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Course: BMED 3600 Physiology of Cellular and Molecular Systems
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Lesson: Stem Cells
Date: 11/09/2020

Class Analysis

The purpose of this paper is to analyze and reflect on my teaching experience with feedback from my CTL capstone peers, a CTL Graduate Teaching Fellow, Dr. Platt, and the students.

Background. The main learning objectives for this lesson were to: 1) understand cell division and differentiation, 2) describe the roles of stem cells in the human body, and 3) describe stem cell applications. All sub-objectives were discussed during class and multiple activities were conducted throughout to introduce topics, encourage interaction, check learning, and gauge prior knowledge. I developed four dropdown response questions and four free response practice problems for the students to complete as a formative assessment, and solutions were provided in the form of text (appearing directly after the completion of the questions). Quiz questions were administered in a summative assessment on Monday, 11/16/20.

After the lesson, 27 students completed an online feedback form and gave answers on 1) what did the instructor do to help you learn, 2) what changes could the instructor make to improve your learning, and 3) is there anything else you would like us to know? I also received written comments from a CTL T2T capstone peer and a CTL Graduate Teaching Fellow.

Learning Objective 1. The students came away with an understanding of cell division and differentiation. This lesson objective was in large part a review of a previous lecture on the cell cycle, and the students were able to show a good understanding of the purpose of cell division in an early word cloud activity. The students answered summative questions on this topic with a correct response rate of 98%, indicating successful learning of this objective.

Learning Objective 2. The students were able to successfully describe the role of stem cells in the human body. Multiple formative assessments throughout the lecture showed student improvement at recognizing cell potency levels, and a word cloud question showed understanding of the unique properties of stem cells. The students asked thoughtful questions on the role of stem cells during a quiz review, which indicated that they had grasped many of the basic concepts we discussed in class. The students answered summative questions on this topic with a correct response rate averaging 97% (although only 85% answered all three correctly), indicating successful learning of this objective.

Learning Objective 3. The students were also able to describe stem cell applications. A word cloud activity showed many tissue engineering applications of stem cells, but I followed up that discussion with examples that they had not included, such as drug testing and "lab-grown meat." We reviewed and discussed stem cell applications during an exam review session, but no summative questions on this objective were selected for the quiz.

Positive Feedback (Sustain).

After the feedback from my previous lecture, I decided to increase the number of interactive components throughout the class. I conducted seven TurningPoint activities including three word clouds and four multiple choice questions. Almost all responses from students who completed the feedback forms mentioned that they appreciated the interactive activities. The word clouds facilitated the introduction of new topics throughout the lesson, and I had a high amount of participation. The multiple choice questions were great for catching misconceptions among the students. For two of the questions, a majority of students answered incorrectly and I was able to take the time to explain the concepts and improve their understanding.

Compared to my first formal lecture, many more students felt the pace of this class was more appropriate. A few mentioned that they appreciated the built-in checkpoints, where I used a summary slide to ask for questions at that point and showed the topics that had been discussed. They felt the momentary pause was useful if only to pause and allow them to "absorb the information." I cut back on content in favor of adding more interactive content and opportunities for questions and discussion, and the students seemed to respond positively. A small number felt the content was more "shallow" than usual, but another few said the pace was still too fast. The vast majority of comments about pace were positive, so I will aim to continue this balance of content.

A couple of the students and my observers thought the presentation of current research applications was beneficial to the students. I will aim to connect course content to current research whenever possible, as this provides context and inspiration for the students.

Negative Feedback (Improve).

I experienced some technical difficulties while conducting the TurningPoint questions that I must work out. This proved less impactful than I had assumed, because the difficulties were primarily on my side and the students were still able to interact fully with the activities (although I did not know this until the end of the lecture). Next time, I will need to better familiarize myself with the technology and take more time to rehearse.

Most of the TurningPoint questions were set to show "live" results, and the students' answers would appear as soon as they were submitted. An observer noted that I should be careful when applying this method, as the students can assume a herd mentality and change their answers when they see how their peers respond. This seemed to happen twice, but both times the "herd" answer was actually incorrect, and I was able to address this. If it had been correct though, it might have hid student misconceptions and led me to believe they had successfully understood the material.

Lastly, I was using a second monitor to present my slides and it was clear from the video stream that I was not looking towards my webcam. To maximize a sense of engagement with the class, I should be sure to show my slides on the monitor with the webcam.