

Use of the Flipped Instructional Model in Higher Education: Instructors' Perspectives

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Abstract

The flipped classroom model is an instructional model in which students learn basic subject matter prior to meeting in the classroom. Students come to the classroom with pre-class work finished, and prepared for active learning experiences. Previous research has shown that the flipped classroom model can 1) motivate students toward active learning, 2) improve their higher-order thinking skills and, 3) increase their collaborative learning skills. However, investigation into instructors' perspectives on using the flipped classroom model in instruction is lacking. This paper is a qualitative case study on instructors' experiences and perspectives on using a flipped classroom model in instruction. Structured interviews were conducted with eight faculty members who had completed a university training program on using active learning techniques and who either used or planned to use the flipped classroom model in their courses. The interview data showed different approaches by the instructors with regards to the implementation of the flipped classroom model in instruction, different perceived challenges, and showed the perceived need for outside support.

Introduction

The flipped classroom, which is also referred as an inverted classroom, is an instructional model in which the learning content is not presented during the in-class time (Strayer, 2007; Baker, 2000), but rather is learned by students prior to the classroom meeting through various forms of media (Bland, 2006; Foertsch, Mose, Strikwerda & Litzkow, 2002). This frees up in-class time for active learning, like practice exercises, problem solving, hands-on work, and collaborative projects (Baker, 2000; Lage, Platt, & Treglia, 2000; Zappe, Messner, Litzinger, & Lee, 2009; Demetry, 2010). In contrast to a traditional, lecture-based, instructor-centered instructional model, the flipped classroom model is composed of two phases of instruction that are "flipped", "inverted", or "reversed" from the typical sequence used in classroom instruction (Bergmann & Sams, 2012).

The first phase in the flipped classroom model is the pre-class learning phase. In this phase, basic subject contents and concepts are acquired by students before class. Students learn by viewing instructor provided learning materials in various media formats, such as online videos, podcasts, or text-format materials (Baker, 2000; Strayer, 2007; Strayer, 2012; Bergmann & Sams, 2012).

The second phase is the in-class learning phase. Because the introduction to basic knowledge content occurs in the first phase, in this phase student-centered active learning activities occur. Examples of these activities are interactive lectures, problem solving, laboratory experiments, collaborative designs and project creation (Gerstein, 2011; Strayer, 2012). A flipped classroom course can be taught in various physical facilities, not only a traditional lecture hall, but also in the technology-enhanced classrooms, in the studios, laboratories, computer labs, meeting rooms, outdoor settings, or in online learning spaces, such as Blackboard. Recent research indicates that students can be kept highly engaged when using the flipped classroom model (Gehring & Peddycord III, 2013; Dove, 2013). Students' motivation is increased by real-world, in-class, active learning activities (Zappe et al., 2009). A key advantage of the flipped classroom is that students can control their learning in terms of the learning pace and mastery of content (Alvarez, 2011). Research has shown that students take the responsibility for their learning, and come to the class better prepared than in traditional lecture approaches (Alvarez, 2011; Fulton, 2012). Research using post-class surveys also demonstrates that students perceived that the flipped classroom offers a unique, yet challenging opportunity to maximize learning effectiveness (Wagner, Laforge & Cripps, 2013; Demetry, 2007), and helps to improve problem-solving and application skills (Zappe et al., 2009). Gerstein (2011), Stuntz (2013), and Strayer (2011) reported that the flipped classroom model can provide an interactive atmosphere, which can improve students' in-depth communication and collaboration (Gerstein, 2011; Stuntz, 2013; Strayer, 2012).

Other research shows that the flipped classroom has a positive impact on students' learning (Gerstein, 2011; Strayer, 2012; Dove, 2013), demonstrated by increased student engagement in learning, increased higher-

order thinking skills, increased problem-solving skills, and improved collaborative skills (Demetry, 2010; Bergmann & Sams, 2012; Wagner, Laforge & Cripps, 2013; Stuntz, 2013; Strayer, 2012). However, from literature review, the authors found that current studies examined the influence of the flipped classroom on students' attitudes, perceptions, and experiences. These research contexts have been limited to one specific course in each case. No studies examined instructors' perceptions or experiences of using the flipped classroom model for instruction.

