

An interview with Niki Juhl and Kristi Mccann, Chemistry and John Adams, Engineering

Redesigning **CHEM 1201: Introduction to Chemistry** course as a hybrid will allow more time for students to process information and empower them through student-driven instruction.

- 1. Some say that teaching is a collaborative process of inquiry, experimentation, and reflection. Describe your experience working together to improve student engagement and retention in the course, Introduction to Chemistry?**

Working on a team to re-design Intro to Chemistry was vital to our success. It allowed each of us to work to our strengths and gave us a group to bounce ideas off of. Instead of problem solving in isolation, we were able to create well developed lessons and units that blended lecture and guided practice. Working in a team allowed the team to identify course weaknesses, develop a plan to implement high-impact teaching practices, experiment in the classroom, and come back together as a team to look at the data collected and evaluate whether our changes were effective or not.

- 2. In your own words, what is a flipped classroom? What changes did you make to this course to make it a flipped classroom?**

A flipped classroom gives the students the ability to work towards mastering content in the presence of the instructor. By watching some lecture at home, we were able to free up time in class to guide students on how to approach and solve problems. What we accidentally stumbled upon was we then had the time to increase the rigor of the problems they could solve. By playing to our strengths as educators, we were able to take different roles in the re-design process. Kristi designed and recorded the podcasts which allowed us to create the flipped classroom. Niki created scaffolded guided practice packets for each chapter that were used in the lecture to help guide learning and mastery of the material. John observed the re-design of lecture early on in the semester to help guide Kristi and Niki as to what seemed to be working and areas that needed improvement. John also broke down the statistics for each assessment to see if the flipped lessons were having an impact on student learning.

- 3. How would you rate the experience for your students? Did your students like how you chose to present your material and your methods of engagement?**

The experience for the students was overwhelming. Initially Kristi and Niki were only planning on flipping the first two units for CHEM 1201, as these units contained content that was critical for success in the last two units. As we approached the end of the second unit, we alerted the students that we would be returning to direct lecture and there was a resounding response to continue the flipped class approach. End of unit surveys were given asking the students for their thoughts and comments on the way content was being delivered. The students overwhelmingly voted to continue in this method, and the semester was completed entirely in the flipped approach. The instructors were most surprised with the strong student support for the flipped classroom.

4. What were the biggest benefits experienced from flipping? Did it improve student engagement and retention?

The biggest benefits for flipping the classroom was in the ability to free-up class time. With more time, the instructors could use class time to model problem-solving and critical thinking, and have students practice problems, collaborate with other students, and increase the rigor of the problems students were exposed to. Quizzes were moved from in class to online. As a result, exams were heavier with short answer (rather than multiple choice) which allowed for a more difficult exam and a better instructor insight into student understanding. As a result, the course has increased student support in the classroom which has resulted in more rigorous problem-solving capabilities of the students.

Another benefit of flipping the course was pushing the ownership of learning back onto the student. Students learned very quickly that they could not come to class without having watched the required podcasts/lectures and they were not given the option of 'sitting out' during practice problems as they were engaged in more active learning. Students as a result showed higher metacognition as documented in survey results.

5. What are some of the greatest challenges you have experienced in flipping your classroom?

The re-design process demanded a lot of time and energy. Kristi and Niki were able to devote hours to identifying trouble spots in content, determining the best lecture for at-home vs. in-class, creating appropriately scaffolded practice problems and keys, analyzing quiz data, and re-writing exams. This task done in this amount of time would not be possible without our team.

6. What are your next steps as you continue teaching?

As we team-taught the course we realized the importance of having more guidance and help for students who were struggling in class. By changing our approach to in class time, we are able to bring in Peer Leaders to decrease the student/instructor ratio which increases the effectiveness of active learning activities. Our Peer Leaders have training in effective teaching strategies and are a resource during class for questions and guidance in problem-solving.