Collaboration Can Promote Students' Creativity

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Abstract

Creativity makes life more enjoyable and successful, both for students and people generally. The complex elements of society require that people be creative in order to guide humanity forward. Thus, educators often strive to promote creativity among their students and themselves. The present paper offers a broad definition of creativity and then examines how cooperation can increase creativity, in education and other endeavours. Next, the paper looks at how people can cooperate to promote their mutual creativity and success. In particular, the paper draws on the literature on cooperative learning, with the last part section of the paper describing six cooperative learning techniques that can boost students' creativity.

Introduction

Some observers believe that we live in an age of individualism (Douthat, 2014). Part of their evidence for this belief lies in what appears to be a prevalence of people advocating for their rights to live as they wish, to express what they feel is their identity and to assert their opinions. Also, society seems to be valuing diversity (Diversity Works, n.d.; Phillips, 2014). However, perhaps what has been labelled individualism actually represents people challenging the status quo and breaking away from uniformity and dominant ways of being and thinking. Examples of these challenges to the status quo include less powerful ethnic groups expressing their culture and people asserting their right to different sexual preferences.

Some forms of what might be labelled individualism emerged in the 1960s in the field of education (the focus of the current paper) as constructivist theory (Wadsworth, 1996). Constructivism challenged the previously dominant paradigm: behaviourism (Skinner, 1974). Behaviourism posits universal laws of learning and sees the education system pouring knowledge onto the formerly blank slates in students' minds. In contrast, constructivism believes that people build their own unique knowledge based on their prior experiences and psychological / sociological foundations.

However, individualism, despite what the name might imply, does not mean acting and thinking alone; constructivists do see a role for collaboration, as interaction with others can stimulate restructuring of people's understandings. This role for collaboration takes full bloom in social constructivism (Vygotsky, 1978), which holds that learning takes place first in the inter-psychological (social) realm before being internalised in the intra-psychological realm. Knowledge is seen as existing and growing in communities.

Indeed, some scholars (e.g., Bruffee, cited in John-Steiner, 2000) have argued that collaboration is a must for learning and creativity. The imperative to collaborate seems especially true given the increased complexity of a world moving towards nine billion people by 2050, a world gifted with ever advancing, globalising technology and big data, yet a world beset by newly arising, complex, unpredictable threats, such as climate change. Also,

evidence from developments in neuroscience (Cozolino, 2013) suggests that not only is cooperation important in the 21st century, but that human minds have long worked best under conditions of collaboration, whether in 2020AD or in 2020BC. Indeed, Dunbar (1998) claimed that social interaction was a main driver of the growth over time of human brains.

The current paper begins by defining creativity and then looks at ways cooperation can increase creativity, particularly in education. Next, the paper examines formats in which people can cooperate and ways to foster creativity via cooperation. Here, the paper makes particular reference to cooperative learning, a well-known approach in education. The final section of the paper explains six cooperative learning techniques that can be used to enhance creativity among students.

What Is Creativity and How Cooperation Can Boost Creativity

Defining Creativity

Dictionary.com (2016) defined creativity as "the ability to transcend tradition ideas, rules, patterns, relationships or the like and to create meaningful new ideas, forms, methods, interpretations, etc." This paper takes a broad approach to creativity, interpreting it within particular situations, e.g., a group of students are creative even if someone somewhere else previously produced something similar, as long as the students' product is new to them. Also, creativity can appear in any area of endeavour; it is not confined to what have traditionally been seen as the creative arts, such as painting and music. Along similar lines, creativity, like intelligence, is possessed by everyone, not just by a few geniuses, and creativity, also like intelligence, can be developed, i.e., everyone can use their creativity and everyone can become more creative.

How Cooperation Can Boost Students' Creativity

Many scholars have proposed that cooperation can enhance students' creativity, as well as learning overall (e.g., Johnson & Johnson, 2013; Panitz, 1999). Some of the proposed mechanisms of cooperation's creativity-boosting are briefly explained below.

