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## Developing Digital Activities to Promote Student Engagement

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# Developing Digital Activities to Promote Student Engagement

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Over the past several years, I have changed how I teach to increase student engagement and activity in the classroom. After years of somewhat traditional lecturing with the use of a classroom response system, I wanted to teach in a way to help students become more engaged in the course and better understand their role in the learning process. While I was not successful at convincing all students that this active course format was better for them, the course grades have shown otherwise. Participating in the Teaching Innovation Institute gave me new ideas of ways I could help promote learning among my students. As a result of the Institute, I made two significant changes in my course including the addition of exam practice quizzes and converting any paper or manipulative-based activities to digital versions.

One change I implemented in my course was the addition of exam practice quizzes. These ungraded, timed quizzes contained pooled questions that had been used on previous years' exams. Each quiz had four to six questions over a day's worth of course material. For each day's material, there would be two or three quizzes spaced out over a week. For fall 2020, each class day had two or three practice quizzes. This encouraged students to have spaced practice (Benjamin and Tullis 5) and retrieval practice (Roediger III et al.), both of which have been shown to improve student learning. About

one-fourth of my students used these regularly and I am hopeful that future changes will encourage more of them to do so. My plan is to download the data for these quizzes for fall 2020 and see if there is any correlation to exam grades after adjusting for differences in math skills, which serve as a good predictor of chemistry grades. Moving forward, I plan to rebuild the quizzes to create one practice quiz for each day and adjust the content to cover the most recent few days of course material. For now, I do not plan to make these graded until I have time to process some of the data to see how they helped students.

The second change was initially motivated by students' access to iPads as a result of the Smart Campus initiative, but was accelerated by the changes caused by COVID-19. In my physical classroom, students spend most of the class period working on small group activities. While I had some digital activities prior to COVID-19, many were still paper-based (Tarsia puzzles, domino activities, game-based activities, etc.). I had started looking for a way to convert these to digital activities that were iPad-compatible in preparation for a summer course but COVID-19 had other plans. Some activities were easier to convert than others, some had to be changed significantly, and some had to be reimagined completely. While most of the digital activities worked well, there are still a few that need additional work to better meet the learning goal of the activity. The other issue that arose due to COVID-19 was that the activities were designed to be completed as a group where ideas could be shared, and questions more readily asked in the classroom. The time constraints of the class period and the logistics of managing breakout rooms for 200 students resulted in me avoiding that option. My goal for the spring 2021 semester is to help students connect with other classmates so they have the opportunity to work together on these activities and support one another.

Both changes presented their own challenges, but the second one was by far more challenging. I have intentionally looked for a variety of types of in-class activities which means there was no one size fits all solution for digital versions. As a result, it took time to wander the web looking for ideas and spend time reimagining activities to meet the same learning goal. I have also realized that some of the activities that were converted more quickly are not the most ideal implementation and will have to be reconsidered. Given the limited time to adapt due to COVID-19, I had to remind myself (more than usual) that "done is better than perfect" and version two will be better.

Participating in TII allowed me the opportunity to work with colleagues across campus from a wide range of disciplines and course types and sizes. One thing that I encourage all faculty to do is to talk with people outside of your discipline and to those who teach very different class types than you. These conversations have often been the most beneficial to me (and hopefully to my colleagues) because it encourages you to think about different strategies you use in the classroom—what works in a small class in sociology may be adaptable to a large course in chemistry. Sometimes it is hard to step outside of our discipline and consider different ideas but any discomfort is far outweighed by the benefits from doing so.

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