. In turn, children learn to listen to what others have to say, be receptive to different perspectives, reflect on what they hear, and comment on the topic at hand. In so doing, children learn to appropriate different ways of talking that build their language repertoires, enabling them to participate in interaction with others and learn (Mercer & Littleton, 2007). When this happens, Reznitskaya and Gregory (2013) argue that students take on key responsibilities for the flow of the discussion as they participate in taking turns, asking questions, evaluating other's responses, introducing topics, and suggesting procedural changes. In so doing, they learn to explain their thinking, providing reasons and justifications for their positions on topics under discussion.

Context for the task

The teacher in the interaction below had previously participated in two days of professional learning workshops where she had worked with other Year 6 teachers to discuss how they would teach a unit of work on earthquakes using the 5E approach to teaching inquiry-based science (Bybee, 2006). This approach to teaching inquiry science aims to *en-*

gage students' curiosity, provide opportunities for them to *explore* topics and *explain* the problem under investigation, *elaborate* on possible solutions, and *evaluate* the proposed outcome. In this instance, the children were investigating: How to construct an earthquake-proof building. Issues that they needed to consider were the stability of their design and the budget constraints that operated. In addition, the teacher had also learnt how to engage students' interest in the topic through dialogic teaching where she actively encouraged them to listen to others, share ideas, and consider alternative viewpoints in the context of cooperative group discussions.

Setting up the task to build an earthquake proof building

1. T. It (task) is looking at the possibility of an earthquake in our area. So, we're looking in particular at a project in which to test a building to deal with earthquakes. Why is it important that we do this kind of thing? Why would somebody actually have a job to test this? (**Open question**)

2. Student. So, we can build things to make buildings stronger for earthquakes.

3. Teacher. Wonderful. (**Acknowledgement of students' response**)
The last couple of lessons we've had a look at what happens to building during earthquakes and how important the building design is to decide if the building is going to survive the earthquake. So, we're looking at this from the builder's point of view to look at how we would go about designing and testing a design. (**Guided inquiry**). Now have a look at the second box which is underneath which has the heading on it 'Rules'. I'm going to give you another minute to read through that box and then I'm going to ask you to actually tell me what the rules are. So, you've got a minute to actually read through that box. (One minute for students to read the information on the task)

4. Teacher. Alright. I'm looking to see if you managed to read all of the rules so I'm going to ask you to give me one rules until we've gone through them. Rhianna, what is one of the rules? (**Open question**)

5. Rhianna. Um, you're not allowed to bring stuff from home and if there's any cheating you get three points from your grade

6. Teacher. Fantastic. (**Acknowledgement of students' response**)
There's not to be any cheating on the project and you cannot help strengthen your building with materials from home. If you do so you actually get points deducted because we're going to use points to decide which building was in fact the strongest or the best built. What's another rule, Lucas? (**Open question**)

7. Lucas. Um, it has to be three stories high.

8. Teacher. It must be three stories high. (**Affirming student's response**) Back group. you'll need to focus a bit more carefully. It must be three stories high. That means you don't get to try and build a really solid little building and try to get away with everyone else designing a much taller and slightly more vulnerable building. Simone, what's another rule? (**Open question**)

9. Simone. If you waste materials you'll be …[inaudible]

10. Teacher. Absolutely **(Affirming student's response) /** If you waste or break the materials that you are given, you don't just get to say we've accidentally torn this bit or cardboard, can we have another one? You will be charged for any replacement material and the costs are written down on the sheet there. So that will actually be part of your budget for your building and it will cost you points. So, your building has to come in at a certain budget and if you spend above the basics, we'll cost your building's budget and that will come off your total points at the end. Are there any other rules we need to follow, Ben? **(Open question)**

11. Ben. Your building height frame isn't allowed to be over 35cm.

12. Teacher. Very good **(Affirming student's response) /** Your building frame cannot be above 35cm in height. It must be three stories but it cannot be taller. Now there was a question asked earlier. What was your question?

