

The Flipped Classroom—Advantages and Challenges

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Keywords: The flipped classroom, Cooperative and collaborative, Higher education

Abstract. The flipped classroom has become increasingly prevalent in higher education, and more traditional courses will likely employ the element of the flipped classroom to supplement out-of-class work with video presentations. In particular, the rapid development of mobile devices will put rich educational resources into the hands of students at any time and place. Some new tools may emerge to support the curriculum of the flipped classroom. In face of this situation, there are obviously benefits and challenges co-existence in the flipped model. The paper gives an evaluation of the flipped classroom and provides some recommendations for colleges and universities to ensure that they can take a hard look at class spaces and support the cooperative and collaborative work running smoothly.

Introduction

In 2007, Jonathan Bergmann and Aaron Sams, two chemistry teachers of Woodland Park High School in Colorado found a way to reteach lessons for those absent students. They spent \$50 purchasing some software to record the classroom teaching content, and posted the video online. The absent student had the opportunity to see what they had missed. Meanwhile, those students, who hadn't missed the classroom, also actively used the online video to review and reinforce classroom lessons [1]. The unexpected effective made Bergmann and Sams realize that they should profoundly reflect the teaching Method and a new teaching Method appeared, called "the flipped classroom". The flipped classroom is a pedagogical model where the typical lecture and homework elements of a course are reversed. It inverts traditional teaching methods, delivering instruction online outside of class and moving homework into the classroom. Online video are watched by learners at home in extra-curricular, while curricular time is devoted to discussions, projects, or summary. The video lecture is often considered as the key ingredient in the flipped class model, such lectures being either created by the teacher and posted online or selected from an online repository. The prerecorded video could certainly be a podcast or other audio format. It is easy to assess and view the video today, which made it so ubiquitous that the flipped model has come to be identified with it.

Different Views on the Flipped Classroom

With the appearance of the Khan Academy, the idea of the flipped classroom has become one of the hottest discussions in the academic world. In general, we believe that online learning and certain academic technologies are worthwhile. However, with all the hoopla over the flipped classroom, there remain both advantages and disadvantages to the teaching method.

The Advantages of the Flipped Classroom

The flipped classroom encompasses some approaches, including active and collaborative learning, problem-based learning and project-based learning [2]. Many advantages of the flipped classroom

have been covered throughout the blogosphere and elsewhere [3, 4, 5], see as Table 1.

Table 1. Some advantages of the flipped classroom

Advantages	
For students	For teachers
Learn at their own pace	Work closely with students in the classroom
Engage concepts with peers	Improve student attitudes
Frustration levels remain low	Teachers can group students together
Particular benefit to those students whose personality types and preferred learning styles impair their performance in traditional educational environment	Improve students' ability to solve open-ended problems

In the traditional classroom, students often try to capture what is being taught at the instant the teacher says it. They cannot stop to reflect upon what is being taught, and they may miss some significant points because they are trying to transcribe the teacher's words. The application of video and other prerecorded media, by contrast, puts courses under the control of students: they can watch, rewind, and fast-forward as necessary. Courses can be viewed more than once, which may help someone that English is not their native language. At the same time, collaborative learning projects can encourage social interaction, teamwork and cultural diversity among students, making it easier for them to help each other mutual learning and for those of different skill levels to support one another. Teachers can devote time to helping students develop synthesis and explore application during class time through: experiential exercises, team projects, problem sets, and activities that previously had been assigned as independent homework [6]. In the typical classroom, students attend regular class lectures and then do their exercise at home. While, the flipped classroom allows students to read the articles and watch videos at home and then work with their peers on the projects during school hours. All those increase teamwork skills, and enhance mutual understanding and trust. The teacher can spend class time working one-on-one with the student who requires extra help

The Disadvantages of the Flipped Classroom

Of course, as with anything, there are also some disadvantages to the flipped classroom, as Fig.1. One of the characteristics of the flipped classroom is that everyone learns knowledge and skills at different paces. But this mode of operation relies heavily on students' self-motivated. Some students are not as motivated as others, and this method of teaching may allow those less motivated students

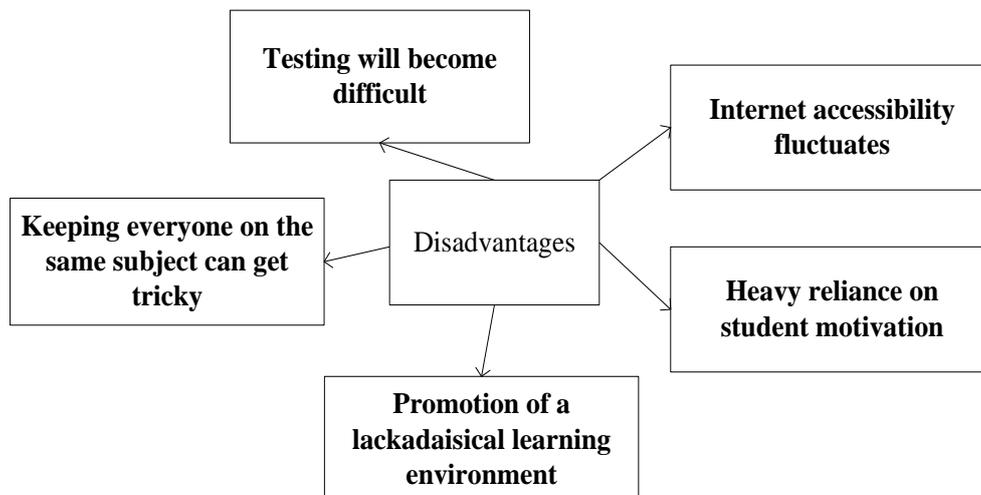


Fig.1 Some disadvantages of the flipped classroom

to get less done [7]. Tests are usually provided to every student synchronously to judge how much they have learned over a period of time. Under the flipped classroom model, every student will each

be approaching tests at different times. This could also make students to delay their learning when they are dreading the next test.

