JOURNAL OF MICROBIOLOGY & BIOLOGY EDUCATION, May 2016, p. 286-287
DOI: http://dx.doi.org/10.1128/jmbe.v17i2.1058

Science Sound Bites, a Podcast for STEM Curriculum Supplementation †

Michael D. L. Johnson* and Kate A. Ayers
St. Jude Children's Research Hospital, Memphis, TN 38105

INTRODUCTION

Classroom learning occurs in a variety of ways. One method in which students learn is through firsthand accounts from experts in the field. Although this method is known to be effective, experts are not always readily available for classroom visits, either in person or via online services such as Skype or Google Hangouts (1). An alternative to in-class visits involves the use of technology in the form of general science podcasts, which are known to be a beneficial and enjoyed form of scientific communication in the classroom (3, 4). Students' comments reveal that podcasts make the presented lesson more "fun" and are effective because the "novelty" of the medium increases motivation to learn (2). However, there is a lack of scientific podcasts that specifically address students in middle school and high school. This gap is even more apparent at the intersection of science, technology, engineering, and mathematics (STEM) education and the primary source of biomedical research.

The goal of the *Science Sound Bites* podcast is to fill a niche of scientist-interviewing-scientist programming that specifically targets middle school and high school STEM students, thus giving teachers an extra tool to engage their STEM students. Although the aforementioned audience was the initial target, the current listening audience has grown to include parents and a wider range of students, from late elementary school through college level. Each episode consists of a casual chat with a scientist that provides real-world applications of current STEM lessons, creates talking points in class by reinforcing STEM vocabulary, and supplements communal STEM understanding. Additionally, these interviews benefit the scientists interviewed by challenging them to deliver their message in a clear and concise way to the public.

Since inception, the episodes produced have featured a range of doctorate level individuals, including postdoctoral fellows, principal investigators, and CEOs and directors of institutes such as St. Jude Children's Research Hospital and the National Institutes of Health (Appendix 1). Topics have been diverse and have covered concepts such as cancer biology ("Traffic on Cancer Avenue" and "Crystal Clear"), infectious diseases ("Keeping Bacteria Out of Line" and "Dueling Bacteria"), plant biology and beneficial microbes in the soil ("Mean, Green, Timekeeping, and Energy Making Machine" and "Don't Eat Me Bro"), mathematical models of biology ("Knocking Infections off the Catwalk with Mathematical Models"), drug metabolism ("All Star Catcher for the Body"), and more (Appendix 1).

One new podcast episode is released on the first of every month, with additional episodes released for special occasions. Interviews are conducted at St. Jude Children's Research Hospital or at scientific meetings, where the interviews are conducted during built-in social or networking times. Episodes are recorded and edited on a standard laptop computer using the free and open-source recording and editing program Audacity (http://audacityteam.org/). Processing for each episode takes approximately one hour.

PROCEDURE

Science Sound Bites podcasts can be used in a variety of ways. The episodes are intentionally kept to roughly 20 minutes in length in order to be easily integrated into lesson plans.

1. Each *Science Sound Bites* episode can be freely accessed from the St. Jude school outreach program website, at www.cure4kids.org/ums/sites/teachers/plugins/page.php?id=19.
   a. Files can be streamed or downloaded in mp3 format from the website.
   b. A list of keywords is given for each episode, and information about the interviewee can be found by clicking their name.
2. Listed keywords from the interviews make it easy for teachers to search for appropriate episodes to integrate into their lesson plan and supplement classroom study of STEM subjects. Keywords can be shared with students before each lesson to aid comprehension.
3. Supplemental material is provided with many episodes. This information can serve as an extra

*Corresponding author. Mailing address: St Jude Children's Research Hospital, 262 Danny Thomas Place, Memphis, TN 38105. Phone: 901-595-5753 E-mail: michaeldl.johnson@stjude.org.
†Supplemental materials available at http://asmscience.org/jmbe

tool to reinforce concepts from the podcast and in teachers' own lesson plans. These additional visuals are in the episode frame at the link above (such as the Hallmarks of Cancer link found with "Traffic on Cancer Avenue"), or in PowerPoint files that can be found at www.tinyurl.com/ssbpodcast. These additional resources, in conjunction with the keywords, can be used to generate discussion points about the episode.

4. Outside of middle and high school curriculum supplementation, other applications include, but are not limited to, college courses, family listening, homeschooling, science clubs, afterschool programs, material for STEM substitute teachers, and learning English language arts in the context of science.
5. Suggestions for subject areas to cover, which are proposed via social media or email, have been used and implemented in the podcast.

CONCLUSION

Currently, there are podcasts that break down or speak to scientific concepts (i.e., *Science* magazine podcast, *Everyday Einstein*), or that give ideas to fuse STEM into classrooms (*STEM Everyday*), but very few (*Ask A Biologist*) that go in depth with a specific researcher's science while maintaining layman's terms and keeping middle and high school students in mind. *Science Sound Bites* is designed to bridge the gap between researcher and general public, but specifically students, while providing expert accounts as extensions of current middle and high school STEM curriculum concepts.

SUPPLEMENTAL MATERIALS

Appendix 1: List of *Science Sound Bites* podcast episodes

ACKNOWLEDGMENTS

The authors declare that there are no conflicts of interest.

REFERENCES

1. **Davis, B. D., M. Flannery, M. Lowe, and J. S. Payne.** 2014. "Meet the expert interviews," an integrative learning experience for microbiology and anatomy & physiology undergraduate students. J. Microbiol. Biol. Educ. **15**:33–35.
2. **de Winter, J., M. Winterbottom, and E. Wilson.** 2010. Developing a user guide to integrating new technologies in science teaching and learning: teachers' and pupils' perceptions of their affordances. Technol. Pedagogy Educ. **19**:216–267.
3. **Lettini, S. E.** 2014. Using ASM podcasts to excite undergraduate students about current microbiological research. J. Microbiol. Biol. Educ. **15:**330–331.
4. **Vatovec, C., and T. Balser.** 2009. Podcasts as tools in introductory environmental studies. J. Microbiol. Biol. Educ. **10**:19–24.