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Using Cooperative Learning to Teach the Sustainable Development Goals

This article advocates for the use of cooperative learning by students and others toward the achievement of the United Nations' Sustainable Development Goals (SDGs). First, the Goals are explained. Second, background is provided on cooperative learning, including explanation of eight cooperative learning principles and exemplification of how one cooperative learning technique might mobilize the eight principles. Third, how cooperative learning fits with student centered learning is explored. Fourth, two cooperative learning techniques are explained for their particular relevance to efforts to achieve the SDGs. These techniques are Group Investigation and Cooperative Debate. Fifth, two cooperative learning principles, positive interdependence and cooperation as a value, and their links to SDGs receive further exploration. Finally, we consider cooperative learning as a Swiss Army Knife and discuss its versatility with SDG examples.

Keywords: Sustainable Development Goals, cooperative learning, positive interdependence, Group Investigation, Cooperative Debate

Introduction

In 2015, the United Nations (UN) proposed 17 Sustainable Development Goals – SDGs - (see Appendix, United Nations, 2022). These goals include ending poverty and hunger, providing everyone with clean water, sanitation, and education, and protecting the environment. Furthermore, each SDG has multiple targets, e.g., one target for SDG 13, Climate Action, is "Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning" (United Nations, 2022). The word "development" in SDGs involves making progress by, for example, building facilities for clean water and sanitation for the two billion plus people lacking either or both of these essential needs. The word "sustainable" involves making this progress in a way that protects the environment such that resources continue to be available for future generations.

The UN has had similar goals before, e.g., in 2000, the UN promulgated eight Millennium Development Goals for ending extreme poverty (United Nations, n.d.). While progress has been made between 2000 and now in some areas, millions of people still die every year from the problems listed in the 17 SDGs, not to mention the many millions more whose bodies, minds, and lives are stunted as the goals lie unmet. Also troubling is the fact that due mostly to resource use by wealthier humans, major detrimental changes are escalating, e.g., deforestation and rising sea levels, perhaps unstoppably, in our planet's ecosystems (Thunberg, 2022).

In the face of this situation, perhaps teachers, students, and other education stakeholders (which actually is everyone) may need to decide that addressing the SDGs should be more than just, for example, an optional afterschool activity for a SDGs club. Maybe the SDGs should have a much greater priority in the education system. However, that decision may well be beyond the purview of most readers of this article. What may be easier, although not easy, to implement would be the use of cooperative learning (CL), both when addressing SDGs, as well as in other elements of the curriculum. The hope is that not only will CL provide a more efficient methodology for achieving cognitive and social impact aims, but that CL will also set a tone in society in which people care about their fellow humans, as well as other animal species.

Now that the SDGs have been briefly explained, the present article next provides background on CL, including one version of CL principles and a small number of the hundreds of CL techniques, before describing how CL can be classified as a student-centered learning methodology and how CL empowers other student-centered methods. It should be noted that, as often happens in Education and other fields, different terms are used in the literature to represent similar concepts and strategies. These differences may reflect very minor or even no differences in emphasis, sometimes due to different contexts, and it should also be noted that students and teachers will each develop their own ways to implement the ideas presented herein. Next, the idea of CL as a tool for striving toward the SDGs is explicated in two particular CL techniques, Group Investigation and Cooperation Debate. Also, the link between the CL principles of positive interdependence and cooperation as a value, on one hand, and concern for others as in the SDGs, on the other hand, is explored. Finally, based on nine purposes of CL, we consider the metaphor of CL as a Swiss Army Knife and discuss CL's versatility in achieving SDGs.

Cooperative Learning Principles

As will no doubt be explained in other articles in this special issue on CL, a very large body of research supports belief in the efficacy of thoughtfully applied CL with cognitive, social, and affective variables and with a wide range of ages and content areas (Johnson et al., 2000; Slavin, 1995). One system of CL principles (Jacobs & Renandya, 2019) includes eight principles. These eight overlap widely with other systems of CL principles and are briefly explained below. Examples will follow.