The purpose of this study was to discover how instructors define the characteristics of “the flipped classroom” instructional model, why they chose to use this model in their courses, and to discover their thoughts on the advantages and challenges associated with using the flipped classroom model. A qualitative case study approach was employed to investigate these instructors' viewpoints.

This study examined the following questions: (a) how do instructors define “the flipped classroom”; (b) why did instructors choose the flipped classroom model; (c) what key factors are associated with the effectiveness of the flipped classroom model; and, (d) what support did instructors view as important for successful implementation of the flipped classroom model?

Methodology

A qualitative case study method was used in this study, in order to gain intensive, rich, and in-depth analysis. This approach was selected as the research methodology because it can provide researchers with a deep understanding of the multiple aspects of a phenomenon in a natural setting (Yin, 2003). Further, it allows a holistic, more comprehensive understanding of meaningful context (Punch, 2005).

Participants

Eight participants were selected from 18 faculty members who attended in a Summer Teaching Institute sponsored by the Teaching and Learning Center at The University of Tennessee at Knoxville, and asked to volunteer in this study (Table 1). In the Summer Teaching Institute, a series of workshops on integrating technologies in instruction and student-centered active learning instructional strategies were provided for faculty members. Four faculty members who had implemented the flipped classroom model (F) in their courses, and four faculty members who were preparing to use the flipped classroom model (PF) in the coming semester were selected as the participants of this study. Additionally, these eight participants were from seven different academic disciplines (Table 1). This diversity enabled the researchers to have a more comprehensive investigation into the stories and viewpoints of university instructors at UTK.

Table 1. Summary of the participants

Flip model status	Course	Code
Flipped (F)	Foreign language	F1
	Foreign language	F2
	Business	F3
	Animal Science	F4
Pre-Flip (PF)	Mathematics	PF1
	Architecture	PF2
	Statistics	PF3
	Forestry	PF4

Interview

An individual structured interview was conducted with each participant. Table 2 contains a list of the interview questions.

Table 2. Interviewing Questions

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1. What lessons did you take from your participation in the Summer Teaching Institute?
 2. Elaborate how you implemented the flipped classroom model, or your plan of using it.
 3. What difficulties have you encountered, or foreseen in implementing the flipped classroom model?
 4. Tell me about the changes in time management you've made with relation to the flipped classroom model.
 5. What is your present definition of the flipped classroom model?
 6. In your mind, what concepts or characteristics of the flipped classroom model are essential?
 7. As an instructor, what advantages or disadvantages could you see of using the flipped classroom model?
 8. What, if any, resources or outside support, other than the Summer Teaching Institute, have or may influence your thinking about the flipped classroom model?
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Specifically, participants were asked to define “the flipped classroom” according to their own experiences and understanding. They were also specifically asked their perceptions of the advantages and challenges associated with an actual or planned implementation. Additionally, they were asked to comment on what support they thought was useful in using the flipped classroom model in their courses.

Data Analysis

Interview data was audio recorded and transcribed into computer files, initially hand-coded, and then computer coded using NVivo software with identification of recurring phrases and regularities in the data (Miles & Huberman, 1994). All initial codes followed closely the concepts used by the interviewees to enhance the validity of this study (Punch, 2005). Each transcribed file was analyzed using the set-up codes, and new codes were added as new concepts were generated. The transcripts were analyzed again after the revisions of all the coding categories. a comparison was conducted in each category between different participants. Major themes were developed based on the comparison of codes regarding to different participants in the same category.

