



Socratic Method: Reflecting on How You Learn

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Context: In class; Outreach Programs

Keywords: Group activity, intellectual development, collaborative learning

Student Activity Time: 30 minutes at the beginning of the outreach program and at the end of the outreach program

Students worked through challenging engineering problems first individually, then as a group to understand the benefits of group learning.

Introducing the Reflection Activity

In an outreach program (i.e. Computer Science or Stanford Summer Engineering Academy), the educator prompted students to think about the way that they think and learn by introducing them to heuristic, cognitive, and collaborative learning and then the Socratic Method. This activity supported reflection by encouraging students to take responsibility for their learning. The purpose of this reflection activity was to support students in becoming aware of how they might approach their education which ultimately, could impact their performance as they progress through school.

At the beginning of the outreach program, the educator started off the conversation by introducing and talking about different types of thinking, such as individual thinking and collaborative thinking. The educator gave a lecture on the Socratic Method and other similar theories before students received an engineering assignment. Students were prompted to discuss their ideas on their impressions of what the various types of learning mean to them.

At the end of the discussion, the educator prompted students with an activity that asked them to individually answer a set of simple problems. This part of the reflection activity introduced students to individual learning. After the students completed the activity, the educator split the students into three groups: those who answered all of the questions correctly, those who answered about half of the questions correctly, and those who only answered one correctly. The students then repeated the exercise as a group—this part of the reflection activity introduced students to group thinking. Throughout the exercise, students were exposed to the effectiveness of collaborative learning. Afterwards, the educator facilitated a discussion on the effectiveness and importance of collaborative learning. At the end of the outreach program, the educator wrapped up the students' experience in the outreach program by coming back to the Socratic Method.

In terms of outcomes, students may come to the understanding that collaborative work can be beneficial. Students have the potential to see the various methods of learning including individual and group learning in addition to concepts such as the

Socratic Method. Students first do the reflection and activity individually and based on the results of these individual performances, the educator groups the students into performance groups: all the top performers are in one group and the lowest in another group etc. Ninety percent of the time the lowest and middle performers catch up with the high performers, so it strengthens the reflective and the collaborative learning methods in creating engaged learning, but it also shows them that the process has optimal learning potential for the least performing students in the group. Most importantly, it lets them reflect on the fact that there are times when you need to do individual deep dives in learning and other times when the collaborative learning method is more optimal and at times they are sequential and linear, you go deep first and then move to the collaborative learning method.

Recreating the Reflection Activity

	Description
1	Facilitate a conversation on the Socratic Method.
2	Distribute the engineering problem worksheet and have students work through the sheet individually.
3	Separate students into groups based on their performance on the worksheet.
4	Have students re-work the worksheet in groups.
5	Facilitate a discussion about the effectiveness of collaborative work.

In the words of the Educator: Tips and Inspiration

Don't stay stagnant. Try to always come up with fresh and new examples or new takes on an old thing. You're always challenged in terms of how you present it to a changing population.

Use mixed mediums. Sometimes I go to the board and go back to basics. Sometimes I teach from PowerPoint slides because in PowerPoint you can give a lot of information but there is no time for taking it all in. And you can't stop, so when I switch to board work, then that tends to switch the dynamics of the lecture and the interaction and the engagement.

Keep a level of energy. I don't feel comfortable when it's all quiet and I can't read their eyes and can't get some kind of expression. I'm not that kind of lecturer, I will adjust in mid-stream if I can't get people's attention.

What was the inspiration for the reflection activity? I was trying to get them to think under uncertainty, so I wanted them to figure out, how do you deal with these challenges, how do you continually continue to be passionate about learning and how do you continue to try to find insight so that they can move on and engage. And so, I also wanted to add because we are so – at Stanford things are either fuzzy or techy, and I wanted to add the fuzziness back into it.