Alexis Courtney
Graduate Teaching Fellow
Department of Chemistry
Graduate School of Arts and Sciences Outstanding Teaching Fellow 2015-2016

"Alexis was a phenomenal discussion leader. She took the time to cater to her students' individual needs. She was enthusiastic, bright, and cheerful in her approach, assisting students in their entire thought process when approaching problems. She explained concepts well and tried many tactics in order to make sure students understood the material." – Student quote from CH212 Evaluation (Spring 2012)

Teaching Experience Summary
All of the discussion and laboratory sections that I have taught have been to undergraduate students. I have additionally designed and lectured a summer course for high school students. Graduate students in the department of chemistry serve as teaching fellows, requiring a workload of 20 hours a week. Boston University uses their own faculty feedback forms to evaluate teaching fellows. The Graduate School of Arts and Sciences accepts nominations for Outstanding Teaching Fellows written by their faculty advisor and selects a student to honor from each department. The Center for Teaching and Learning at Boston University selects applicants each year based on passion and effectiveness in teaching for a Scholar in Teaching and Learning Program. This program utilizes discussions to instruct future educators on teaching as research and pedagogical techniques to enhance student learning.

The courses that I have taught so far:
CH203 (Fall 2013, Summer 2015) Organic Chemistry I
CH204 (Spring 2014, Summer 2015) Organic Chemistry II Laboratory
CH131 (Summer 2014) General Chemistry for Engineers
CH211 (Fall 2014) Intensive Organic Chemistry I
CH212 (Spring 2015, 2016, 2017) Intensive Organic Chemistry II
CH218 (Fall 2017) Integrated Science Experience II
Chemistry of Medicine Lecturer (Summer 2016-2018)

Outstanding Teaching Fellow in the Department of Chemistry 2015-2016
Scholar in Teaching and Learning Program 2017-2018

Summary of the feedback forms tabulated below:
Scale: 1-5 with 1 being poor and 5 being excellent.

Chemistry of Medicine – Summer Challenge

	2017	2018
Number of Students	20	20
Course Evaluation		
The extent to which I found the class intellectually challenging	4.1	3.8
The extent that assignments furthered my understanding	3.8	4.2
I found the textbook/cases/course materials helpful	4.1	4.5
The extent to which I would recommend the course	3.8	4.6
I would rate the course overall as	4	4.5
Instructor Evaluation		
The instructor's ability to present material is	4.3	4.6
I would rate the instructor's enthusiasm as	4.9	4.8
The instructor's ability to encourage questions/discussion is	3.9	4.3
The instructor's mastery of the course material is	4.9	4.9

The instructor's overall rating is	4.4	4.8

Discussion Sections – Organic Chemistry and Intensive Organic Chemistry

	2013	2014	2015	2016	2017
Number of Students	91	32	32	24	22
Effectiveness at explaining concepts	4.6	4.8	4.8	4.9	5
Ability to stimulate interest	4.1	4.7	4.7	4.7	5
Class Participation	4.1	4.8	4.7	4.8	4.9
Grading	4.4	4.7	4.7	4.8	4.9
Returning Assignments	4.4	4.9	4.8	4.8	4.9
Quality of Feedback	4.4	4.8	4.8	4.8	4.9
Availability	4.5	4.8	4.8	4.7	4.9
Overall	4.5	4.8	4.9	4.9	5

Laboratory Sections – Intensive Organic Chemistry

	2014	2015	2016	2017
Number of Students	17	18	14	8
Effectiveness at explaining concepts	4.9	4.9	4.9	4.6
Ability to stimulate interest	4.7	4.9	4.7	4.6
Class Participation	4.7	4.8	4.8	4.8
Grading	4.9	4.9	4.8	4.8
Returning Assignments	4.8	4.9	4.9	4.6
Quality of Feedback	4.8	4.8	5	4.6
Availability	4.8	4.8	4.7	4.8
Overall	4.9	5	4.9	4.8

