Research Paper Education

Role of Flipped Classroom in Education

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ABSTRACT

Education is one field that is constantly changing and adapting to meet the needs of students. Educators are continually challenged to find new strategies for engaging students in the classroom so as to increase the effectiveness of the learning process. A flipped classroom inverts the normal learning process. It "moves the lectures outside the classrooms and uses learning activities to move practice with concepts inside the classroom" (Strayer, 2012, p. 171). The strategy "flipped classroom" also known as the "inverted classroom" or "reverse instruction" - a method incorporates technology to "flip" or "reverse" what is typically done in class with what is typically done as homework which supports instructional material for students that can be accessed online. At the heart of the flipped classroom which is moving the "delivery" of material outside of formal class time and using formal class time for students to undertake collaborative and interactive activities relevant to that material. This frees up classroom time that had previously been used for lecturing. This paper examines the concept of flipped classroom concept, challenges and its application on a virtual learning environment ahead of class.

KEYWORDS Flipped classroom, Bloom`s Taxonomy,Learning Theories

Introduction

Recent advancement in technology and in ideology have unlocked entirely new direction for education. The use of technology is a key component in allowing lectures to be pre-recorded and made available to students outside of the classroom setting. The philosophy behind the flipped classroom teaching methodology is that it allows instructors to teach both content and process. Eric Mazur a professor of physics at Harvard University suggested that "Learning is a two-step process. First, you must have some transfer of information; second you must make sense of that information by connecting it to your own experiences and organizing the information in your brain" (Demski, 2013, p. 34). The flipped classroom is designed to create a classroom experience that inspires lifelong learning and meets the objectives of Mazur's reference to a two-step process. Despite the recent accolades being extolled to the flipped classroom, there are also cautions about the need for both teachers and students to be properly trained in how to use and teach a flipped class.

A common assumption in the flipped classroom is that new technologies make it easy to convert instructor lectures through digital recordings and place these online for student access outside of face-to-face class time (EDUCAUSE, 2012; Tucker, 2012). As a result, students can review lectures in advance of class, then have class sessions for working together on the assignments that traditionally would have been done as homework. Not only are students seen as gaining through working together on "homework" problems in class, but instructors are able to more quickly see where students are struggling and provide remedial support which advocates that by using class time for student discussion, collaboration and problem-solving, the traditional lecture-based mode of instruction can be replaced by a more student-centered learning that is not only more effective but also achieves larger goals of 21st century skills (Bergmann & Sams, 2012). The increased emphasis on higher order thinking, team work, and problem-solving are seen as critical components in modern learning theory (Bransford & National Research Council, 2000; Pink, 2006; Willingham, 2009). The flipped classroom is gaining support at all levels of education, including in primary, secondary and post-secondary classes.

Flipped Classroom

The presence and increase in blended learning, and more specifically the "flipped classroom," addresses two current topics at the forefront of society at this time: increased presence of technology and the need for higher levels of student achievement in education. A flipped-classroom is the presentation of information via a pre recorded lecture and traditional classroom time used for assignments. As society shifts its expectations of the delivery and accessibility of information, schools must also adapt to meet these changing expectations. The use of blended learning and the "flipped classroom" address the changing expectations of society in respect to technology, as well as the possibility to increase student learning through increased social interaction when problem solving during traditional classroom time.

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Learning Theory behind Flipped Classroom This section identifies learning theory that supports flipped classrooms from a pedagogical standpoint.

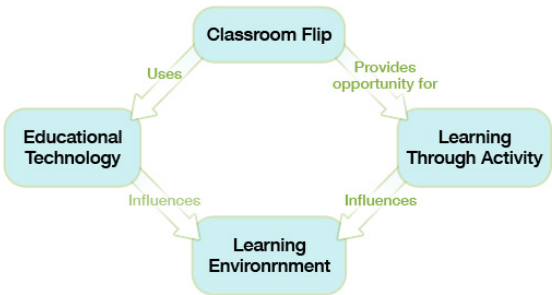
How People Learn (National Research Council, 2000) states that to develop competency

in a subject, students must develop factual knowledge, understand that factual knowledge in the context of a conceptual framework, and organize knowledge in a way that allows them to transfer and apply it. By allowing students to use knowledge in class with feedback from peers and the instructor, flipped classrooms help students correct misconceptions and organize new knowledge effectively. Based on this theory, there are four key elements of the flipped classroom identified by Vanderbilt University's Center for Teaching (Brame, 2013):

1. Provide an opportunity for students to gain first exposure to content prior to class.
2. Provide an incentive for students to prepare for class.
3. Provide in---class activities that focus on higher---level cognitive activities.
4. Provide a mechanism to assess student understanding.

