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Comparing Teachers' and Students' Perception of Flipped Classroom in Singapore

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Abstract: In the traditional classroom model, students learn concepts in class and apply what they learnt while working on related problems at home. In the flipped classroom, students would learn content outside classroom time, often at home via video lectures. The freed up class time is then used for more in-depth, application-based learning activities. These higher level cognitive tasks increase the opportunities for collaborative work among students. As more and more teachers are adopting the flipped classroom model, it is an opportune time for us to study if teachers and students share a common understanding of what a flipped classroom entails, as well as what benefits a successfully flipped classroom promises since such an alignment bring about realization of the full potential of implementing the flipped classroom. In this research, we surveyed 22 teachers and 188 students at an institute of higher learning in Singapore where the flipped classroom had been implemented for two semesters. We found that even though there is agreement between teachers and students on the salient features of the flipped classrooms, they do not share a common understanding of what the flipped classroom is and the key benefits of flipping the classroom. We provided some practical recommendations on how to better align teachers and students in their understanding and expectations of the flipped classroom.

Keywords: flipped classroom, collaborative learning, personalize learning, mobile learning

1. Introduction

The flipped classroom model started out as the inverted classroom in earlier days. It represents the reorganization of the structure of a typical classroom model. The term "inverted classroom" was thought up by a group of professors at Miami University (Ohio) to describe the use of this new pedagogy method (Lage et al., 2000). The paper "Inverting the Classroom" was published in 2000 by Maureen Lage, Glenn Platt and Micheal Treglia where they discussed about inverting the classroom to accommodate different learning styles.

> Inverting the classroom means that events that have traditionally taken place inside the classroom now take place outside the classroom and vice versa.
>
> Lage et al., 2000, p. 32

In the traditional classroom model, students learn content in class and apply what they learnt by working on related problems, commonly referred to as "homework", at home. In large classes, content delivery often takes the form of lectures. While lectures can be an effective means of knowledge transfer (Hattie, 2008; Schwerdt & Wupperman, 2010), students may experience frustration if the pace of the lecture is too slow, or experience confusion if the pace is too fast. Research found that the lecture method is relatively poor instructional approach for maintaining student attention (Bligh, 2000), and that students' attention typically falls after the first 20 minutes. (Cannon and Newble, 2000).

In the flipped classroom, students would learn new content outside classroom time on their own, often at home via pre-recorded or curated video lectures. The freed up classroom time is spent on more in-depth, application-based and collaborative learning activities where students can discuss, clarify and work together with their peers; and teachers can offer personalized guidance to students (Baker, 2000; Strayer 2012). Research have found that flipping the classroom can lead to a more inclusive, more active and more student-centered classroom where students are given greater control over their own learning, have more opportunities to receive real-time feedback, more opportunities for

exploration and collaboration with peers. (Bergmann, 2013; Flipped Learning Network 2013; Fulton, 2012).

2. Background and Aims of the Study

The institution at which our research was conducted implemented the flipped classroom model two semesters ago. In all, roughly 1000 students, 45 subjects and 80 academic staff members were involved. At the end of the second semester, we felt that it would be an opportune time to review the implementation and experiences of academic staff and students.

Specifically, we wanted to study if academic staff and students share a common understanding of what the flipped classroom is and what flipping the classroom promise. We felt that this was important since we believed that the full benefits of flipping the classroom can only be achieved if both teachers and students have the same expectations and ideals. The research questions for this study are as follows:

1. Do teachers and students have the same understanding of what the flipped classroom is?
2. What, in the opinion of teachers and students, are the three most salient features of the flipped classroom?
3. What, in the opinion of teachers and students, are the benefits of flipping the classroom?
4. How was classroom time used under the flipped classroom model?

3. Methodology

Anonymous structured questionnaires were used to collect data for this research. Prior to data collection, the questionnaire was piloted on 10 students and 2 teachers. After the pilot, we replaced terms which were reported to be ambiguous, we also reduced the number of questions as our pilot respondents found that there were too many.

To collect inputs from students, we liaised with their teachers to request for a 15 minute slot to go to their class to administer the questionnaire. Printed questionnaire with no identifying markings were distributed to students. The purpose of the study was explained and students were instructed to think of class they took in the previous semester that had adopted the flipped classroom model and complete the questionnaire based on this class. Students were not required to reveal what class they were thinking of and who taught them for the class. Completed questionnaires were dropped into a box we brought along with us.

