Jigsaw

Why Is This Strategy Useful?

There is broad agreement that cooperative learning methods should be promoted in teaching mathematics and science. Learning activities like restructuring problems, integrating different points of view, giving explanations and analyzing misconceptions, collaborative practice, high intensity of student activities and controversial discussions, are typically used when engaging in cooperative methods. The jigsaw method provides a cooperative learning environment which fosters learner activity, joint acquisition of content and mutual explaining. It may also reduce racial conflict among children, improve student motivation and increase enjoyment of the learning experience. This method works for all age groups, although it should be applied carefully with very young children.

Description of Strategy

Students in a class are divided into teams, the so-called ‘home groups’. The teacher gives a short introduction of the subject matter and explains how it will be divided into subtopics. Each member of a home group chooses one particular subtopic. Now those students who have chosen the same subtopic meet in ‘expert groups’ in order to study the material and prepare to teach it to their home groups. As ‘experts’, students return to their home groups and teach their teammates, the ‘novices’, in their respective subtopics. Finally, all students are tested individually on the complete material that was covered. The external structure of jigsaw ensures that learners acquire knowledge in an autonomous and self-regulated way and produce explanations for each other. This challenging character of the jigsaw method leads to the recommendation that jigsaw should be applied carefully with very young children. A potential problem of the method is that learners may master their own subtopics, but nonetheless fail to teach it to their teammates in an adequate manner. As a consequence, students would show deficits in the subtopics they did not work on in their expert groups but which were taught to them by other experts.

Research Evidence

At least one randomized controlled trial provides support for this strategy. Nine third grade classes from three elementary schools in Frankfurt/Main, Germany, with a total of 208 students participated in the study. Three conditions were used for this study – standard jigsaw, jigsaw with additional questioning training and the control of teacher-guided instruction. Classes were assigned randomly to the three conditions with two exceptions: in two schools, teachers had chosen to teach cooperatively or teacher guided, respectively, before the start of the study.

Results from this study showed no differences between the three conditions for the math units. Differential analyses did reveal that ‘experts’ learned more than students in teacher-guided instruction. The use of the jigsaw method with third graders showed satisfactory learning results. There was a modest impact of the questioning training and low learning gains in the cooperative classes in the astronomy unit. Also, there were high discrepancies between learning outcomes of experts and novices. This shows that explicit instruction of explaining skills in combination with well-structured material are key issues in using the jigsaw method with younger students.
Sample Studies Supporting this Strategy


Background: There is much support for using cooperative methods, since important instructional aspects, such as elaboration of new information, can easily be realized by methods like 'jigsaw'. However, the impact of providing students with additional help like a questioning training and potential limitations of the method concerning the (minimum) age of the students have rarely been investigated.

Aims: The study investigated the effects of cooperative methods at elementary school level. Three conditions of instruction were compared: jigsaw, jigsaw with a supplementary questioning training and teacher-guided instruction.

Sample: Nine third grade classes from three schools with 208 students participated in the study. In each school, all the three instructional conditions were realized in three different classes.

Methods: All classes studied three units on geometry and one unit on astronomy using the assigned instructional method. Each learning unit comprised six lessons. For each unit, an achievement test was administered as pre-test, posttest and delayed test.

Results: In the math units, no differences between the three conditions could be detected. In the astronomy unit, students benefited more from teacher-guided instruction. Differential analyses revealed that 'experts' learned more than students in teacher-guided instruction, whereas 'novices' were outperformed by the students in the control classes.

Conclusions: Even third graders used the jigsaw method with satisfactory learning results. The modest impact of the questioning training and the low learning gains of the cooperative classes in the astronomy unit as well as high discrepancies between learning outcomes of experts and novices show that explicit instruction of explaining skills in combination with well-structured material are key issues in using the jigsaw method with younger students.

Additional Resources

Jigsaw Classroom http://www.jigsaw.org/


Sample Activity
Source: Jigsaw Classroom http://www.jigsaw.org/steps.htm

Jigsaw in 10 Easy Steps.

The jigsaw classroom is very simple to use. If you’re a teacher, just follow these steps:

1. Divide students into 5- or 6-person jigsaw groups. The groups should be diverse in terms of gender, ethnicity, race, and ability.

2. Appoint one student from each group as the leader. Initially, this person should be the most mature student in the group.

3. Divide the day's lesson into 5-6 segments.

4. Assign each student to learn one segment, making sure students have direct access only to their own segment.

5. Give students time to read over their segment at least twice and become familiar with it. There is no need for them to memorize it.

6. Form temporary "expert groups" by having one student from each jigsaw group join other students assigned to the same segment. Give students in these expert groups time to discuss the main points of their segment and to rehearse the presentations they will make to their jigsaw group.

7. Bring the students back into their jigsaw groups.

8. Ask each student to present her or his segment to the group. Encourage others in the group to ask questions for clarification.

9. Float from group to group, observing the process. If any group is having trouble (e.g., a member is dominating or disruptive), make an appropriate intervention. Eventually, it's best for the group leader to handle this task. Leaders can be trained by whispering an instruction on how to intervene, until the leader gets the hang of it.

10. At the end of the session, give a quiz on the material so that students quickly come to realize that these sessions are not just fun and games but really count.