13. Student. What if it's 36cm?
14. Teacher. What if it's 36cm? Who believes they might know what the consequences might be if your building is just a little bit too big? There will be a point deduction. Any of the rules that are exceeded will have a consequence in terms of points. So that's the potential price you pay if you're not careful. Any other rules to follow? Jodie? (**Open question**)

15. Jodie. The building must be made of cardboard.

In the interaction above, it is interesting to note how the teacher is modelling many of the principles of dialogic teaching advocated by Alexander (2008) where the teacher and students address the task together, in this case, how to construct an earthquake proof building. They engage in reciprocal interactions where they listen to each other and share ideas as the teacher plans and steers the classroom talk towards the specific educational goal of constructing the building. She achieves this by asking a series of open questions designed to probe students' thinking on the topic (Turn 1, 4, 6, 8, 10, 14) and affirming their responses (Turn 3, 6, 8, 10, 12), helping them to remain engaged with the discussion at hand as she guides the discussion (Turn 3). In effect, the teacher aims to help the students achieve a common understanding of the issues around constructing an earthquake proof building by asking questions that build on students' previous responses to guide and prompt the interaction.

   In the above interaction, the teacher is clearly engaged in dialogic teaching which Alexander (2008) notes occurs when: (a) teachers and students discuss tasks together; (b) they listen to each other, share ideas, and consider alternative perspectives; (c) students voice their opinions freely without the fear of being sanctioned; (d) they build on each other's ideas to establish logical and cogent understandings; and (e) the teacher steers the discussion to ensure students develop an understanding of the purpose of the activity.

   The following is an example of the discussion one group had on how to construct an earthquake proof building. This discussion occurred immediately after the interaction above as the students set about discussing how they would undertake the task.

Student interactions as they worked together to construct an earthquake proof building

1. S1: Well, with Indy's idea, if it was in the ground, it would move with the earth which would make the building go like that (moves hands from side to side) and it could split in half which would make it shake even more. (**Makes suggestion on movement of the building**)

2. S2: Yes but if it moved with the earthquake, the earthquake wouldn't be shaking it. It would just be moving it from side to side. (**Elaborates with reason**)

3. S1: It would still be shaking it. (**Makes a statement**)
4. S2: So things would get damaged and possibly collapse with the building so maybe shear walls may not be as good an idea as we first expected (**Suggests possible consequences**)
5. S3:The thing that I've always thought is that triangles are always the strongest structures. (**Makes suggestion**)

6. S1: Whoever said that it had to be an exact rectangular prism? Maybe we could even make it slightly tip (indicates with hands). (**Makes suggestion**)

7. S4: But the thing is that we've only got so much material and we can't go over budget. We've got three levels and we're going to have one there (indicates with hands), one there, and one there and then you're going to have the thing over the top. (**Reminds group that there are limitations to what they can do**)

8. S1: You don't necessarily have to have it go to a point, do you? (**Seeks clarification**)

9. S2: It says here about the shear wall (reading), 'It's reinforced concrete walls positioned perpendicularly to each other to absorb the force that would otherwise crack the building.' (**Makes suggestion with possible consequences**)

10. S3: But you could always do something like have concrete beams. (**Suggests possible structure**)

11. S1: So if this was our triangle, that would be floor one, floor two, floor three and then that would be extra for stability. (**Provides reason why the suggested design would work**)

12. S4: You mean making it go up like that? (drawing a triangular shape). (**Seeks clarification**)

13. S1: Yes. (**Confirms**)

14. S2: But you'd have to have some way of making that even because the floors are all the same size. (**Challenges idea**)

15. S4: You don't have to have a point at the top, do you? (**Seeks clarification**)
16. S1: It would add more stability, wouldn't it? Calise, you're the expert on triangles. (**Acknowledges another student's expertise and seeks information**)

17. S3: Well, in these pictures .....

18. S2: I think this is going to be a little bit more advanced but I'm thinking that if we had the shear walls ....(**Suggestion**)

