

Initial Assessments of E-Learning Modules in Cytotechnology Education

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ABSTRACT

Background: Nine E-learning modules (ELMs) were developed in our program using Articulate software. This study assessed our cytotechnology (CT) students' perceptions on the content of the ELMs, and the perceived influence of the ELMs on students' performance during clinical rotations.

Methods: All CT students watched nine ELMs before the related classroom lecture and group discussion. Following that, students completed nine preclinical rotation surveys. After their clinical rotations, students completed nine postclinical rotation surveys.

Results: Statements on the content of the ELMs regarding the quality of the video and audio, duration, navigation, and the materials presented, received positive responses from the majority of the students. While there were a few disagreements and neutral responses, most of the students responded positively saying that the ELMs better prepared them for their role, as well as helped them to better perform their roles during the clinical rotation. The majority of the students recommended developing more ELMs for cytology courses in the future.

Conclusions: This study has given hope that the ELMs have potential to enhance our online curriculum and benefit students, within the United States and internationally, who have no easy access to cytology clinical laboratories for hands-on training.

INTRODUCTION

The cytotechnology (CT) education program at our institution is currently the only program in the nation that offers synchronous distance education, serving three satellite sites.

Responding to the demands from potential online students for asynchronous training within the US and internationally, the feasibility of a complete online curriculum using virtual microscopy (VM) was assessed in our program.¹ The results indicated that the students were able to learn cytomorphology using VM and apply their learning to screening glass slides, providing assurance that CT students can be trained online to accurately screen glass slides.

However, currently there is a need for the online CT students trained using VM to have additional in-person training in a cytology laboratory to observe and learn the hands-on techniques such as cytology specimen preparation, FNA, and ROSE.

The long-term goal of our CT program is to reduce or eliminate this need for additional in-person training in the cytology laboratory by adding E-learning modules (ELMs) to our current online curriculum. Therefore, ELMs that demonstrated hands-on techniques in cytology were developed. This study was a first step toward thorough evaluation of these ELMs.

The main purpose of the present study was to assess our CT students' perceptions of the ELMs that were developed by our CT program.

METHODS

E-learning modules	Number of Specific learning objectives	Number of video clips	Number of Self-assessment questions	Duration in minutes/seconds
Initial Handling	1	1	2	2:56
Centrifugation	1	1	3	2:14
Cyto-centrifugation	1	1	2	3:49
Papanicolaou Staining	1	1	4	4:09
Diff-Quick Staining	1	1	2	1:53
Coverslipping Technique	1	1	2	1:59
Fine Needle Aspiration Technique	4	5	7	12:23
Rapid On-Site Evaluation	3	6	9	8:52
Tele-cytology	5	5	13	10:00

Table 1: E-learning module components



Figure 1: A screenshot of one of the E-learning modules

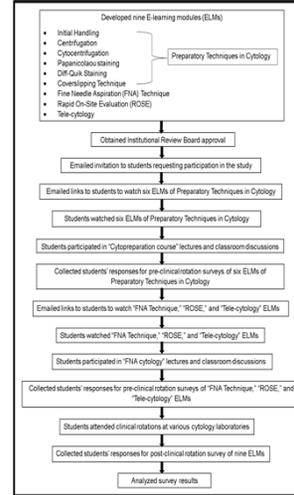


Figure 2: A summarized version of the methodology

DISCUSSION

The majority of the CT students in our program had positive responses regarding the content of the ELMs and believed that ELMs prepared them as well as helped them to better perform their role during the clinical rotations.

Some of the comments for the ELMs were:

- "I had a great understanding of what I would be needed for during an FNA procedure so I was prepared to do FNA during my rotation without much extra training"
- "The ELM gave me an understanding of why the Pap Stain is done and how it is done"
- "After watching the ELMs, during discussion I feel like I am better able to participate"
- "Exposure to the campus institution's protocols via ELMs is probably most beneficial to the distance students since they get to see two perspectives on the same technique"
- "I find the ELMs very helpful"
- "I thought the ELMs were a great way to introduce topics without having to get together for lectures"

In the future, we have decided to use the facilities in the E-learning laboratory at our institution to develop more ELMs. In those, we plan to include an introduction slide narrating the duration, computer compatibility requirements, and demonstrating the navigation of the ELMs. We also plan to include more interactive self-assessment exercises in the ELMs.

RESULTS

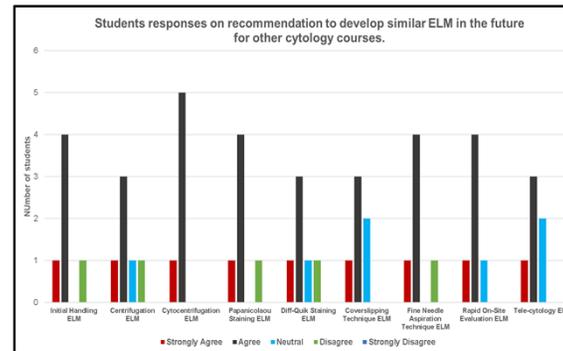


Figure 3: Students responses (n=6) on recommendation of developing E-modules in future for other cytology courses.

CONCLUSION

- This study has given hope that the ELMs have potential to enhance our online curriculum and benefit the students, not only within the US but also internationally, who have no easy access to cytology clinical laboratories for hands-on training.
- With the suggestions for improvement and positive comments given from the students who participated in this study, we plan to develop more cytology ELMs.

REFERENCES

Donnelly, A. D., Mukherjee, M. S., Lyden, E. R., & Radio, S. J. (2015). Online education in cytotechnology programs: A pilot study. *Journal of the American Society of Cytopathology*. DOI: 10.1016/j.jasc.2016.02.001

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