1. Fellow students can bring to bear different perspectives, skills, experiences, personalities, intelligence profiles (Gardner, 1993), aptitudes, information and working styles.
2. Communicating with others can spark thinking. For instance, when others ask questions or disagree, reformulation may take place. Also, teaching others can inspire more ideas and greater understanding.
3. Being part of a group of two or more may motivate students to try harder to develop new, useful ideas. Additionally, groupmates can put pressure on peers to do their fair share, at the same time that groupmates provide each other with support in the face of difficulties.
4. The support that groups provide may encourage students to take risks and try new ideas.
5. In groups, everyone has at least one other person to listen to their ideas and provide feedback.

6. Students can practice working together and build the skills and attitudes necessary to cooperation for creativity in education and other areas of life.
7. Being part of a group gives students more power and resources to implement ideas.
8. Groups add a social element that can provide fun, comfort and relaxation.

Formats for Cooperation and How To Promote Cooperation for Creativity

John-Steiner (2000) studied famous collaborations in the arts and sciences and found that creative collaboration can take many forms: face to face or at a distance, in pairs or in larger groups, at a one-time session or over many years. Additionally, not all collaboration needs to take place in formal contexts, e.g., Trigg (2016) argued that teams benefit from increased opportunities for informal communication. Furthermore, creative collaborations can take place among colleagues, among those involved in intimate relationships, e.g., the philosophers Simone de Beauvoir and Jean-Paul Sartre (Beauvoir, 1984), siblings, e.g., the airplane inventors Orville and Wilbur Wright (McCullough, 2015) and parents and children e.g., the anthropologists Mary Catherine Bateson and her parents Margaret Mead and Gregory Bateson (Bateson, 1984) and among people of the same or widely different age groups, current levels of expertise, e.g., the historians Ariel and Will Durant who began as novice and expert, respectively, but later became co-experts (Durant & Durant, 1977) and fields of expertise, e.g., the composer Igor Stravinsky and the choreographer George Balanchine (Taper, 1974), or Picasso, the painter, and Apollinaire, the poet (Richardson, 1991).

Collaborators can work on common projects or can help each other with their own individual projects. For instance, de Beauvoir and Sartre each wrote many books, but never as co-authors. Instead, the other's feedback was crucial to each's individual work. In a published interview, Sartre was quoting as saying to de Beauvoir (cited in John-Steiner, 2000, page 15):

> I had one special reader and that was you. When you said to me, "I agree; it is all right," then it was all right. I published the book and I didn't give a damn for the critics. You did me a great service. You gave me a confidence in myself that I should not have had alone.

How To Promote Cooperation for Creativity

Creative collaborations and their dynamics have been described and analysed in several works including Bennis and Biederman (1997), Chadwick and Courtivron (1996), John-Steiner (2000) and Pycior, Slack, and Abir-Am (1996). The present article seeks to blend these scholars' work with scholarship from social psychology, in particular, Social Interdependence Theory (Johnson & Johnson, 2009). Based on this blending, the remainder of this section of the paper presents five principles for promoting successful group interaction.

1. Positive Interdependence

Positive interdependence means that group members (as few as two members constitute a group) feel that their outcomes are positively correlated, i.e., what benefits one group member benefits the others, and what hinders one group member hinders the others.

This feeling of positive interdependence encourages group members to put aside their egos and strive to achieve group goals. John-Steiner (2000, p. 48) noted that creative collaborations "involve relinquishing some aspects of individual autonomy, a possible temporary strain." In the same vein, she quoted Stevenson (p. 52) as follows, "You give up some of your freedom, in a sense. On the other hand, you expand your reach by such a great amount". For example, when Picasso took time to provide feedback on the work of fellow painter, Georges Braque, this took time away from Picasso's own work, but he felt it was time well spent.

2. Individual Accountability

Individual accountability is promoted when group members are aware of each member's contribution to the group, and everyone feels some pressure to do their fair share. This principle addresses the frequently cited problem of social loafing (Kurau & Williams, 1993) by one or more group members. Everyone doing their fair share in the group does not necessarily mean that each person does the same amount or makes contributions of equal value, as each member has different information, skills and circumstances. Thus, their contributions may differ given the specifics of a particular group task and other variables. For example, roles can vary and change over time, as they did in the case of the historians, Ariel and Will Durant. When they began their collaboration, Ariel was more of a helper than the full-fledged collaborator which she came to be.

