ABSTRACT

Little literature on grant writing courses/assignments in undergraduate education exists. To gather data and best practices, a semester long undergraduate grant writing assignment was developed as an introduction to the grant writing process. This assignment was tested in both a seven-week advanced biochemistry laboratory setting and semester long advanced biochemistry lecture course. The goal of the assignment was to progress student learning from passive to active engagement as the students developed their own solutions to self-identified problems in biochemistry using primary literature. To achieve this goal, scaffolding of assignments, graded rubrics for all drafts, peer reviews and one-on-one meetings were utilized. Assessment of the assignment was completed using student evaluations, unsolicited emails, student writing samples, student peer reviews/reflections, and research faculty assessment of their students. Conclusions drawn from these various areas demonstrated that students were better prepared for research, had improved scientific communication skills, and had developed real world skills.

CURRICULUM DEVELOPMENT

1st year: 100 level courses: lab reports
2nd year: 200 level courses: lab notebooks
3rd year: 300 level courses: primary literature (journal articles/literature reviews)
4th year: 400 level courses: proposal/grant writing

Class Assignment Distribution

CHE 474: Advanced Biochemistry: Medicinal and Structural Biochemistry
CHE 476: Advanced Biochemistry Laboratory

Assignment Scaffold

Timeline of Semester Assignments

Week 1: Grant topic
Week 2: First draft of background/specific aims
Week 3: Second draft of background/specific aims
Week 4: Preliminary data draft
Week 5: Full grant draft #1
Week 6: Final full grant
Week 7: Grant Critiques/Grant review session

Assignment Grant Scores

PROS

• Rubrics for every assignment have been helpful to allow students to understand where improvement is needed. Rubrics are designed to provide enough detail to be informative but not so much that it is prescriptive.
• Mainly looking for completeness and how well the research questions stem from the introduction and how they are answered by the experiments proposed
• Students often have improved proposals after they see gaps in the writing of others
• Student reviewer comments have been right on target
• Classroom Grant Scores show that students mainly agree on scoring

CONS

• Grant writing can be discouraging for students

REFERENCES


FUTURE DIRECTIONS

One of the intended consequences of this grant writing program is to develop these skills especially for students interested in graduate school. Following this class and others like it, the students can then apply for the NSF graduate research fellowship program with improved confidence and grant writing experience.

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