STANFORD UNIVERSITY NEWSLETTER ON TEACHING

*Speaking of Teaching Winter 1999 produced quarterly by the Center for Teaching and Learning*

SPEAKING OF TEACHING

WINTER 1999 Vol.10, No. 2

Without denying the significance of traditional lectures

and instructor-led discussions in undergraduate education,

an increasing number of teachers are recognizing

the value of also assigning collaborative work to their

students. Small group work, used both in and out of

class, can be an important supplement to lectures,

helping students master concepts and apply them to

situations calling for complex applications of critical

thinking skills. In a recent talk in the Award-Winning

Teachers on Teaching Series entitled “Let Them Do It

Themselves—In Groups,” Professor of Biological

Sciences and President Emeritus Donald Kennedy

addressed this issue, reminding his audience that

Stanford students “do a great deal for one another” in

promoting learning, and that it’s important that instructors

“tap into this by practicing a kind of catalyzed

learning by creating opportunities whereby [collaboration]

can crystallize and take shape.”

While many instructors occasionally break their

classes into small informal groups to accomplish brief

tasks, the kind of collaborative group work discussed

here refers to projects that last an entire class period,

several class sessions, or even an entire quarter. Groups

may be assigned by the instructor or decided upon by the

students themselves (and there are advantages and

disadvantages to each approach) but the key is that the

tasks to be accomplished require interdependence—so

that no individual student can complete the assignment

alone. Sometimes called Problem-Based Learning, when

it extends over a period of time, this form of instruction

requires the teacher to plan projects in advance but then

step aside in order to facilitate—not dominate—the

actual learning process.

Collaborative group work requires careful planning on

the part of the instructor, and is not without its difficulties

for students. But the benefits can be substantial,

including increased participation by students in all

components of the course, better understanding and

**Cooperative Learning:**

**Students Working in Small Groups**

*Check Out A New Source of Insights*

*about Teaching!*

Current issues of the

**National Teaching & Learning Forum**

are now available on CTL’s Website at

http://www-ctl.stanford.edu

under “Resources for Faculty”

*Researchers report that, regardless of the subject matter, students working in small*

*groups tend to learn more of what is taught and retain it longer than when the same*

*content is presented in other instructional formats.*

Barbara Gross Davis, *Tools for Teaching*

retention of material, mastery of skills essential to success

in the course or in a career, and increased enthusiasm for

self-directed learning—the kind of enthusiasm that can

spur students on to independent research or honors

projects.

Outlined here are some suggestions for using collaborative

tasks to accomplish course goals, including advice

on how to avoid potential problems.

**Assigning Group Tasks that Promote**

**Learning**

The decision to include cooperative learning assignments

in a course should be based on a careful examination of

course goals. For example, if students are expected to be

able to apply theoretical knowledge to real-world problems,

or demonstrate decision-making or problem-solving

skills similar to those made by professionals in the field,

then it may be appropriate to include group work in the

design of the course. It’s best not to think of group work

as something added on to an existing course structure, but

instead something that helps shape the design of the

syllabus and helps synthesize specific course objectives.

Other important factors to consider before including

group assignments are class size—since larger classes will

require more attention to organization—and the means

that will be used to evaluate group work (so that sufficient

*Page 2 Speaking of Teaching Winter 1999*

**A Preparatory Checklist**

**for Collaborative Tasks**

**Have I determined or clarified. . .**

• where the group experience fits into the overall

curriculum?

• what the overall purpose is and what the

learning goals are?

• whether the learning goals are sufficiently specific,

clear, worthy, realistic, and achievable?

• the group activities and the schedule—are the

activities meaningful and is there sufficient

time to accomplish the goals?

• the planned group’s size and mix of

characteristics?

• who the learners are—their interests, strengths,

and learning needs?

• what resources are needed for the session?

• the kind of leadership I need to provide?

• the learners’ roles and responsibilities?

• how decisions will be made in the group?

• how the learners will be evaluated?

Adapted from *Fostering Learning in Small Groups: A*

*Practical Guide* by Jane Westberg & Hilliard Jason.

time and instructional support are available to provide

feedback on group projects).