3. Interpersonal and Small Group Skills

Students need to master and skilfully deploy a wide range of interpersonal and small group skills in order to unleash the creative potential of their collaborations. Taking part in peer interactions provides students with an arena for developing their interpersonal and small group skills. Some of these skills include making suggestions and appreciating suggestions received, getting the group back on task and knowing when the group needs to go off task to relax, and convincing others and being willing to disagree even when in a minority. As to the latter point, it can be said that the brave acts of minorities who are willing to disagree with ideas of established or dominant groups can be empowering and can spark creative thinking as these minorities try to break spirals of silence (Noelle-Neumann, 1974) by making themselves heard.

Knowing how to disagree and being willing to do so without damaging the relationship may be one of the key interpersonal skills. John-Steiner (2000, p. 54) described the debates between Albert Einstein and Neils Bohr as examples of respect despite disagreement: "Effective debate requires deep familiarity with the thinking of the opponent - an immersion into a thought structure than can sharpen one's own." She continued, "Scientists who attack each other's approaches are in conflict, but they are also partners, just as opponents in chess or tennis" (p. 54). Crick (n. d.), the co-discoverer of DNA has been quoted as having said about his Nobel Prize winning collaboration with James Watson: "Our … advantage was that we had evolved unstated but fruitful methods of collaboration … If either of us suggested a new idea, the other, while taking it seriously, would attempt to demolish it in a candid but non-hostile manner".

Disagreements possess an enabling power to harness the creative potential of those who are in conflict. For instance, intercultural communication theory (Gudykunst, 1983) postulates that because intercultural differences and preconceptions exist between individuals, people may come to adjust their messages in order to engage in effective exchange of ideas, negotiate and mediate differences and take turns in terms of expressing and advancing opinions. The result can be an empowering cooperation that paves the way for creativity to take place.

4. Promotive Interaction

To promote creativity and other forms of thinking, students need to engage in discussions. For instance, Webb et al. (2009) found that when students explained to each other when doing tasks, benefits accrued both to the people receiving the explanations and the ones giving the explanations. However, if only answers were exchanged and no discussions took place, neither recipient nor giver benefited. These discussions can take place face-to-face or from a distance. The principle of promotive interaction fits well with Vygotsky's (1978) notion of the vital role of language in interpersonal endeavours. Mutual appropriation can take place in which all participants learn from the interaction (Leont'iv & James, 1981).

The idea of promotive interaction at a distance fits with the cybernetic theoretical tradition of communication (Craig, 1999). Cybernetics challenges people to decipher the relevance of software and hardware in human interaction as well as in examining the crucial and creative value that virtual interactions offer to individuals or groups who are currently abreast with modern ICT. Indeed, technological developments provide much potential to spark students' creativity in settings both in and out of school.

To be promotive, interactions should not be too one-sided. Trigg (2016) suggested that less successful teams have dominant members and cliques, and there are often group members who talk or listen but do not do both. That is not to say that interaction must be completely balanced, but everyone should have an equal opportunity to participate (Fushino, personal communication). John-Steiner (p. 68) used this quote from Picasso to illustrate a famous example of balanced, promotive interaction:

> Almost every evening I went to Braque's studio or Braque came to mine. Each of us to see what the other had done during the day. We criticized each other's work. A canvas was not finished until both of us felt it was.

Furthermore, not all promotive interaction needs to occur with members of the same group; indeed, inspirations gained from beyond the group can be brought back and shared with the group. Taking this a step further, included in promotive interaction are discussions that might seem off-task, such as discussing coffee preferences while taking a break, as such discussions can encourage a relaxed, warm feeling among group members, which will later facilitate the on-task interactions.

However, too much interaction can have a negative impact. Uzzi and Spiro (2005) found a curvilinear relationship between the quantity of communication and the outcomes of the collaborators. Pentland (2012) estimated that in a typical project team, a dozen or so communication exchanges per working hour may turn out to be optimal; but more or less than that and team performance can decline. This fits with the principle of individual

accountability, i.e., everyone needs time to do their own work before engaging in further promotive interaction.

