

Teaching Using Small Group Activities: Assessment of a 10 year Experiment

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Abstract

In 1992, I began teaching all my math and computer science courses by having students read the material before class and engaging them in enrichment activities in small groups during class. I continued with this "guide on the side, not sage on the stage" process until I retired in 2002. In this paper I will describe my experience and assess its effectiveness against my teaching over the preceding 30 years. The paper will include explanations of how to engage in this type of teaching and references for those who wish to try it out. The presentation will model this teaching philosophy, so those who plan to attend should have read the paper in the proceedings before the session.

Introduction

In the summer of 1992, having completed my 30th year of teaching Math and Computer Science in a traditional way by lecturing and answering questions, I attended a summer institute sponsored by Pacific Crest. During the 4 day institute, I learned about the philosophy of process education and practiced teaching using small groups of students working on guided-discovery activities. I heard faculty at the institute object vehemently to the effectiveness of this type of teaching and witnessed the facilitator, the President of Pacific Crest Corporation, vilified for suggesting that students would learn better using this "guide on the side" approach than they ever could using the traditional "sage on the stage" way of teaching. However, I could see the efficacy of process education. The next semester, I converted all my courses to reduce the amount of time spent in lecturing and increase greatly the time students worked in teams on activities.

Although it was rough in the beginning and my student evaluations were terrible, I went back to another institute the next summer and discovered what I was doing wrong. Things improved steadily from that point and I continued to use the process education approach with my teaching until I retired in 2002. In this paper I will describe this approach and how it generated much better results than what I had tried to do before 1992. I will also describe how my scholarship both before and after my retirement has been influenced by my experience with process education.

Process Education

According to (Beyerlein, 2008), process education is an educational philosophy, driven by studies of performance, that emphasizes continuous development of learning skills, the use of assessment principles, and mentoring to produce self-growth. There are several overriding principles governing the successful application of the philosophy:

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Principles governing faculty performance:

1. Faculty must fully accept responsibility for facilitating student success.
2. In a quality learning environment, facilitators of learning (teachers) focus on improving specific learning skills through timely, appropriate, and constructive interventions.
3. Mentors use specific methodologies that model the steps or activities they expect to use in achieving their own learning goals.
4. A Process Educator can continuously improve the concepts, processes, and tools used in their work by doing active observation and research in the classroom,

Principles governing student performance:

1. Every learner can learn better, regardless of current level of achievement; one's potential is not limited by current ability.
2. Although everyone requires help with learning at times, the goal is to become a capable, self-sufficient, life-long learner.
3. An empowered learner is one who uses learning processes and self-assessment to improve future performance.
4. To develop expertise in a discipline, a learner must develop a specific knowledge base in the field, but also acquire generic, life-long learning skills that relate to all disciplines. (PE Conference, 2007)

Teaching Experience

What attracted me most to process education was its emphasis on my responsibility for student learning and the insistence that every student can succeed. I was fed up with observing the better students succeeding in my courses and the weaker students failing to learn. Many of my colleagues blamed this phenomenon on the students and their work ethic and did not take any responsibility for the results. I found that when students work in small groups, with at least one superior student, one weak student and the rest average students in each group, everyone learns better. The superior students achieve a greater understanding by explaining concepts to the others, the weak students are encouraged by the smallness of the group to ask questions that would not occur to the others, thus helping explicate the material on a deeper level. The average students are forced to interact with their peers and take on roles that they would never experience in a traditional classroom. It was true that the superior students rebel at first when confronted with this process. They would claim that I was being paid to teach (i.e. lecture) to them. My answer was always a question: "Are you learning?" After a while they had to admit that they were.

In my courses the first year I ignored some of the basic principles of process education. I did not pay attention to helping the students improve their learning skills; the discovery activities focused on the content of the course exclusively. I did no assessment and did not insist that the students do any self-assessment either. As a result, a number of students simply blew off the activities. I did not assign grades for the quality of their work. It is little surprise that the early attempts were doomed to fail. After I learned the importance of assessment – one member of each team played the reflector role and had to report the strengths, areas for improvement, and insights about their work together several times during each class, and I would collect these reports at the end of class. I insisted that each team assign themselves a grade on their performance at the end of each class. If I agreed with the grade, I would double it; if not, I would let it stand. I insisted that each student keep a learning journal where they would assess their own performance after each class. I would collect these journals several times during the semester and assess randomly chosen entries.

Instead of intervening when a team was struggling with the material during class, I would try to discover what learning skills they needed to improve in order to improve their ability to understand and process the material. Under the philosophy of process education, students can always learn the course content if they have improved their learning skills enough. At the start of each semester, I spend a few classes assessing important learning skills and helping the teams develop these skills. I would emphasize that I am obsessed with learning and the goal of the class, no matter what the subject matter, is to help them improve their skills. Teamwork skills are also very important in today's work environment. I had a number of students write to me after graduation saying how well they were prepared to work in teams in their jobs. By using the learning of the content of the course as a means to improve learning skills, I helped students learn both content and process.

I never grew comfortable with this type of teaching. I found myself wondering whether I, in fact, was cheating students by not explaining everything to them – by forcing them to read the material in the textbook before class and then wrestle with problems requiring information from the reading during the class. I tried never to answer a question unless it was with another question while students were working on activities. I did set aside a period at the start of class to allow them to ask me consulting questions before I gave a quiz on the reading material. These were group quizzes and received a grade. Thus, in each class the team had a quiz grade and a class grade. My classes were very different from what the students were used to, but they often would try to convince my colleagues to conduct class the way I did. That sometimes led to strained relations, exacerbating my discomfort.

All in all, I am happy that I persisted. It is my belief that all students do learn better using these principles, and a little discomfort on my part led to big payoffs for the students. Another positive effect of this effort was the improvement of my scholarly work.

Scholarly Work

Over the last ten years, especially since I retired from teaching, I have devoted much of my scholarly writing to developing the theory and practice of process education. I wrote a paper on a process education approach to teaching Computer Science for ASCUE (Smith, 1996). I became one of the original editors for the Faculty Guidebook (Beyerlein, 2008), focusing on the Learner Performance area of facilitation and building a quality learning environment. In this role, I have written 12 of the modules (chapters) in this guidebook, and mentored other faculty authors in writing 9 other modules. It has helped me keep involved in academic life without going back to the classroom. At this point, I am so far removed from day-to-day classroom activities that I can no longer effectively write more modules. This paper is my swan song in that regard. However, I can still serve in a supporting role. I put together the proceedings for ASCUE and have taken over administration of the peer-review track for this conference. I am treasurer of the Academy of Process Educators, and webmaster of other organizations.

Conclusion

This paper has rambled somewhat, but I hope I have interested you in process education. If you wish to learn more about this philosophy of education, I encourage you to join the Academy of Process Educators (Academy, 2009). This organization is designed to support those who are committed to helping students grow their learning skills and who are ready to take responsibility for student success. The dues are \$50 per year and are included in the annual conference registration fee. This year's conference is at Gaston College in Charlotte, NC.

Another useful resource is the Faculty Guidebook I discussed above. That and other resources can be found on the Pacific Crest website (Pacific Crest, 2009). For anyone seriously considering adopting techniques developed to further the philosophy of process education in their teaching I would urge them to attend one of the teaching insti-

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tutes sponsored by Pacific Crest. A calendar of events can be found on their website. Participation in any of these organizations may well revolutionize your teaching as it did mine.

Finally, I have several syllabi on my website (Peter, 2002) with links to the activities I used in my classes. You are welcome to use any of this material.

References

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