

PEER-LED TEAM LEARNING EVALUATION

EVALUATION STRATEGIES

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Over the past five years (1995-2000) there have been three stages in the overall evaluation of peer-led workshops.

1. *Implementation* Initially, project leadership was interested in everything that was happening and looked at all activities, procedures, responsibilities, etc. connected with the program. We knew that cooperative learning had proven value and that peer leaders could be highly effective, but much was still unknown about the details that would be needed for a successful PLTL program. We gathered data through focus groups; surveys of students, student leaders, and faculty; interviews with participants at all levels; observations; use of literature from related programs; and comparative studies.

2. *Outcomes* Evaluation activities and the analysis of data by the Project Evaluator, by individual professors conducting comparative studies, by learning specialists, and others provided a set of outcomes clearly indicating the success of the workshops. A few of these outcomes are:

- ... Students in the workshop groups almost always achieve better grades than similar students taking the same course, tests, etc. but not participating in workshops;
- ... Students value the problem solving skills, group interactions, and conceptual development that peer led team learning provide them;
- ... Peer leaders demonstrate growth in their ability to work with groups and individuals, and acquire deeper levels of understanding of the discipline in which they work.

3. *Critical Components* A consideration of the outcomes led to the articulation of the six critical components now familiar to those adopting the PLTL model. These components provide a basic plan for introducing PLTL learning, and also for evaluating a program once it has been implemented.

Critical Components and Evaluation

There is solid evidence that the PLTL workshop model leads to success, but when certain elements are not present the workshop will not proceed as designed, problems generally occur, and student performance is less likely to improve. While the Project Evaluator will continue to gather and analyze data, it is important that, as the PLTL model is more widely adopted, faculty members participate in its evaluation. The more data we have from a variety of settings and disciplines, the more able we will be to account for the success of PLTL and to address problems.

1. *Integration of Workshops with the Total Course* This is to some extent an umbrella category bringing together the other components. But it needs to be stated if only to maintain vigilance against the

possibility of sliding toward a TA/recitation arrangement. Also, we have noticed an important morale factor. Students report positively about the workshops when they experience that the workshops improve their overall learning and contribute to success.

- ... The workshops take a considerable amount of student time and energy. Consequently students must value the workshops or the impact will be considerably diminished.
- ... Second, integration means that the workshop leaders are aware of the approach taken in the lectures and the professor's overall method.
- ... Third, the model requires that the professor refer to the workshops in lectures and at other times indicating their importance to learning.

Although the workshop program can be coordinated by a faculty member or graduate student not teaching the course, it has been found that this can lead to a lack of overall fit. Student leaders are one step removed from the lecturer; students in workshops are two steps removed. When questions arise, there is a lack of confidence by both students and student leaders that the priorities and methods of the instructor are clearly understood and are being interpreted correctly in the workshops.

2. Involvement of Workshop Professors: Professors adopting the Workshop model are involved at differing levels concerning the supervision of leaders; attendance at the workshops themselves; and the development of materials. Guidelines for the most appropriate levels exist in different parts of program documents but have not yet been organized, and there are a number of open questions. The workshop model recommends that the professor:

- ... preview the workshop materials and activities with the student leaders;
- ... prepare, review, and update the workshop materials; and
- ... be available to students and student leaders according to need.

3. Training and Activity of Workshop Leaders The training of leaders varies from site to site depending on the interest of the workshop professor, the presence of someone trained in science or math education, the involvement of a learning specialist. We hope that on-going analysis will reveal more about the behaviors and procedures needed for training leaders and for identifying successful approaches by the peer leaders. The model recommends:

- ... that workshop leaders be skilled in group work,
- ... that they perform as facilitators rather than lecturers or teaching assistants,
- ... that they have a training program before they begin, and
- ... that they have content knowledge and problem solving ability appropriate to undergraduate students.

The presence and activity of the peer leader distinguishes the PLTL Workshop model from most other varieties of cooperative learning. Peer leaders generally understand that they are to guide rather than give direct instruction. But there is considerable variation in the style of problem solving that peer leaders adopt. Some are more algorithmic, showing students how to set up and solve particular problems. Others are more conceptual, stressing the general principles and abilities that will permit students to approach categories of problems.

