

Flipping to engage students: Instructor perspectives on flipping large enrolment courses

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The purpose of this study was to investigate instructor perspectives on the implementation of flipped classrooms in large enrolment classrooms. Five instructors teaching in different disciplines – ranging from mechanical engineering to sociology – were purposefully selected to provide in-depth analysis of the process of converting a traditional course to a flipped format. The findings indicated that flipped approach broke the social code of large enrolment courses by shrinking the instructors and empowering the students. Benefits and challenges the format brings are discussed and recommendations for implementation are provided.

Introduction

Higher education institutions strive to transform teaching and learning experiences by implementing innovative pedagogical approaches to enhance the quality of education. Although flipped classrooms have been around for a few years, they continue to be at the forefront of educational practices and discussions in higher education (Estes, Ingram, & Liu, 2014; Karabulut-Ilgu, Jaramillo-Cherez, & Jahren, 2017). This instructional practice allows for higher-order learning to occur during face-to-face class sessions, where students are involved in active inquiry and strategic application exercises (Honeycutt & Garrett, 2013). To prepare for such exercises, students engage with the new content independently, outside of class and typically through media-rich online instructional materials. Learning prior to class is controlled by frequent low-stake assessments and aided by additional computer-mediated instruction (Parslow, 2012). The in-class session becomes a safe space to ask questions, explore topics, solve problems, and collaborate with peers under the guidance of the instructor, who provides timely and meaningful feedback and encouragement. The role of the instructor in the flipped large enrolment classroom, where creating an engaging and effective learning environment is always a challenging task (Rivera, 2015), is paramount to ensuring that students benefit from the structure, which relies on the students' integrity, responsibility, and buy-into the social contract of active learning.

Research literature on flipped classrooms is abundant with specific examples of flipped implementations which boast efficient uses of class time (Cole, 2009), student active involvement (Boucher, Robertson, Wainner, & Sanders, 2013; Crews & Butterfield, 2014; Flipped Classroom Trends, 2015; Gannod, Burge, & Helmick, 2008; McCallum, Schultz, Sellke, & Spartz, 2015), increased interaction between instructors and students (Lage, Platt, & Treglia, 2000), increased comprehension of content (Fautch, 2015; Redekopp & Ragusa, 2013; Vaughan, 2014) and statistically significant improvement in learner performance as well as decreased withdrawal and failure rates (Flynn, 2015). Flexible access to instructional materials prior to face-to-face class time is lauded to be highly effective, scalable and motivating to students (Davies, Dean, & Ball, 2013; Gilboy, Heinerichs, & Pazzaglia, 2015; Velegol, Zappe, & Mahoney, 2015), who tend to take ownership of their learning (Enfield, 2013; Lage et al., 2000) and collaborate effectively with peers (Love, Hodge, Grandgenett, & Swift, 2013; Strayer, 2012).

Large enrolment courses are fraught with many challenges, such as lack of learner engagement and participation, lack of opportunities to attend to learner differences, excessive workload for instructors, and impersonalisation of teaching (Ipinge, 2013). Flipping has been found to demonstrate increased participation (McLaughlin et al., 2014), increased learner emotional satisfaction and intellectual accessibility when compared to traditional large lecture courses (Mooring, Mitchell, & Burrows, 2016) and improved performance and learner satisfaction (Deslauriers, Schelew, & Wieman, 2011; Eichler & Peebles, 2016; Love et al., 2013).

With the research focusing on student perceptions and gains, instructor roles and experiences in a flipped classroom remain under investigated. The purpose of this article is to describe the complexity of instructor experiences in a flipped large enrolment classroom beyond a specific implementation. The researchers aim to

investigate common achievements and struggles of creating and teaching in a flipped environment that calls for student cognitive presence and acceptance of responsibility and the code of behaviour that honours intellectual exploration with others. Understanding that the very essence of flipping requires that the instructor gives up the comfort of being the subject matter expert (Fautch, 2015) and instead embraces the facilitation of the learning of the other in which the other emerges as an expert (Roach, 2014), and given the challenges of large enrolment classrooms, what can we learn from the instructor stories of flipping? More specifically, the following research questions are addressed in this study:

- (1) How is flipped classroom implemented in large enrolment higher education courses?
- (2) What are instructor perspectives on instructor and student roles in flipped courses?
- (3) What are instructor perspectives on the benefits and challenges of flipped learning in higher education context?