The kinds of group tasks planned for the course also

need to be examined to ensure that they are likely to result

in effective group efforts. Group cohesiveness can be

encouraged and some of the difficulties groups face (which

are examined below) can be eliminated or minimized if

assignments are designed to:

(1) require a high level of individual accountability

for group members;

(2) require members to discuss issues and interact;

(3) ensure that members receive immediate, unambiguous,

and meaningful feedback; and

(4) provide explicit rewards for high levels of group

performance (Michaelson, Fink, and Knight 1997).

Individual accountability is essential to group success,

since the natural tendencies of some students to dominate

and some to withdraw will gradually come into play unless

some mechanism is in place requiring everyone to participate.

This may be as simple as a worksheet that each

member uses to note down their contribution—to the

group discussion in class that day or to work on a larger

project during the week. Or it may involve having students

critique each other’s contributions, especially if part of the

end product is a written document to which everyone

contributes.

If, indeed, a final written report documents the group’s

work, it is very possible that little discussion or interaction

actually occurred as the assignment moved to completion;

in this case, though the instructor asks for a group effort,

students are able to divide work up, delegating tasks to

individuals, one of whom eventually gathers together the

various individual parts. Interaction and discussion are

much more likely if students are required to solve a

problem or make a decision based on research and analysis

of a complex situation. With such problem-based tasks

which immerse students in information-rich discussions,

“they are also likely to learn two important lessons about

their group: (1) Other members’ input is a valuable resource

and (2) *we* can accomplish something by working

together that none of us could have accomplished on our

own” (Michaelson, Fink, and Knight, 1997).

Feedback from the instructor, from group members, and

from other groups helps each group keep on track and

therefore helps build cohesiveness. If groups are unclear

about their progress, then difficulties between members

may hinder their ability to work in an orderly fashion

toward an agreed upon goal. And finally, the final work

should be graded as a group project, so that peer pressure

from within the group motivates individuals to work

together—even though organizational or personal difficulties

may arise along the way.

Another way of considering what makes an effective

group activity is to consider the characteristic features of a

good problem:

• They tell engaging stories in settings to which the

students can relate, thus solidifying the eventual

connection between theory and application.

• They are open-ended, challenging students to make

and justify estimations and assumptions.

• They engender controversy or require decisions, so

their solutions require students to demonstrate

thinking skills beyond simple knowledge and

comprehension.

• They are complex enough for students in each group

to recognize the need to work together to succeed in

arriving at a satisfactory conclusion (Allen, Duch,

and Groh, 1996).

And finally, group assignments should include a detailed

plan for proceeding with the work including, if possible,

examples of stages along the way that help groups monitor

their success. Instructor feedback, in meetings or from

progress reports, should be included in the time-line for the

project.

**Teaching Students to Work in Groups**

In a competitive academic environment, where students

have most often been rewarded for individual effort,

collaboration may not come naturally or easily for everyone.

And even though most students have worked together

informally in study groups or social organizations, they

*Speaking of Teaching Winter 1999 Page 3*

may never have thought carefully about the kinds of skills

that best promote group achievement. Faculty who make

collaborative assignments and fail to provide specific

guidelines or models for successful work may find students

struggling to get group projects off the ground.

Of course, some students (like some instructors)

initially express skepticism about the value of group work,

or feel that class time is best spent hearing from the

instructor (who’s the authority) rather than working with

students who, they believe, know as little as themselves.

Others may feel that they have succeeded thus far on

individual effort, and don’t want to be encumbered by

other students with different histories of success or

different working methods. And some students are simply

shy and unaccustomed to sharing their work with their

peers. Being clear, at the outset of the class and in the

syllabus, about how much of the work in the course will

involve group effort, and about why such group work will

help achieve the goals of the course, will go a long way

toward overcoming the objections of some students (and

will at least warn students with serious reservations that

they may want to choose another course). Addressing the

importance of group work and the goals of group work is

essential, since students will be far more motivated to

participate if they see the relevance of the group assignments

to larger course objectives.