1. *Positive interdependence* is a feeling among members of groups of usually 2-4 members that their outcomes are positively correlated, i.e., that what helps one helps the rest of their group members, and what hurts one hurts the others. The success of groups is based not on how well the groups do tasks but on how much each individual group member grows as a result of collaborating on the tasks.

2. *Individual accountability* is a feeling among group members that they each need to do their fair share in contributing to the groups' effort to achieve their goal(s). This principle seeks to avoid the problem of what is sometimes called "freeloading," i.e., one or more group members seek to avoid doing their fair share. Please note that "fair share" may not be the same as "equal share."

3. *Equal opportunity to participate* aims to provide openings for each group member to learn and to contribute to the learning of the others. This principle seeks to avoid the

problem of what are sometimes called "takeovers," i.e., one or more group members seek to dominate group discourse and decision-making. While *equal opportunity to participate* seeks to give everyone chances to take part, *individual accountability* encourages everyone to use those opportunities.

4. *Maximum peer interactions* involves both (a) many peer interactions taking place, i.e., maximum *quantity* of peer interactions, and (b) peer interactions in which students utilize thinking skills and cooperative skills, i.e., maximum *quality*. The quality of these many peer interactions is where the magic of CL occurs, where CL goes from being 1 + 1 = 2 to being 1 + 1 = 3 or more.

5. *Group autonomy* promotes groups looking to their own resources first, before seeking help from teachers, thus reinforcing *maximum peer interactions*. A simple slogan to promote group autonomy is Team Then Teacher, i.e., please consult your groupmates before asking the teacher, or 3 + 1 B4 T, i.e., please ask your three, or however many, groupmates and, if necessary, another group before asking the teacher.

6. *Heterogeneous grouping* encourages students to usually learn with people different from themselves. Ideally, groups should embody the diversity which exists in each classroom. At a minimum, groups often combine students of different levels of past achievement.

7. *Learning cooperative skills* highlights a range of skills that promote effective interactions with others. These skills include, just to name a few, checking that others understand, asking for reasons, disagreeing politely, thanking others, and encouraging others to participate.

8. *Cooperation as a value* expands the feeling of *positive interdependence* beyond the small group. This expansion can reach to the entire classroom, the entire school, and all the way to the entire world, including other species.

To provide a better understanding of the eight principles, in the next section, we exemplify how one CL technique, Everyone Can Explain, might mobilize the principles.

An Example of the Eight Principles in Action

Everyone Can Explain is one of more than 100 CL techniques. Plus, each technique has variations, some of which teachers and students can invent for themselves. After Everyone Can Explain is described, Table 1 links the technique to the eight CL principles from the previous section. These principles help optimize the interaction among students as they use the technique.

Everyone Can Explain

Step 1 – Students are in groups of 2, 3, or 4 members. Each group member has a number, e.g., 1, 2, 3, or 4. The group attempts a question, problem, or other task. They first work on it individually.

Step 2 – Everyone has a turn to share their ideas. They discuss and try to reach a consensus on a response, including, crucially, an explanation of their response.

Step 3 – The group checks that everyone in the group can give and explain their group's response or responses, in the case the group did not all agree on the same response.

Step 4 – A number is called, and the group member with that number gives and explains their group's response(s). The group is evaluated based on that person's response, e.g., if #3 is called and group member #3's response is judged to be good, members 1, 2, and 4, not #3, may be praised, for assisting #3.