Findings

Perceived “flipped classroom” Definition

All eight participants generally understood “the flipped classroom” to be a teaching and learning model in which the subject knowledge concepts, which are the lecture material, are completed outside of class for students’ self-directed learning. After this “prior knowledge” is acquired students come to class to apply what they have gained from pre-class learning and do so in a more interactive and collaborative way than a typical lecture format. The following statements represent several participants’ definitions of the flipped classroom:

“What I think is the flip model is one in which the students not only study the verb conjugations at home but also study the grammar at home, and they come to class to do their homework. (F1)”

“The flipped classroom is to use the class time doing exercises instead of myself standing in front of them repeating what they could have read in the book. (F2)”

“The flipped model to me means the student does a lot of the groundwork outside of class and they bring their basic knowledge of the material to class, and then you actually have active learning, where they are engaged in using that material to solve problems.” (PF3)

“The flipped classroom is a model in which pushing out information [outside class] and putting more ownership on students, and students come in at a level of preparation. It's a bit more than just reading the material, because in many cases reading is not the level of comprehension that you want. You want them to already start thinking about the integration of facts and concepts, and then come into class. (F3)”

The participants had different focuses regarding the flipped classroom. F2 focused on the instructor’s role change in the flipped classroom and emphasized that the instructor is no longer the transmitter of knowledge in class. PF3 focused on students’ engagement in problem solving in class with the knowledge base gained during pre-class learning. F3 focused on students’ responsibility for their learning, and emphasized students’ preparation before class. All of the participants placed emphasis on the students’ acquisition of basic knowledge learning *before* class and the use of in-class active learning activities. These activities emphasize students’ enjoyment and knowledge application skills in the classroom setting.

The instructors described how they would implement the flip model in their courses. A common aim was to transfer students' passive learning to active learning, and to create more time and opportunities to apply the knowledge gained during the in-class sessions.

Foreign language instructors, F1 and F2, had students learn vocabulary before class. This is common for foreign language instruction and "similar" to a typical approach in the flipped classroom. They "flipped" their courses in order to give students more in-class time for "high level activities", such as "oral translation" and "writing exercises". Lower levels of learning such as "recognition" vocabulary and grammar would have occurred prior to coming to class. PF2, an architecture instructor, indicated that his/her aim was "to change students' passive learning style and to encourage students to engage in complex projects having as many 500 variables". P3, who taught different sections of a supply-chain business course along with several other instructors, expressed the aim of the flipped classroom as:

"We want students to be able to apply concepts and to make a very different level of learning. We want students to read, comprehend at a certain level and then come into class, and we'll start the discussion not about what the definition is, but really start talking about it in application, strengths, weaknesses and so forth; incorporate technology in instruction (P3)."

P4, an instructor in animal science, had previously implemented a "partial flipped course", in which only a proportion of the course was implemented as a flipped classroom approach. The flipped part of the course was in an online format. The students' pre-class learning assignment was to upload their presentations on a discussion forum. The in-class time was for face-to-face intense discussion of the pre-class uploaded online presentations. P4 perceived it as a way to "allow for much deeper delving into the learning content than using the class time to go through the presentations". The students "had no longer listened to others' presentations as audience", but "engaged into more intensive and detailed discussions about what each presentation said."

Moreover, all the instructors viewed improving students' self-directed learning skills as an additional aim of using the flipped classroom model in their courses

These instructors' perceived advantages of using the flipped classroom model in instruction could be summarized as: (a), freeing in-class time for students' active learning, (b) enabling students into an more interactive and more in-depth way of learning, (c) improving students' skills in application and problem solving, and, (d) improving students' skills in collaboration and self-directed learning.

Perceived Approaches for Making an Effective Flipped Course

Interview data revealed four major components instructors should do to make an effective flipped course. These were: (a) ensure students have prepared for in-class session prior to class; (b) have organized instructional design with good structural components; (c) design learning materials and activities based on students' feedback, and, (d) provide instant support and scaffolding of learning in class.

Ensure Students Have Prepared Prior to Class

All eight instructors highlighted the importance of students' pre-class learning. They stated that students needed to complete assignments in pre-class learning to ensure that they could get involved in the in-class active learning activities.