Instructors well practiced in leading classes through

complex intellectual inquiries often do not fully appreciate

the fact that their sophisticated teaching skills have been

honed over years of interaction—and that most students

have little training in guiding their peers through such

activities. The interpersonal and organizational skills

needed for managing a group project need to be highlighted

in any assignment, so that students recognize the

importance of such things as: listening, clarifying statements,

and providing good feedback; keeping discussions

on task; probing assumptions and evidence; eliciting

viewpoints and perspectives; mediating conflicts; and

summarizing and presenting findings (Bosworth, 1994). If

specific skills are called for in an assignment, the instructor

should identify them and provide examples of the

successful use of such skills in the assignment or in

classroom sessions. One simple way of providing such

help is to suggest roles group members might adopt in

their work—for example, facilitator (to lead discussions),

notetaker (to record and summarize progress), planner (to

outline where and how the group is proceeding through

the assignment), evaluator (to elicit critiques)—and

provide descriptions and examples of these roles.

Unless group management skills are identified, and

unless students are asked to reflect on their successes and

difficulties with exercising these skills, few participants

will see the relationship between completing the project

and achieving some of the larger goals of the assignment

or course. The time taken to examine these skills can be

crucial to the success of these projects; as one group of

faculty using group work in an introductory biology

course point out, “Although most teachers are understandably

reluctant to spend valuable class time discussing

group process, we suggest that the student disengagement

that results from major problems in group dynamics

makes the investment of one class period in group work

skills well worthwhile” (Miller, Trimbur, and Wilkes,

1994).

**Forming and Guiding Groups**

Most faculty who have included collaborative work in

their courses agree that groups of between 4 and 6

students seem to work best, though depending on the task,

larger groups (8-10 students) can function successfully.

Determining how the groups will be formed can be more

complicated, since ideally the groups should be diverse

enough to include students with a range of intellectual

abilities, academic interests, and cognitive styles. Allowing

students to select their own group members can work

well in small classes, but this method always runs the risk

of further isolating some students or creating cliques

within the class as a whole. With larger classes, random

selection, selection based on compatibility of schedules

(students who can meet for group sessions at a certain

hour each week), or selection determined by the instructor

based on questionnaires completed on the first day of

class can work well and all will seem fair to the students.

Once groups have been determined and their assignments

have been explained, it’s not wise to wait until the

final product or solution appears before providing feedback.

Not only do students sometimes need help interpreting

assignments, often they need advice and encouragement

at the outset, to reassure themselves that the path

they are choosing leads in the right direction. By including

early check-ins, and especially by asking for the

group’s overall plan of action, instructors can not only

offer useful suggestions but also redirect efforts potentially

headed for disaster. Besides asking for an initial

plan, instructors can have students report on their

progress through a checklist of steps in the project or ask

for brief journal entries each week.

In offering feedback during group projects, however,

it’s important to allow students to make their own decisions

about how to proceed. The instructor’s role is to

guide but not dictate what should happen amongst the

group members. If, for example, group members complain

that someone isn’t doing his or her fair share, make

it clear that solving this issue is up to the group and won’t

be solved by the intervention of the instructor.

**Evaluating Group Work**

Since as stated earlier, individual accountability is essential

in ensuring successful group work, instructors need to

determine how best to grade, taking both individual and

group effort into consideration. Of course in most classes,

a grade for any group project will usually be supplemented

in the student’s final grade with midterm and final

examinations. But individual accomplishment in the

group work itself can be assessed, so that members feel

that even their contribution to the group has been evaluated

adequately. During the group project, students can

still be given in-class quizzes asking for specific information

on what they have learned so far, what they feel they

have contributed to the project, and how they would

*Page 4 Speaking of Teaching Winter 1999*

**Bibliography on Cooperative Learning**

Allen, D., Duch, B., and Groh, S. “The Power of Problem-

Based Learning in Teaching Introductory Science

Courses.” In L. Wilkerson and W. Gijselaers (Eds.),

*Bringing Problem-Based Learning to Higher Education:*

*Theory and Practice.* San Francisco: Jossey-Bass,

1996.

Bosworth, K. “Developing Collaborative Skills in

College Students.” In K. Bosworth and S. Hamilton

(Eds.), *Collaborative Learning: Underlying Processes*

*and Effective Techniques.* San Francisco: Jossey-Bass,

1994.