CL Principle	**How *Everyone Can Explain* Mobilizes the Principle**
Positive Interdependence	The group is evaluated based on the response and explanation given by the one group member who is selected at random. Thus, they "sink or swim together."
Individual Accountability	Each group member may be chosen to represent their group. They cannot pass that responsibility to groupmates. Thus, they feel pressure to be ready to represent their group.
Equal Opportunity to Participate	Groupmates are encouraged to assist all group members to be ready in case they are called upon to represent their group. No one can take the place of the groupmate who is called upon.
Maximum Peer Interactions	If the class consists of 50 students, and they are in groups of 4, 12 groups of 4 and 1 group of 2 exist. Thus, potentially 13 peer interactions take place simultaneously, as groups prepare their responses with explanations. That addresses maximum *quantity* of peer interactions. Also, groups need to not only respond but also explain the thinking behind their responses. The explanations promote maximum *quality* of peer interactions.
Group Autonomy	Groups attempt to develop their responses on their own, but if they encounter difficulties during this attempt, they can seek help first from another group, and, if help is judged to still be needed, they can check with their teacher. Also, groups who finish before other groups can offer to help groups who may be struggling.
Heterogeneous Grouping	When groups are mixed on past achievement, it becomes more likely that they will be able to develop appropriate responses and accompanying explanations for those responses. When groups are mixed on other variables, members may be exposed to more perspectives, as well as having opportunities to develop collegial relationships with people different from themselves.
Learning Cooperative Skills	Among the cooperative skills that might be useful in *Everyone Can Explain* include asking for reasons, praising others, and checking that others understand.
Cooperation as a Value	Whether this CL principle is mobilized depends in part on the topic on which the class is focused and even more on whether that focus is strictly academic or if it has an applied, real-world element. For example, if the topic is how to help older people learn to use IT, a real-world focus might be the students later going to a community center to work with seniors to improve their IT skills, or even just helping family members and neighbors.

Table 1. Linking the CL technique Everyone Can Explain to eight cooperative learning principles

Cooperative Learning and Other Student-Centered Learning Methods

In Education and related fields, a paradigm shift has been taking place toward theories and applications that focus on control being exerted by people generally, rather than by governments, companies, and other large institutions. These theories include Social Constructivism (Brown & Palincsar, 2018), Humanism (Rodgers, 1979), and Socio-Cultural Theory (Vygotsky, 1978). Specifically in Education, student centered learning (SCL) can serve as an umbrella term for many of the changes that have resulted from his paradigm

shift. In SCL, students have more power in areas including choosing what content they study, how they study it, and how and by who their learning is assessed. Teachers' roles change in SCL, from teachers mainly being the dispensers of knowledge and the judges of student learning to instead being facilitators, as students take more control of their own learning, both during their time in formal education, as well as throughout their lives as lifelong learners. Table 2 links characteristics of SCL, CL, and Extensive Reading (Extensive Reading Foundation, 2022), another SCL method. In Extensive Reading (ER), students read in large quantities, often making their own choices about what they will read. Teachers serve as facilitators of ER by: (1) helping students in their reading choices; (2) modeling enjoyment of reading by themselves being readers; (3) developing potential post-reading tasks that motivate further reading.

Characteristics of Student Centered Learning	Links with Cooperative Learning	Links with Extensive Reading
Students are offered more control of their own learning, with the hope that greater agency increases engagement and readiness for lifelong learning.	CL increases student control as there is power in groups, and students play multiple roles in their groups. Many of these roles are typically played by teachers in teacher centered learning.	Students have some control of what they read, e.g., if they are interested in a particular SDG, they can read in large quantity about that.
Students learn how to learn, developing generic strategies useful to many contexts.	Knowing how to work with others, e.g., developing cooperative skills, a CL principle.	Reading strategies include "narrow reading" (Cho et al., 2005), i.e., reading in one topic area to build knowledge of relevant vocabulary.
Students learn with others different from themselves, coming to appreciate that differences in people, learning and assessment methods, and topics can facilitate rather than hinder learning.	The CL principle of heterogeneous grouping encourages students to work toward common goals with people different from themselves, thereby learning the topics studied, as well as the perspectives of the people with whom they study.	Reading provides students a window onto the world, helping students appreciate the wide range of contexts that exist.
SCL seeks to include students' needs and interests in the curriculum, e.g., by connecting the curriculum to students' lives outside of school.	CL gives students opportunities to share about their worlds with groupmates and others.	Students can also write materials that others in their class and beyond can read. Also, although reading is usually done silently, student can discuss what they read and their reactions to their reading with peers.
Teachers as fellow learners: Teachers do not pose as all-knowing sages. Instead, they show students that teachers too need to learn and that they enjoy learning.	Teachers can more easily learn from students when students harness their peer power. Also, teachers should model cooperation by collaborating with fellow teachers and others.	Teachers should model enjoyment of reading, whether or not they read the same materials as students are reading.
Motivation and the self: Learners develop a powerful image of their ideal future and seek to acquire and use strategies and tools to realize their ideal future.	Groups formulate goals, such as what they can do toward a particular SDG target and collaborate toward achieving those goals.	Students, individually and in groups, can set goals for reading. They can motivate and otherwise assist each other to reach their goals.