In addition to quantitative feedback, the department supplies end-of-semester feedback from students detailing the strengths, weaknesses and comments for the instructor. In my evaluations, many students describe me as "approachable and sweet," "patient and helpful," and "calming" and that I "made discussion very comfortable and the class overall enjoyable." My rapport with students helped me obtain verbal feedback during every class meeting, so that I could tailor the discussions and laboratory sections to their needs. This was immensely helpful during the progression of the course, because I could employ active learning strategies and provide additional course materials and resources. For example, several students stressed that they were unsure of the learning objectives for the chapter they were learning about, I was then able to provide them with clear goals for the chapter and clarify the expectations for course content for the rest of the course.

Knowledge, Chemistry Fundamentals and Course Material

The courses I taught, especially Intensive Organic Chemistry, required detailed chemistry knowledge in addition to understanding course content and expectations. I believe that in order to teach effectively, educators much have superior command over the material. This required preparation through reading the textbook, attending lectures, and meeting with the professor for weekly updates. To enhance student learning and guide discussion sections, I developed weekly packets filled with different types of chemistry problems. Students felt that these packets were helpful and provided quality informal feedback on a weekly basis. I additionally provided resources, such as trend tables and PowerPoint lectures in discussion and lab sections to aid student learning.

Student testimonials:

"Very knowledgeable, willing to answer all questions, extremely helpful, patient, challenging and motivating"

"Made packets that were very helpful, simplified complex topics"

"She not only knows her chemistry but also how to explain it well"
"Is well informed about the topic, enjoys the topic and teaching it, teaches the material well, has a strong background in the field"
"Very clear… makes difficult concepts more concise and easier to follow along"
"She provided extremely helpful and challenging discussion packets that were very good exam study problems"
"Stimulated interest in the class… relates what we are learning well to our lives"
"She can easily relay the information at a student's level"
"Alexis is wonderful at explaining concepts as many ways as it takes and is endlessly patient"

Encouraging Student Learning

I believe that an important part of chemistry is critical thinking and problem-solving skills. I had students either work in partners for a think-pair-share approach or in groups to answer worksheet questions. I would call on students to come up to the board to show their attempt at the problem and would guide them through thinking if their answer was incorrect. I found that while initially students were shy, by creating a comfortable and relaxed atmosphere in the classroom, students were able to share more readily. Additionally, I incorporated technology into active learning activities, using iPads to facilitate group work using the ChemDraw App in a problem-solving game. Developing active learning strategies for Chemistry of Medicine has also encouraged student learning. High school students responded well to games and activities associated with drug discovery, pharmaceuticals, and treating infectious disease, appreciating the "hands-on approach." Furthermore, providing students with quality feedback allows for learning progression in the course. I found that by giving students constructive feedback, through comments or discussion, they were able to apply it to future problems and assignments.

Student testimonials:

"Good discussion to complement lecture, packets were a bit intense but really enforced material in lecture"
"Very thorough when explaining concepts, extremely helpful, discussion feels very relaxing, worksheets were very extensive and very helpful"
"Discussion was a useful portion of the course to reinforce concepts from lecture through group directed work and discussion packets"
"Constructive comments in discussion, lab grades and going over exam concepts"
"Great teaching style, packets were awesome"
"The best part of having the packets is that she would not tell us we're wrong but ask us to explain ourselves until we realized that we were solving the problem incorrectly"

Dedication and Interest for Teaching

When thinking of educators that have inspired me to pursue this profession, I first think of their passion and enthusiasm. I find that students are more willing to put in effort if they believe their professor cares about their learning outcomes. When teaching a discussion or lab I find it important to always be patient, friendly, and positive showing excitement for the course material I am presenting. To enhance student engagement, I try to highlight ways in which chemistry can be applied to the real-world and other fields. I believe that I show my commitment through the development of course resources and have tried to provide outside help through office hours and review sessions. Additionally, I respond to student e-mails quickly and in detail to answer student questions efficiently.

