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2020

Reflections on Implementing Active Learning Techniques in a Large Lecture

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Recommended Citation

anderson, elisabeth, "Reflections on Implementing Active Learning Techniques in a Large Lecture" (2020).
Q2S Enhancing Pedagogy. 90.
<https://scholarworks.lib.csusb.edu/q2sep/90>

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1E: Practice & Reflect I – Planning an Effective Class Session

In this first module on engaging learners we explored ways to plan out a class session to engage students in the learning process.

Last week I used several of techniques in this module in my lecture on Scientific Method. I began the class with a talk about vaccinations and how they can be a controversial topic. I told them today we were going to focus only on the flu vaccine. A quick poll of the class produced the expected result that most of them do not get flu shots. I shared statistics on how many people died and were hospitalized by the flu in the 2017-2018 flu season. These numbers were surprising to most because many think of the flu as a more serious cold. This engagement trigger was a good way to get the class wondering how this was going to tie in with the days lesson.

I gave the class several minutes to talk with their peers and come up with a list of everything they know about the flu vaccine. We created a class list of their thoughts and knowledge of the flu vaccine. I then moved into my lecture on the scientific method, the first step of which is making observations which they just did about the flu vaccine. I talked about asking questions based on their observations and forming a hypothesis. We went back to our list of observations and chose one to form a hypothesis. Again we took a few minutes for a think-pair-share to form a hypothesis. Once we had an agreed upon hypothesis I continued my lecture on the experiment process. The class then broke into their groups again to design an experiment to test the class hypothesis. They were instructed to write out their hypothesis on a blank sheet of paper. After the allotted time I asked them to exchange papers with a neighboring group and critique the experiment. Some students shared with the class what type of modifications they suggest to the experiment. Other students shared their basic experimental design. This lesson worked well for strategically placed active learning activities.

I closed the class by creating a flow chart of the scientific method so they had a visual of the process.

Lessons on the scientific method are a great way to get student thinking critically. I feel like overall this was a very successful lesson. Students were engaged and thinking rather than passively listening and maybe jotting down everything I said. By working with their peers, students that may have checked out mentally from a traditional lecture were now thinking about the material because they enjoy the social aspect of this type of assignment.

There were students that have not yet become comfortable with participating in this kind of exercise. I will continue to walk around the room and when I find a student that seems unengaged start asking them questions and asking the questions of the students around them as if I assume they are part of the same group. This can serve as an icebreaker for those students without the embarrassment of knowing I am making them do icebreakers.

I will continue to use these techniques as the level of student engagement was high. I had several students stopping me as I walked around the room during group work times asking questions about the lack of specificity in our hypothesis, what are my thoughts on the flu vaccine, and their thoughts on how we could test things. I would like to modify the "share" part of it so students do not become so comfortable with their neighbors that it becomes complete social time when I ask them to talk to their neighbors.

Elisabeth, Your reflection for module 1E is complete. It sounds as if you got your class engaged from the get-go when you introduced the question of flu shots. You then went on to have several interactive aspects of the class. Nice job!

3B: Practice & Reflect I – Using Active Learning Techniques in Large Classes

This week I worked with the active learning cycle and focused on providing cues to keep students on task. We have been studying the cell cycle in class and have gone over mitosis. This week we worked on meiosis, which is very similar but has some vital differences. I started class having students discuss in small groups the importance of the process of meiosis being performed accurately (concept introduction). I posted the topic on the projector and told students they had 5 minutes to discuss with their neighbors. During the 5 minutes I circulated around the room and listened to student discussions.

At the end of the 5 minute period I shared with the class some of the ideas I heard as I walked around the room. This led into my mini-lecture on meiosis and why the process must be done accurately (inaccurate chromosome numbers in humans leads to death or serious health conditions like Down Syndrome). This concept introduction provided students with key terms necessary to understand the topic and with common learning pitfalls students experience. I shared verbally the major difference between mitosis and meiosis and related the process of meiosis to making a baby.

