

An Innovative Approach to Teaching the History of Physiology

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ABSTRACT:

Physiology and Disease students at the Illinois Mathematics and Science Academy in Aurora employ inquiry driven activities to improve their understanding and articulation of the discipline. After covering the major physiological concepts for the semester, a novel assessment has been introduced as the final project in the class to help integrate the concepts and promote student creativity and learning. Students are asked to create and present several skits on the history of physiology for specific time periods ranging from times before Christ to the 21st century.

INTRODUCTION:

- Students take responsibility for their own learning by designing and writing screenplays outlining the history of physiology during various time periods and presenting them in class in the form of skits.
- Students are required to divide the screenplay into different scenes, each scene representing development of a specific disease or achievements of a specific scientist, such as the work of Landsteiner, Huxley, etc..
- The goal of these activities is to help students better research, understand and articulate their understanding of the history of physiology on assessments, while simultaneously exhibiting their creativity and passion.

MATERIALS AND METHODS:

- Students submitted a written script for their final project before performing it.
- Students were required to devise questions for an interactive game like jeopardy with their audience for at least 20 min after presenting their skits.
- Students were given free range to portray the characters in their presentation in any manner they wished,
- Students gave the audience a quiz at the end of their game.
- Students wrote a formative on their presentations.

Figures 1 and 2 represent student work and Fig 3 shows student survey comments.

RESULTS :

- Student understanding of the history of physiology seemed to be enhanced as evidenced by student surveys (Figure 3).
- Student scripts (Fig 1) and games (Fig 2) were well received by their peers who had many questions to ask of the presenters.

SCENE 2

[Scene changes to an operating room, where Surgeon is speaking with Frank and Harold. Harold is another man who is willing to donate his healthy kidney to Frank.]

SURGEON: So Harold, I understand you're willing to lend a hand—or a kidney—to help Frank out?

HAROLD: Yes, sir. What needs to be done?

SURGEON: The first step is to check that you two have compatibility, meaning Frank's body won't react badly to your parts.

HAROLD: Alright. How do we do that?

SURGEON: Skin grafts.

FRANK: Alright, let's do it.

[Surgeon, Frank, and Harold do the skin graft and wait a few seconds to check Frank's body's reaction.]

Figure 1: An excerpt from a 20th century student script



Figure 2: Some examples of interactive student games played by students with their audience

1. "I absolutely loved this assignment. I understood the history of physiology so much better because of what I had to write. At first I thought it was a drag but it actually helped me learn how physiology progressed through the ages."
2. "Oh My God! I never thought that the history of anything let alone physiology could be so interesting! I actually learned something."
3. "I very much liked the free range of creativity that I was allowed for this assignment. I even played my clarinet to illustrate a point and the teacher encouraged me!"
4. "I wish all classes allowed us to interact with our peers in this way, it was fun creating the interactive game and writing the acts of the play and even more fun acting them out!"
5. "Awesome assignment! I loved the freedom to create while researching actual facts. Helped me learn a lot."

Figure 3: Student survey results from this assessment

DISCUSSION:

- Students seemed to gain a better understanding of the history of physiology through continual reflection and writing of their understanding.
- Student surveys indicated that students enjoyed studying better through hands on experiences and liked being creative in completing their assignments.
- Since it was observed that more time spent on creative assessments seems to be well received by students, there are plans in place to assess student performance in this unit through assessments and correlate these scores with student understanding. This in turn will help create more opportunities for student understanding.