5. Group Processing

The fifth principle, group processing, means that group members set aside time to discuss what they, individually and collectively, are doing and feeling. Group processing fits with the overall trend in education to promote reflection (Farrell, 2014) as part of the self direction (Skager, 2014) and mutual understanding necessary for collaborators to articulate and openly discuss their differing assumptions about the world as well as their inner experiences (Craig, 1999). This processing can focus not just on what has not gone well in the group, but it can also include what has gone well, in the hope that these fortunate features can be repeated and improved even further. Trigg (2016) urged that groups regularly review how well they are functioning and make changes so as to devote more time to creativity. John-Steiner (2000) argued that feelings should be included in discussions of group functioning, because: "Sustained thinking and working together, then, are not solely a cognitive activity" (p. 48).

Given the many ways in which people differ, e.g., personality types (Myers & Myers, 2010), students spending time to better understand their collaborators and the dynamics of groups seems time well spent. This processing benefits from structured observations. Observations can be done at the group and individual levels, and observation can take such forms as teacher observation, peer observation, self observation and observation by recording devices, e.g., audio recordings can be used to measure each members' talking time. In addition to acting as observers, teachers can also facilitate group processing by teaching students about individual differences. For instance, scholars working in Positive Psychology have developed instruments to access people's current levels in various character strengths, e.g., gratitude (McGrath, 2014).

A Sixth Cooperative Learning Principle?

Jacobs, Power and Loh (2002) proposed another CL principle: cooperation as a value. This principle builds on the principle of positive interdependence, expanding the mutual feeling of sink or swim together beyond the small group of two, three or four members to the entire class, school, town/city, country and world, and including not just humans but other animals as well. The hope is that just as positive interdependence can motivate the group members to strive to meet the group's goals, cooperation as a value can motivate group members to strive to meet the goals of larger groups. Examples include groups of scientists using their creativity to find ways to prevent and treat deadly diseases and groups of social activists using their creativity to help people adopt environmentally friendly behaviours, such as moving towards plant based diets.

Using Cooperative Learning Techniques To Promote Cooperation for Creativity

Cooperation seldom goes smoothly, and it is easy to find students, other education stakeholders and people generally who have pessimistic views towards cooperation in learning and in other activities (Jacobs & Greliche, 2015). To encourage more optimistic views towards cooperate and, thus, to promote more successful student-student interaction

towards creativity and towards learning and thinking generally, cooperative learning principles have been used to develop hundreds of techniques and other strategies. Several of these are presented in this section of the paper. Each is meant to be generic, i.e., to apply to a wide range of content and students. Furthermore, each technique and strategy can be modified to suit different contexts, including different approaches to learning and teaching.

Everyone Can Explain (Jacobs, Power, & Loh, 2002)

This cooperative learning technique is usually done in groups of two to four members, with each group member having a number based on where they are seated in their group, e.g., the person on the far right of the group is #1. The teacher or class comes up with a question or task, and each group works to develop their response. To promote creativity, questions/tasks should be open ended. Students decide on their group's response and check that all group members can give and <u>explain</u> their group's response (please remember that the technique is called Everyone Can <u>Explain</u>). Then, a number is chosen and the person in each group with that number may be called on to give and explain their group's response, either to the entire class, or they might move to another group and present just to that group.

Everyone Can Explain promotes several of the cooperative learning principles explained above. Positive interdependence is encouraged because the group has the goal of preparing a response and assisting each member to present and explain that response. Individual accountability is promoted as students do not know who will be selected to take on the role of group representative. The promotive interaction can take place while the group prepares their response and decides how to explain it.

Exchange A Question (Jacobs, Power, & Loh, 2002)

This cooperative learning technique is normally done in groups of two. Each person writes a question and then a response to their own question. Next, the two partners exchange questions, but not answers, respond to each other's question and then compare and discuss their responses. Based on the promotive interaction that takes place within their group, they may wish to develop revised answers to their questions. For instance, they may think of ways to use visuals to elaborate on their responses.

When using Exchange A Question, certain question types might be more conducive to creativity, e.g., hypothetical questions, such as "How would your life so far have been different if you had been born as a male instead of a female or vice versa?" Although hypothetical questions have many possible quality answers, that does not mean that any answer is a quality answer. For instance, here is a hypothetical question: "How would Singapore be different today if it had not become independent from Malaysia in 1965?" The following answer would probably not be a quality answer, because of the thinking behind it: "If Singapore had remained in Malaysia, Singapore would have more mangoes, because 'Malaysia' begins with the letter 'm', and 'mango' also begins with the letter 'm'."

