Engaging Students with Technology in an Asynchronous Learning Environment

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Abstract

Millennial students are driving change in learning environments around the world. Unlike previous generations, Millennials' constant exposure to the Internet and other digital media has shaped how they receive information and learn. In order to adapt to Millennials' learning preferences, educators are adapting to using different technology to engage with today's students. This paper discusses how we flip hybrid classes and use free technology that is independent of the learning management system to build, manage and deliver content to students, while keeping them engaged inside and outside the classroom.

Introduction

Our society is extending from the Information Age to the Interaction Age, (Milne, 2007). While in the Information Age, the focus was on delivering and accessing digital content. In the Interaction Age, the role of digital content has broadened to something around which people engage and interact. Twenty-first century teaching practices have been influenced to a large degree by the Interaction Age. Learning has evolved from traditional face-to-face lectures and textbooks in a brick and mortar classroom to online lecture delivery methods, use of mobile digital devices,

augmented reality, virtual reality, use of wikis and blogs and various collaborative websites. In conjunction with this movement teaching and learning practices have also evolved. All of this has led to a movement towards a self-directed, contextualized, engaged learning environment.

Research has demonstrated that engaging students in the learning process increases their attention and focus, motivates them to practice higher-level critical thinking skills, and promotes meaningful learning experiences. Instructors who adopt a student-centered approach to instruction increase opportunities for student engagement, which then helps everyone more successfully achieve the course's learning objectives.

Further, researchers have demonstrated that today's students have a penchant for highly active and participatory experiences inside and outside their classrooms, (Oblinger, 2006). This has offered an opportunity for teachers to design their instruction and delivery methods to suit the needs of today's students in the Interaction Age. More and more instructors are adopting engaged learning in several different ways and they are using different learning technologies to enhance that learning experience. However, there are some challenges that instructors face in this regard. First, technology is expensive and often instructors are restricted to using technology that is compatible with the learning management system used in their institutions. Second, there is a learning curve for instructors as they adopt new and varying technology to use in their classrooms. Last, but not the least, instructors need to apply the new technologies as a means to improve learning and understanding rather than as an end in and of itself.

We are three instructors, teaching three different hybrid courses that we have taught for several years as traditional face-to-face classes. In the hybrid courses, we have flipped our classes and have adopted an engaged learning environment and enhanced that environment using technological innovations. The purpose of this paper is to discuss how we flipped our classes, how

we incorporated the specific indicators of an engaged environment and how we incorporated technology that is cost effective (i.e. free) and independent of any learning management system.

Motivation for Changing Our Teaching Modality

Traditionally the courses we teach have been identified by students as "difficult" courses. Even though these courses are required for graduation, typically 1% to 2% of the students will withdraw from the courses. Of those who remain, 10% to 20% are unable to successfully complete the courses. Historically, there are many more students that have been earning a 70% to 75% (a letter grade of C) rather than 90% to 100% (a letter grade of A) in our traditional face-to-face classes.

We also face a unique set of challenges in our institution, which is a community college in Queens, New York. First, our students are commuter students, who sometimes have multiple jobs, have family responsibilities and other commitments. Most community college students work either full or part-time while attending school. The day to day demands placed on this student population has continued to increase. Many students report the requirements of family, work, and school often seem overwhelming. Sometimes, due to external circumstances, they are unable to attend class and when they do attend, they come unprepared. Second, we have a very diverse group of students from varied ethnic and cultural backgrounds. Some of them are first generation immigrants and a lot of them are first generation college students. The American Association of Community Colleges (AACC 2015) reports that 36% of students are the first generation in their family to attend college. The vast majority of our students are not native English speakers and despite the language proficiency that they have to demonstrate, they have difficulty following lectures in English. We have also observed that sometimes students are disinterested and

disengaged in the classroom. They appear to be distracted during lecture sessions, and seem to have no interest in the subject matter. We decided to address these issues in two ways. We wanted our instructional materials available for students when they were unable to attend class. We also wanted them to have access to the instructional materials so they could review them at their own pace as many times as they needed to. Further we wanted them to be more engaged with the learning process both inside and outside the classroom, take responsibility for their own learning and become life-long learners.