Table 2. Characteristics of Student Centered Learning and Its Links to Cooperative Learning and Extensive Reading

A multitude of other SCL methods and theories exist, and peer interaction can feature in them all, thus making crucial the insights CL can contribute. Among just some of these methods and theories are Task-Based Language Teaching (Long, 2016), Multiple

Intelligences (Armstrong, 2017), Problem-Based Learning (Ali, 2019), Project Work (Fried-Booth, 2002), Positive Psychology (Kristjánsson, 2012), and Inquiry-Based Learning (Pedaste et al, 2015). In turn, all these offer powerful contributions to progress toward the SDGs.

More Cooperative Learning Techniques for the SDGs

Despite all the momentum in favor of SCL, in the authors' observations, teacher centered instruction still dominates, as does its parallels in the larger society, including top-down governance. More than 100 years ago, Dewey (1916, pp. 43-44) bemoaned a similar lack of progress away from top-down teaching, despite the lip service already being paid to more democratic methods of learning:

> Why is it, in spite of the fact that teaching by pouring in, learning by a passive absorption, are universally condemned, that they are still so entrenched in practice? That education is not an affair of "telling" and being told but an active and constructive process, is a principle almost as generally violated in practice as conceded in theory.

The purpose of the current section of this article is to introduce two cooperative learning techniques with roots in Deweyian Philosophy of Education that can prepare students and teachers for tackling the SDGs: Group Investigation and Cooperative Debate.

Group Investigation

Group Investigation (GI) (Sharan & Sharan, 1990; 1992) was specifically designed to implement Dewey's ideas in the classroom (Dewey, 1897; 1916). With GI, the class is a group of groups. The class decides on a topic, e.g., how to take action toward one of the SDG targets. Then, each group chooses a subtopic to work on. For example, one of the SDGs is Quality Education, and a target under that goal involves inclusion. Each group in the class could take one aspect of inclusion, e.g., inclusion of students from refugee families, learn about that aspect, and think of ways to promote inclusion of related students. (Inclusion obstacles may differ in each context.) Examples of students who might face inclusion obstacles might be those: with low income, without nearby schools, with mental and/or physical challenges, and family issues, as well as females, senior citizens, gender nonbinary, and minority groups.

Once each group has chosen their subtopic, they discuss among themselves how they will go about investigating their subtopic and then divide up the work. Next, after working on their own, members report back to their groups and, with their newly gained information and perspectives, groups review their subtopic, perhaps do more research, make a plan to present to the entire class – including ideas for actions that can be taken individually and collectively – and rehearse their presentation to bring it inline with criteria decided by the class. Everyone has a speaking part in the presentation.

Sharan and Sharan (1990) stated that GI was created to combine democratic processes with academics. This can be seen in how students, not teachers, choose the class' overall topic, as well as their individual group's subtopic. Furthermore, students decide for themselves how they will investigate their topic, and, in a sign of the flexibility of CL principles, students join groups based on their interests, rather than based on the goal of

heterogeneous grouping, as suggested earlier in this paper. Perhaps, GI could be seen as appropriate for students who are more experienced with CL, who feel comfortable working with peers different from themselves, and who are proficient with cooperative skills and with encouraging individual accountability among groupmates.

Another issue, not only with GI but with students learning in support of the SDGs, arises if students do not want to address such serious, often unhappy matters. Perhaps instead, students would rather talk about where to go in their area for weekend fun or which song is the best for dancing. In such cases, in keeping with SCL values, teachers might like to accede to students' wishes. At the same time, teachers can model for students' interest in and action for the SDGs in hopes of sewing seeds for changes in students' interests. Additionally, working together to help others can be very enjoyable, e.g., one of the authors of this article has accompanied groups of students who joined a project (Safe Water Gardens, 2022) to help villagers in rural Indonesia install sanitation systems (SDG 6) and gardens (SDG 3). Additionally, music was part of the adventure.

