“Meet the Expert Interviews,” an Integrative Learning Experience for Microbiology and Anatomy & Physiology Undergraduate Students†

Barbara D. Davis‡, Mary Flannery, Marty Lowe, and Jeannie S. Payne
Bergen Community College, Paramus, NJ 07652

INTRODUCTION

Integrative learning occurs when students make connections between academic disciplines and complex, real-world problems by applying knowledge and skills to new situations. One goal of higher education is for students to be able to integrate or connect concepts learned in different courses. “Meet the Expert Interviews” is one in a series of outreach projects designed to integrate the biological disciplines and illustrate the relationship of class material to off-campus settings (2). This project created the opportunity for students to read current scientific literature and interview authors, thus incorporating their learning via outreach to professionals and encouraging students to make connections with complex, real-world problems. Students explored Shiga-toxin–producing E. coli (STEC) outbreaks and applied knowledge to conduct interviews with authors.

We hypothesized that this project would allow for enhanced understanding of STEC pathology, transmission, diagnosis, treatment, and epidemiology. We anticipated that student connections with the clinical microbiologist and authors of STEC research papers would enhance understanding of their professional roles.

This article is intended for microbiology and biology undergraduate educators and can be useful in a classroom or laboratory.

PROCEDURE

One Anatomy and Physiology (A&P) and three Microbiology professors participated in the project over three semesters. The faculty selected the STEC theme, Echo360 capture recording technology and invited authors of STEC scientific literature to be interviewed.

The introductory STEC seminars covered basic microbiology, E. coli pathogens, microbial aspects of the German STEC E. coli O104:H4 outbreak, pathophysiology, laboratory diagnosis, and STEC public health implications. Faculty, a visiting professor, and a clinical microbiologist conducted the seminars.

Students were introduced to the STEC research papers and asked to read, analyze, and create questions for the author. A faculty committee chose questions using a rubric. Selected students were invited to interview authors of the following papers: fall 2011 – “Epidemic profile of Shiga-toxin–producing Escherichia coli O104:H4 outbreak in Germany” (3); fall 2012 – “Long term risk for hypertension, renal impairment, and cardiovascular disease after gastroenteritis from drinking water contaminated with Escherichia coli O157:H7: a prospective cohort study” (1); spring 2013 – “A novel vehicle for transmission of Escherichia coli O157:H7 to humans: multistate outbreak of E. coli O157:H7 infections associated with consumption of ready-to-bake commercial prepackaged cookie dough – United States, 2009” (4).

Interviews were conducted via telephone conference calls twice and once using Adobe Connect Pro. The interviews were recorded and made available to all students. Echo360 recording technology failed in one interview and was replaced immediately by videotape.

Qualitative student surveys were conducted at the end of each semester to assess student perceptions of “Meet the Expert Interviews.” A total of 129 students responded to the surveys.

Results of the student opinion surveys about the “Meet the Expert Interviews” were very positive and are described in Figures 1, 2, and 3.

Between 92 and 98% of the students (n = 48) in fall 2011 agreed or strongly agreed that the seminar enhanced their understanding of E. coli pathology, transmission, diagnosis, and treatment and 94% agreed or strongly agreed that the interview increased their understanding of epidemiology and determining the cause of an outbreak. Similar positive results were observed for these questions in fall 2012 (83–90%, n = 49) and spring 2013 (81–97%, n = 32). Fall 2012 data does not include a question on pathology.

Additionally, for 2011 and 2012, the majority of students (100% and 87% respectively) responded that the interview made them more aware of the role of clinical microbiologists and epidemiologists in outbreaks.

‡Corresponding author. Mailing address: Bergen Community College, 400 Paramus Road, Paramus, NJ 07652. Phone: 201-612-5558. Fax: 201-612-3876. E-mail: bdavis@bergen.edu.
†Supplemental materials available at http://jmbbe.asm.org
CONCLUSION

Technology is available to easily bring experts into the classroom and interviewing authors creates a personal and relevant student experience. “Meet the Expert Interviews” were well received by both A&P and Microbiology students and faculty. The project stimulated interest in scientific literature and required additional research to fully comprehend the papers. Students integrated learning from different sources to understand the interconnections between the disciplines and actual situations.

An English Basic Skills class was invited to participate in the spring 2013 interview as part of a Science Literacy pilot program. This interdisciplinary approach will be considered for future research projects.
This project transferred the learning process to new, off-campus situations and provided students with the opportunity to address real-world problems. “Meet the Expert Interviews” required extensive faculty and support staff planning and outreach but was very successful and will be used in future semesters.

SUPPLEMENTAL MATERIALS

Appendix 1: Tips on how to coordinate “Meet the Expert Interviews”
Appendix 2: Rubric for selection of student questions for authors
Appendix 3: “Meet the Expert Interviews”: student survey questions

ACKNOWLEDGMENTS

This paper was presented as a poster session at the 2013 ASM General Meeting. We gratefully acknowledge the support of the Departments of Biology and Horticulture, Media Technologies and CITL, as well as Professor Don Reilly, BCC, Dr. Yvonne Lue, and Professor Tammy Atchison, Pitt Community College, NC. The authors declare that there are no conflicts of interest.

REFERENCES

1. Clark, W. F., et al. 2010. Long term risk for hypertension, renal impairment, and cardiovascular disease after gastroenteritis from drinking water contaminated with Escherichia coli O157:H7: a prospective cohort study. Br. Med. J. 341(7782):1089.

2. Davis, B. D., M. Flannery, and J. Payne. 2012. A webinar case study by a clinical microbiologist to microbiology and physiology students: an integrative learning experience. J. Microbiol. Biol. Educ. 13:91–93.

3. Frank, C., et al. 2011. Epidemic profile of Shiga-toxin–producing Escherichia coli O104:H4 outbreak in Germany. N. Engl. J. Med. 365(19):1771–1780.

4. Neil, K. P., et al. 2012. A novel vehicle for transmission of Escherichia coli O157:H7 to humans: multistate outbreak of E. coli O157:H7 infections associated with consumption of ready-to-bake commercial prepackaged cookie dough – United States, 2009. Clin. Infect. Dis. 54(4):511.