"It is a biggest issue to have students do the work outside class, so that they are prepared when they come into the classroom... If the students can do the work outside class within the lecture content, it means we [instructors] can devote a whole class to be in the field, developing vegetation sampling plans and wildlife monitoring plans... If the students haven't done those, they are going to find it is very difficult to follow classroom content. (PF4)"

"...want them [students] to already start thinking about the integration of facts and concepts... when they come into class if they've [prepared], if we've done the Flip correctly, that's kind of where we start. (F3)"

"That students really have done the pre-class work is essential to the flipped classroom model. Students need to learn the basic knowledge, not only reading the materials, but also answering the questions... I don't feel it is going to be hard to carry out the in-class active learning, if the class is pre-organized, pre-class materials are already delivered, and make sure the students have learned before class, then come to class prepared. (PF3)"

Instructors indicated that in order for the flipped classroom model to be effectively implemented, students must do the prerequisite learning phase before coming to class. Instructors identified this as the "biggest issue", "important", and "essential". Instructors believed that the pre-class learning equipped students with basic concepts

required for in-class active learning. The in-class sessions provided students the opportunities to apply, integrate, and interact the knowledge gained from pre-class learning.

In order to ensure students learned before class, all the participants indicated that requiring students to finish some pre-class assignments was necessary. In addition to quizzes, participants shared other approaches they used for pre-class learning assignments, such as asking students to take notes when viewing pre-class learning videos (PF1), posting writing samples before class (F2), and posting presentations online for instructors and teaching assistants to review (F4). F3 used the “carrot and stick” approach to increase student completion of pre-class assignments. The scores of the pre-class quizzes were calculated into students’ final grade. Students would lose the grade if they did not finish the pre-class quizzes. The grade jeopardy provided the “stick”. These quizzes were not difficult, so if the students had gained the knowledge through pre-class learning, it would be easy to get this 10% of the final grade. In this sense, it was a “reward”, or “carrot”, that brought students to a good level of preparation for the in-class phase.

F3’s statement corresponded with the summary of PF1, who was a pre-Flip instructor, planned to use the flipped classroom model in the coming semester. PF1 commented that the pre-class assignment was necessary. PF1 planned to take the grades of students’ pre-class assignments as a part in the final grade of the course, with the aim of promoting students to be prepared prior to class. However, PF1 suggested that the pre-class assignment should not be too difficult, or take too much time for students to complete.

Be Well-organized in Instruction

All the instructors commented that in comparison to the traditional instructor-centered, lecture-based model, the flipped classroom model required them to be better organized in instructional design and implementation. PF2 commented:

“You [instructor] need to be very well organized, have very clear objectives as to what they [students] are to do prior to class. (PF2)”

PF2’s comments focused on clear organization when designing and assigning pre-class assignments. PF1’s comments further illustrated the importance of a well-organized structure in the flipped classroom instruction:

“Structure, schedule of the course, activities, group arrangement, must be well-organized... You have to do a schedule. There has to be some organization in class during the group activities so that it's not just chaos. I've got to organize how I'm going to do that and just how we're going to get started each day. (PF1)”

PF1 indicated that instructors should be well-organized in all aspects of the flipped classroom instruction, such as the syllabus, schedule for activities, activities design, and grouping arrangement for the in-class collaborative work, in order to avoid chaos in class. This was in agreement with F4’s comments:

“You need to be organized, you need to plan ahead. (F4)”

Moreover, F4 comments on good organization on students’ evaluation:

“There is a deadline for submitting the presentations, then five days for reviewing and evaluating each other’s group presentations... The evaluation of this course was rubric guided. (F4)”

When designing and implementing the flipped classroom instruction, the instructor should have clear and detailed organization of what the students should do for the complete semester. Students should be guided by the instructor to know when they would have access to pre-class learning materials before a specific day, the deadline and requirement for submitting the pre-class assignment, the in-class activities requirement, grouping assignment, and how their learning would be evaluated.

In addition, F3 suggested that instructors should take the organization of students’ responsibilities assignment in group work into consideration:

“Success is marked by students taking responsibility...making sure that the students understand what their responsibility is...makes it [instruction] successful. Collaboration and shared learning are essential components, characteristics in Flip” (F3).