Student testimonials:

"Really took course seriously and went out of her way to make extra discussion packets and explain concepts, great availability, answered emails at any given time"
"Very caring, puts so much time into helping students, lively, funny, very patient"
"Alexis is so helpful, she holds extra review hours before exams and helps me feel prepared, always"
"Lecture slide shows very well done"

“Dedicates so much time to her students, quick in email responses, stimulates interest in the subject”
“Very available, goes above and beyond what’s required, has extra office hours, and will always email back to questions about topics and specific problems and mechanisms”
“She was thoroughly engaged in the subject at hand and was very invested in her students”
“Plans discussion problems ahead of time”
“Probably the best TF I have ever had, goes above and beyond to provide students with extra resources and supplement lessons”
“Affable, explains clearly, comes around to check up on progress, enthusiastic, cool TF, puts in a lot of effort”

Approachable, organized and comfortable learning atmosphere

I believe that students learn best when they are in a non-stressful environment and feel that they can make mistakes without consequences. I feel that one of my greatest strengths is my approachability, as students can talk to me without pressure. I always stress that I want to “know how I can help you learn” and encourage questions in discussion and office hours. Students are often worried about judgement when asking what they feel are “dumb” questions, I try to assure students that all questions are welcome. To increase student comfort levels with participation, I often share my chemistry journey to students during the first discussion section. Additionally, it is important to provide organization in laboratory and lecture, so that students can easily understand learning outcomes.
Student testimonials:
“Alexis was amazing, super organized, very knowledgeable”
“To say you are the best TF is truly an understatement”
“Alexis is a very inspiring discussion professor!”
“Very energetic and lightens the atmosphere”
“Alexis was always happy to help and to answer questions. I never felt shy or hesitant to ask her a “stupid” questions”
“She made lab a fun environment”
“Really learned a lot because of your patient, kind instruction and jokes on the side to keep us all sane”
“Never made me feel shy about asking questions – always helped when I needed it”
“Was SO refreshing to be graded on something without the expectation of failing”
“Alexis made a stressful lab environment MUCH less so”
“course runs very well and organized”

Data Analysis from Evaluations

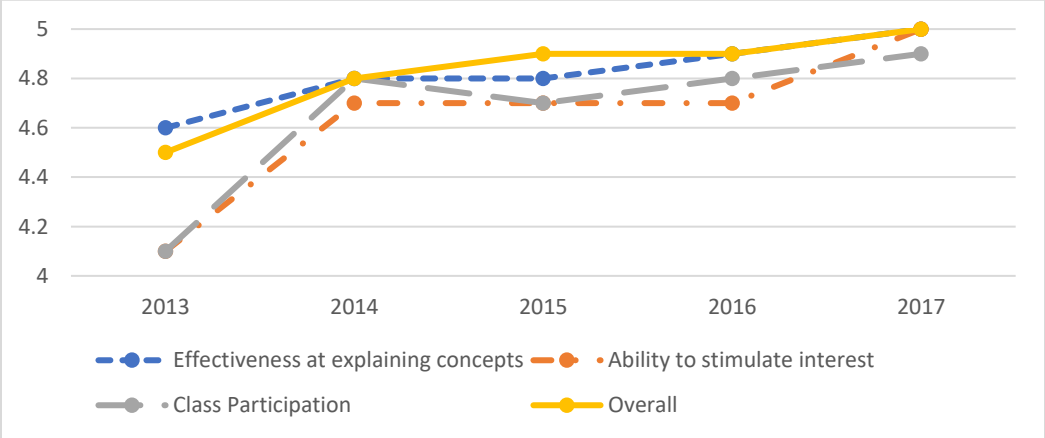

Figure 1: Trends in average evaluation scores for different categories (1=poor, 5=excellent)