To collect inputs from staff members, we emailed them with an invitation and an explanation of the purpose of the research. Printed questionnaires with no identifying markings were then distributed. Staff were given similar instructions to think of a class they had taught in the previous semester that had adopted the flipped classroom model and complete the questionnaire based on this class. Completed questionnaire were dropped into our letterboxes.

In total, we administered the questionnaire to close to 200 students and 40 staff members. After the removal of unusable returns that contained excessive number of invalid responses, we ended up with inputs from 188 students and 22 staff members.

4. Findings

We gave our research participants four definitions of the flipped classroom models, adapted from various literatures (Missildine et al. 2013; Lage et al. 2000; Bishop & Verleger 2013; Baker, 2000). Each definition, presented in Table 1 below, focused on a different aspect of the flipped classroom. Some parts of the definitions are omitted due to space constraints of this paper. Our research participants were invited to pick the definition that best matched their understanding of what the flipped classroom is.

Table 1: Four definitions of the flipped classroom.

Definition (Some parts omitted due to space constraints)	Focus
Flipped classroom represents a re-ordering of classroom and at-home activities. Inverting the classroom means that events… traditionally taken place inside the classroom now take place outside…	Focuses on the re-arrangement of learning activities
Flipped classroom represents an expansion of the curriculum, rather than a re-arrangement of activities. It employs group-based interactive learning activities and allows deeper exploration…	Focuses on expansion of curriculum
A flipped classroom delivers the content to students outside of the classroom using taped lectures, videos, or other technologies… when students go to class, they participate in application-based activities using content they have consumed outside the classroom.	Focuses on technology involved
A flipped classroom is a model in which the typical lecture and homework elements of a course are reversed. It is the repurposing of class time…	Focuses on the repurposing of classroom time

The response, presented in Figure 1, showed that while about half of the students and staff members agreed on third definition, the other half were spread across other definitions. The varied responses suggested that there may be differences in the implementation of the model across different subjects and the learning experiences that followed.

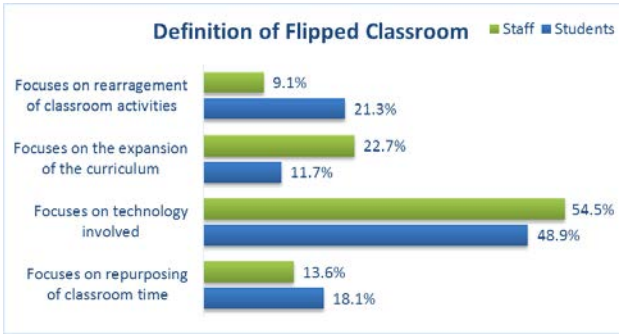

Figure 1. Students and staff responses on the definition of flipped classroom.

We then asked students and staff members what, in their opinions, are the three most salient features of the flipped classroom? The results are presented in Figure 2.

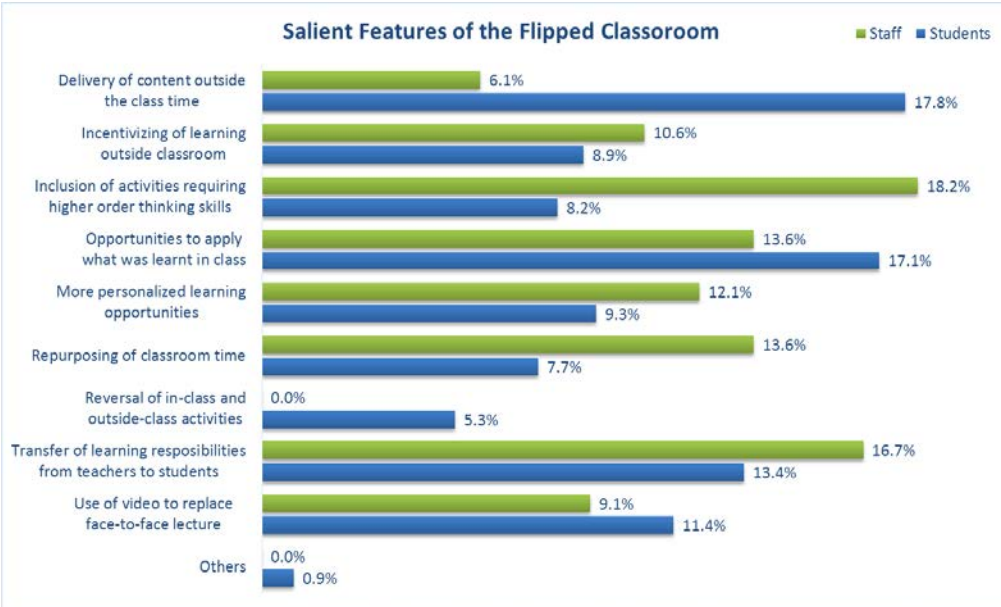

Figure 2. Students and staff responses on the salient features of flipped classroom.