Methodology

Qualitative case study methodology was employed to examine instructor perceptions of large flipped classrooms. The unit of analysis was a large land-grant Midwestern university represented by five embedded units of analysis – study participants. By probing into the story of each participant, examining a range of sources and being highly cognisant of the larger institutional context, the researchers delved into the realities of every participant and the ways in which they interpreted their own experiences in the flipped classroom. Through the exploration of these experiences, the researchers aimed to construct an understanding of multiple realities (Merriam, 2009) of the flipped classroom and its place in the convoluted world of higher education.

Research context

The Flipped Learning Initiative sponsored jointly by the Office of the Senior Vice President and Provost and the Center for Excellence in Learning and Teaching was launched in Fall 2014 to enhance large enrolment courses across the university's academic programs. This enhancement was promoted through better instructional uses of online and classroom spaces, learning resources and technologies, and meaningful connections between students and the instructor. The initiative offered monetary and instructional support to the instructors of large enrolment courses to create online instructional materials and (re)design a course flow in which student learning prior to a face-to-face session relied on the newly created multi-media resources. All grant recipients were partnered with a CELT's instructional designer who facilitated the course design and development process (Center for Excellence in Learning and Teaching, 1995–2018).

Research participants

Purposeful sampling was used in this study to identify the people that could best inform our research questions (Creswell, 2013). The participants were selected from the grant recipients of the Flipped Learning Initiative. All the grant recipients were given an online survey and asked to define what flipped learning meant for them and describe the types of activities they designed for their flipped courses. The survey results indicated that every instructor conceptualised flipped learning in different ways. A selection criterion was created which included three main items: flipping, teamwork, and time and interaction in class. For flipping, they needed to include some pre-class online activities and in-class activities that required teamwork and interaction. Based on their definitions of flipped learning and description of their course activities, six participants were invited to participate in the study.

Five participants accepted the invitation and participated in the study. This small number of participants allowed the researchers to explore in-depth perspectives and experiences in the participants' transformation process from traditional to flipped learning contexts. In order to secure the anonymity of participants, pseudonyms were used to describe each case. Of the five instructors who participated in this study, Karen was a senior lecturer in mechanical engineering who had 18 years of industry and over 8 years of teaching experience. Matt was a professor in the Department of Ecology, Evolution and Organismal Biology who had over 40 years of teaching experience. Sarah was an assistant professor in kinesiology who had over 8 years of teaching experience. April

was an academic adviser in the College of Liberal Arts and Sciences who had over 8 years of teaching the introductory level orientation for open option and professional students. Finally, John was an associate professor in sociology who had over 20 years of teaching experience; his research focuses on social theory and political economy. Table 1 displays detailed information about each flipped course investigated in this study.

Table 1.
Detailed course information

Course	Size and set-up	Academic credits	Course description
ME 270 (Karen) <i>Introduction to Mechanical Engineering Design</i>	~ 250 students 6 sections* ~ 60/section 4 instructors 6 TAs	3 credits	Overview of mechanical engineering design with applications to thermal and mechanical systems. Introduction to current design practices used in industry.
BIOL 312 (Matt) <i>Ecology/Animal Ecology/Environmental Science</i>	~ 400 students 9 sections ~ 45/section 3 instructors 5 TAs	4 credits	Fundamental concepts and principles of ecology dealing with organisms, populations, communities and ecosystems. Laboratory and field exercises examine ecological principles and methods as well as illustrate habitats.
KIN 467 (Sarah) <i>Exercise and Health: Behavior Change</i>	~ 70 students 1 section 1 instructor	3 credits	A study of grading, assessment and evaluation in physical education with a focus on measuring cognitive and psychomotor achievement.
LAS 101 (April) <i>Orientation for Undecided Students</i>	~ 541 students 10 sections ~ 60/section 1 leading instructor 7 academic advisors	1 credit (Pass/Fail)	Introduction to all undergraduate colleges. Provides information about university resources and services, assists with a successful academic transition to the university, and helps initiate the process of identifying academic major(s) and eventual career paths.
SOC 134 (John) <i>Introduction to Sociology</i>	~ 300 students 3 sections ~ 100/section 1 instructor 1 TA	3 credits	Social interaction and group behaviour with emphasis on the scientific study of contemporary US society, including issues relating to socialisation, inequality, and changing rural and urban communities.

*Section refers to one of the classes formed by dividing students taking the same course.

Data collection sources and procedure

Data sources included course design documents, a survey, and semi-structured interviews. The document analysis and survey results were used to identify the participants for this study. The main data source was the semi-structured interviews, each of which took around an hour. All the interviews were recorded and transcribed verbatim for analysis, which totalled 3 hours and 46 minutes of audio recording and 87 pages of transcripts. The interview protocol included open-ended questions about the participants' professional background, teaching history, motivation to flip, the role of the grants in shaping the flipped course design, and perceptions of struggles and achievements associated with teaching in a flipped classroom.