We were able to address the first issue by transforming our courses to asynchronous or hybrid courses. We used lecture capture methods like Camtasia to create instructional videos that were placed on the learning management system and were available to our students when they needed it. We embedded short YouTube videos and other online resources pertaining to our courses into the learning management system. As we were teaching our hybrid classes, it became apparent to us that our face to face sessions became more learning centered rather than teaching centered. Since lecture notes, reading assignments and instructional videos were already available to students, the in-class sessions were repurposed for more knowledge application. We were doing problem solving, performing analysis, and holding discussions in class. Our students became more engaged and they were eager to participate in discussions and collaborative activities. These changes allowed us the opportunity to observe peer to peer knowledge transfer in our classrooms.

This positive experience in teaching hybrid courses has led us to question if there may be added benefit to our students by flipping our classes and incorporating varying degrees of technology that helps us create a more engaged learning environment.

Technology Enhanced Hybrid Flipped Classroom

The flipped classroom is a pedagogical model where students are exposed to new material outside of the classroom via lecture videos, assigned readings, or other online videos/resources while the traditional face to face classroom sessions are repurposed for assimilating and applying the knowledge gained through discussions, hand-on activities, problem-solving, etc. The students gain *first-exposure learning* prior to class and focus on the *processing* part of learning (synthesizing, analyzing, problem-solving, etc.) in class. In terms of Bloom's revised taxonomy, (Prensky, 2001) this means that students are doing lower levels of cognitive work like gaining knowledge and comprehension outside of the classroom and focusing on higher level cognitive activities like application, analysis and synthesis and problem-solving in class, where they have the support of their peers and are guided by their instructor. This approach contrasts from the traditional model where the first-exposure to new material occurs in the classroom and students assimilate and apply knowledge through homework. Hence the term "flipped classroom".

Hybrid classes can facilitate the flipped model very effectively. The instructional videos and other online resources are already available on the learning management system. So it almost becomes necessary to use class time, not for teaching and lecturing, but rather for learning.

In our flipped classes, prior to a face to face session, students are required to complete a reading assignment from the textbook, review the lecture slide/video or the micro lecture and watch any relevant videos that are assigned by the instructor. If the students encounter any learning issues or have questions, they can contact their peers or the instructor via a Discussion Forum available in the learning management system. Prior to coming to class the students are also required to complete a short online quiz and/or a low level skills worksheet that helps the instructor

assess student understanding of the material. The students are given credit for accomplishing this task. As a result, we noted that all students participated in this activity and consequently they were coming to class prepared to do participate effectively during in-class activities.

The face to face session begins with the instructor highlighting and/or reviewing the important issues related to the topics covered online. Students are then given a case study, a short writing assignment or problems to solve as deemed appropriate by the instructor. Sometimes the students are divided into smaller groups that allow them to work collaboratively and facilitate peer to peer knowledge transfer. The instructor is available to guide and provide assistance as needed. Thus, the role of the instructor in the classroom is one of "guide on side" rather than one of "sage on stage". The role of the students is one of cognitive apprentice (Baker, 2000).

In our flipped classes, we have implemented an engaged learning environment based on some specific indicators of engaged learning (Angelino, Williams & Natvig, 2007). Engaged learning embodies the principles of active learning and collaborative learning. Active learners are self-regulated, self-directed motivated learners who take responsibility for their own learning and are able to transfer knowledge to solve problems creatively. Active learning requires students to participate in class, as opposed to sitting and listening quietly. Engaged learning also involves being collaborative, i.e. valuing and having the skills to work with others. In our engaged learning environment, students are required to reference and integrate resources from beyond the boundaries of the classroom, work in collaborative groups and work towards a deliverable.