We found moderate agreement between staff and student (Pearson's r = 0.44). Both staff and students recognized the higher responsibility on the part of the learner in the flipped classroom. Both also agreed that there is more opportunities to apply what was learnt in the flipped classroom. The notable differences in opinion was that students, focusing on the operational aspect, identified the delivery of content outside class time as a salient feature, while staff taking a more farseeing view, recognized the potential to include higher order thinking activities during class as a salient feature.

Next, we asked our respondents to estimate the percentage of classroom time used for each broad category of activities like discussion, problem solving, and collaborative work with peers, clarifying doubts on lecture materials, giving/receiving feedback and others. Their responses are presented in Figure 3 below. We see strong agreement (Pearson's r = 0.88) between students and teachers. This suggests to us that students were able to appreciate the type of learning activities planned by their teachers in the flipped classroom and that teachers had taken good advantage of the fact that students are now coming to class having already pre-learnt the required content materials. However, we see that only a small portion of the classroom time is seen by students and staff members to be used for peer collaboration, we felt that this is a pity and that the true benefit of the flipped classroom could be realized if more collaborative work is included in the design of the learning activities.

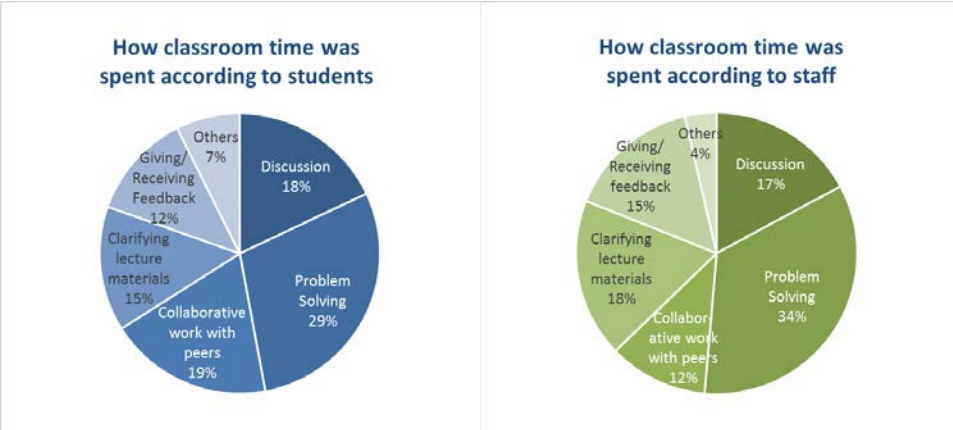

Figure 3. Respondents' estimation of percentage of classroom time used for various activities.

Finally, we asked our research participants to identify five benefits of flipping the classroom which they have personally experienced. The response by staff and student is presented in Figure 4. We noted low agreement between staff and students (Pearson's r = 0.15). There were three benefits which students and staff opinions differed considerably.

Students felt that they benefited from having more accessible lesson content but teachers do not feel that this was noteworthy. This difference in opinion suggests to us that staff members do not fully appreciate the amount of flexibility the flipped classroom had afforded to students in terms of when, where and how they consume the lesson materials.

Teachers felt that there were more opportunities for students to engage in active learning, but students did not thought so. The difference could also be due to students being under-prepared for the higher order thinking activates in class, so rather than being engaged, they ended up being lost in class.

Students and staff also disagreed that there is increased opportunities for student-teacher interactions. We felt that this may be related to how some flipped classroom was implemented. Some implementations of the flipped classroom replaced the face to face lecture with recorded videos of the lecture. The freed up time were designated as free time for students to consume the lecture materials instead of being repurposed for other activities. Such implementations resulted in a net decrease of interaction time between students and staff and may be why some students felt there were lesser engagement opportunities with their teachers.

