DOCUMENT RESUME

ED 432 739 CS 013 661

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TITLE Cooperative Learning Techniques in Reading Instruction.
PUB DATE 1998-06-00
NOTE 13p.; Workshop presented at the SAAL and STU Seminar on Reading in a Multilingual Context: From Theory to Practice (Singapore, June 2-3, 1998).
PUB TYPE Guides - Classroom - Teacher (052) -- Speeches/Meeting Papers (150)
EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Class Activities; *Cooperative Learning; Elementary Education; *Reading Instruction; Teaching Methods; Workshops; World Wide Web

ABSTRACT

Defining cooperative learning (CL) as a collection of concepts and techniques for enhancing the value of student-student interaction, this paper describes a workshop presenting key CL concepts. It describes two CL techniques that can be used in the teaching of reading and highlights connections between CL concepts and these two techniques. The paper provides activities using the techniques with four inter-related texts on the environment for the workshop participants. Contains 9 references; 4 appendixes contain Internet resources on cooperative learning, reading passages and questions used in the workshop; and other learning technique illustrations. (SC)

Cooperative Learning Techniques in Reading Instruction.

by George M. Jacobs

Published:

1998-06

Cooperative Learning Techniques in Reading Instruction
Workshop presented at the SAAL & STU Seminar on
Reading in a Multilingual Context: From Theory to Practice
2-3 June 1998, York Hotel, Singapore

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Introduction

Cooperative learning (CL) can be defined as a collection of concepts and techniques for enhancing the value of student-student interaction. Some of these concepts and techniques are discussed below. A great deal of research has been done on CL across many subject areas and age groups. In this research, CL has usually been found to be associated with superior results on a variety of cognitive and affective variables. (For reviews of this research, see Bossert, 1988-1989; Cohen, 1994; Johnson & Johnson, 1989; Sharan, 1980; Slavin, 1995.) Appendix 1 lists some Internet sources of information on CL. Specific to the topic of this SAAL and STU Seminar, among the research mentioned above are studies supporting the use of CL in reading instruction, e.g., Hythecker, et al, 1988; Klinger and Vaughn, 1999; Madden, 1988. Many books and articles suggest techniques for doing this, e.g., High, 1993; Slavin, 1995; Stone, 1990.

This workshop begins with the presentation of key CL concepts, followed by description of two CL techniques that can be used in the teaching of reading. Connections between CL concepts and these two techniques will be highlighted. Workshops participants then take part in CL activities using the techniques with four inter-related texts on the environment (Appendix 2)

Key Concepts in CL

Various approaches to the use of CL exist, each with different emphases. Kagan (1994) presents a well-known approach. Some key concepts of this approach are presented below.

Positive Interdependence: Positive interdependence exists when group members feel that what helps one member helps all and that what hurts one hurts all, i.e., they sink or swim together. This feeling can be promoted by roles, information distribution, rewards, and the creation of a common identity. Positive interdependence provides group members with support from their groupmates.

Individual Accountability: The idea here is that group success depends on the learning of each individual member. This feeling can be promoted by individual quizzes or assignments following group work, or by roles and information

distribution. Individual accountability evokes pressure on group members to learn and to publicly display their learning.

Collaborative Skills: To work successfully with others, students need to develop collaborative skills, such as asking for help, making suggestions, and disagreeing politely. Development of these skills often requires direct instruction and systematic follow-up.

Heterogeneous Grouping: Often learning and other educational goals are best promoted by the teacher establishing heterogeneous groups on the basis of such factors as ethnic group, past achievement or proficiency level, sex, and on-task behaviour.

Equal Participation: Group activities can be structured to encourage all group members to participate to a roughly equal degree. Means of doing this include providing each member with a turn to speak or particular information that they need to contribute to the group.

Simultaneous Interaction: In teacher-fronted instruction, one person speaks at a time, i.e., sequential interaction. When group activities are used, one person per group may be speaking, e.g., if a class of 40 students are working in groups of four, ten people may be talking simultaneously.

Two CL Techniques for Teaching Reading

MURDER (Hythecker, et al, 1988) is a dyadic script (Appendix 3). After setting a purposeful yet relaxed mood, the pair each silently read the same section of a text that has been divided into sections. When they have finished reading that section, one of them (without looking back at the text) summarizes the section's main points, while the other person monitors the summary for accuracy and completeness. Next, both members elaborate on the ideas in the section. Elaborations can take such forms as connections to prior knowledge, opinions, emotional reactions, applications, questions of understanding, and questions regarding wanting to know more. Next, the pair read the next section, reversing the roles of summarizer and monitor, with both again elaborating. This continues until the entire text has been completed, at which time they create an overall text summary.

