

The Flipped Classroom: An Opportunity To Engage Millennial Students Through Active Learning Strategies

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"Flipping" the classroom employs easy-to-use, readily accessible technology in order to free class time from lecture. This allows for an expanded range of learning activities during class time. Using class time for active learning versus lecture provides opportunities for greater teacher-to-student mentoring, peer-to-peer collaboration and cross-disciplinary engagement. This review of literature addresses the challenges of engaging today's students in lecture-based classrooms and presents an argument for application of the "flipped classroom" model by educators in the disciplines of family and consumer sciences.

A sense of urgency to adapt to Millennial learning preferences is heightened as educators increasingly struggle to capture the attention of today's students. Unlike previous generations, Millennials reared on rapidly evolving technologies demonstrate decreased tolerance for lecture-style dissemination of course information (Prensky, 2001). Incorporation of active learning strategies

into the classroom is critical in order to reach Millennial students. This review of the literature investigates the "flipped" or "inverted" classroom model (Bergmann & Sams, 2012; Lage, Platt, & Treglia, 2000) in order to address challenges of student engagement in lecture-based classrooms. The authors present an argument for the possible application of this model by educators in the disciplines of family and consumer sciences.

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The Millennial Student

Millennials are individuals born between 1982 and 2002 (Wilson & Gerber, 2008). Millennial students, referred to as "digital natives" (Prensky, 2001), have been exposed to information technology from a very young age. Millennials' access to technology, information, and digital media is greater than that of any prior generation. According to McMahon and Pospisil (2005), characteristics of Millennial

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students include 24/7 information connectedness, a preference for environments that support multi-tasking, and gravitation toward group activity and appreciation of the social aspects of learning. This generation is distinguished by their access to technological and collaborative experiences.

Millennial students drive change in learning environments around the world. The technology, with which digital natives matured, has induced today's students to "think and process information fundamentally differently from their predecessors" (Prensky, 2001, p. 1). Although educators bemoan this generation's inability to focus, Millennial expert Marc Prensky (2010) pointed out that "it is not our students' attention capabilities that have changed, but rather their tolerance and needs" (p. 2). This characteristic actually validates the urgency to adopt alternative methods of instruction, and many teachers are incorporating active learning strategies as a better way to engage these students.

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Active Learning

For decades, educators and educational researchers have questioned the effectiveness of teaching methods that are entirely lecture-based (Barr & Tagg, 1995). Despite innovations in technology enabling alternative techniques for pedagogy, lecture formats continue to be the primary method for teaching adult learners (Bligh, 2000). Educators and researchers have come to recognize the "complexities of teaching and learning for understanding as opposed to just knowledge retention" (Ritchhart, Church, & Morrison, 2011, p. 7). If the goal of teaching is to engender understanding, educators must move from rote memorization of knowledge and facts, known as "surface learning," toward "deep learning," where understanding is developed through "active and constructive processes" (Ritchhart et al., 2011, p. 7). To achieve this objective, educators must shift from a teaching-centered paradigm toward a learner-centered paradigm.

Chickering and Gamson (1987) suggested seven principles as ideal best practices in active learning. *Active learning* is an umbrella term for pedagogies focusing on student activity and student engagement in the learning process (Prince, 2004). Teaching methods promoting active learning are those "instructional activities involving students in doing things and thinking about what they are doing" (Bonwell & Eison, 1991, p. 1). Activities should be designed to emphasize important learning outcomes requiring thoughtful participation on the part of the student (Prince, 2004).

Four broad categories of instructional approaches for use in an active learning classroom have been identified: (a) individual activities, (b) paired activities, (c) informal small groups, and (d) cooperative student projects (Zayapragassarazan & Kumar, 2012). These methods encompass many activities such as conceptual mapping, brainstorming, collaborative writing, case-based instruction, cooperative learning, role-playing, simulation, project-based learning, and peer teaching (Zayapragassarazan & Kumar, 2012). Active learning methods require students to utilize higher-order thinking skills such as analysis, synthesis, and evaluation (Bonwell & Eison, 1991). This more holistic approach to instruction engages students with varied learning styles and appeals to the typical Millennial learner who thrives in an environment of variety and change (Prensky, 2010).

The Flipped Classroom

Active learning pedagogies continue to evolve, and new methods of delivering course material are being developed. Assimilating active learning can be as simple as integrating in-class activities alongside traditional lecture. Yet educators in elementary through post-secondary education are finding innovative ways to restructure the classroom (Strayer, 2007) in order to focus attention on the learner (Bergmann & Sams, 2012). Instructors adopting the flipped classroom model assign the class lecture or instructional content as homework. In preparation for class, students are required to view the lecture. According to Tucker (2012), students utilize the time in class to work through problems, advance concepts, and engage in collaborative learning.