Bruffee, K. *Collaborative Learning: Higher Education,*

*Interdependence, and the Authority of Knowledge.*

Baltimore: Johns Hopkins, 1993.

Cohen, E. *Designing Groupwork: Strategies for the*

*Heterogeneous Classroom.* 2nd Ed. New York: Teachers

College, 1994.

Cramer, S. “Assessing Effectiveness in the Collaborative

Classroom.” In K. Bosworth and S. Hamilton (Eds.),

*Collaborative Learning: Underlying Processes and*

*Effective Techniques.* San Francisco: Jossey-Bass,

1994.

Davis, B. *Tools for Teaching*. San Francisco: Jossey-

Bass, 1993.

Kennedy, D. “Let Them Do It Themselves—In Groups,”

Center for Teaching and Learning videotape. 1999.

Michaelsen, L, Fink, D., and Knight, A. “Designing

Effective Group Activities: Lessons for Classroom

Teaching and Faculty Development.” In D. DeZure

(Ed.) *To Improve the Academy.* Stillwater, OK: POD

Network, 1997.

Miller, J., Trimbur, J., and Wilkes, J. “Group Dynamics:

Understanding Group Success and Failure in Collaborative

Learning.” In K. Bosworth and S. Hamilton

(Eds.), *Collaborative Learning: Underlying Processes*

*and Effective Techniques.* San Francisco: Jossey-Bass,

1994.

Smith, K. “Cooperative Learning: Making ‘Groupwork’

Work.” In T. Sutherland and C. Bonwell, *Using Active*

*Learning in College Classes: A Range of Options for*

*Faculty*. San Francisco: Jossey-Bass, 1996.

Tiberius, R. *Small Group Teaching: A Trouble-Shooting*

*Guide.* Ontario: OISE, 1990.

Westberg, J. and Jason, H. *Fostering Learning in Small*

*Groups: A Practical Guide.* New York: Springer, 1996.

improve the group’s efforts. Or individuals can be called

upon at random to make brief reports on the group’s

progress, including a description of problems overcome

and questions still to be addressed.

Grading the group achievement overall should be

based both on the success of the final product and the

group’s assessment of its operations. Many group efforts

result in a paper or presentation or the solution to a

specific problem. If class size allows, the entire class can

offer feedback on such products by having them

shared—papers can be photocopied and made available

on reserve or can be posted on a website; presentations

can be made to the entire class or can be videotaped and

circulated. To help students fairly evaluate other groups’

work, the instructor can distribute evaluation guidelines

that ask students to score projects (for example, on a

scale of 1 to 5) in such areas as degree to which they

address and clarify major issues, raise and answer

relevant theoretical or practical concerns, explore

relevant research, and address objections or contrary

findings. More extensive individual critiques, especially

of written work, can be part of the project as it develops,

and can also be incorporated into students’ final individual

grade.

Groups themselves can evaluate the effectiveness of

their own work toward the final product, and assess each

member’s contributions. Again, an evaluation form can

be provided that asks group members to rate their peers

in areas such as their professionalism (attendance at

meetings, participating appropriately), their initiative

(suggesting ideas, working constructively toward common

goals), and their independence (completion of tasks

at agreed-upon deadlines, researching topics and sharing

resources) (See Cramer, 1994, p. 76 for a sample evaluation).

By explaining these grading procedures early in the

course, before the group work begins, students will

probably express less discomfort with the idea of a group

grade, and will feel peer pressure to contribute and work

toward the common goal. Most students, indeed, are

concerned that they not appear foolish or irresponsible to

their classmates.

**Experimenting to Learn**

Many faculty members who recognize the benefits of

collaborative work still hesitate to use it, fearing that

coverage of material will be sacrificed. Restructuring a

course to include group work may indeed mean spending

more time on fewer topics, but “research shows that

students who work in groups develop an increased ability

to solve problems and evidence greater understanding of

the material” (Davis, 1993). Perhaps beginning with

modest collaborative assignments and supplementing

classwork with additional readings will resolve some of

the conflicts between coverage and depth. Students, with

the proper help, can be guided toward greater autonomy

and take on a greater responsibility for their own education

if instructors provide them with useful, engaging,

and relevant tasks to accomplish with their peers.