Teachers sometimes need to guide students in how to set questions that can spark their own and their partner's creativity. One way to provide this guidance is to show students examples of the type of questions that might incite creativity, and then to lead students to unpack such questions, so that students understand the keys to writing such questions. Also, when first introduced to Exchange A Question, some students wonder why the technique

involves them answering their own question before exchanging it with their partner. The main reason for this step in the technique is to make it more likely that students will set doable questions for their partners.

Structured Academic Controversy (Khourey-Bowers, 2006)

Johnson and Johnson (1985) devised Structured Academic Controversy as a cooperative learning variation on the typical competitive debates done in education. Students do this technique in foursomes divided into twosomes. Each twosome is assigned a position on the topic, e.g., one twosome is assigned to the position that environmentally harmful foods should be taxed, while the other twosome is to argue that such foods should not be taxed. In Step 1, the pairs prepare, present and rebut. So far, this script follows that of a typical debate, but in Step 2, the script deviates, as the pairs reverse their assigned position and then repeat the prepare, present, rebut procedure, i.e., the twosome who originally spoke in favour of the proposition is now opposed and vice versa. Next, in Step 3, the script changes once more. Here, students no longer hold an assigned position and are no longer part of a twosome. Instead, each member of the foursome acts on their own to present their own true position – in favour, opposed or some third position – and strive to convince their three groupmates to agree with their position.

When in Step 2 the assigned positions reverse, some students wonder if it might be boring and repetitive for each group of two to present the same perspective that the other twosome only recently presented. However, this situation offers students scope for creativity to develop their own ways to present a position previously presented by their two groupmates. Furthermore, in Step 3, students again have scope for creativity, when they each decide on their own, real view on the debate topic and work to convince their groupmates to agree with them.

In Steps 1 and 2 of Structured Academic Controversy, when students rebut the other position, and in Step 3, when students argue for their own views on the debate topic, the cooperative learning principle that students need to learn and apply interpersonal and small group skills comes particularly into play. For instance, the skill of disagreeing politely might be especially useful. As with many other interpersonal and small group skills, disagreeing politely has both non-verbal and a verbal components, although these may differ across cultures. Non-verbal means of disagreeing politely could include smiling in a friendly way and looking relaxed. As to the verbal aspects of the skill, gambits that might be useful include, "You raise some good points. At the same time, have you considered … " and "I respect your point of view. I see the matter somewhat differently", as well as paraphrasing differing views before attempting to rebut them.

Friendly Spy

The idea of group projects in education goes back at least to the Project Method (Kilpatrick, 1918). However, projects seem to have become more common in the past 25 years with the rise of the Student Centred Learning paradigm (Jacobs, Renandya, & Power, 2016) and the advent of structured proposals for conducting group projects, e.g., Group Investigation (Sharan & Sharan, 1992) and Problem Based Learning (Boud, & Feletti, 2007).

Friendly Spy offers one of many means for spreading the collaboration beyond the individual group, so that groups can cross pollinate each other.

As in Everyone Can Explain, in Friendly Spy, each group member has a number based where in the group they are seated, and a number is chosen randomly. The person with that number moves to another group and 'spies' on that group, observing the content and process of the other group. The spies need not operate clandestinely: they can ask questions and openly take photos. Furthermore, to demonstrate their friendliness, spies are encouraged to make suggestions and ask probing questions to their hosts. Finally, spies return to their home groups and share the insights they have gained.

Group Investigation (Sharan & Sharan, 1992)

Group Investigation was designed to link Dewey's (1929) ideas about schools as places for students to contribute to society, as in the cooperative learning principle of cooperation as a value. As noted in the section on Friendly Spy, in Group Investigation, students do projects in groups. The class chooses a topic, perhaps one that addresses a felt need. Students, then, form groups which investigate a particular matter related to that topic. After each group member has done some investigating, the groups meet to collaborate on a presentation of their findings. The students' presentations are evaluated by peers and the teacher.

