

Cooperative Learning

**Ideas for
Effective
Classroom
Practice**

Cooperative Learning in the Physics Classroom

- The presentation is based upon the “Learning Together” model developed by Johnson, D., Johnson, R. & Holubec, E. (1988). *Circles of Learning: Cooperation in the Classroom*. Edina, MN: Interaction Book Company.
- Several other models exist (e.g., Slavin), but the above model is perhaps the most applicable to physics teaching.

Cooperative Learning v. Other Forms of Learning

- **Cooperative learning is just one form of classroom/student learning structure.**
- **Other forms include:**
 - Individualized (criterion-based grading system)
 - Competitive (norm-based grading system)
- **Cooperative learning is perhaps the most important of the three types of learning situations, yet it is the least used (<20% time).**

Cooperative Learning: Definitions & Traits

- **Cooperation -- working together to accomplish shared goals**
- **Cooperative Learning -- the instructional use of small groups wherein students work together to maximize their own and each other's learning**
- **Common Elements:**
 - shared learning goals -- desired outcome in which the students demonstrate as a group and individually a mastery of the subject studied
 - goal structure -- specifies the ways in which students will interact with each other and the teacher during the instructional session

Not all group learning is cooperative learning.

- **groups arguing over divisive conflicts and power struggles**
- **a member sits quietly, too shy to participate**
- **one member does the work, while the other members talk about sports**
- **no one does the work because the one who normally works the hardest doesn't want to be a sucker**
- **a more talented member may come up with all the answers, dictate to the group, or work separately, ignoring other group members**

Effective Cooperation

- ...does not occur by chance.
- ...can not be based on the assumption that all students possess good social and learning skills.
- ...occurs when the essential components required for each cooperative activity are ensured.

Learning Together: Essential Components

PIGS FACE

Johnson & Johnson

Positive Interdependence

- **Students have two responsibilities:**
 - learn the assigned material
 - ensure that all members of the group learn the material
- **Each student should see his or her contribution as essential for group success.**
 - each student makes unique contribution
- **Interdependence occurs when students cannot succeed unless all their group members also succeed.**
- **Structuring interdependence: common goal, joint rewards, divided resources, complimentary roles**

Individual Accountability

- **Teacher must assess (directly or indirectly) how much effort each member is contributing to the group's work.**
- **Teacher must provide feedback to groups and individual students.**
- **Teacher must help groups avoid redundant efforts by members.**
- **Teacher must ensure that every member is responsible for the final outcome.**

Group Processing

- **At the end of the process, students reflect to determine which member actions were helpful and which were harmful.**
- **Students then make decisions about which actions to continue, change, or delete.**
- **Such processing allows groups to:**
 - **focus on maintaining good working relationships.**
 - **learn and improve cooperative skills.**
 - **provide feedback on member participation.**
 - **think at a metacognitive level as well as cognitive level.**
 - **celebrate success of the group.**

Social Skills

- **Students must get to know and trust one another.**
- **Students must communicate accurately and unambiguously.**
- **Students must accept and support each other.**
- **Students must resolve conflicts constructively.**

Face-to-Face Interaction

- **Successful interaction occurs as a result of positive interdependence.**
- **To maximize opportunity for success:**
 - keep groups small (2 - 6 students)
 - keep groups heterogeneous within, homogeneous without
 - assist students with guidelines for interaction:
 - acceptance, support, trust, respect
 - exchange of information
 - motivation

What's the difference?

Cooperative Group

Positive interdependence
Individual accountability
Heterogeneous membership
Shared leadership
Responsible to each other
Task & maintenance emphasized
Social skills directly taught
Teacher observes & intervenes
Group processing occurs
Mutual assistance

Traditional Group

No interdependence
No individual accountability
Homogeneous membership
One leader
Responsibly only for self
Only task emphasized
Skills assumed or ignored
Teacher ignores groups
No group processing
Competitive

The Advisability of Using Cooperative Learning

- **Works well with inquiry and constructivist approaches.**
- **Supports multiculturalism efforts.**
- **Promotes social development.**
- **Assists with classroom discipline.**
- **Provides for more than one “teacher.”**

Cooperative Learning

- **Cooperative learning has the best and largest empirical base of any educational innovation.**
- **Cooperative processes have been shown to advance higher-level conceptual learning.**
- **Cooperative learning at the high school level is well worth exploring.**