Lage et al. (2000) performed a study using the flipped classroom for an economics course. They found easy-to use, readily accessible technology to develop course materials for the flipped model. These instructors reported spending about 2 hours per topic to create videotaped lectures and digital slide presentations with voiceovers. Although contact hours remained the same, they found preparation time was significantly reduced after the initial groundwork was completed. They reported that question and answer sessions at the beginning of each class took about 10 minutes of class time followed by students working and learning together on “an economic experiment or lab that corresponded to the topic being covered” (p. 4). As anticipated by Blair (2012), the use of flipped classrooms could result in less effort creating lecture presentations. This increase in available time might be redirected to create in-class activities that deepen concepts and increase student’s knowledge retention.

With internet access widely available on most college and university campuses, students may view web-based instruction on their own time, at their own pace. This provides opportunities to utilize the classroom for the application of information addressed in the online lecture. Because students have viewed the lecture prior to class, contact hours can be devoted to problem solving, skill development, and gaining a deeper understanding of the subject matter (Bergmann & Sams, 2012). The teacher is able to provide students with a wide range of learner-centered opportunities in class for greater teacher-to-student mentoring and peer-to-peer collaboration, increasing the possibility to engage Millennial students (Prensky, 2010).

Learning Using Non-Lecture Based Strategies

A flipped, or inverted, classroom model could be adapted easily to multiple disciplines such as textile design, apparel design and construction, interior design, and nutrition. Of particular relevance are courses in which a lecture is primarily based on disseminating information and learning occurs when students apply these instructions to complete a task or an assignment. The flipped classroom model suggests the use of a variety of technologies in preparing and posting lessons for

students’ access prior to class. The implementation of computer-aided instruction (CAI) can be used to assess the likelihood of success in a flipped classroom within different disciplines.

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Slocum and Beard (2005) provided a list of topics for which CAI has been developed. Among the topics are textiles, flat pattern design concepts, concepts in clothing construction, and visualizing three-dimensional designs from two-dimensional patterns. Slocum and Beard (2005) argued that the development of additional CAI modules could allow instructors to use limited class time to guide students through unique learning paths appropriate to individual skill level or project needs. Therefore, we can safely deduce that the flipped classroom could be beneficial for topics where class lecture is predominantly utilized to provide instruction. For example, implementing the flipped classroom in clothing construction would allow students and instructors to focus class time on skill development, problem solving, and active learning of construction concepts while executing assignments.

Similarly, Byrd-Bredbenner and Bauer (1991) conducted an experimental study to compare the effectiveness of the CAI modules with traditional lectures for a college nutrition course. Their findings indicated that students enjoyed using CAI and that nutrition knowledge was improved. The benefit of a mixed method technique (Carew, Chamberlain & Alster, 1997; Zubas, Heiss, & Pedersen, 2006) was evident in studies conducted in the discipline of nutrition; students who accessed lecture material posted online or completed self-paced online tutorials in addition to attending the traditional classroom lecture demonstrated improved test scores in the respective nutrition courses. All of the above findings support Wishart

and Bleases' (1999) claim that environments in which technology is used innovatively can lead to both improved learning outcomes and teaching. Technology provides opportunities for teachers to meet the needs of students with various learning styles through the use of multiple media (Bryant & Hunton, 2000).

Benefits of Using a Flipped Classroom Model

Instructors implementing a flipped classroom use various methods for preparing the online content. Strayer (2007) made useful observations and suggestions for instructors who consider using the flipped classroom model. When the focus of the flipped classroom is on giving students the freedom to interact with the content according to their own learning style, the flip seems to be more successful. Due to the structural differences of the flipped classroom model, students become more aware of their own learning process than do students in more traditional settings. Students will therefore need more space to reflect on their learning activities in order to make necessary connections to course content. The teacher must plan for a component in the course structure allowing for reflection to take place. It is important for the teacher to be able to see and comment on specific aspects of student reflection. This feedback cycle will be crucial in assessing student learning.

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Flipping the classroom allows for a range of teaching methodologies to be employed such as videotaping the instructor while lecturing, creating videos with voiceover and screen-capture software, instructions accompanied by visual aids, utilizing videos found online from sources such as YouTube and TeacherTube, and integrating discipline-specific websites of videos available through professional organizations and companies (Roehl, 2013). This

allows instructors to improve communication and connection with students possessing a broad range of abilities.

