

Participatory Learning Approach

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INTRODUCTION

The Participatory Learning Approach (PLA, pronounced “play”) engages students as active participants in the full life cycle of homework, projects, and examination. PLA’s core idea is that students design the questions or projects, execute them, and then assess and grade their peers’ solutions. Each stage can be performed by individuals or by teams. Students should be able to observe (read) everything their peers do so they can learn further from others’ efforts.

Designing problems challenges students to critically assess understanding of a subject by their peers. This encourages students to analyze course materials in order to determine the most important aspects for this assessment. *Evaluating solutions* challenges students to assess how fully a set of materials (the solution) fits their understanding of the field as well as the problem posed.

PLA is designed to work for a wide range of students from junior high through graduate and professional schools, as well as for training and adult learning. PLA has the following major objectives:

- to increase learning of course materials (primarily) and assessment skills (secondarily); and
- to provide and evaluate a systematic, collaborative approach to homework assignments, projects, and examinations, focusing on active participation and peer evaluation;

FOUNDATIONS

PLA is grounded in constructivist theories of learning (Piaget, 1928; Vygotsky, 1978) which suggest that knowledge is actively constructed by, rather than transmitted to learners. People learn by applying their knowledge to meaningful problems (Brown, Collins & Duguid, 1989; Hawkins & Pea, 1987), actively building their own understanding.

Assessment and instruction typically are viewed as separate activities with different purposes. Some researchers have called for changing classroom culture so assessment becomes *authentic*—a fundamental part of the learning process (Shepard, 2000; Wright 2003). In PLA, assessment is closely tied to the learning process, in which students both assess other students’ work and have their own work assessed.

Self-evaluation and peer evaluation contribute to learning in several ways. This awareness is facilitated when students are given specific criteria by which their own work is evaluated (Shepard, 2000). Students participating in assessment activities develop a metacognitive awareness of what constitutes excellent work (Frederickson & Collins, 1989; Liu, Lin, Chiu & Yuan, 2001). Students reported benefiting from needing to defend their opinions about their work (Klenowski, 1995) and from having access to their peers’ work (McConnell, 1999). Knowing that their peers would read their assignments also motivated their learning (McConnell, 1999).

An analysis of 62 studies showed that self-, peer, and co-assessment are effective tools for developing competencies required in professional organizations (Sluijsmans & Moerkerke, 1999). Peer assessment practices should develop lifelong learning skills such as ability to evaluate one's own work and that of one's peers, which employers seek from students when they enter the professional world (Boud, 1990; Hargreaves, 1997).

PLA PROCESS

PLA embodies the following systematic process. The following description assumes that students work individually on each stage. Alternatively, collaborative groups could perform the task at any stage, which would further enhance learning.

Software supporting PLA could streamline the process for both students and instructors, reducing cognitive and administrative overload. Software to fully implement PLA is currently under development at the New Jersey Institute of Technology. In the meantime, classes could utilize learning management systems such as BlackBoard, WebBoard, and WebCT to post entries in a threaded manner (so that description, solution, and grades are grouped together for each problem). Instructors optionally may

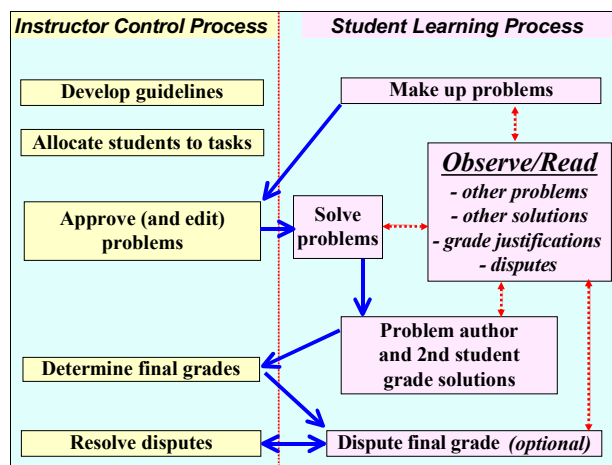
permit all entries to be posted anonymously, allocating an ID to each problem and telling students the ID of the problem they should work on.

The following description assumes the use of supportive software. Students should be able to read everything peers post online, which is an important learning component. Figure 1 illustrates the PLA process.

Software could assist with allocating students to PLA tasks (i.e., which problems to solve and grade). Software also would facilitate students observing their peers' activities. The stages of the PLA process include:

- Each student designs a problem, using guidelines provided by the instructor. Students post the problem description online.
- The instructor approves the problem description, editing it if necessary.
- Each problem is allocated to a different student who will solve it.
- Each student posts his or her solution online. Students grade the solution to the problem they authored, using guidelines provided by the instructor. Students may be required to grade using several different criteria. They must provide a written justification of at least two sentences for each evaluation criterion. *Justifications, a detailed written critique—positive or negative—are a vital aspect of learning how to assess.*
- Students are allocated a second solution to evaluate, providing each solution with a second opinion.
- Instructors assign a final grade to each solution, using the two student evaluations as input. If the two student grades are close enough (e.g., within 10 out of 100 points), to conserve time the instructor optionally may choose to accept the higher grade without re-evaluating the solution.
- Students optionally may dispute their grade, in which case they must re-grade their own solution using the same evaluation guidelines. Disputes are an especially important feature. They help ensure the fairness of the PLA approach, especially when instructors do not have time to carefully review each answer and evaluation. If a student believes the peer evaluations were

Figure 1. Instructor and student processes within PLA. Solid arrows show the process flow. Dashed arrows emphasize that students also learn by observing everything their peers do.



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