

## **Applying Informal Cooperative Learning Groups Techniques In The Classroom**

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Numerous papers and workshops have been presented on cooperative learning (CL) by the American Society for Engineering Education (ASEE) [1 ,2,3,4]. The resulting benefits from such research, as well as anecdotal examples, have motivated many engineering management educators to examine the use of CL techniques instead of the traditional lecture approach to teaching engineering courses. However, the true challenge is how to apply these techniques. The majority of the literature deals with theories and principles rather than application; what examples are included have tended to be drawn from other fields. Thus, engineering management educators who desire to incorporate these techniques are faced with a challenge; which is how to apply them, while minimizing the associated time demands and addressing students' resistance to change.

Cooperative learning has been defined as using of small groups of students working together to maximize each other's learning [3]. Fundamental to CL is the positive interdependence among the group members, a sense of "we're all in this together. " There are several ways to incorporate CL, including informal cooperative learning groups, formal cooperative learning groups, and cooperative base groups [4,5].

Incorporating informal CL groups into a specific engineering course is a good method for increasing student participation and revitalizing passive lectures. Additionally, it tends to be less demanding on precious resources, such as the instructor's preparation time or classroom time, than the more formal CL techniques. Once the informal techniques have been integrated into the class, more formal techniques can be added as desired.

Informal cooperative learning activities can be accomplished in small groups consisting of two or three students or by the class as a whole, and require anywhere from a few minute to an entire class period. The purpose of these activities is to increase student involvement in the learning process. They shift from being passive scribes to being teachers, team members, critics, and active learners. CL techniques can be used for almost any course subject, whether quantitative or qualitative.

The author has successfully applied informal CL techniques in a variety of courses, including operations research, computer simulation, project management, safety engineering,



and work design. Actual examples of successfully incorporated CL activities will be presented and can be briefly grouped as follows:

- **Synthesize of material** - students, either in small groups or the class as a whole, recall what was discussed in a previous lecture or in the assigned readings. "How does this tie-in with what we discussed last time?"

- **Direct questions** - students are asked specific open-ended questions to encourage group discussion. "What are the advantages or disadvantages of this technique?" "How would you sell this to upper management?"

- **Problem solving** - students work example problems or homework problems in groups. Students can be required to present their results on the board or via an overhead projector.

- **Case studies** - students review and present cases, define problems, discuss alternatives, and recommend solutions.

- **Structured presentation** - students briefly prepare and present an analysis of predefine material. This can be structured as a debate, where the students present a particular view, or as a comparison, where the students present a particular example.

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