We have also incorporated varying degrees of technology to enhance our engaged classroom environment. Apart from using technology that is already available within the learning management system, we have incorporated technologies to build content like micro-lectures for our classes, manage the content in one space and we have used technology to interact with our

students, both inside and outside the classroom. The benefit of the tools we have used is that they are cost effective (i.e. free) and they are independent of any learning management system. These tools have the potential for supporting student learning in creative and innovative ways, all while keeping them engaged and interested.

Content Creation

There are several tools available for course content creation that is independent of a learning management system. We have used PowToon, ScreenChomp and Educreation for various purposes.

PowToon is a web based application that is used for creating engaging presentations and animated videos with a cartoon like feel. It lets the instructor incorporate humor and visual appeal in the presentation of lecture slides or micro lectures, which can be used as a creative and fun alternative to PowerPoint slides. PowToon provides the instructor with prerecorded music, characters and props, several that are animated, that can be used in preparing lessons. It is also possible to upload music to add to the presentation. Each frame/slide in PowToon is preset to 10 seconds and an additional 10 seconds can be added to each. PowToon also provides ready-made templates that can be modified for the instructor's specific needs. The free version is limited to five minutes per presentation, an unlimited number of presentations can be created, and they can all be shared and viewed online through the PowToon site.

We have created PowToon micro lectures explaining concepts and provided students with a link to the PowToon site in the learning management system. For example, we have used PowToon in an accounting class to create animated videos and slide shows to explain accounting concepts such as debits and credits, and financial statements. We have also used a PowToon video

to explain the three legal forms of a business. The use of the animated characters to represent a sole proprietor and a partnership brought to life each business form. In a finance class, PowToon was used to explain the functions of the Federal Reserve System and to explain monetary policy. PowToon is able to bring concepts alive for students, hold their attention and help them retain information.

The free ScreenChomp app can be used to create video lectures with an iPad and post them on the ScreenChomp website, where students can then download the recordings as MPEG-4 files. The app looks like a whiteboard and allows the instructor to mark it up, post images or scroll through. This takes place in the form of a video, in which the instructor can record one's voice while writing on the whiteboard. Students can watch the video as many times as needed.

We have used ScreenChomp to explain how to work through a problem, specifically when students need further instruction on a specific topic. We find that ScreenChomp is good for shorter lessons, or providing students with quick detailed responses to homework problems, or reinforcing topics that they did not grasp in class. For instance, we have used ScreenChomp to demonstrate statistics problems and accounting problems. Using the voice recorder personalizes the instruction for the students, and student feels that the instructor is guiding them.

Educreation is a free presentation, teaching and storytelling tool for the classroom. It is a recordable interactive whiteboard that captures the instructors' voice and handwriting as they explain a concept or work through a problem. It can be used to produce short video lessons that can be saved as a public or private file and it can be shared with the classroom as a whole or with an individual student. Educreation is different from ScreenChomp in that it allows the instructor to create a video of several pages of slides. We have used this tool to create micro-lectures on specific topics that students may need to access.

Creating lessons in Educreation and ScreenChomp is just like presenting to an actual class of students. The choice of different color markers allows instructors to highlight and emphasize certain aspects of the lesson just as the instructor would on the whiteboard in a face to face classroom. The ability to upload backgrounds is an excellent feature for creating accounting lessons on journalizing and posting to ledgers. With Educreation one can create several pages with different backgrounds then record a lesson in which the background content is animated. Educreation has been particularly helpful in Statistics class where we have used it to demonstrate how to solve problems. Students have the added advantage of referring to the video as and when needed.

Content Management and Content Delivery

Blendspace is a free web tool for instructors to collect, annotate and organize digital resources in one place to form a bundled, interactive lesson for students in an e-learning environment. With a free account one can create a "canvas" and easily pull in other material like videos, web links, documents and images either from the web or from one's own computer. Then the instructor can make this multimedia canvas available to students by using one URL link. Blendspace also gives the instructor the ability to add multiple choice quizzes into lessons. Consequently, Blendspace is more than just a tool for sharing information, it can be used to assess a student's understanding of material right alongside the content. Blendspace can even autograde the assessments if the correct answer choices are made available.