Dewey (1916) highlighted that the key goal of Education lies not in the advancement of individual students, e.g., earning a degree as a stepping stone for a prestigious and financially secure career. Instead, the main goal should be learning in order to contribute to the advancement of society generally. Similar ideas were espoused by Freire (2000).

When doing GI and with SDG activities generally, students contribute to the greater good, but it may be useful to differentiate actions into two types: those at an individual level and those at a societal level (Jacobs et al., 2022). An example would with SDG 13 Climate Action. As is well-known, use of fossil fuels results in release of greenhouse gases which causes perhaps irreversible impact on ecosystems (Thunberg, 2022). An action at individual level would be to turn off lights when not in use or to use fans instead of air conditioning. A societal level action would be to pressure governments and companies to move toward alternative energies or to persuade universities and other organizations to divest from companies involved with fossil fuels (Chawla, 2022). Of course, actions at individual and societal levels can co-exist.

Cooperative Debate

As noted above, Dewey (1916) rejected rote learning and heavy reliance on teacher talk. Instead, following Rousseau (1769/2010), Pestalozzi (1801/19), and Froebel (1826/1974), and similar to what Piaget (1975) would later espouse, Dewey valued experiential SCL which involves students in constructing their own understandings of the worlds around them. Disagreement, handled properly, i.e., encounters with conflicting ideas, is a key tool in that construction. As Dewey (1916, p. 188) explained, "Conflict is the gadfly of thought. It stirs us to observation and memory. It instigates invention. It shocks us out of sheeplike passivity and sets us at noting and contriving .... Conflict is a sine qua non [essential condition] of reflection and ingenuity."

Debate provides a well-known forum for the conflict of ideas. However, traditional debates evoke an atmosphere of competition and negative interdependence, rather than cooperation and *positive interdependence*. This hostility in traditional debates mirrors what seems to be happening in society generally, where discussions with the goal of learning information and appreciating different perspectives become rare, giving way to verbal attacks, even threats of violence. Fortunately, Johnson and Johnson (1995) designed a very different form of debate based on CL principles and aimed at increasing understanding and empathy. This alternative debate structure goes by such names as Academic Controversy, Constructive Controversy, and Cooperative Debate. The latter name seems

to be the simplest and will be used hereafter, abbreviated as CD. The seven steps in CD are described below, although, as with all CL techniques, variations are possible. Flexible time limits should probably be set for each of the steps. As students become familiar with CD, such structuring may become unnecessary.

Step 1 – The class decides on a debate topic. Students form groups of four divided into pairs. Perhaps, some consideration might be given to balancing the pairs as to past achievement. An alternative to one debate topic per class is for each foursome to choose their own topic. Each pair in the foursomes is assigned to take one side on the issue to be debated, e.g., if the topic is whether public transport should be free in order to encourage people to use public transport instead of cars, Pair A is assigned to argue for free public transport, while Pair B is assigned to argue for normal public transport fares. Pairs have a fixed amount of time to prepare to present their assigned view, and to encourage *individual accountability* and *equal opportunity to participate*, pairs divide their debating points so that each person has about the same amount of speaking time.

Step 2 – Each pair takes turns to present their assigned position for a set amount of time. The other pair take notes and serve as timekeepers.

Step 3 – This is the rebuttal phase. In preparation, the pairs separately discuss what points in the other pair's presentation they might want to rebut and how to rebut it. Then, each person has an opportunity to rebut a point raised by the other pair in Step 2. Next, there is open discussion, with each student sticking to their assigned view.

Steps 4-6 – This step is where CD starts to differentiate itself from traditional debates. Each pair now has to change sides and argue for the view which they had previously argued against. For example, Pair A who favored free public transport now argue against it, whereas Pair B who previously spoke for maintaining normal public transport fares, now must favor no fares. Some students may worry that they will just repeat the arguments raised by the other pair in Steps 1-3; however, perhaps they can be challenged to develop new arguments. Alternatively, foursomes can exchange pairs, e.g., Pair A from one foursome changes places with Pair A from an adjacent foursome. Pairs repeat Steps 1-3 with their new assigned positions. This assigned shift of positions allows students to not just hear/read different perspectives; even more deeply, students represent different positions.