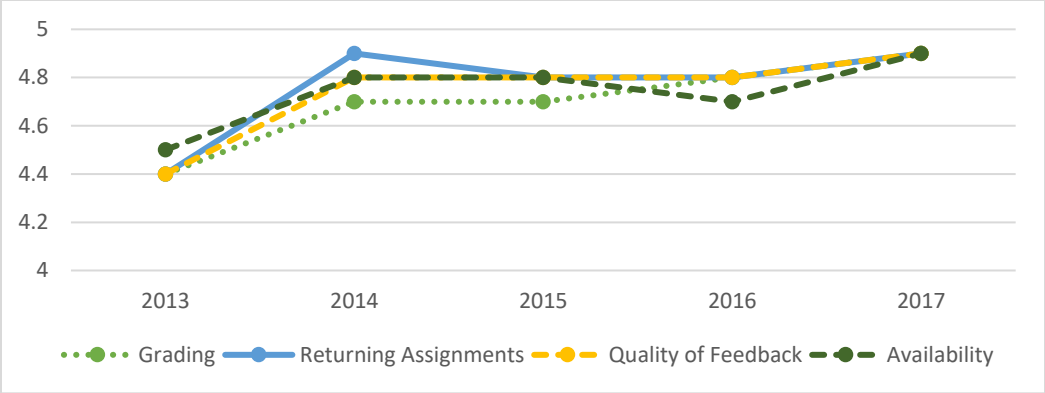

Figure 2: Trends in average evaluation scores for different categories (1=poor, 5=excellent)