We have used Blendspace in two ways to support engaged learning: content management and content delivery. We have created a canvas and added our instruction material like Educreation videos, PowToon videos, ScreenChomp videos along with our PowerPoint lecture slides, YouTube

videos, and other documents simply by dragging-and-dropping into the canvas. We are able to manage all this content using one URL. This is very convenient for students, since all of their material is contained within one space.

Blendspace facilitates an engaged e-learning environment by enabling self-paced student content engagement, in which students can absorb the content at their own pace and can customize their learning experience through self-directed knowledge acquisition. This creates a win-win scenario for both faculty and students. Faculty can efficiently and seamlessly manage their digital content and students can experience unfettered access to a montage of learning material that satisfy their personal and individualized learning needs.

Student Interaction

Blackboard Collaborate is a collaborative tool that is available in the Blackboard learning management system. While Blackboard Collaborate is not independent of the learning management system, almost all learning management systems include a collaborative tool. We have used Blackboard Collaborate for online discussions with students. The electronic whiteboard within the system is particularly helpful for providing a digital space for instructors to explain solutions to problems in an interactive online session. Students are able to record these learning sessions for repeated viewing at their convenience, even after the session is over.

Poll Everywhere is free application that promotes student participation in class. It can be used directly from the web or can be embedded in a PowerPoint slide. One can create a poll for a specific class and students can vote by using their cell phone to text message their answer. The polls update seconds after students enter their votes, and the results can be displayed on the presenting screen.

In a face to face session of a hybrid flipped class, we have used Poll Everywhere to immediately gauge the classes' understanding of concepts. It can be used to challenge perceptions or misconceptions (create cognitive dissonance). The polls can be simple multiple choice questions and students can text their answers or the polls can be open ended questions, asking students to describe an experience. The words that the students use to describe an experience will show up on the presentation slide. This is a way to share everyone's thoughts in class. Further, giving students an opportunity to break up passive learning into more active learning can refocus their attention and invigorate the learning process.

Conclusion

The purpose of this paper was to discuss how we flipped our classes, how we incorporated the specific indicators of an engaged environment and how we incorporated cost effective stand-alone technology into our flipped classes. Our flipped class model incorporates the following five components:

1. **Student-centered content exploration** through the use of reading material, micro lectures, and videos.

2. **Instructor/peer support** administered through the learning management system's collaborative discussion feature.

3. **Mini-assessment/correction activities** that allow the instructor and the student to stay abreast of student progress.

4. **Topic alignment discussions** in which the instructor highlights important topic issues and guides students in creating a framework for knowledge exploration.

5. **Facilitated "head/hand" experiences** in the classroom which allow the students to put into practice what they have learned.

Flipping a class can be achieved in several different ways. We have identified 5 broad based components that instructors can use as a guideline for transitioning from a traditional class to a flipped class. The benefit of this flipping model is that it allows instructors to flip a class using a modularized approach by tackling component areas singularly or comprehensively.

We have also demonstrated how our flipped class model supports and promotes an engaged learning environment. As students are introduced to and explore content areas, they are simultaneously encouraged to become active learners who independently manage their interaction with online content to gain knowledge at their own pace. In the face-to-face sessions, as faculty, we facilitated student engagement in active and collaborative learning by prompting group work activities, exploration and integration of resources from beyond the boundaries of the classroom, and by helping students focus on the completion of specific deliverables. Students and faculty benefit from this level of student engagement. Student confidence and knowledge grows as "learning and producing" becomes the focus, instead of "lecture and presentation."

Finally, we have demonstrated how technology can be used to effectively support flipped pedagogy and aid student engagement in an economical and easy way. We shared several applications that can be used to create engaging content, maintain and deliver content efficiently, and interact remotely or face-to-face with technology driven students. Future studies will examine student attitudes towards the flipped pedagogy, the technologies and student content and course engagement, specifically looking to see if student confidence, satisfaction, and outcomes are increased from the use of these technologies. In addition, future studies will also explore faculty

experiences with flipped pedagogy technology and will attempt to measure administrative and pedagogical efficiency factors.

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