Students in poor areas may not have the ability to possess the computers and the Internet that the flipped classroom requires. Students who have not personal computers or network would be forced to use public computers or network at a library or an internet café. There are some limitations if it is busy. This is problematic. Another downside is students spend all of their "homework time" in front of a computer screen, which adds the student's time sitting sedentary, which doesn't help students get up and get away from their computers, televisions, and iPods.

The Development of the Flipped Classroom Needs a Multi-disciplinary Cooperation Learning Ecology

Unlike the traditional classroom, the flipped classroom requires additional skills, provided by photographer, videographer, instructional designers, business manager, IT specialists, platform specialists, and so on. Teaching environment, technical environment and social environment form a multi-disciplinary cooperation learning ecosystem (see Fig.2).

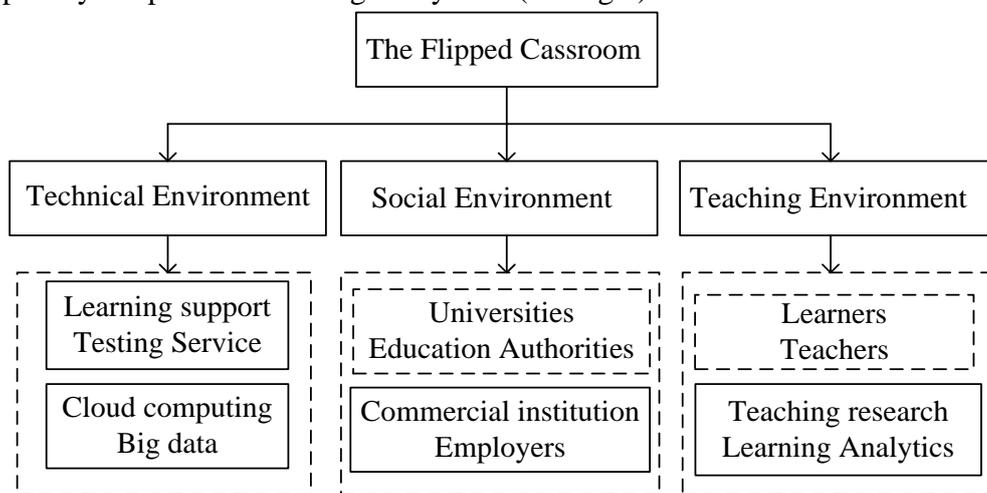


Fig. 2 A multi-disciplinary cooperation learning ecosystem.

Science and technology can lay a foundation for the development of the flipped classroom. New tools emerge to support the out-of-class portion of the curriculum. The rapid development of portable electronic devices will put a wider range of educational resources into the hands of students at anytime and anyplace. Currently, more audio and video educational resources can be obtained with the popularization of internet and information technology. Developed social network brings a better platform for learners around the world, which greatly reduces the threshold of online learning. Professor Daphne Kohler said the video cost is reducing and makes online teaching and learning easier and cheaper [8]. As Nathan Harden ominously noted, "recent history shows us that the Internet is a great destroyer of any traditional business that relies on the sale of information." [9] It is easy to get wrong in the flipped classroom. Although the idea is straightforward, a successful and effective flip needs careful preparation. Making videos requires feeding with more energy on the part of faculty, and extra-curricular and curricular elements must be carefully integrated for learners to understand. As a result, introducing a flipped classroom means additional work and new skills for the teacher.

Conclusions

The flipped classroom provides a new methodology and modality for teaching and learning, which constitutes a role change for instructors who give up their front-of-the-class position in favor of a more cooperative and collaborative contribution to the teaching process. The roles of students have a corresponding change from passive participants to positive participation. The flipped

classroom puts more responsibility on the shoulders of students and gives them greater impetus in the process of learning. While it remains unclear how the flipped classroom will evolve in the years to come, early trends allow us to estimate that they might bring about a dramatic impact on the traditional colleges and universities. Combining traditional instructional methods with online learning will no doubt play a major role in providing high quality education to learners.

References

- [1] T. Bill, The flipped classroom online instruction at home frees class time for learning, *Education next*, (2012)82-83.
- [2] M. Prince, Does active learning work? a review of the research, *J. of Eng. Educ.* 93 (2004) 223-231.
- [3] S. Zappe, R. Leicht, J. Messner, T. Litzinger, and L.H. Woo, "Flipping" the classroom to explore active learning in a large undergraduate course, in *Proceedings of 2009 ASEE Conference*, Austin, TX. (2009)
- [4] A. Dollar, ASEE annual conference 2011, main plenary, URL: http://www.it.uu.se/research/group/upcerg_new/events/ASEE2011_resources/plenary_slides.pdf, accessed on May 3, 2012.
- [5] A. Yadav, D. Subedi, M.A. Lundeberg, and C.F. Bunting, Problem-based learning in electrical engineering, *J. of Eng. Educ.*100 (2011) 253-280.
- [6]A.H. Charles, The benefits of flipping your classroom, <http://www.facultyfocus.com/articles/instructional-design/the-benefits-of-flipping-your-classroom/#sthash.TicT2ie8.dpuf>.(2013)
- [7] J. Krueger, Five reasons against the flipped classroom, <http://www.stratostar.net/blog/2012/07/02/educate/five-reasons-against-the-flipped-classroom/>
- [8] Information on <http://www.ftchinese.com/story/001047178>
- [9] H. Nathan, The end of the university as we know it, *The American Interest*, (2013)