By providing these four elements, a flipped classroom that

supports student learning.



The Flipped Classroom Significance

In traditional lecture students take notes and try to capture the concept while they are listening. Unfortunately, the dynamic nature of the traditional lecture does not let them to reflect instantly on arguments and they fail to capture essential essence of the session while recording notes (Tucker, 2012). In contrast with the flipped model, students pre-visit the lesson contents to empower themselves to take control of the session. In this approach they can read, watch and repeat as needed. This flexibility also provides opportunities to address different ability and special need concerns. This also helps lecturers to underpin any knowledge gaps and take remedial action. The collaborative learning environment encourages peer interaction among students from various skills and let them learn from each another to become communities of practice as suggested by Wanger (1999), and Collis and Moonen (2006).

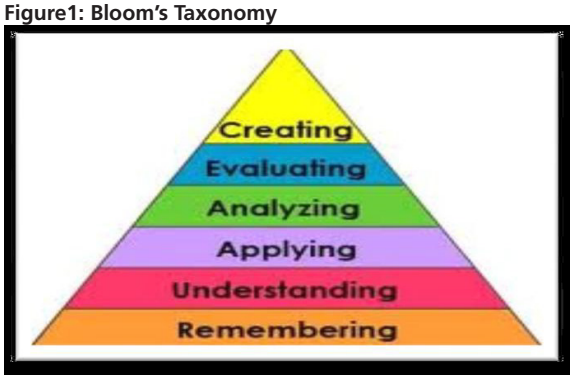
The Flipped Classroom in Practice

The flipped classroom has no specific model representation as the term is broadly used to convey almost any classroom environment that provides lesson material in advance of the session in any format followed by in class activities. It demands that the learning should take place in a way that mirror the actual context which develops the learners' skills to fulfil the demand of their complex role within learning various approaches, clarify content, check understanding, monitor progress and provide one to one support.

The Flipped Classroom and Bloom's Taxonomy

The flipped classroom provides an opportunity to students to learn the contents before attending the class. The idea is to address students learning at the lower level of Bloom's taxonomy so students can remember and understands the contents by reading lecture notes or view the videos. As the student comes to the class they involve in activity based learning individually or in groups thus giving them an opportunity to master their knowledge and skills by working on the higher levels of Bloom's taxonomy by applying, analysing, evaluating and creating new knowledge and understanding as shown in figure

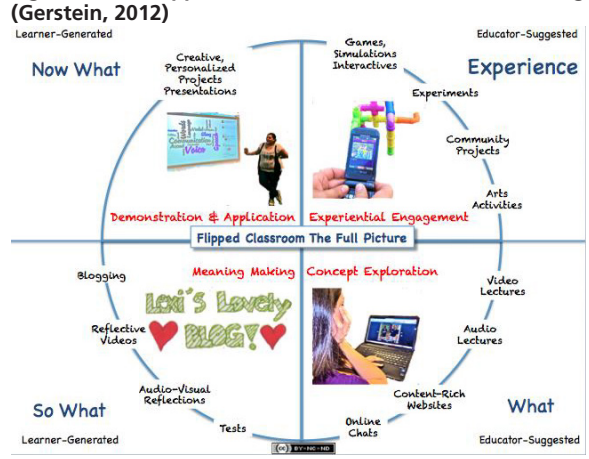
Figure1: Bloom's Taxonomy



The Flipped Classroom and Learning Theories

Historically the role of a teacher has been to spread their knowledge during class time and giving homework to reinforce learning (King, 1993). In this approach students were not encouraged to interact with each other and critically evaluate their understanding of the theoretical concepts. Kings (1993) argues that "this passive nature of learning is known as the transmittal model as this assumes students as empty vessels into which knowledge is being poured." In this approach might be effective for producing the workforce for the industry but have very little impact in today's complex information age where success relies on independent thinking to manage risks and issues. By contrast the flipped classroom is part of constructivist learning theory in which learners create their own knowledge based upon their previous experience (Brown, Collins, & Duguid, 1989) and teachers are the learning support not knowledge transmitters (Rhodes & Bellamy, 1999). In the flipped classroom approach students are able to actively create their knowledge in a meaningful manner that allows them to both better understand and process the learned content as detailed in figure 2 (Gerstein, 2012).

