Diversity and inclusivity efforts in course design involve promoting and the work of scientists from underrepresented groups in science among students from a variety of diverse backgrounds. However, STEM education can face barriers in the design and implementation of these activities due to faculty time, constraints on course material, external concerns about academic rigor, and difficulties in linking course topics to diversity elements. In this paper, we explore the use of the Scientist Spotlight and Data Nugget Faculty Mentoring Network, a QUBES project dedicated to designing teaching activities that focus on quantitative skill development through highlighting the work of scientists from underrepresented groups. The activities present an opportunity for students to use podcasts or written/video interviews to interact with scientists using the framework of quantitative reasoning and the shared experiences of their science, work. Here, we share best practices on curricular and pedagogical implementation strategies that can cover the overarching goals of designing activities that promote student quantitative skill development and highlighting the work of scientists from underrepresented groups. Integrating diverse scientists perspectives into creativity in teaching materials. This creativity emerges from diversity, and that the voices of scientists from diverse backgrounds are realized only through inclusion of these best practices in a teaching environment. A critical part of including diverse voices are also our efforts to expand to the desires of students in STEM. Our work in this paper allows us to draw some best practices that we can use to design and develop science-based learning activities that help to create an inclusive environment with whom we teach, mentor or work in our discipline.

Introduction

The BioSkills guide, a nationally validated resource based on the Vision and Change curriculum recommendations for undergraduate biology education, provides educators with a list of core competencies that can be used to structure course design (Clemmons et al. 2020). The ability to use quantitative reasoning is a major component outlined by this framework. The use of a BioSkills guide is focused on diversity and inclusion through the concept of underrepresented groups in STEM (Dawber 2019). Specifically, including representation of underrepresented groups into STEM education can promote more inclusive and equitable learning environments (Able 2003). Lack of representation of diverse scientists, intentional or unintentional, in popular media (Tanner 2009), curriculum materials and faculty (National Science Foundation 2013), and within classrooms (Cheyran 2009) can impact student views on the types of people who become scientists and how they conduct the process of science. Course design with the BioSkills Guide and Science and Society competencies can help to address the lack of representation of diverse scientists present in many biology courses and STEM (Schinske 2014). Dawber et al (2019) have shown that these efforts may actually promote student success and student engagement in science courses. The use of STEM metrics in science teaching counteracts science-based learning outcomes within introductory courses has been shown to be positively important student stereotypes of scientists and promote identity (Schinske 2016). Scientists Spotlight activities have been used to blend inclusive teaching practices with course content coverage (Schinske 2016), successfully aligning the omnipresent teaching of core concepts into a single assignment. We designed a framework that can be used by faculty to develop a scientific and societal component of their courses that pertain to the same skill development activities, such as reading primary literature and interacting with scientists. This can be achieved by using the use of a bioinformatics (McTaggert 2018), faculty can base these activities to support the student learning experience and focus on the representation of diverse scientists in STEM. Specifically, using teaching strategies that can promote student persistence and success in the course. An emphasis on the importance of the scientist’s role in society and the way that science is conducted in the classroom helps to build a bridge between students and the wider scientific community. By fostering this type of engagement, the use of scientific careers can be used to connect to the concept of the science. This results in an increased awareness of the role of diversity within the scientific community and the importance of scientists from underrepresented groups to society. This allows students to see the diversity within the scientific community and the importance of scientists from underrepresented groups to society.

Figure 2. Development of the Scientist Spotlight and Data Nugget assignment design begins with using backwards design to develop learning outcomes associated with the core competencies from the BioSkills Guide. Multiple steps are outlined to ensure that the assignment is achievable for students to complete during the course term. Each step in the designing process builds on the previous step, allowing for a clear understanding of how the assignment can be developed and presented to the students in the course. The assignment begins with the development of the assignment through the design of the BioSkills Core Competencies. This is followed by the development of the assignment through the definition of the assignment, which is then followed by the development of the assignment through the definition of the assignment. The final stage in the design process is the definition of the assignment through the definition of the assignment. The assignment is then completed through the development of the assignment through the definition of the assignment. This process results in a clear understanding of the assignment and the ability to develop the assignment in a clear and concise manner.

Figure 3. Recommendations for selecting appropriate candidates for the Scientist Spotlight portion of the assignment. Scientists from underrepresented groups may have many demands upon their time and their bandwidth may be limited for participation in diversity and inclusion activities. A mindful approach to selecting scientists involves being aware of the time and emotional costs associated with participation. As such, it is recommended that candidates in the assignment be given the chance to complete the project of the assignment.

Scientific Interviews can be Conducted in a Variety of Formats to Facilitate Flexibility in Finalizing the Assignment


References