


# ACTIVE LEARNING WITH ACHIEVE CHEMISTRY

## in Hybrid Flipped Classrooms

<b>PRODUCT USED</b>	Achieve for <i>Interactive General Chemistry</i>	
<b>STUDY DESIGN</b>	Evaluation Study with Descriptive Analyses	
<b>COURSE</b>	General Chemistry	
<b>INSTRUCTOR</b>	Dr. Anthony Hascall	

### How a traditional lecture-style instructor uses Achieve to foster active learning in hybrid classes at a large four-year university

#### The Challenge

##### Student Preparedness and Involvement in their Own Learning

Dr. Hascall is an experienced instructor and has been teaching flipped hybrid General Chemistry for eight years. His class meets three times a week for an hour face-to-face and once a week for an hour online. The online portion of the class serves as the lecture and he works problems and does active learning in class. Though he describes himself as a traditional lecturer who walks around the room when students work problems, he states, *“Ideally I would not lecture at all in class. Students would do work before coming to class and would practice problems with me during class.”* Dr. Hascall reports student focus and preparation are challenges. In the past, Hascall would encourage students to do assigned problems and actively engage in their own education by giving in class quizzes, however, he states students don’t like that and it took class time. He also struggled with students not interacting with hard copy textbooks at all. After COVID, the class changed to all online and Professor Hascall had to adapt quickly. He found himself lecturing more this past spring but plans to use virtual breakout rooms to engage students this Fall.

#### Achieve Implementation

##### Using Achieve Textbook Integration to Deepen Knowledge

Dr. Hascall explains instructors want students to interact with the textbook in order to help them learn and Achieve solves that. *“The big advantage of Achieve is the fact that you can assign sections from Interactive General Chemistry and it is integrated. You can link to videos or homework problems. There are embedded lectures and simulations in it and you can assign sections for credit so you can get students to read the sections when you want them to.”* The fact that *Interactive General Chemistry (IGC)* is a digitally native product in the Achieve platform means the e-text and assignments are fully integrated. This helps students gain a deeper knowledge of content on their own than is possible to cover in class, so class time can be spent clarifying specific things that need to be addressed.

*“Students like that it is fun, easy to use, and that it doesn’t hurt their grade if they don’t answer right.”*

##### Using Achieve Features to Engage Students in their Own Learning

Achieve’s deep question library is one of Achieve features that Dr. Hascall uses to engage students. *“It is a deep question library which provides a lot of hints and feedback to help students when working on their own. If students make a mistake on calculations, Achieve can recognize what they have done and help guide them to get the correct answer.”* The quality questions on any topic found in the library reflect the level he desires his students to reach and shows them what he wants them to know and what they need to be able to do. The questions are *“clear and not going to confuse students and when they do come from a different angle than what I teach in class, it takes them beyond just regurgitating what they learned in class. Students learn from approaching a problem in a slightly different way too.”*

Other features such as pre-class assignments, post-class quizzes, LearningCurve Adaptive Quizzing, and homework problems *“help students come to class prepared to do active learning.”* Dr. Hascall states the pre-class assignments *“motivate them as it counts as part of their grade and the Achieve built-in pre-class quizzes get them thinking about material before class.”* The LearningCurve activities *“help them master basic concepts before jumping in to do more complicated problems. Students like that it is fun, easy to use, and that it doesn’t hurt their grade if they don’t answer right.”* The post-class quizzes give them practice and shows them what he expects them to know. Having those quizzes in Achieve to assign—rather than doing them in class—has been helpful and has freed up the class to jump into active learning assignments and do other things. The overall organization of Achieve *“is very clean and simple. Students can go in and see what is going to be due which helps them stay organized.”* Dr. Hascall encourages students to take advantage of these Achieve features in order to be accountable for their own learning.

## The Results

Achieve keeps students accountable in hybrid flipped classroom and enhances pedagogical practice.

### Fostering Student Accountability

*“Like learning to play a musical instrument: you can’t just watch, you have to play.”* Instructor Hascall reports his students are actively engaged in their own learning through *Interactive General Chemistry* in Achieve. Students come to class prepared and *“get more out of class and are able to study better and do better on tests.”*

### Enhancing Instructor Pedagogy

Dr. Hascall notes that Achieve has both *“helped and enhanced my pedagogy. The Interactive General Chemistry textbook is concise and focused on what is more important for students to know. Achieve does that so well. It gives me more time in class to share a story about why a topic is relevant or where it’s used in an area where students might not have expected.”* Instructor Hascall’s advice for other instructors is *“whether or not you are using a flipped classroom, Achieve helps to organize and focus students’ studying outside of the classroom by giving them specific tasks to work on and examples to practice. But working effectively before coming to class is especially important with the hybrid, flipped classroom model.”*

***“IGC takes care of nuts and bolts stuff and frees up time in class for deeper discussions.”***

## School Background

Northern Arizona University (also known as ‘NAU’) is a public four-year state-supported college offering bachelor’s, master’s and doctoral degrees. The undergraduate population of over 27,000 students attend one main campus in Flagstaff, Arizona. The college has a 85% admission rate and the student to faculty ratio is 25 to 1. Student demographics are 55% white, 24% Hispanic/Latino, 6% two or more races, 3% Black, 2% Asian, and 2% American Indian. A majority (81%) of the students are under 24 years old and 64% are in-state students. (citation: NCES)

## About the Professor

Dr. Antony Hascall is an experienced chemistry instructor with 13 years teaching Chemistry at Northern Arizona University. He uses Achieve to teach large classes of General Chemistry. Instructor Hascall has been implementing Achieve for *Interactive General Chemistry* since it’s start and used Sapling prior. Dr. Hascall’s colleagues are all using Achieve (changed from Sapling).

## Study Limitations

Although the data are rich, the findings of this case study are specific to the instructor who participated. They cannot be generalized to all institutions who use Achieve. The results are also descriptive and should not be used to infer causation.