Step 7 – This may be the most important step in CD. Now, students are still in their foursomes, but they no longer belong to a pair; they are on their own. Perhaps most crucially, students no longer have an assigned view. Instead, each student develops their own view on the issue; it might be one of the two assigned views, or it might be a third view. For instance, a third view on public transport fares would be to reduce the need for public transport by setting up more bicycle lanes, perhaps including bicycle taxis, and to subsidize people to buy safety equipment for their bicycles, such as helmets, lights, gloves, and pads.

In Step 7, the foursomes attempt to reach consensus, but more important is that they use cooperative skills while discussing. These skills include asking for reasons, paraphrasing what others have said before possibly disagreeing with them, finding points of agreement, and smiling in a friendly way.

Many disagreements have arisen as to how to address the SDGs and even whether 17 is the correct number (Visseren-Hamakers, 2020). The use of cooperative skills lends hope that discussions aimed at achieving the SDGs can feature the kind of quality peer interactions that lead to 1 + 1 = 3. Note: two possible topics for SDG CDs are; (1) The Climate Crisis Can Be Averted; and (2) Avoiding Food From Animals (e.g., meat, fishes, eggs, and dairy) Can Lead to Zero Hunger (SDG 2).

To conclude this section of the article, while Group Investigation and Cooperative Debate might seem particularly apt for addressing the SDGs, all the many CL techniques are applicable, not only for groups in Education but for groups of two and more in almost any

context. The key lies in understanding and looking to implement CL principles. Lewin (1951), who, along with Deutsch (1949), is often credited with inspiring modern cooperative learning, particularly the concept of *positive interdependence*, is also thought to be responsible for the following quote: "Nothing is as practical as a good theory (p. 169), [or in this case, principle]".

Johnson, Johnson, and Holubec (2013) proposed nine ways to promote positive interdependence. Table 3 presents eight of these along with examples of how each can be expanded beyond small classroom groups.

Ways to Promote Positive Interdependence	**Example in Groups of 2-4 in a Classroom**	**Applications to Cooperation as a Value and the SDGs**
Group goals – Understanding their goal(s) and working to achieve them.	Everyone in the group improves their ability to multiply fractions	The SDGs contain 17 goals and targets for each, e.g., a target under SDG 5, Gender Equality, is "Recognize and value unpaid care and domestic work." Progress is valued.
Identity – Sharing a common identity.	Groups have names, mottos, songs, logos, handshakes, etc.	The multi-colored SDGs posters with a logo for each goal, have become common sights on bags, walls, clothing, etc.
Environmental – Groups are as physically close as is personally comfortable so as to be able to hear each other easily and easily see what each is doing.	Even in virtual learning, where hardware and internet allow, students can share with each other.	SDG 10, Reducing inequalities within and between countries, seeks to provide everyone opportunities to enjoy environmental *positive interdependence*.
Reward / Celebration – if groups achieve their goals, all members receive equal rewards / celebrate together.	A group celebrates after all members improve / attain a designated standard on multiplication of fractions.	The SDGs' targets are monitored. In place of bad news and pessimistic forecasts, progress should be made known and celebrated.
Resource – These can be knowledge resources or materials resources, e.g., different colored markers.	In the CL technique Jigsaw (Aronson, 2022), each group member has different information which they need to teach their partners.	Everyone needs to evaluate what resources they have and can develop to contribute to achieving their chosen SDGs; sometimes, a project can address multiple goals.
Role – Everyone has a role to play in enabling goal attainment.	In a foursome, rotating roles might be facilitator, thanker, questioner, and example giver.	When working with people in different places, in the same country or internationally, roles may be based on resources, e.g., those with access to online databases can find useful articles, and those with more funds can purchase resources, while those closer to a situation can chose what to purchase. At the same time, regular classroom roles remain relevant.
Outside Enemy – Enemies can be people, but they can also be standards or problems.	Last month, a group read a total of 12 books judged to be at approximately their reading level. This month, they aim to read more.	The difficulties involved in achieving the SDGs offer a number of "enemies" that will require cooperation with many friends, old and new, to overcome.
Fantasy – Imagining being different people, in different places, and/or different times	Students imagine they are visited by members of a new species. What will this species look like? What can they do? How can the students communicate with them?	Perhaps people can fantasize about a utopian future in which all the SDGs are accomplished, or conversely, a dystopian future in which humanity falls miserably short of meeting the SDGs. Will either fantasy illuminate or inspire their path?