The time gained by removing the lecture portion from class allows for more one-on-one personal engagement between the teacher and students.

With a traditional lecture format, teachers might not be aware of student progress until after testing (Chickering & Gamson, 1987). A flipped classroom allows teachers greater insight into students' grasp of information and learning as a result of increased student/teacher interaction. The time gained by removing the lecture portion from class allows for more one-on-one personal engagement between the teacher and students. Furthermore, a flipped classroom allows students who may be hesitant to ask questions in the middle of a lecture to seek assistance from the teacher during their individual feedback sessions. Students also have the opportunity to "replay" the lectures several times before formulating their questions.

Additional benefits of the flipped classroom model include the ability for the class to move forward despite both teacher and student absences. Flipped classroom pedagogy has the potential to address situations in which students miss lectures due to illness and for students who are engaged in university-supported activities such as athletics. It allows absent students to stay on track without lengthy interaction with the instructor. Similarly, it is beneficial for teachers as it allows students to move forward with course material even when the teacher is absent. This feature enables the course to proceed as scheduled without unnecessary delays.

Limitations of Using a Flipped Classroom Model

The flipped classroom may not be applicable to all subjects. For instance, Strayer (2007, 2012) performed a comparative study between a flipped classroom and the traditional classroom for an introductory statistics course. The findings of this study demonstrated that students participating in the flipped classroom were less satisfied with the

teaching format than students in the traditional classroom were. Students participating in the flipped classroom did not adjust swiftly to their new learning environment. Some students were uncomfortable participating in group learning activities because they preferred working alone. Others were accustomed to the old method of doing assignments on their own, in the setting of their choice. The radical change was not well received. However, students in the flipped model experienced more innovation and cooperation in their learning when compared to the traditional classroom students.

Challenges with the flipped classroom model include adapting traditional lectures to alternative media in order to post content online. Other challenges teachers face include making changes to the online lectures. The flexibility required to make adjustments to course content may be dependent on the technology originally used to create the lecture. Complexity of making changes could vary between re-recording an entire video lecture or could be as simple as adding an additional slide to a PowerPoint presentation. As technology used for presenting information gets smarter, faster, better, and cheaper, educators will be forced to learn and access more of these tools (Prensky, 2010).

The flipped classrooms, as well as active learning, require students to assume more responsibility for their individual learning experience. Teachers must include clear expectations of self-direction and motivation within their syllabus or framework of the course. For this reason, verification, through application of information in a project-based scenario, may be one indication that students have performed the task of viewing the lecture prior to entering the classroom. For example, Woodland Park High School chemistry teachers Jonathan Bergmann and Aaron Sams used the flipped classroom model whereby they posted their lectures online. Bergmann said he checks students' notes during class. He requires each student to come to class with a question as verification of watching the lecture. However, as Bergmann pointed out, it takes a while for students to get accustomed to a new system of learning. He observed the benefits of the new system when students were

asking better questions and thinking more deeply about the content as the year progressed (Tucker, 2012).

When discussing the use of the flipped classroom model, it is important to recognize the financial limitations of public schools, teachers, and students who may have limited financial resources. The success of this model relies on the availability of computers and access to the internet outside of the classroom. Therefore, educators must be cautious in implementing this system if they are unclear as to whether all learners will be able to easily and consistently access the online content.

Conclusion

The introduction of any new strategy requires a shift in the minds of both educators and students. Teachers must be willing to experiment with alternative strategies in the classroom. For those instructors who are willing to apply these new methods, it is important that they periodically reflect on their teaching effectiveness. At the same time, students may require more than a semester to adapt to the new method of instruction and to recognize its value. Through active learning and technology-enabled flipped classroom strategies, students may develop higher order thinking skills and creativity.

The effective application of vital competencies such as critical thinking, creativity, communication, and collaboration (Blair, 2012) at one's workplace is more likely if these skills are acquired in college. In addition, one's adaptability to new technologies is crucial for graduating students to succeed in the workplace. This underlines the need for the provision of technology-infused learning environments at educational institutions. Training must be provided for educators in the application of existing and emerging technologies.

At a time when educational institutions face increasing demands to improve learning experiences and capture the attention of Millennial students, the flipped classroom strategy provides an opportunity to address both these concerns. These pathways toward more powerful learning outcomes, retention of knowledge, and increased depth of knowledge suggest an optimistic future for education.

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