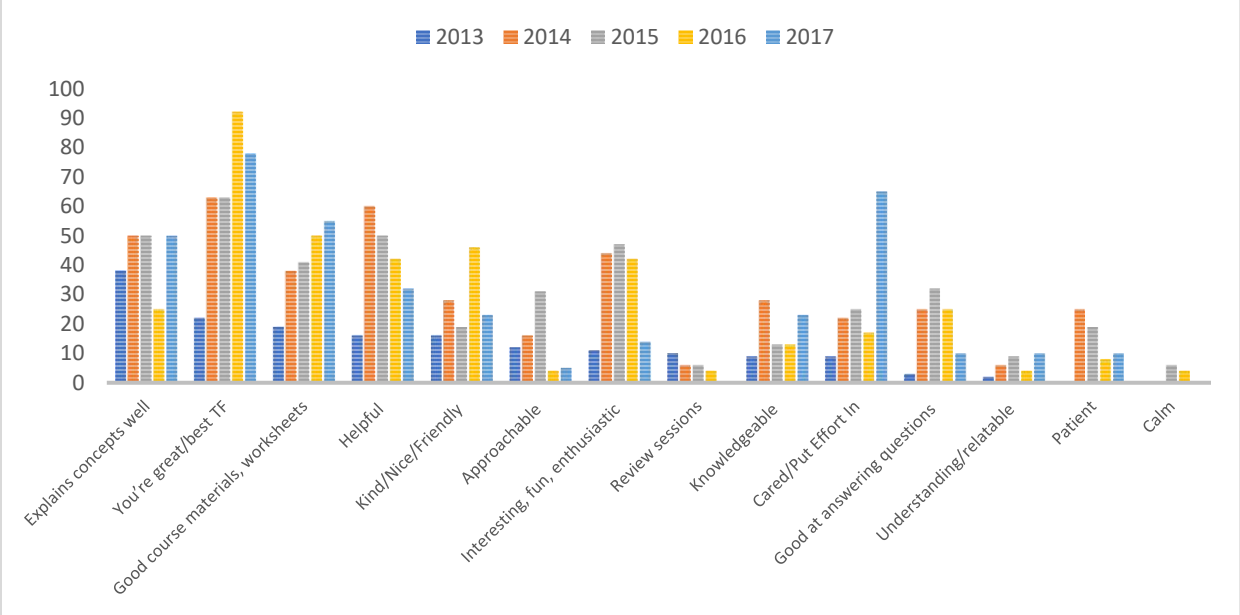

Figure 3: Trends in common positive comments shown as a percentage of students

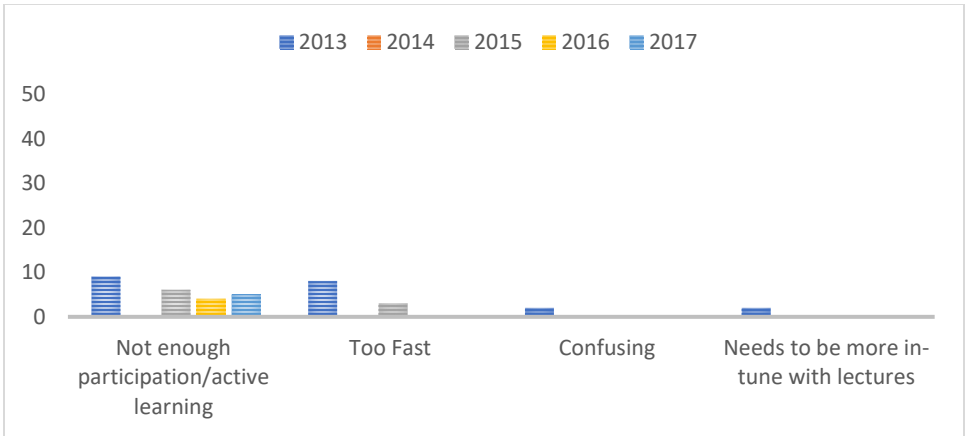

Figure 4: Trends in common negative comments shown as a percentage of students

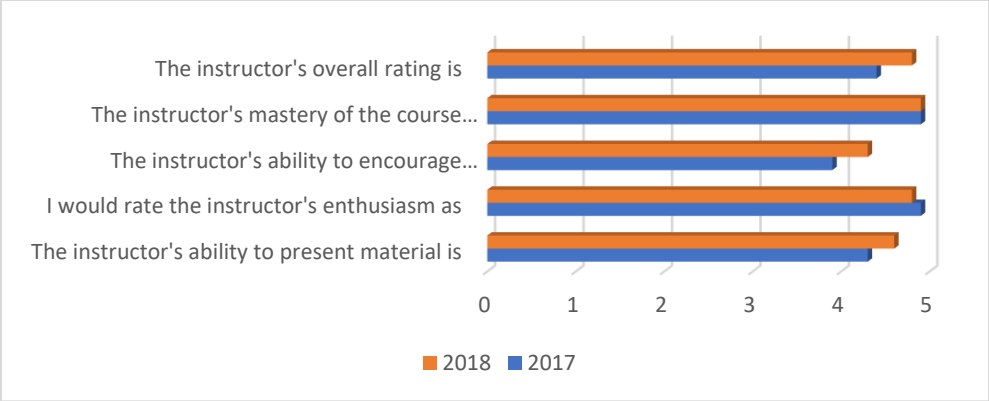

Figure 5: Trends in average evaluation scores for Chemistry of Medicine (1=poor, 5=excellent)

Scope for Improvement

Using end-of-semester evaluations, the feedback from the above tables has been summarized to showcase trends in evaluation scores (Figure 1 and 2). Qualitative evaluations were analyzed for recurrent comments, both positive and negative, to get an idea of how the majority of students felt about my instruction (Figure 3 and 4). Evaluations for Chemistry of Medicine were also analyzed for trends, but were treated separately due to a difference in survey questions (Figure 5).

Overall, scores show a progressive increase from my first semester teaching. I found the area that most required improvement was class participation. When first teaching, I was uncomfortable forcing students up to the board as no students voluntarily contributed. I got comments that I "should encourage more class participation," "ask students to be more involved," and that I had "too [many] blackboard problems, I'd rather have more active discussions." The next semester, I began my first discussion with group activities so that the students would be more comfortable working in groups and sharing their work. By utilizing these strategies in the first discussion, students had a clear idea of participation expectations for the rest of the semester. Although the active learning strategies greatly enhanced class participation scores, I feel that I still have room for improvement. In some instances, students felt that I need to provide more guidance prior to problem work, "perhaps doing a brief overview of the types of the questions on the discussion packet before we attempted the questions." In another case they felt that I should improve the balance of solving and explaining solutions, "maybe more balance in time taken to solve problems and explain solutions. In another class we get 10 minutes or so to solve a question, then discuss." I believe these problems arise due to time constraints in discussion and students felt that they didn't have ample time to work on the problems. Furthermore, one student felt that they "wished there was more of an initiative for classmates to work in groups to finish work." In the future, I believe it is important to organize class time more efficiently and consider motivation when planning group work to increase student involvement.