Table 3. Eight Ways to Promote Positive Interdependence with Applications to Cooperation as a Value and the SDGs

Positive Interdependence and Cooperation as a Value

Indeed, the principle of *positive interdependence* has so many practical applications in so many areas of life. The eighth principle, *cooperation as a value*, seeks to expand the feeling among people of their outcomes being positively correlated, of "All for one and one for all," of "We sink or swim together" from its nurturing home inside small classroom groups outward to encompass everyone, human and otherwise, on the planet.

Working for the SDGs offers one path to applying the CL principle of *cooperation as a value*. For example, SDG 5 calls for gender equality. If people help females, even those living on the other side of the world, develop their potential, we have more people applying their cognitive, affective, and social intelligences to achieving the other 16 SDGs. Similarly, Einstein is said to have talked about people increasing their circles of compassion, i.e., those other beings about whom we care (Popova, n.d.).

The Versatility of Cooperative Learning

The research evidence supporting the use of CL has already been mentioned in this article. More anecdotally, Jacobs (2013) offered a collection of quotations supporting cooperation. One of those quotations that is particularly apt to the quest for the SDGs is the African proverb, "If you want to go quickly, go alone. If you want to go far, go together" Djoghlaf (2008), because many of the problems brought to awareness in the SDGs have plagued humanity for centuries, and although the hope is to achieve the SDGs by 2030, that seems extremely unlikely. Instead, any progress at all on many of the goals may be difficult to achieve. Thus, an effort sustained long after 2030 will certainly be necessary.

Figure 1 uses the metaphor that CL is a Swiss Army Knife. Such a knife has many blades and other features which makes it useful for a wide variety of purposes. The nine purposes of CL highlighted in Figure 1 are the provision of *peer feedback*, feelings of *belonging* and *support*, increased *power* and *social skills*, greater use of *thinking* skills, heightened *concern for others*, and more *motivation* and *learning*. Perhaps the best-known meta-analysis of research on CL was by Johnson, Johnson, and Stanne (2000). More recent meta-analyses include Setiana et al. (2020) and Turgut and Gülşen Turgut (2018).

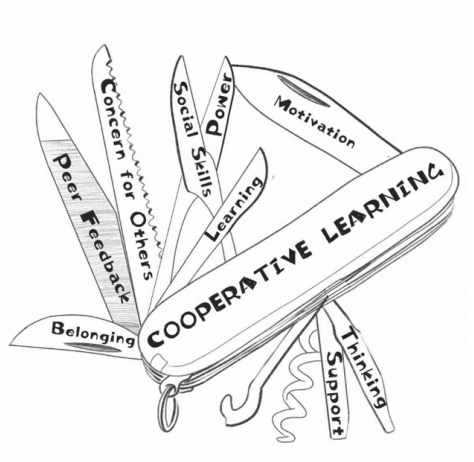

Figure 1. A Swiss Army Knife of Cooperative Learning
** Inspired by Philip Wollen https://www.facebook.com/AnimalActivistCollective/posts/1916974278416451*

Table 4 provides examples of the nine purposes of CL shown in Figure 1, in the context of the SDGs. Of course, other purposes also exist.

