

Peer Teaching in Small Group Settings

By About H. Cherif

Peer teaching involves students teaching students in small group settings, where the teaching role passes from student to student until each (in the small group setting) has taught once. The teaching is done under the supervision of the classroom instructor, who divides the class into small groups, giving each group a topic that is closely related to the other groups' topics.

Peer teaching in small group settings is an excellent learning method because it is student centered, self-directed, and involves cooperative group investigation. It aims to help students achieve a breadth of knowledge and a depth of understanding beyond the core concepts and skills of the studied topics, by teaching them self-learning responsibilities. These self-learning responsibilities, which are a natural part of peer teaching, include conducting individual research, understanding the research findings, and communicating their understanding to other students. By participating in this learning method, students will have the opportunity to acquire abilities and skills such as collecting information, organizing data, thinking critically, making decisions, detecting problems and generating solutions to them, communicating effectively, and writing clearly. Students will also learn the relationship between the studied concepts, and recognize the impact which understanding those concepts will have on their lives.

The role of the classroom instructor in the peer teaching approach is to facilitate the group activity by: 1) establishing the related concepts, theories, or topics that need to be studied and learned; 2) monitoring the small group processes; and 3) evaluating the final product in a meaningful way.

The role of each student in the peer teaching approach is to choose one of the four topics to research on his/her own for two weeks, to write a report and then to teach (as presenter)

what he/she has learned or mastered to a small group of around three other students. This means that each student will be a presenter or peer-teacher one time and a student in a small group setting three times. So, each student at some point is either teaching his/her particular topic or learning about one of the other three topics.

During the research and data gathering period, students are advised to select from their chosen topics only key concepts to be studied, and then to organize the data around these concepts. For example, the acid rain students could use the key concepts of defining the problem, examining the sources of the problem, examining the environmental impact, and investigating the short-term and long-term solutions. Through these key concepts, the presenter provides the students with useful data with which to help them make informed and responsible decisions related to environmental issues.

Table 1 illustrates the range of topics which can be taught using the peer teaching and learning method. I have found this approach to be very effective in teaching related topics that center around a specific theme such as environmental issues, human genetic disorders, planetary studies, and the applications of biotechnology. See Table 1 for more details. In this paper I will use a set of related environmental issues as an example to demonstrate the use of peer teaching and learning in the classroom. The example issues are energy, pollution, overpopulation, and acid rain.

Mechanism of the Peer Teaching Approach

Divide (for example) a class of 24 students into four study groups of six students. Each group will choose one of the four topics to research (e.g., energy, pollution, over-population, and acid rain). In a period of two weeks, each student in a given group will do his or her own

research and will write a three-page report on a given topic individually. This means that by the end of the two weeks, there will be six reports on each of the selected topics: energy, pollution, overpopulation, and acid rain. By the end of the research period, each student submits a copy of his/her research report to the instructor. The instructor reviews the quality and scientific information in each report, makes suggestions and comments, and then returns them on the following week (the third week).

In the third week, students of each group (say the energy group) will meet for 45 minutes to share and discuss their research findings and use this meeting as a way to make their report more scientifically accurate and comprehensive. They do this by individually revising and rewriting their reports based on the instructors suggestions and comments and on the group discussion.

In the fourth week, all the students re-group into six presentation groups of four students each. Each of the presentation groups has one representative from the study groups on energy, overpopulation, pollution, and acid rain. Each presentation group sits together in a round table or classroom setting in an isolated or semi-isolated area with a blackboard or overhead projector.

In each presentation group, peer teaching will then start with the energy student (the student from the energy study group) teaching his/her three classmates about energy for 15 minutes followed by a five minute period of questions. During this time, the other three students in the group are not allowed to take notes, only to listen and ask questions. After there are no more questions, the energy student will teach again about energy, this time for 20 minutes. This time, however, the presenter is expected to include information from the questions asked by his/her classmates. Also, this time, the three other students in each group are allowed to take notes. By the end of the second teaching period, all the students return to the classroom, and a general discussion about energy will be carried out for 20 minutes by one of the energy students, with the help of the instructor. As an assignment, all students (except those who researched and taught the energy topic) will prepare a 2-to-3 page summary on energy using the information he/she learned from his/her classmates as well as the general discussion.