MURDER embodies the key CL concepts defined above. It promotes positive interdependence because group members depend on each other to some extent to play the roles they are given. For instance, the monitor can help check the summarizer's understanding of the section, and both can deepen each other's understanding of the text with their elaborations. One way that individual accountability is encouraged is by the rotating roles of summarizer and monitor. Many different collaborative skills could be taught to help students be better "MURDERers", e.g., the skill of asking for an explanation when a groupmate

gives an elaboration.

Heterogeneous grouping, another key CL concept might help MURDER to work better. For example, students from different ethnic groups might have different experiences and perspectives, leading a heterogeneous pair to generate more varied elaborations. Also, if a pair consisted of students of different proficiency levels, the stronger student might be able to help the weaker one to understand the text. Equal participation is facilitated by the fact that each gets a turn to summarize a text section. Simultaneous interaction is likely because in a class of 40, twenty students could be talking at one time.

Jigsaw (Aronson, et al, 1978) is one of the best-known CL techniques, with many variations having been developed (Kagan, 1994). In the original version (Appendix 4), students begin the lesson in their home team which normally consists of four-members selected by the teacher with an eye toward heterogeneity. A text with four parts or four texts related to the same subject is used with each member of the home team receiving a different portion of the text or a different text. This is their "piece" of the "jigsaw puzzle".

Students then leave their home teams and form expert teams, usually of no more than four members, with students from other home teams who have the same piece. The job of these expert teams is to read their piece and figure out how to teach it to the members of their home team. Guide questions can be helpful here, and examples of these can be seen at the end of each of the texts in Appendix 2. Also, students can construct a graphic organizer, such as a mind map, to use as a teaching device. When the expert teams are ready, the home teams reform, and each member takes a turn to teach their piece to their home team. Afterwards, a variety of possibilities exist, e.g., the team can perform a task that requires knowledge from all the pieces, or students can individually take a quiz with group members' scores being used to determine what, if any, reward their home team is to receive.

Let's look at how Jigsaw operationalizes CL concepts. Positive interdependence is fostered because, e.g., group members depend on each other to teach them their piece of the jigsaw puzzle. Individual accountability may be activated by the fact that each member has been given unique information, and, in some cases, has to individually complete a quiz. A range of collaborative skills could come into play when using Jigsaw. For instance, in the expert groups, students need to be able to ask each other for help if they do not understand a part of the text they are to teach.

One way of dealing with heterogeneous grouping in Jigsaw is to have one text or text part that is a bit easier than the others and to give that to the least proficient student in each group (Coelho et al, 1989). Equal participation is made more likely by the fact that when the home teams reassemble, each person has the opportunity to present their piece. These presentations represent one of many

times that simultaneous interaction may occur during Jigsaw.

Conclusion

This workshop presented two of the many CL techniques that can be used in the teaching of reading. Just a few of the other applicable CL techniques are Numbered Heads Together, Three-Step Interview, and Pairs Check (Kagan, 1994). Further, educationists can modify CL techniques and create their own, keeping in mind the CL concepts explained and exemplified above.

In more than six years working in education in Singapore, the author has noted more teachers turning to group activities and using the insights offered by CL to increase the success of these activities. When group activities work well, students are energetically collaborating, learning from and with each other, pushing themselves to think more deeply and work more enthusiastically. Just as importantly, students are experiencing for themselves the power and joy of cooperation, lighting a path towards a future where cooperation displaces competition and individualism as the dominant mode and mood among humans and between humans and our fellow planetary inhabitants.

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Appendix 1 - Internet Resources on Cooperative Learning

- ***International Association for the Study of Cooperation in Education (IASCE).***

http://miavx1.muohio.edu/~iascecwis/
This site, maintained by Larry Sherman of Miami University in Ohio, includes information about the International Association for the Study of Cooperation in Education (IASCE). Past issues of their newsletter are available. There is also a place for initiating and participating in discussion.

- **Gan Siowck Lee's Home Page for Educators**

http://pppl.upm.edu.my/~gansl/cl.html
Professor Gan teaches at Universiti Putra Malaysia. Her home page offers an impressive collection of links to cooperative learning and other important topics in education, such as the environment.