Researcher's roles and quality assurance

In qualitative analysis, personal interpretations, biases, values, and personal interests that the researchers bring to the table need to be explicitly stated (Creswell, 2013). In this regard, the researchers acknowledged their roles and relationships with the participants. Two of the three researchers were the instructional designers who worked closely with three instructors of the Flipped Learning Initiative. To avoid any conflicts of interest, the

interviews were conducted in teams of two, and at least one of the researchers in a team had no prior contact with the interviewee. The interviewers developed a rapport with the participants so that they felt comfortable sharing their experiences and opinions without feeling pressured. The study received ethical approval from the Institutional Review Board at the university.

Three strategies were employed to ensure the accuracy of findings and interpretations: member checking, providing thick descriptions, and clarifying researcher bias. For member checking, a copy of the manuscript was sent to the participants to make sure interpretations were accurate representations of their interviews. Feedback received from the participants was taken into consideration and any mismatch was corrected. Next, rich and thick descriptions were supplied to help the readers understand the degree to which the research findings and interpretations can be generalised (Green & Holloway, 1997). Finally, all participants were informed about the researchers’ roles, the purpose of the study, the data collection methods and possible uses of the research results.

Data analysis

A cyclical analysis was conducted throughout this study (see Figure 1). A qualitative analysis software application, NVivo, was used to manage and code the data. To develop a code book, all authors independently coded one randomly selected transcript. Next, the codes were compared to create a detailed code book and develop a coding protocol (Miles, Huberman, & Saldaña, 2014). The remaining transcripts were coded in teams of two, where each team member first worked independently on a transcript designated to a team, and next collaborated with the peer researcher to compare the codes and reach an agreement for each code (Brinkmann & Kvale, 2015). Once the team came to an internal agreement, the codes were brought to the attention of the other team. If a consensus was reached across the teams, the new codes were added to the code book. In the absence of consensus, the codes were entered into the code book and marked as lacking consensus, and the code book was updated. Every time new codes were added, the teams went back to the data set and recoded as needed. If a disputed code was not reused in recoding, it was taken out of the code book. Alongside, the researchers kept a collaborative reflective journal and wrote analytic memos to reflect on the coding choices and processes (Saldaña, 2016). At the final stage, the coded data were categorised and organised into themes based on the research questions.

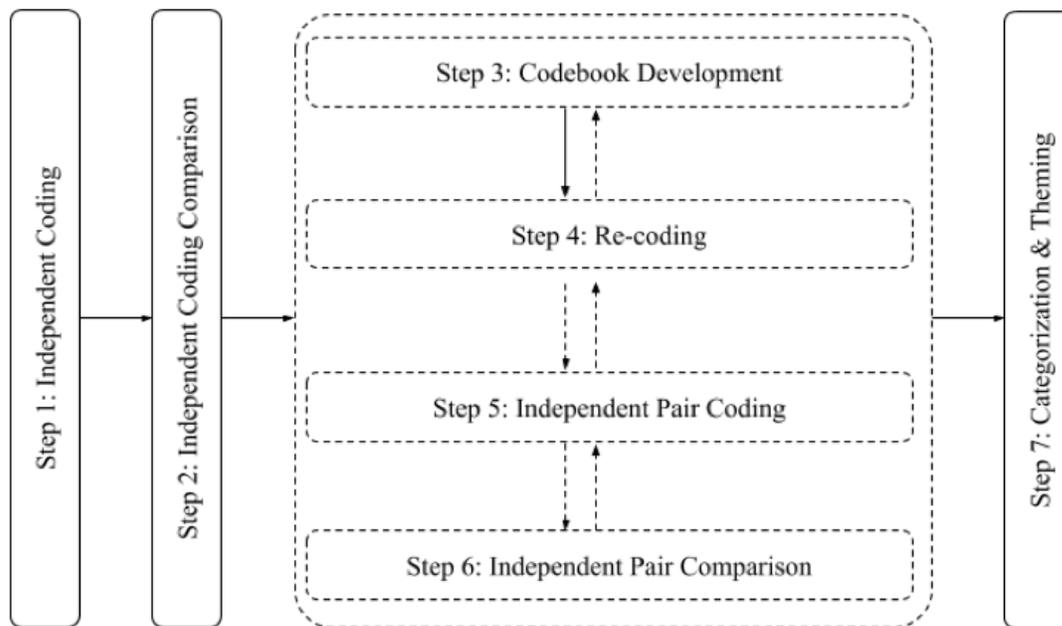


Figure 1. Data analysis process

Results and discussion

In this section, the research questions listed previously will guide the presentation and discussion of findings.

