

PLA: Participatory Learning Approach

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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.

Our PLA research has the following major objectives.

- To increase learning of course materials (primarily) and assessment skills (secondarily).
- To provide and evaluate a systematic, collaborative approach to homework assignments, projects and examinations, focusing on active participation and peer evaluation.
- To develop accompanying software that maximizes student learning, facilitates collaboration, and minimizes student and instructor overhead in conducting PLA.

To date we have pioneered and refined the PLA for five semesters with essay-question exams in a graduate-level information systems course, with both distance learning and traditional sections, and in an undergraduate programming class with short essay questions. Experimental results show that a large majority of students believed that their learning had increased through the PLA process, recommended its use in future courses, and actually reported enjoying the exam process.

PLA embodies the following systematic process, which our planned software will facilitate. 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.

Students should be able to read everything peers post on-line, which is an important learning component. All entries will be “threaded” so that description, solution and grades are grouped together for each problem. Figure 1 illustrates the PLA process.

- Each student designs a problem, using guidelines provided by the instructor. Students post the problem description on-line.
- 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 on-line.
- Students grade the solution to the problem they authored, using guidelines provided by the instructor. Students may be required to grade along 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.*

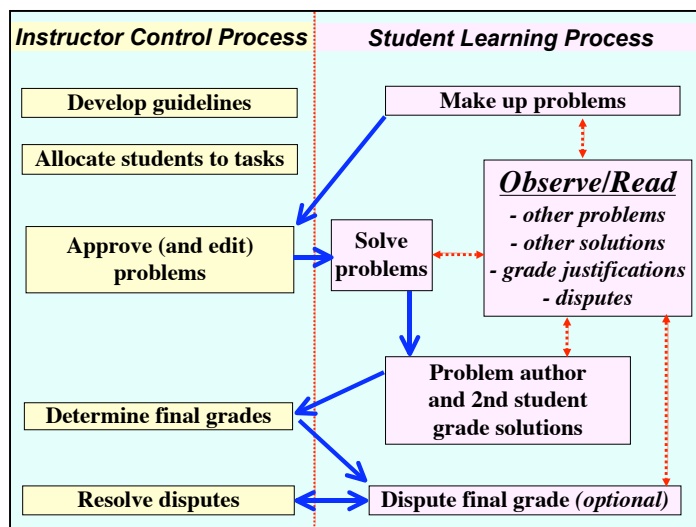


Figure 1: Instructor and student processes within PLA. Solid arrows show the process flow. Dashed arrows emphasize that students also learn by observing everything their peers do. Software will guide students and instructors, as well as assist with administration, such as allocating students to PLA tasks and emailing anyone late.

- 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 incorrect a dispute will ensure that the instructor focuses adequate attention to this specific problem.*
- The instructor determines the final grade for the disputed solution.

PLA forces students to view a subject from several new vantage points. Often solutions will be quite different from how the evaluator views the problem, forcing a rethinking of the material. The PLA stages of problem design, solution design, solution evaluation and dispute arbitration take place over a period of time and often the class will have moved on to new materials while the latter stages are being conducted. This repetition provides reinforcement. The extended time span fosters synthesis, as students revisit prior topics at the same time they are learning new materials.

Finally, students learn from reading what their peers have written—problems, solutions, grading justifications and disputes. Message counts in our on-line system at NJIT (WebBoard) showed that students spent a lot of time reading what their peers had written.

We are greatly encouraged and excited by the results of our preliminary studies. We envision PLA becoming a major, general pedagogical tool. PLA will foster more knowledgeable students, confident and skilled in collaboration and subject-, self- and peer-assessment. We invite others to collaborate with us on developing PLA further and as test beds.

References

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