- ***Mid-Atlantic Association of Cooperation in Education***

http://www.geocities.com/~maacie/
MAACIE is a non-profit organization dedicated to providing a network for people interested in studying, evaluating, developing, or applying cooperative educational methods, approaches, or points of view in educational settings.

- ***Ohio Association of Study of Cooperation in Education home page***

http://miavx1.muohio.edu/~oascecwis/
The IASCE is a non - profit educational association, dedicated to the study and practice of cooperation in Education. This field includes the increasingly popular cooperative classroom methods where students work together in learning teams to master academic content and collaborative skills. But Cooperation in Education also includes teachers working together to support and coach each other, to develop and share curriculum materials, and to join with students, parent, business and community leaders to improve the physical, social, and intellectual quality of
their schools.

- ***California Department of Education's COOPERATIVE LEARNING home page***

http://www.cde.ca.gov/iasa/cooplrng.html
This site is an excellent overview of CL's response to diversity in the classroom. It contains several links to other CL resources!

- ***George Jacobs' homepage***

http://www.geocities.com/Athens/Thebes/1650/index.htm

Go to the CL section for a number of articles on CL.

♦ ***Cooperative Learning Center's Homepage***
http://www.clcrc.com/
This is the site of the Cooperative Learning Center at the University of Minnesota. Co-directed by Roger T. Johnson and David W. Johnson, the center staff develop and refine theory and research related to cooperative, competitive, and individualistic approaches to teaching and learning. Staff also develop practical procedures to be used in classrooms, schools, and other settings: CL, school-based decision-making, academic controversy, conflict resolution, and peer mediation.

♦ ***Kagan Cooperative Learning Homepage***
http://www.kagancooplearn.com/
This site contains information about purchasing resources for implementing CL. They also have a place to send questions about using CL and a newsletter about CL..

♦ ***Susan Ledlow and Neil Davidson's website***
http://eminfo.emc.maricopa.edu/innovation/ccl/index.html
Susan Ledlow and Neil Davidson's home page contains considerable information on Cooperative and Collaborative Learning, especially in post-secondary environments. A listserv is also provided.

♦ ***Cooperative Learning (CL) Network***
http://www.sheridanc.on.ca/coop_learn/cooplrn.htm
The Cooperative Learning (CL) Network is an association of colleagues at Sheridan College who model, share, support, and advocate for the use of CL. This is an information-rich web site devoted to uses of CL in post-secondary (college) classroom environments.

♦ ***ERIC Abstracts on Cooperative Learning***
http://www.ascd.org/services/eric/ericcoo.html
Selected abstracts on CL prepared by the Association on Supervision and Curriculum Development (ASCD)

♦ ***SouthWest Educational Development Lab Classroom Compass***
http://www.sedl.org/scimath/compass/v01n02/welcome.html
Issue of Classroom Compass devoted to CL. Classroom Compass is a publication of the Eisenhower Southwest Consortium for the Improvement of Mathematics and Science Teaching (SCIMAST) project based at the SouthWest Educational Development Lab.

• **Rikki Ashley's Cooperative Learning Homepage**
http://members.home.net/riketa/index.htm
Basic information on CL.

Cooperative Learning Listserv

For those interested in an international LISTSERV on CL they may subscribe to the CL listserv by sending an e-mail message to LISTSERVER@JARING.MY.
Include in the body of the message:
SUBSCRIBE CL YOURNAME.
All postings to the list should then be sent to:
CL@jaring.my

Appendix 2 - Reading Passages and Questions Used in the Workshop

Text #1 -- Overcoming Water Pollution

People are responsible for polluting the water in lakes, rivers and oceans, as well as under the ground. Water pollution means that there is less clean water for people and land animals. There is less water for drinking and for recreation. In addition, there are fewer places for water animals to live.

There are many sources of water pollution, including sewage, industrial waste, oil spills and deforestation. Each of these sources is discussed below. There are also suggestions for possible solutions to each type of pollution.

Sewage comes from both homes and industries. Home owners, business people and the government can work together to lessen this source of pollution. We can avoid pouring harmful substances into sinks and toilets. Also, we could buy products which do not harm the environment. Governments can set up sewage treatment plants. These plants filter household sewage before it is released into bodies of water. Industrial sewage often contains poisonous chemicals. Industries could treat their own sewage.