Flipped classroom in higher education

The instructors in this study taught in different academic disciplines ranging from sociology to mechanical engineering. Their implementations of flipped classrooms were similar in some aspects and different in others, which implies that flipping does not offer a one-size-fits-all universal solution (Table 2). Rather, each version of flipping was a reflection of the instructor's teaching philosophy and current instructional struggles and issues within their unique learning contexts. Flipping engendered a modification of time and space of learning. Face-to-face meeting time was either reduced and supplemented with online materials or remained intact even though prior engagement with online materials became mandatory as part of coursework.

The nature of in-class time was qualitatively different in the courses included in this study. John, April and Sarah used the in-class time for engaging students in fruitful discussions while Karen allocated the larger portion of in-class sessions to collaborative design projects. Karen's students were able to design and manufacture a prototype of a sustainable product that could potentially change the life of an impoverished community. Flipped classroom pushed the passive content that students can engage with independently outside of class. This created time for collaborative activities during class, as Matt pointed, "putting it online, that gave us another 20–30 minutes in some cases to devote actually doing the studies" (Matt, transcript, p. 9). How independent and collaborative activities were designed was based on the nature of the course content. However, there was a direct and connected relationship between the two in order to encourage active student preparation and participation. The in-class sessions also offered opportunities for students to clarify and reinforce concepts studied online through the instructors' feedback and scaffolding.

The transformative learning experience that the instructors aim to foster is what makes a flipped classroom:

[A] pedagogical approach in which direct instruction moves from the group learning space to the individual learning space, and the resulting group space is transformed into a dynamic, interactive learning environment where the educator guides students as they apply concepts and engage creatively in the subject matter. (Flipped Learning Network, 2014, p. 1)

Nevertheless, for flipped classrooms to truly become a disruptive transformative approach, wherein the individual space fosters preparation work, and the face-to-face space encourages dynamic and reflective practice, requires instructors as well as students' preparation to take up new roles, and to face the challenges that permeate the teaching and learning in higher education contexts.

Instructor and student roles in flipped classroom environments

A theme that emerged early in the data analysis identified flipping as a mutual responsibility, a social contract between the instructors and the students in their large enrolment courses. In a sense, flipping was perceived to be changing the dynamics of large enrolment courses, in which students tend to be seen as anonymous, voiceless and unprepared learners (Waite, Jackson, & Diwan, 2003) whose only obligation is to come to class on time and absorb knowledge dispensed by the instructor. In fact, the participants cited this very passive student behaviour as one of the major motivators for changing the status quo, as in the words of John:

The only solution is for us to work together. That, to me, is one of the biggest transformative experiences...to provide a moment where learning is fun again, and learning is growth, and learning is feeling stronger and more powerful than you thought before. As opposed to just meeting the bureaucratic requirements and getting the grades. (John, transcript, p. 2)

Table 2
Course information before and after flipping

Course	Before flipping (a typical week)	After flipping (a typical week)	Flipped classroom		
			Before class	During class	After class
ME 270 (Karen) <i>Introduction to Mechanical Engineering Design</i>	One-hour long lecture A three-hour long lab	A three-hour long lab	Students complete interactive online modules and self-assessments Students take an online quiz	A mini-lecture to answer student questions Application exercises completed in teams Work in permanent teams to develop and produce an engineering design product by the end of the semester Work in permanent teams and as a course to discuss submitted hypotheses One viable hypotheses is selected for testing by all teams Teams develop a testing procedure Fieldwork to conduct testing Team discussion to defend the team's testing procedures and results	Lab work to master the tools Team meetings to reflect on and improve the product design
BIOL 312 (Matt) <i>Ecology/Animal Ecology/Environmental Science</i>	A one-hour long lecture A three-hour long lab to conduct a mini-lecture and fieldwork	A one-hour long lecture Interactive modules and self-assessments A three-hour long lab to conduct Application exercises and fieldwork	Students attend a weekly lecture Students complete interactive online modules and self-assessments Students submit a hypothesis before lab	Students develop a testing procedure Fieldwork to conduct testing Team discussion to defend the team's testing procedures and results	Individual report writing on the results of testing and team discussion
KIN 467 (Sarah) <i>Exercise and Health: Behavior Change</i>	A three-hour long lecture	One hour of online work weekly A two-hour long F2F session	Students watch three online lecture videos (10 min each) Students take an online quiz	A mini lecture to highlight major points Small group work on a problem (e.g. case study) Groups report back to class Mini lecture to conclude and/or activity	A semester-long project
LAS 101 (April) <i>Orientation for Open Option and Pre-professional Students</i>	Three one-hour long lectures	One 50-min session Online individual activities and quiz prior to F2F	Students read articles Students complete an online quiz	Team-based learning: Team quizzes using clickers Application exercises	Blog entry/essay on F2F experiences
SOC 134 (John) <i>Introduction to Sociology</i>	One three-hour lecture	Online videos before F2F One three-hour session	Students watch lecture videos	Topic discussions Peer writing group discussion and application exercises	Individual writing assignments