19. S4: Remember, we can't go over our budget. (**Reminds group of budget constraints**)

It is clear that the students are actively involved with each other in the group as they make suggestions on the building's construction and the consequences that may result, provide reasons as to why a suggested design would work, seek clarifications on the possible design, and acknowledge and affirm the ideas of others. In so doing the children have learnt to appropriate many of the ways of interacting that their teacher has demonstrated. For example, they are listening to each other, asking questions, providing suggestions to help clarify the task, elaborating on ideas and providing reasons for different suggestions, and actively building upon the responses of others. Alexander (2008) noted that when these types of interactions are evident, the children are demonstrating the "learning talk repertoire" (p. 112). This type of learning talk repertoire occurs when teachers provide opportunities for students to interact with others where they are encouraged to listen to each other, be receptive to alternative perspectives, and think about what they hear.

Discussion

The purpose of this article is to discuss some strategies that promote dialogic talk during cooperative learning. An example of one teachers' interaction with her students and a follow-up small group activity were used to illustrate how the teacher engaged in dialogic teaching and how the students, in turn, appropriated some of these strategies in their interactions with each other. There is no doubt that teachers play a critical role in promoting student interactions and discussions in both the classroom and in small, cooperative group activities (GILLIES, 2011). They do this by creating an environment where they model how to dialogue with others, so students learn how to listen respectively to what others have to say, to ask for clarification on issues they do not understand, provide reasons and explanations for positions they adopt, and demonstrate a willingness to adapt or accept the information provided by others (LITTLETON & MERCER, 2013). When this happens, not only do students interact more openly and freely with each other but they learn to ask more probing questions, provide more detailed explanations about the phenomena they are investigating, and work constructively to achieve the group's goal (BOYD, 2016).

In a study of the dialogic interactions of three Year 7 teachers and 17 groups of students (3-5 students per group) in their classes, Gillies (2016b) found that dialogic talk by the teachers or peers had the capacity to stimulate or extend students' thinking and advance their learning. These outcomes are achieved when teachers encourage students to exchange information, explore issues, interrogate ideas, and tackle problems in a cooperative environment that is supportive of these discussions. Webb, Franke, Johnson, Ing and Zimmerman (2021) also reported on the importance of students participating in whole-class and small group discussion to explain their ideas and engage with the ideas of others. When this occurs, students can build new connections between mathematical ideas and representations and extend their problem-solving strategies in ways that are directly associated with their participation.

Boyd, Mykula, and Choi (2019) noted that effective teachers plan, guide and shape students learning experiences, so they anchor academic language in what students already know and work hard with students to help them connect what they currently understand

and know to what they are learning. When this happens, students learn to grapple with new ideas and generate new meanings as they engage in dialogic exchanges with others.

Others who have reported on the importance of dialogic talk in classrooms and small groups include Hargreaves and Garcia-Carrion (2019) who found that when teachers create the time for students to interact with each other, the students are more likely to engage in sustained interactions in which they demonstrate more higher-level cognitive dialogue; they provide more explanations, reasons, and creative ideas than students who did not have this opportunity. Similar findings were reported by Lin et al. (2019) who found that when teachers utilise collaborative reasoning where students work in small groups to resolve a controversial issue, their academic language was more sophisticated as they learnt to provide reasons and justifications for their own positions while being challenged to consider the perspectives of others. "The dialogic properties that learners internalise from CR gradually become the basis for them to construct new ways of thinking and to socialise new ways of acting towards one another" (p.15).

In summary, research by Gillies (2016b), Webb, Franke, Johnson, Ing and Zimmerman (2021), Boyd, Mykula, and Choi (2019), Hargreaves and Garcia-Carrion (2019), and Lin et al. (2019) demonstrate that dialogic talk by teachers or peers has the capacity to stimulate and extend students thinking and advance their learning. Teachers play a key role in steering, encouraging, and arbitrating student discussions so students, in turn, are guided to develop clearer and deeper understandings of the topic they are discussing. It is only when teachers understand the importance of dialogic talk in classroom discussions that the potential it has to promote student thinking and learning will be realised.

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