4. *Materials*. In general, professors adopting the workshop approach spend considerable time writing or adapting materials. The model recommends:

- ... that materials be challenging and engaging but not so difficult as to discourage students;
- ... that the skills and knowledge developed in workshops be directly related to tests and grades;
and
- ... that the materials lend themselves to small group work.

Interviews with workshop professors reveal a general appreciation of materials made available, combined with a need to adapt them to local situations. The same materials have been reported to be too difficult at one site and too easy at another. It is expected that the chemistry materials prepared, piloted, and published by the *Workshop Project* will be useful at a number of sites and that the process may provide a model for other disciplines. Physics, biology and mathematics are beginning to develop packages of materials suitable for PLTL.

5. *Organizational Arrangements*. There are a number of important workshop arrangements, particularly space, time, and the size of groups. The Workshop model recommends:

- ... a two hour workshop, held once a week,
- ... about 6-8 students per group,
- ... that attendance be required, and
- ... that space be adequate for concentrated small-group activities.

Preliminary data indicate that there is a correlation between the length of the workshop and the proportion of time spent on interactive group activities. Surveys of *Adopt and Adapt* sites reveal that in shorter workshops the peer leader spends proportionately more time answering students' questions than in the longer workshops in which proportionately more time is devoted to small group learning.

In a similar way, when the size of the group increases, the session tends to evolve into a number of smaller groups, of three to five students, with the peer leader visiting each group in turn. It has also happened on occasion that through attrition or dissatisfaction the group's size may degenerate into a group of two or three students. Thus it becomes clear that the critical components are organically linked to one another.

6. *Departmental and Institutional Support*. This is critical for institutionalization. The workshop program cannot survive without adequate resources, nor is it likely to survive if implemented by one or a very small number of faculty. A critical mass is required for the workshop approach to take root and become a normal part of the business of a department and institution. The model suggests that:

- ... the workshop approach be extended across several courses and disciplines;
- ... that administrators such as department heads and deans support the workshop approach; and
- ... that the institution provide local funding.

Interviews with workshop faculty have uncovered a pattern regarding institutional support. At the outset, when first planning workshops, faculty members are generally enthusiastic about the

pedagogical advantages, have acquired some resources with which to pay peer leaders and have begun to develop materials. Consequently they are not much concerned with institutional support. But after a few years, particularly if colleagues begin to adopt workshops, the need for on-site support becomes evident and even critical for long-term success.

Critical Components			
1. Integrated with the Course	Students view workshop as important to learning	Leaders are aware of lecture approach	Lecturer refers to workshops
2. Professor's involvement	Preview of problems with peer leaders	Preparation and review of materials	Available to students and student leaders
3. Leaders	Skilled with groups; facilitator rather than teacher	Training and supervision	Discipline knowledge and problem-solving skills
4. Materials	Fit with course; relate to tests	Engaging and appropriately Suitable for group activity	
5. Organizational arrangements	Time	Space	Group size Attendance
6. Evidence of support and growth	Disciplines and courses	Support	Support

Table I - Critical Component Evaluation Matrix for PLTL. This table summarizes the essentials for each critical component. It is useful only in connection with the explanatory materials. Group size, for example, refers to the accepted norm, based on considerable experience, that peer-led team learning will work effectively with groups of about 6 to 8 students.

Table I summarizes the workshop model and the ratings associated with the recommended approach. The table may give the impression of an overly mechanical approach. But it is simply an attempt to list the various elements that have been found important in the workshop model.

Student Performance Since the first sites in the project began workshops more than five years ago, a number of comparison studies have been made to gather data about the effectiveness of the workshops on student performance as reflected in tests and grades. To date there are eight studies that have achieved strong positive results, and one study with ambiguous results. Several other studies are currently underway.

As workshop methods are adapted it will be important to add to the collection of studies, especially to determine how the workshops flourish in differing environments and disciplines. Professors can also contribute additional data by maintaining records of attendance, grades, and in so far as possible, tracking the academic decisions and careers of peer leaders.

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