The participants recognised it was essential for their flipped classrooms that students were empowered through a teaching and learning structure. This structure would favour learners' independence and learning strategies, and allow room for mistakes, all the while enforcing a sense of both individual and shared responsibility for learning.

Matt described this shared responsibility by emphasising the value of the time students spent on fieldwork during laboratory times. Students, he argued, need to be knowledgeable about lab safety procedures, equipment and some content prior to productive inquiry-based lab sessions. Matt explained his students were convinced that they had to share responsibility, firstly, because the course departs from a traditional cookbook-type lab where listening and passive observation were the only participation modes; instead these were inquiry-based lab sessions requiring students to come prepared and work in teams to complete the lab tasks. This flipped routine created a shared understanding that in-class time was a valuable commodity and creating more time for this kind of inquiry-based learning was a personal and collective responsibility which benefits all learners.

This sentiment that flipping distributed responsibility for learning across students and the instructor was echoed by April, who flipped a large enrolment college-wide orientation course. Her students were freshmen for whom her class was the first introduction to the idea of assuming responsibility for learning unlike the traditional assumption that "if you were in a large lecture classroom, you get to come and sit down, and you are not required to say anything" (April, p. 3). Instead, April asked her students to use in-class time for classroom discussions and team-based exercises which required preparation prior to class. Ultimately, every instructor in this research singled out a component of the classroom that was integral to this instructional method: that students and the instructor were co-creating knowledge and co-creation rejects passivity and intellectual laziness.

Reflecting on his role in his flipped course, John, who admitted feeling very comfortable in front of hundreds of students and enjoying lecturing as a form of performing arts, revealed that flipping shrank him. He referred to shrinking to explain that he replaced lecturing with recorded online materials to be viewed before class. It was during the actual recordings of his video materials that he discovered that he used to spend a whole in-class session on explaining content that could be shrunk into 15 minutes in the video. He stated:

It is amazing that it shrinks me ... Now Mr. Charisma [here refers to his lecturing personality as Mr. Charisma, thus hinting at his performing talent] goes away, and I am more reflective. I am more thoughtful. I am smaller. I am less emotional. And I think that is really good. (John, transcript, p. 15)

Flipping allowed John to think of something bigger than his oratory skills and the constant pressure of keeping the audience captivated. He said he kept thinking about "how life itself can become part of this experience. That my job is to help students learn to reflect on experience in a way that helps them direct growth and direct them towards their own values". (John, transcript, p. 11)

Flipped classrooms forced the instructors to reexamine their role and move away from lecturing and towards active student engagement. For example, Karen felt more involved in students' class projects:

Rather than trying to figure out what material I am going to lecture on today, or how I can explain it better to the students. Now that we have everything online [for students to engage prior to class], I spend more time with the students understanding their projects and trying to help them with my own design background. (Karen, transcript, p. 7)

Similarly, presenting content through online videos, Sarah's role transferred from that of a mere subject matter expert to a facilitator during class, who asked students questions, encouraged them to ask, made clarifications, managed the flow of team-based activities and "walk[ing] around and talk[ing] to them and bring[ing] it back together as a large class at the end where I am just asking them questions and their teams report on whatever is that we did that day" (Sarah, transcript, p. 6).

Benefits and challenges of flipped classroom

The second theme that emerged from the data revealed a plethora of benefits for both students and instructors as well as some challenges during the design and implementation phases. Among the benefits for instructors the following were identified: flexibility, knowing students better, reduced workload, and reduced variability in content delivery. Benefits for students included flexibility and accessibility, increased interaction with instructor, increased interaction with peers, increased preparation for class, and increased learning. Challenges that the instructors faced, on the other hand, included lack of appreciation, student resistance, student accountability, teamwork, technical issues, and time and logistics.