For the concept application portion (majority of the class period) I had students work in groups to draw the cell at each phase of the cell cycle. I drew the beginning cell on the projector, listed the 10 steps they should have drawn out at the end of the process, and warned them that many online drawings of the process will leave out most of the steps so they would need to fill in the blanks. I also explained to the students that processes like this are easy for students to copy off the board, but leads to a lack of understanding of the process. In my experience, the best way to understand something this abstract is to work through it. I set the students free to work and circulated around the room, stopping at many of the groups to ask them why they had drawn what they did or why they started with 4 chromosomes, but in step 2 they only had two chromosomes. This helps students see the difference between homologous chromosomes and sister chromatids, and to see that sister chromatids are formed during the DNA replication phase of interphase. After making a full circuit around the room I went back to my tablet and had the class describe to me how to draw the second step in the process. Anybody that was on the wrong track was now redirected to the right place.

When the allotted time was up I handed off my tablet (which is connected wirelessly to the projector) to one of the students. I asked them to complete the drawing for the next step. Once they had drawn it I asked the class if they would make any changes. The student was then instructed to pass the tablet to somebody else to complete the next step. This continued to complete all of the steps in the process. Some students were right on target, whereas others had misconceptions that needed correcting. The corrections were made in real time by their classmates. I found this effective not only because misconceptions were cleared up in real-time, but because it forced students to analyze their classmates' ideas and have the confidence to suggest corrections.

Some students were hesitant to draw for the class, but the relative anonymity of sitting at their desk drawing on the tablet made it less painful than coming to the white board at the front of the room. Some students also needed prodding to work on the assignment during active learning time because they are used to being passive learners so I believe it makes them a bit uncomfortable to have to figure things out.

Overall a very effective lesson with students excited to work through the problem.

Elisabeth, Your reflection for module 3B is complete. I love how active the students were in the lesson here. Students were allowed to make mistakes and they learned from each other. Great!

3E: Practice & Reflect I – Planning and Facilitating Effective Class Discussions

I choose to launch conversations using the sentence completion activity. In our unit on Genetics there are many ethical questions that can be considered. One of these questions is whether you would have genetic testing done prior to having children. I began the discussion with the sentence prompt: If I were offered a test to determine if I have any genes that I could pass along to my children that might cause diseases I would _____.

Students were given 3 minutes to gather their thoughts and complete the sentence. They then formed small groups to discuss their thoughts on the matter. During this time period I circulated throughout the room to hear what thoughts the students were having. This allowed me to prepare ahead of time for what might be said in the whole class discussion and think of ways to direct the conversation in a meaningful and impactful direction. After the small group discussions we reconvened as a class for a large discussion. Students were instructed that they would be allowed one opportunity to speak as there are over 200 other students in the room that need an opportunity.

Of course the first students to speak were the ones that always participate, but this opened up discussion and gave others a little extra confidence that other people agreed with them and they were not ridiculed publically. I did need to allow pause times to allow students to build up the courage to share their opinions. I refrained from talking very much the discussion other than to interject with enthusiasm that something was a good point or that there are a lot of people that feel that same way or that different personalities would do different things with the information gained by the genetic testing so people really need to understand themselves before they opt to obtain the information.

I think the biggest challenge was that my talkers wanted to keep sharing when someone else made a comment. I kept them seeing the fun in only being allowed to speak once by saying things like "I know!!! There are so many thoughts in my head too. So hard to keep them all in!!!".

Overall it was great to see different students participating and see the passion about a subject from students that always seem so timid (which sometimes appears as disinterested).

I will continue using this technique in the future and maybe next time try creating a visual on the board listing arguments for and arguments against the topic. This may encourage additional students to participate as they will have a visual reminder of what other people have said. I would also like to try assigning each side of the room a position on the topic and having them make the argument even if they personally disagree with that position.

Elisabeth, Your reflection for module 3E is complete. I loved your sentence completion. Very thought-provoking. It sounds as if the students also had a lot to say about it. Nice job!

ACUE Reader , Feb 20 at 12:36pm