Oil is carried all over the world in ships. It has many uses. Oil is used to fuel cars and to generate electricity. Sometimes the ships carrying oil leak. As a result, oil spills into the ocean. This pollutes the water and kills plants and animals. There are at least three ways to lessen this risk of pollution. We can use less oil. We can develop alternatives to oil use such as building cars that run on solar energy or energy from the sun. We can insist that all oil tankers have double hulls. This will reduce the chances of oil leaking into the ocean.

Trees often grow along river banks and seashores. Their roots help to hold the soil in place. If trees are cut down, heavy rain can wash soil into rivers and seas. This is a problem for several reasons. Too much soil in the water can cover the places where fish lay their eggs, thus preventing reproduction. Soil can also carry pollution from homes and industries. Soil pollution can be prevented by banning logging in shore area and by replanting trees in places where they have been removed.

Although solving the problem of water pollution is not easy, it is possible. Progress has already been made in many areas of the world. Some rivers which were once heavy with pollution are now clean and usable. It is up to us to help make more progress.

Jigsaw Questions: What are the causes of water pollution? What are some solutions?

Text #2 -- Conserving Energy

Energy is so much a part of our daily lives that we often take it for granted. For example, we use energy from gas, electricity and wood to cook. We use energy from petrol, gasoline and motor oil to travel. We also use energy to run entertaining machines such as televisions and stereos. Unfortunately, most of the energy we use comes from fossil fuels such as oil, wood and coal. As a result, our energy use contributes to the destruction of our environment. Fortunately, there are many solutions to this problem. These include reducing energy use and using alternative energy sources.

A lot of energy is used in buildings and in transportation. There are many ways we can reduce the amount of energy used in these two areas. In buildings, we can lower the amount of heating or air-conditioning we use. We can also make sure that lights and appliances are switched off when not in use. When shopping, we can buy electrical equipment that uses less energy. For example, some computers, ovens and washing machines have power-saving features.

Ways to reduce the amount of energy used in transportation include walking or riding a bicycle. Another idea is to take public transport such as busses or trains. If we have to use private cars, we can try to share with other people so that there are fewer cars on the road.

Using energy from sources other than fossil fuels is another way of protecting the environment. Sources of alternative energy include solar, wind and wave power. Solar energy has been used to heat water and houses. Wind and wave power have been harnessed to generate electricity. Support from individuals, governments and corporations is necessary if we want to increase use of alternative sources of energy.

Many people around the world are becoming richer. Once they have enough money, many are eager to buy the convenience and pleasure that comes from products which use energy. We need to remember to use energy wisely in order to ensure that this convenience and pleasure is not at the expense of our environment. After all, we have only one planet!

Jigsaw Questions: What problems are caused by high energy use? How can these problems be reduced?

Text #3 -- Reversing Deforestation

Forests safeguard the health of our planet. They protect the soil, provide water, regulate the climate and provide a home for thousands of animal and plant species. Unfortunately, forests are being cut down all over the world, both for timber and to provide land for agriculture and development. Possible solutions for the problems of deforestation are presented below.

Extensive logging of forests can cause soil erosion, extensive flooding and the extinction of many animals and plants. To prevent this damage, governments must take steps immediately. Forests can be turned into national parks which will promote tourism in the country. In this way, stopping logging can actually generate money for the national economy. Governments also need to pass laws to control logging. They can make sure that these laws are strictly enforced and punish any illegal loggers.

Another idea is to plant trees. A "Go-Green" campaign can be organised to encourage individuals, schools and offices to plant more trees in cities and along roads. Trees should also be planted in areas where they have already been cut down. In order to prevent soil erosion and flooding, logged areas should be replanted immediately after the trees have been cut down. Reforestation, unfortunately, cannot save the many plants and animals that are lost when the original trees are removed. Therefore, forest areas that are especially rich in animal and plant species should be preserved as national parks.

Another way to save trees is to find ways to grow food and to house people which do not require destroying forests. Hydroponic farming is one such method. Using this technique, fruit and vegetables are grown in water instead of soil. To reduce the amount of materials needed for housing, developers can build high-rise buildings instead of single- or double-storey houses and bungalows. This will reduce the pressure for more land.

We should all be concerned about saving the forests. Trees are beautiful and useful. They have a right to grow tall and strong and to live a long life! In addition, trees purify the air that we breathe. If we do not act quickly to save them, we are actually contributing to our own destruction!