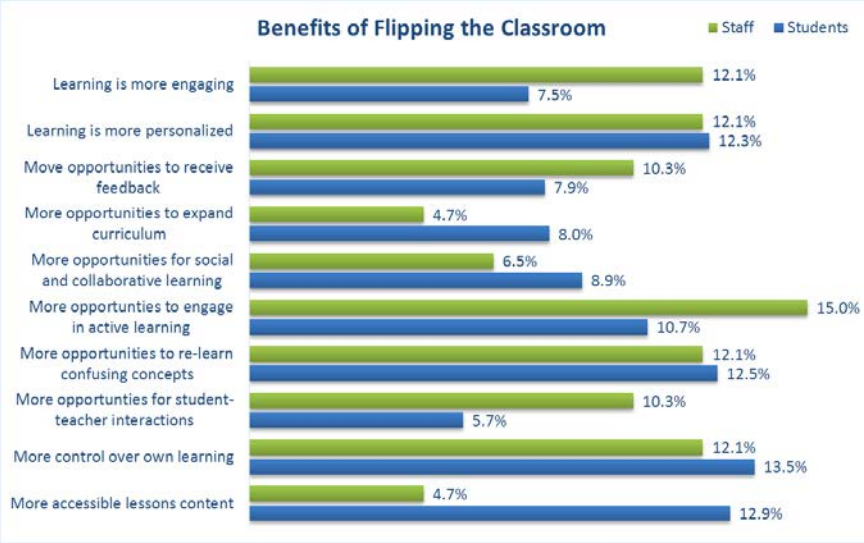

Figure 4. Students and staff responses on the benefits of flipped classroom.

5. Conclusion and Recommendations

In order for any educational innovation to succeed, there must be a common vision among students, teachers and administrators. Our research showed that presently, students and staff members have varied understanding of what the successfully flipped classroom should be and what it promises. We recommend that the school administrators and teacher representatives come together to jointly define what the flipped classroom should be, in the context of the school, taking into account any uniqueness in the nature of the subjects taught as well as the profile of the students and staff. Once this common definition is developed, it should be communicated to both staff and students. The communication could take the form of an introductory video, to be shown at the start of each course. There should also be clear guidelines on how freed up classroom time should be utilized.

The benefits of collaborative learning is well publicized (Annett, 1997; Laal & Ghodsi, 2012; Dillenbourg, 1999), the flipped classroom offers a perfect setting for collaborative learning to take place. We felt that teachers should take advantage of the flipped classroom by designing activities that require students to work collaboratively in small teams during class, that way, not only can students learn from each other, more complex tasks can also be assigned to enhance learning.

Our next recommendation concerns the use of mobile technologies for learning on the go. In the flipped classroom, students have the flexibility to peruse the recorded lectures whenever they like. If these lecture recordings are in the format that is compatible with their mobile devices, they would also have the flexibility of where and how they carry out their learning. Hence, we would like to recommend for the school to develop guidelines prescribing the size, duration and format for video lectures used in the flipped classroom. This would allow students to consume the materials anywhere, anytime therefore taking advantage of the ubiquitous connectivity and perverseness of mobile devices today.

The transfer of responsibilities of learning from teacher to students is quite significant in the flipped classroom. More effort and discipline is required on the part of the learner. We suggest that staff recognize this effort by incentivizing the greater effort required of students. Some practical recommendations include having in-video or post-video quizzes which accumulate towards students' coursework scores. Multiple attempts should be allowed for such quizzes in order to encourage the re-learning of concepts which students had difficulties with. Students can also be asked to prepare their own summary notes while they are watching the lecture videos, students can then be allowed to bring in a limited number of these summary notes for their tests or final examinations.

6. Limitations of Research

Our findings are predicated upon self-reported data collected through the use of questionnaire. Despite our efforts to address concerns regarding the validity and reliability of this data collection instrument, through piloting our questionnaire, assuring anonymity of our respondents and getting a sufficiently large sample; we recognize that there remains concerns regarding our findings. Our research could be further enhanced by conducting in-depth interviews with some of our respondents to triangulate our findings. However, due to time constraints, we could not do that. This may be a possible area for further research in the future.

At the time of our research, the flipped classroom model was still a novel implementation at the school we researched. Both students and staff have had only two semesters worth of experience to give their inputs for our research and teachers might not have been given sufficient time to perfect the implementation of the flipped classroom. We would like to recommend for a follow-up research to be conducted two years later.

While it is our belief that our recommendations made above would be general enough to be applicable to institutions planning to adopt the flipped classroom model, we would like to caution against the generalization of our findings as they may be unique for the context of our study.

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