Benefits for instructors

Flipped classroom added flexibility to the course structure and enabled the instructors to reduce the contact hours without impeding learning, as Sarah mentioned: “Now what I've been able to do is push that lecture to home, shrink the classroom three hours to two hours which also means it's not a night class anymore” (Sarah, transcript, p. 11). For Sarah, the reduced contact time was compensated through the provision of content in the online space.

Another value of flipped learning identified by the instructors was getting to know their students better. This approach not only enabled instructors to spend more time with students at an individual level, but also provided opportunities for tracking student behaviour, as April explained referring to online tasks in her course, “We have all these data that we never had before on these students and what they're thinking” (April, transcript, p. 8). Similarly, Karen mentioned how she was able to provide support for students, as she did not have to lecture on the content. She stated, “I spend more time now with the students understanding their projects and trying to help them with my own design background” (Karen, transcript, p. 7).

By utilising the online learning environments, instructors in this study were able to reduce the workload for the teaching teams as opposed to prior research findings that concluded flipped classroom yielded increased workload for instructors because of the amount of front-end investment (Kalavally, Chan, & Khoo, 2014). Auto-graded online tasks and small-scale assessments, reduced the effort spent on grading significantly, as Matt explained:

That's always been one of the big things, how can we decrease the workload for our teaching assistants because they're grading a huge number of lab reports in addition to running lab class and we have a reputation for being one of the more time consuming tougher instructional jobs for grad students. (Matt, transcript, p. 8)

Instructors were able to reduce the variability in content delivery in courses with multiple sections and multiple instructors. Utilising the same lecture videos in the online environment ensured students learned the same material regardless of which sections they were enrolled while still allowing some flexibility for other instructors during face-to-face sessions. This would also assist in future courses to make sure all students have the same prerequisite knowledge, as Karen pointed out:

It will help reduce variability from teaching teams and cut down on issues that we have with people having a different lecture style and all that stuff will be removed from it, and it will all be very standardized. It will be great because that standardisation we need, too, for the students coming into the capstone. I'm hoping that we'll see some improvement in the students coming into the capstone. (Karen, transcript, p. 13)

Benefits for students

Instructors perceived that flipped classroom brings flexibility and accessibility to students because it allows students to access the course content at their own time and pace. As Matt pointed out, “they can go and do stuff anytime they want, up to the day before the class meets. It provides an opportunity for them to do this whenever they want to do it, it somehow forces them to anything” (Matt, transcript, p. 18). Further, Karen believes that

flexibility involves students accessing the content materials at students' own time, without compromising the compliance of deadlines:

The flexibility for them to complete the material. It's not to say they don't have any deadlines. The deadline is they complete it before they come into the next class period in which they'll apply it with their teams. I think that that really helps them. They can do it on their own time. They can go back and review materials if they don't understand it. (Karen, transcript, p. 8)

Similarly, flipped classroom opened up and extended a space for increased interaction with the instructor. As the face-to-face contact time was spent on active learning tasks rather than lecturing, students had the opportunity to interact more often, and directly with instructors, as Sarah remarked, "It means that I get to actually have one-on-one interactions with almost everyone in the classroom as I walk around to talk with the different groups about how they're doing and what their ideas and thoughts are" (p. 4). Having the instructor available for help during class seemed to be a great advantage of the flipped approach (McClelland, 2013).

Instructors also believed that increased interaction with peers was facilitated in a flipped classroom course by offering opportunities to students to work more closely with their peers. John remarked that the interaction among students not only improved the learning opportunities but also social interactions, as he stated, "They're more focused. They're more interested, because they've been talking with each other. It's just better" (p. 10). As opposed to the expectations for students in a large enrolment classroom – sitting quietly, listening to the professor and taking notes – students in flipped classroom environments were expected to interact with their peers, collaborate on projects and problems, and discuss with each other, which they seemed to have enjoyed (Ankeny & Krause, 2014; Bailey & Smith, 2013).

Increased preparation for class is another value for students. Through the implementation of flipped classroom, instructors perceived that their students were better prepared for in-class activities, as Matt commented, "they're much better prepared when they come and that seems to have worked reasonably well" (p. 10). This finding is in alignment with previous research that, in flipped learning, students came to class better prepared and formed better study habits compared to traditional classroom approaches (Mok, 2014; Papadopoulos & Roman, 2010). Even though students are always asked to do their readings (i.e., a chapter from a textbook), pre-class engagement seemed to be higher in flipped classroom environments. Associated quizzes and the synergistic relationship between pre-class and in-class assignments could explicate the increased preparation for class.