Figure 2: The flipped classroom model of active learning (Gerstein, 2012)



Prospective Advantages and Challenges of Flipped Classroom

In flipped classrooms allow teachers to help students complete more challenging learning activities and provide tailored instruction based on students' weaknesses. This strategy can lead to both benefits and challenges for students and instructors.

Advantages:

- Improved learning outcomes: is considerably more effective than face---to---face and online learning, as compared to either strictly face---to---face or online instruction.
- Improved insight into student learning: Prerecording lectures frees up class time for teachers to interact with students. Additionally, by utilizing quizzes to access mastery, instructors can quickly evaluate students' understanding of a topic both as individuals and to provide targeted instruction and more quickly identify misconceptions.
- Student---paced lectures: Students have the ability to rewind, pause, and speed up lectures, giving them more control over the pace of instruction. The lectures are also always available, so students can access the content when they want, even if they have to miss class and they can re---watch lectures as needed.
- More personalized learning: Between self---paced lectures at flexible times and one---on---one Interactions with teachers in the classroom, allows learning to be more personalized to each student which supports different learning styles. For example, because lectures are self---paced, students can use them in various ways to match their learning styles.
- Reaching more students: Moving lectures outside of class might require less class time per student allowing instructors to teach larger classes. For example, if a class of 50

students meets three times a week (e.g., Monday, Wednesday, Friday) to listen to lectures and then worked on problems at home, then a flipped class of 150 students could be split into three groups of 50 that each meet once a week (a group of 50 meets on Monday, another group of 50 meets on Wednesday, and the last group of 50 meets on Friday) to ask questions and receive an hour of help with problem solving but without changing the ratio of students to teachers.

Challenges:

- Bridge the digital divide. Many of our students don't have access to technology at home. The flipped classroom method does not have strong provisions in place for these children.
- Lecturing doesn't equal learning. This method of teaching works for some learners, many others thrive with a model that takes a more constructivist approach. While there's no doubt that flipping is preferable to sending kids off on their own to make meaning of lectures, without questioning exactly how the pedagogy works, which is not good in part of students.
- Asynchronous lectures: Students view lectures in their own time, so if students have questions about content, they might not be able to get timely responses from an instructor.
- Additional Resources: As with designing any new class, redesigning a class to be flipped takes time. Because of this time commitment, it is recommended that always flip an existing class that are familiar with teaching rather than create a new class that is flipped. At least a couple months requires to explore possibilities and design the class before trying to implement it.
- Contradicting Culture, Policy, and Accreditation: Flipping a class might go against students' and colleagues' expecta tions. Pedagogical reasons are essential for flipping that can explain to others and redesign the class in a way that fulfils policy and accreditation regulations.

The Flipped Classroom Future

The flipped classroom concept develops and popularity increases, new innovative and creative ideas and tools will be readily available to fully support the concept. The ongoing development and affordability of smart mobile devices will diversify educational resources and encourage flexible learning (Eastwood, Coates, Dixon, Harvey, Ormondroyd and Williamson, 2009). Also, as the benefits of the flipped classroom are fully appreciated by institutions there will be collective efforts to transform the culture of teaching and learning with a unified approach (Strayer, 2012).

Conclusion

The flipped concept offered a new direction that helps education institutions to meet the expectations of today's students by providing modern teaching and learning resources. The flipped model offers a great use of today's innovative technology, which has made it possible for learners to gain access to the information on the move (Gerstein, 2012). The flipped concept is driven by the constructive learning theory and provides the active learning environment with added benefit where teachers are able to use modern technology to engage students into the learning process (Gerstein, 2012). Although there are many limitations to the flipped classroom strategy and no empirical research exists to substantiate its use, anecdotal reports by many instructors maintain that it can be used as a valuable teaching strategy at any educational level, depending on one's learners, resources, and time. The flipped classroom method requires knowledge of technical skills, theoretical underpinning and pedagogical expertise to implement effectively. Therefore teachers are advised to see flipped model application into their area of practice before they plan to implement which will build their confidence to overcome any potential difficulties. Also they should connect with their communities of practice for help and further guidance on the learned experiences shared by their peers (Shimamoto, 2012)

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