Purposes of Cooperative Learning	Examples of These Purposes
Peer Feedback	Students provide groupmates with feedback on their ideas for connecting with governments, NGOs, other students to fulfil SDGs.
Belonging	Maslow's (1968) Hierarchy of Needs highlighted the importance of feeling a part of something larger than oneself. Membership in a CL group can provide that feeling of belonging, and having a group goal, such as taking steps toward an SDG target can increase that feeling.
Support	In CL, students pool their resources and play at variety of roles, thereby supporting their groups as they strive at achieve the SDGs.
Power	By acting as a group, students can speak with a louder voice and, perhaps, have greater impact toward SDG targets.
Social Skills	By interacting with groupmates, students have opportunities to practice social skills and to see how important such skills are as students strive to involve everyone they can in furtherance of the SDGs.
Thinking	As students hold elaborated interactions with peers, they flex their thinking muscles, in line with the CL principle of *maximum peer interactions*. Achieving SDGs, without doubt, requires high levels of thinking.
Concern for Others	When students feel *positively interdependent* with their groupmates, a "one for all, all for one" feeling exists among group members. The next step involves the enlarging of students' circle of compassion.
Motivation	Students learn not just for themselves but also to help others. The hope is that the CL principle of *cooperation as a value* will encourage students to also help others beyond their small classroom group. We hope students will not forget the hundreds of millions of children prevented by poverty from attending school or even living to reach school age.
Learning	For all the above eight reasons, CL can lead to more learning. Having the SDGs as a larger objective for learning may further promote cognitive and affective gains.

Table 4. SDG examples of the nine purposes of Cooperative Learning at displayed in Swiss Army Knife drawing in Figure 1

Conclusion

In Malaysia and Singapore, we have a word *kiasu* which supposedly captures important insights into local culture. *Kiasu* means to be afraid of being left out; it is supposed to show selfishness. According to the terminology of Social Interdependence Theory (Johnson & Johnson, 2009), one of the key theories upon which CL is based, *kiasu* can be seen as representing a feeling not of positive interdependence, i.e., good for you is good for me, and bad for you is bad for me, but a feeling of negative interdependence, i.e., a belief that our outcomes are negatively correlated; if you swim, I sink, and if I swim, you sink. Jacobs and Tai (2022) argued, however, that cooperating is the *kiasu* thing to do.

Why does helping one person succeed boost their helpers' chances of success. Several explanations present themselves. First, Webb and colleagues (2009) did a series of studies leading to the conclusion that by teaching others, people learn. However, teaching does not mean merely giving answers; it must also mean explaining, giving examples, and otherwise elaboration, as in *maximum peer interactions*. Second, those whom we assist may later assist us. Third, when others do well, the standard increases, thus pushing us to improve further.

Something similar can be seen with the SDGs. For example, SDG 1 is No Poverty. Some people in the wealthier world might worry that when people escape poverty, they become competitors for university places, for high-skill jobs, etc. In contrast, from a *positive interdependence*, *cooperation as a value* perspective, when people escape poverty, they become much more able to contribute to accomplishing the other SDGs and other important goals for society.

Another example of how assisting others can be the selfish thing to do can be seen in the headline "Forest fires in Indonesia trigger haze fear in Singapore" (Reyes, 2013). To explain, fires are often used to clear fields, particularly of palm oil trees, in Indonesia, and the winds may direct the resulting haze from the fires to nearby Singapore, resulting in poisonous breathing conditions (SDG 3 – Good Health and Well-Being). Of course, the air is even worse in Indonesia at the point of the fires. Fortunately, by helping Indonesians avoid these fires (SDG 15 – Life on Land), people in Singapore help themselves and people internationally, as the fires can burn for months, pumping large amounts of greenhouse gases into the atmosphere (SDG 13 – Climate Action). Many actions exist, at both individual and societal levels, for people in both countries and beyond to take (PM Haze, n.d.), e.g., choosing haze-free cooking oil or reducing use of oil). Indeed, cooperating with and for others could be seen as the intelligent choice, as a case, not mainly of empathy or compassion, but of enlightened self-interest.

To conclude, this article has attempted to explain cooperative learning and to recommend it in Education and other human endeavors. One such endeavor involves meeting the United Nations' Sustainable Development Goals. The article made suggestions as to how CL techniques and principles can inspire cooperation and achievement of both learning and social goals and can make that learning more efficient in small classroom groups, as well as on larger stages.

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