



Rekha R. Srinivasan
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April 18, 2016

Re: Proposal titled "Novel Hierarchical approach to flipped class-room involving graduate and undergraduate teaching assistants with peer-peer learning."

The Nord Grant Committee:

Herein, I am proposing a novel teaching approach that would incorporate a hierarchical method of teaching with elements of flipped classroom. This methodology is a direct outcome of my training at an NSF funded workshop in teaching methods in organic chemistry which I was able to attend due to a 2014 Nord grant funding.

A flipped classroom approach involves off-loading some of the lecture content from the classroom. Most active learning classrooms combine flipped models with in-class peer-peer interactions to engage students. But, motivating students to go through reading materials and watch lecture videos before coming to class is challenging to say the least. Another issue with flipped class model is the lack of spontaneous conversations about organic chemistry that happens in class while discussing a particularly interesting reaction. Anecdotally, many of my students share with me that the most interesting of my classes have been ones where I discuss my experiences in the lab while doing a particular reaction. My failures and successes connect the squiggles and lines in their textbook to actual working experiments in the lab. I was intrigued by the idea of exposing students to instructors of various levels of such experiences in organic chemistry. I have traditionally had a very positive experience with using UG student supplemental instructors for doing problems with students outside of classroom. I have never used graduate TAs for class-room instruction in organic chemistry lecture, but they have been invaluable as graders. Herein I have carefully constructed a classroom model that incorporates instructions from me, Graduate TAs (GTAs) and Undergraduate TAs (UTAs). In the classroom, concept lecture/discussions will be led by me, followed by problem solving by students in small groups of no more than six. Each of these student groups will be facilitated by UTAs. Many such small groups and UTAs will be facilitated by GTAs. I will be present for all of these sessions as super instructor to offer final comments and thoughts about problem sets. Instead of making videos of **lectures** for students to watch outside of classroom, I propose to work with my UTAs to create videos of organic chemistry **problems and mechanism**. Since most of the assessment in organic chemistry involves proposing mechanisms and solving problems, I feel students will be motivated to watch these short videos as opposed to long videos of concept lectures. Many of our TAs choose a career in teaching and this approach gives them valuable teaching experience and insight into students' thought process. The chemistry department is supporting me by providing Graduate teaching assistants. I am requesting that Nord foundation support this grant by paying for 6 weeks of summer salary for two undergraduate TAs starting from July 1st. I have experience with similar methodologies with creation of videos for organic chemistry laboratory classes that

have changed how these labs are taught. These videos are still being used by other faculty members six years after they were made. I believe incorporating such videos into the lecture will greatly improve student learning and appreciation of organic chemistry.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Rekha R. Srinivasan". The signature is fluid and cursive, with the first name "Rekha" being the most prominent part.

Rekha R. Srinivasan, Ph.D.
Senior Instructor of Chemistry,
Case Western Reserve University

Budget:

Total funding requested is \$2160.

Undergraduate TA pay for two students at the rate of \$12/hour for 15 hours/week for 6 weeks per student.