Similar processes and procedures will be repeated in the following three weeks with two changes: the topic being studied and the students who teach it will be different. This means that each week the presentation groups could change; the only criterion for these groups is that each group needs to have a representative from each of the four study groups. In my example, the fifth week would be devoted to over-population, the sixth week to pollution, and the seventh week to acid rain.

Even though each student only researches and presents one topic, he or she has learned and taken notes on all four topics. By the end of the exercise, each student will have written three two to three page summaries, as well as his or her own report on the researched topic.

Advantages of the Peer Teaching Approach

There are several advantages in using this particular method of teaching and learning; some which I have observed follow.

1. As the students in the class prepares their reports, each has a unique ownership of the materials that establishes him or her as the center of the activity and the source of information about the given topic. It is his/her responsibility to choose relevant key concepts, and to teach them effectively to the group. The retention of this student-owned learning materials would be high, and thus a solid knowledge base is established for future self-study. As one of my students once said:
I felt I needed to become an expert in this area [energy] in order to best help the group. As a group member, I also sought to listen attentively, ask pertinent questions, and take good notes. I felt informed and enlightened. At the time of writing my final report, I discovered that I had established a solid knowledge base and developed a depth of understanding that enabled me to write a high quality final report.
2. Students are required to acquire and organize data, to sense problems, and to develop concepts and language to convey their understanding. Today, these skills are not only considered highly desirable in the job market, but they are also a part of the survival skills in all kinds of societies.
3. Because every student is involved with an independent, yet cooperatively investigated project, the focus on

learning the knowledge is not an end in itself. Students are also intellectually engaged in their own cognitive development through the analysis, synthesis, and evaluation of their own research, learning materials, and method of communication.

4. Sometimes, presentations in small groups by other students are easier to absorb than lectures by the teacher and may be perceived as having more validity by some students.
5. Psychologically, peer teaching gives the students a greater feeling of control over and responsibility for their learning, and involved learners learn better than passive learners.
6. Even though the approach of peer teaching is student centered and self-directed, it is a cooperative group investigation and qualitatively holistic. As another of my students once wrote:

Toward the end of the exercise, I realized that the issues were related. For example, the use of certain kinds of energy causes acid rain, which causes water pollution which may eventually result in a decrease of population, of a given living species. This helped me to understand the need for taking a holistic view in examining issues and a holistic approach in solving problems. But most of all, it forced me to critically question my own lifestyle.

7. Peer teaching allows an opportunity for students to experience being the leader in one domain. It gives them a sense of power and teaches them leadership skills. The students also learn to be

accountable for their own work and they achieve the goal of positive interdependence in a group. Listening to others and valuing what they have to say is also an important part of the process.

8. Because presentations are restricted to a limited time, the presenters have to consider how to best convey the information they have collected, so that useful notes can be taken by their classmates. This forces students to think critically, to organize their gathering of data and information efficiently, and to try to eliminate unnecessary words and extraneous thoughts from their teaching and writing.

Additional Concerns

There may be a few students for whom the responsibility is more than they think they can handle. These students will be tempted to abdicate responsibility and say it's too hard: "I can't do it!" If the instructor knows the students well enough, he/she should consider giving those students some extra guidance in the completion of their tasks. One other problem that might come up is that not all students have the same abilities in research and presentation, so that overall quality might be uneven. One way of minimizing this would be to make sure that group members must meet to review progress etc., so that any friction between them over the relative quality of presentations is minimized.

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Table 1
Examples of Themes and Topics That Can Be Taught Using The Peer Teaching Method.

Specific Themes	Related Topics
Environmental Issues	Pollution, Energy, Acid rain, Population
Human Genetic Disorders	Autosomal recessive disorders, Autosomal dominant disorders X-linked recessive disorders, Incomplete dominance disorders
A Planetary Comparative Study	Mars, Earth, Venus .
Applications of Biotechnology	In agriculture, In medicine, In industry, In energy resources, In environmental management.
Mechanisms of Trait Inheritance	Cell theory, Trait theory, Chromosome theory, Theory of genetic control (Operon theory).
World Biomes	Tundra, Coniferous forst (Taiga) , Deciduous forest, Tropical rain forst, Grasslands, Desert,
Energy Flow and Food Webs In Ecosystem.	Producers, Consumers, Decomposers.
Methods of Plant and Animal Breeding	Mass selection (controlled breeding), Inbreeding, Cross-breeding, Hybridization.