One way that creativity can come into play in Group Investigation involves the manner in which the presentations are done. Rather than the typical stand-in-front-of-class-and-lecture presentation, groups can use visuals, songs and music, skits, dance and gestures, and poems. Another way to vary from the traditional presentation format is to involve the audience in the presentation, beyond the typical "Any questions?" at the end of a presentation. For instance, the audience can take a quiz or do a survey, interview each other or join in when the presenters sing or dance.

With Group Investigation, the cooperative learning principle of cooperation as a value can be highlighted not just by the selected topics, but also by the inclusion of an implementation element in students' projects. For example, if a class investigates factory farming of chickens, in addition to learning about the situation, students might also use their creativity to think of ways to improve the situation for the chickens and the humans who work on the farms and to convince the public, companies and governments to implement their suggestions, e.g., advocating for better conditions for the workers in farms and slaughterhouses or for the animals, or for reductions in human consumptions of chickens. In this way, students learn not just for grades but also to promote enhanced outcomes for themselves and others. Rogers (1995), who proposed the diffusion of innovations theory of communication, indicated that collective implementation of innovative ideas coupled with conformity to shared decisions and persuasive power can lead people and organisations to achieve their goals.

Tell – Spin-Off (MAACIE, cited in Jacobs, Power, & Loh, 2002)

Tell - Spin Off is one of a family of nineteen cooperative learning techniques developed by the Middle Atlantic (USA) Association for Cooperation in Education. These dyadic scripts lead students to cooperate with each other in a range of ways, from repeating

what their partner has said to disagreeing with their partner. Students and teachers can develop their own variations. Tell – Spin-Off seems to be one variation particularly apt to spark creativity. The steps can go as follows. One member of a dyad offers an idea or suggests a topic. Their partner's response should connect to the initial offering in a tangential way. Thereafter, the partners take turns spinning off ideas based on what their partner has said. Partners can ask each other to explain connections if they are not clear. Later, pairs can share some of their dialogs with other pairs or the class.

An example of such a Tell – Spin-Off dialog could be:

Student #1: I like to eat oranges.
Student #2: My bicycle is orange.
Student #1: East Coast Park is a good place to ride bicycles.
Student #2: My home is east of the university.
Student #1: Sumatra is west of Sulawesi.
Student #2: 'f' is the last letter of 'of'.
Student #1: Frogs like to hop.
Student #2: Kangaroo babies are called 'joeys'.

Tell – Spin-Off highlights the cooperative learning principle of individual accountability, because each member of the dyads needs to listen carefully to their partner and then to craft a response. This structuring for individual accountability contrasts with too many group activities in which one or more group members seem to avoid doing their fair share, and seek to have their partners do most of the work. However, in addition to holding everyone accountable, Tell – Spin-Off and other cooperative learning techniques also hope to foster the principle of positive interdependence such that students help their groupmates who might be facing difficulties. For instance, if one group member does not understand their partner's response, the partner can explain it, e.g., in the dialog in the preceding paragraph, if #1 does not understand how "Kangaroo babies are called 'joeys'" connects to "Frogs like to hop", #2 could ask #1 to think about how kangaroos move.

Conclusion

This article sought to highlight the role of cooperation in fostering creativity among students. A broad definition of creativity was adopted, seeing the possibility for creativity in all of life's endeavours. Indeed, in today's increasingly interdependent world, humans rely on each other for basic necessities, such as food, clean water and electricity, as well as for almost everything else we use and do. Could creativity enhance all of this? For instance, could cashiers at supermarkets use their creativity to brighten their customers' day?

The introduction to this paper discussed whether individualism may be on the rise and in ascendance over cooperation. No doubt, many factors in many societies seem to prioritise individual achievement over collective achievement. For instance, even in team sports, often one person is singled out as the star of the team, the one with the largest salary, the one with the most commercial endorsements and the one most sought after by the media and the public. Thus, promoting cooperation for creativity and for other educational goals faces important obstacles. The hope is that stakeholders in education, most definitely including students, recognise the importance of both creativity and cooperation, and utilise the cooperative learning principles reviewed in this paper, as well as the literature on fostering

creativity, to construct learning environments in which students and teachers can collaborate so that their creativity can blossom for the benefit of themselves and of us all.

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