Jigsaw Questions: What causes deforestation? What are some possible solutions?

Text #4 -- Improving Air Quality

The air that we breathe is not safe anymore. For more than a century, it has been polluted by poisons coming from factories, motor vehicles and power stations. As a result, the environment is being damaged. The number and severity of respiratory or breathing diseases is increasing. How can we help to reduce this problem? There are many ways.

Factories emit many different kinds of poisonous gases and fumes which pollute the air. To reduce pollution, factories can use pollution-control filters in their smoke stacks. They can also change their manufacturing processes so that they give off less poisonous gases. Governments should be involved in taking action against factories that are releasing excessive fumes and gases. Governments can also encourage the development of technology that removes many pollutants so that they are not released to the environment.

The number of motor vehicles on the road is increasing at a frightening rate. This not only causes traffic congestion but also increases air pollution. One

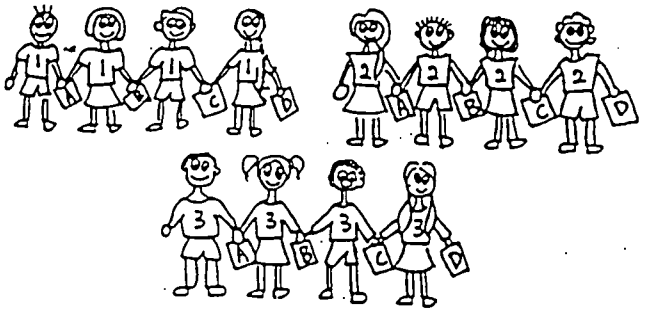
way we can reduce this problem is by organising car pools. Other ideas include using public transport, walking or riding a bicycle. Using unleaded petrol can also help.

Humans cannot live for more than a few minutes without air. Thus, clean air is a precious but rapidly disappearing resource. Many countries have realised the serious dangers of air pollution and have taken steps to reduce it. Success depends on each and every individual playing their part in keeping the air free of pollution. Only then can we all breathe a sigh of relief.

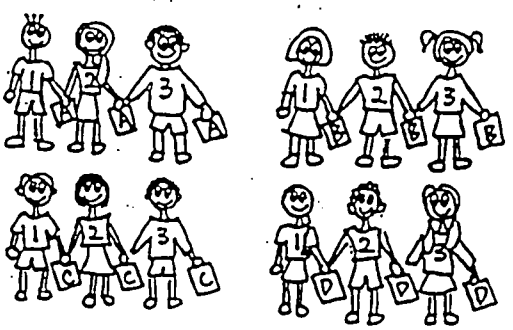
Jigsaw Questions: What causes air pollution? What are some actions that can be taken to reduce it?

Appendix 3 - The MURDER Script

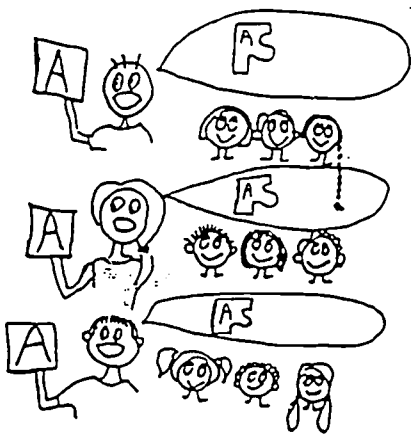
Mood -	set a relaxed mood
Understand -	by reading silently
Recall -	the main ideas in the section
Detect -	errors or omissions in the summary
Elaborate -	on the main ideas
Review -	the entire text



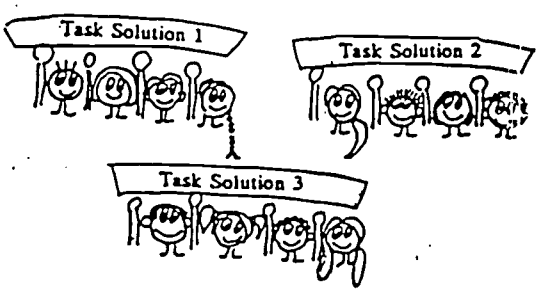
1. Each home team member gets a different piece of the reading material: Piece A, B, C, or D.



2. They form expert teams to become experts on their piece.



3. They return home and teach their piece to their home team.



4. Home teams combine the information from their experts with their other knowledge to perform a task.

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