Another area of improvement that I addressed was the speed of my lectures. During my first semester teaching, students stated that "sometimes you go too fast when doing the problems on the board," that I "go through material too quickly sometimes," and that I "didn't stop for questions" or "give them time to think of questions". When planning my next discussion sections, I tried to incorporate more student involvement and let their speed of work dictate the progression during class. Over time I have seen a significant decrease in comments suggesting that my lectures are too fast, and if mentioned the focus is on wishing that discussion sections were longer in length.

The last issue I wanted to address was that some students felt that I needed "to be more in-touch with the course instructor – discussion leader needs to be informed about expectations, what to cover" during my first semester teaching. The instructor I was working with used a hands-off style towards teaching staff and as a first semester

teacher, I was unsure how I could approach this issue for improvement. In my next semester, I worked with an advisor who, in contrast, was hands-on, requiring weekly meetings, discussing openly his plans for the course, and involving the TF's in course content. This environment was highly beneficial and helped me convey expectations with higher accuracy. Students now comment that my packets "were incredibly helpful and more like the exam questions than the homework questions." When working with another hands-off professor during the Spring of 2017, my experiences helped me feel more prepared to ask pertinent questions to the professor in order to ensure that we were on the same track.

Although most students found my availability excellent, others found that they wished I had "additional office hours" or held "office hours more frequently." As my teaching load already exceeded the expected 20 hour load, I was unable to offer more office hours in addition to my research requirements. To mitigate this, I strongly urged students who could not attend my office hours to contact me if they had any issues and I answered e-mails daily. Additionally, I offered multiple review sessions during the week of the exam so students had the opportunity to ask me last minute questions.

I experienced similar comments in regards to class participation and speed when teaching the Chemistry of Medicine lecture. Students felt that they wanted "more class discussions" and that a "slower pace would be better." My excitement when preparing course material became a hinderance, I tried to teach too much material for the allotted time. The next year I modified the class material in order to highlight the important concepts and in turn, slow down the speed of my lectures. Additionally, to improve student participation, I designed and implemented group activities and games to showcase lecture material. Students were excited about the activities citing that I applied a "great learning activity" and that the "extra activities" and "group work" were most effective in their learning. Gratifyingly I saw an improvement in my class participation score and a decrease in comments that the speed of the course was too fast.

Finally, I would like to conclude with some overall quotes from my teaching from students:

"Alexis is so committed to her job and ensuring we get the help we need. She is always available and is extremely easy to get in touch with. She's very approachable and very intelligent, I haven't asked her a question that she has not been able to answer. She stimulated my interest in the chemistry lab and made it a great experience!"

"Alexis is an incredible instructor. She has a huge wealth of experience and knowledge in the lab that makes her a great resource, but it's also how she delivers her information that makes her such an effective TF. She explains things at the right level for her audience, uses visuals, and checks for our understanding."

"Alexis is the absolute best TF I've ever had! She is knowledgeable, comfortable teaching, relatable, experienced with the class. You can tell she actually cares about this class and teaching with how prepared she is to help outside of class and her stacks of practice problems."

"Hands down the best TF I've had at BU, can explain virtually any challenging topic in very simple ways, extremely helpful in and outside of class, genuinely cares for students and their well-being as well as success in the class. Went above and beyond to help us learn, enjoy the material and sometimes connect it to daily life."

"Plenty of practice problems, approachable, always willing to help whether it be in office hours, through email or in person, great attitude, kind, encouraging, always willing to help, will make an amazing professor someday, grateful to have had you as a TF"