In addition to the benefits aforementioned here, the flipped classroom seemed to improve student learning and the quality of student work as they were able to receive more support from instructors, according to Matt and John. Likewise, the flipped classroom allowed instructors to achieve learning outcomes that focused more on professional skills, as also argued by Yelamarthi, Member, and Drake (2014). In this regard, Karen pointed out:

I think that's the beauty of it. That's the value of this class. It's what the class learning outcomes are to achieve, so teamwork, professional communication, written and oral, and then also sustainability. This allows us for the students to accomplish the learning outcomes, I think, which is the value added of the course. I think before we were encroaching on their learning outcomes with all of the lectures. (Karen, transcript, p. 122)

However, not all instructors perceived a difference in the flipped classroom in regards to the students' grades. For example, Sarah commented that "I would say the material is exactly the same. Their grades are exactly the same. They didn't do less well, with some of those materials delivered online which I was really happy to see" (p. 11). With this format, she was able to utilise all the other benefits (e.g., flexibility, accessibility). Previous studies specifically looking at the effectiveness of flipped classrooms over traditional approaches indicated mixed results as well. While some concluded that students in a flipped environment performed better than their counterparts in traditional environments (Amresh, Carberry, & Femiani, 2013), others found no difference (Davies et al., 2013).

Although the flipped classroom provided several benefits for instructors and students, instructors faced some challenges during the development and implementation stages. Instructors participating in this study stated that the time they had spent on improving their teaching was not considered in their promotion process. Although instructors were aware that it would benefit them in the long run, spending time on teaching might take valuable time off from other responsibilities considered essential for a tenure-track career, like John pointed:

I could have made this better if I'd have felt safe to do it, but I really need to be promoted right now. I really do. I've said this many times, and it's so true. This is the only job I know of where the more you give to your employer, the less valuable you are to them. And the more you feather your own nest, and build your own system of portable honor, which is what a vita is, it's for the publications, the more valuable you are. (John, transcript, p. 17)

Another challenge one of the instructors faced involved resistance from students. Flipped classrooms require students to take responsibility for their learning and be actively engaged in the learning process as opposed to having a passive absorbent role in a traditional teaching environment in big lecture halls (Amresh et al., 2013; Bland, 2006; Gannod, Burge, & Helmick, 2008). With flipped classroom, instructors in this study had been “breaking the social contract of the large lecture classroom”, as April stated. For example, in April’s course, students did not like being required to talk in front of 500 students. Another reason for the resistance from students was lack of awareness of the benefits that the approach provided for their learning. They thought instructors used this approach to make their job easier. As April explained, “I think they thought this is an easier way for us to get information out to six hundred students ... I don’t think that they completely connected that” (April, transcript, p. 8).

How to hold students accountable for completing the online tasks was another challenge that instructors faced. Expecting students to come to class prepared is not something new; however, it does not always happen. Lack of preparation may not necessarily be of much concern in a traditional classroom because the instructor would discuss and deliver the same information. In a flipped environment, on the other hand, pre-class preparation plays a crucial role in successfully completing in-class assignments and tasks. Therefore, instructors aim to ensure students come to class having done all the required pre-class tasks. In Karen’s course this was a big struggle, as she pointed out: “We really don’t have anything in place that tells us, ‘Yes, they viewed the material, or they turned on the video and they went and did something else and they came’. We have really no way of knowing that.” (Karen, transcript, p. 5). The most common method used to hold students accountable is to have an assessment (e.g., quiz) and give point distribution for the online tasks.

Occasionally, instructors encountered some logistical and technical challenges. For example, John was not able to get things done on time, as he stated:

Equipment was important to me, and there was so much bureaucratic delay that I didn’t get the equipment and the software until March ... That was really frustrating to me, because I had a TA [teaching assistant] or an RA [research assistant] that was fantastic to have, she was really good, but I couldn't have her do everything I wanted her to do. (John, transcript, p. 18)

Lastly, instructors who had to work as a team, either as a teaching team or design team, encountered some challenges mainly because of the differences in how team members conceptualised flipped classrooms. For example, April had invited campus representatives as guest speakers and asked them to design some online activities and some application exercises. The speakers did not understand what exactly she expected them to do, as April explained:

It turned out that they didn’t understand again necessarily what they were supposed to be doing, and they didn’t understand that not doing it the way that I had envisioned or asked was going to create problems. They thought because I’m a subject matter expert I’m just going to get up here and do my presentation, and it’s going to be fine and the students are going to learn something. We had quite a bit of resistance there too that was very unexpected and had to have a lot of follow-up conversations with people. (April, transcript, p. 5)

Likewise, Karen had to work with a teaching team who were not always on board in terms of what to do and how to do it. As the lead person in the initiative, she had to convince people about the value of this approach and guide them in conducting the classes as planned. Karen explained:

I think that's probably the thing that maybe other teams have seen this as well. You might have one person who totally gets it and wants to do it. That's probably me and maybe one other faculty member, but others are not. You're here and others might be, so you have to try to get them there. I think the students got them there, and that's what I was hoping would happen that the students would understand the value. (Karen, transcript, p. 13)

Overall, participants in this study identified several benefits of the flipped approach. Despite a few roadblocks along the way, instructors were content with how their courses turned out and how students benefited. Reflecting on their first experience, they already had plans for how they would revise their course so that their students could have more engaging and successful learning experiences. This experience encouraged instructors to consider converting their other courses into a flipped format.

Conclusion

The purpose of this study was to investigate how flipped classroom was implemented in a higher education context, how instructors' and students' roles changed, and report instructor perspectives on benefits and challenges of this relatively innovative pedagogical approach. The results indicated that instructors chose flipped classroom to address some challenges with their existing course design, leading to a significant shift in instructor and student roles. According to the participants, flipped classroom provided several benefits for students and instructors. These benefits for instructors can be summarised as flexibility, getting to know students better, reduced workload and reduced content variability. Benefits for students, on the other hand, included increased interaction with the instructor, increased interaction with peers, increased preparation for class and increase in learning gain. Despite all these positive evaluations, instructors in this study pointed out some challenges they faced during the development and implementation phases of their flipped classrooms. These challenges encompassed lack of appreciation, student resistance, student accountability for completing online tasks, teamwork challenges, and some technical and logistical glitches. However, the participants indicated that benefits outweighed these challenges, so they planned to continue to teach their courses using a flipped approach and they had already started thinking about the changes they would like to implement to improve student experience.

Pedagogical implications

Based on the findings of this study, we can make the following recommendations for instructors considering flipping their courses as well as the administrative staff facilitating such endeavours.

Released time for course development: Instructors in this study, particularly tenure-eligible instructors, complained about the relatively low impact of teaching in the tenure and promotion process, which is a common problem across academia. Converting a traditional course to a flipped format requires a high front-end preparation and time commitment that instructors may prefer to spend on other endeavours that would directly contribute to their promotion process. University administrators could at least provide time release to encourage instructors to work on their course improvements and development.

Meaningful interaction between online and in-class tasks: Instructors in this study stated that they used the online tasks to have students be prepared for in-class assignments, so there was a clear connection between what students do online and what they do in class afterwards. Some instructors, who were not included in the study but were team-teaching the courses under investigation, tried to lecture on the topics students studied online and that seemed to have received resistance from students. This implied that the online tasks and in-class activities should be complementary rather than repetitive.

Class size does not matter: One clear message that this study conveys is that flipped learning is possible in any size of classrooms. Instructors usually opine that interactive activities are hard to manage in large enrolment classrooms and they tend to use the traditional lecture approach. However, the results here indicated that flipped classrooms provided opportunities for shifting the student and instructor roles in these large enrolment classrooms. Students were active participants of the learning process rather than passive recipients, and instructors “shrank” from being the sage on the stage to facilitators of the learning process.

Explain the rationale for the flipped course structure: Millennial students are very much used to being surrounded by technology and tools, that sometimes it is easy to assume that they would be able to effectively use them in their learning process. Yet, as previous studies have also concluded, digital literacy does not always translate into being able to effectively employ technological tools in learning environments (Kennedy, Judd, Churchward, Gray, & Krause, 2008). Students have presumptions about teaching and learning that are challenged by innovative pedagogies like flipped classroom, which requires deep learning approaches as opposed to surface learning approaches in traditional lecture formats (Danker, 2015). Therefore, it becomes pertinent to prepare students for the new teaching and learning approach by explaining the rationale behind the pedagogical decisions made, and how these will impact the type and quality of their learning experience. Ideally, this will lead students to have a better understanding of their own responsibility and search for alternative learning strategies.

Limitations and directions for future research

With any research, this study has some limitations that need to be taken into consideration while interpreting the findings. The first limitation relates to the small number of participants, which might be of concern. However, the goal of this study is not to make any generalisations; rather, the study aims to provide a rich and contextualised understanding of flipped classroom in higher education through thick descriptions and intensive study of exemplary cases. A second limitation is the lack of student perspectives. Interpretations on benefits for students were based on instructor perceptions of how the flipped classroom benefitted their students. Students’ perceptions also provide valid information that will inform the extent of the innovative approach to enhance learning; however, these perceptions are outside the scope of this work. Future research may compare student and instructor perceptions.

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