Based on the interviews, none of the participants expressed concerns on how to be well-organized in instruction, but indicated that it was not difficult, just to be careful in scheduling the instruction. PF2 seemed to be very confident in organizing the class by commenting that he/she felt “really good in standing up and orchestrating a jazz band”. PF2 indicated it was much better to have a general plan of the whole course, which would enable the instructor to respond to whatever came up in class.

Think as Students

Six of the participants indicated that when they considered the instructional design of the courses to be implemented in the flipped classroom model, getting to know more about students was important. Finding out students' characteristics and needs, viewing instruction from students' viewpoints, and getting feedback from students, would play a critical role in making instruction more effective.

Awareness of the students' needs motivated F3 and colleagues to think of using the flipped classroom in the supply-chain business course they taught. Comprehensive and deep probing into the learning styles and needs of students, described as "digital natives", provided them guidelines for their instructional design. F3 explained that the instructors learned to "think as students". They found that the students, who were better in using technology, got bored on the exams, and they were good in searching and communicating the exam answers, so approaches which could improve and test students' abilities in application and problem solving were necessary. The activities should not only "make students a different level of learning" (F3), enabling higher-order thinking, but also reduce students' workload, because most students "had to work more than 10 hours a week" (F3). As a result, instructors should build short time exercises to help students to learn and apply knowledge. F3 also suggested that instructors should "really start digging a little bit deeper" on how students prepare for class, how much effort they invest, and whether they know how to prepare for class.

F1 and F2 both suggested that when preparing the pre-class learning materials, instructors should look at the knowledge from students' perspectives.

"Instructors should look at them [pre-class materials] from a slightly different perspective, because students will learn when the instructor is not with them" (F1).

"Instructors always think some knowledge is simple, but not to the students. The instructor does not recognize it. Especially when instructors create videos, they don't have the students to judge if they can get all the knowledge understood via viewing them" (F2).

F1 and F2 suggested that when preparing pre-class materials for the flipped classroom, instructors should think of students' current knowledge level, and design the pre-class learning materials that students can understand.

Additionally, PF1 suggested that the pre-class videos should be kept short in order to keep students' attention on pre-class learning:

"...doing little quick things just to grab students' attention, or just a little brief lesson without overwhelming them with information" (PF1).

Most participants suggested that instructors should actively collect students' feedback on instruction. For example, F2 and F4 gave students' surveys during the semester to get their comments on pre-class learning materials, and made changes to improve instruction, PF3 "monitored students' feedback on discussion board" in order to make revisions on instruction.

Provide Instant Support in Class

All participants claimed that a big advantage of the flipped classroom model was that students could have instant support during in-class exercises. Illustrations of instant support in class are described below.

"Students can have instant help because the instructor, GTAs, and other students will be in there. So to me that seems like a huge advantage" (PF1).

"Students [will] practice more with support right there; they can actually work through problems and they are not trying to struggle through them on their own in their dorm at night with no help available" (PF3).

An instructor in the design stage of the flipped classroom, PF3, believed the application of skills would be improved over that of the students in traditional lecture-based model. This is because students would practice more and receive more immediate guidance and scaffolding in a just-in-time situation. PF1 mentioned this as "a huge advantage" highlighting the importance of instant support in class from not only the instructor, but also GTAs' and other students.

"Some exercises are difficult. I plan to challenge students, they have to think, they have to analyze. I work when they only if they have problems or instruction is not enough" (F2).

F2's comment demonstrated the rule of providing students instant support in class. PF2 felt that the instructor's support should motivate and guide students to think and explore by themselves. PF3 argued that it was a challenge for the instructor to "balance providing students freedom to be responsible for their learning and giving them support".

PF1 focused more on instructor's interaction with students:

“I really like to have interaction with students. I think FLIP will allow me to have interactions a lot more both with the class as a whole but then with groups of students and one on one...in-classroom activities is particularly appealing to me, rather than [standing] in front of the classroom and just lecturing” (PF1).

PF1’s instant support was similar to an in-class interaction with students. Instructors could flexibly interact with a whole class of students, interact among different groups when students were having collaborative work, or interact with a specific student.

Perceived Challenges

In the interviews, the participants were also asked to share challenges they had or foresaw with the flipped classroom model in their courses. The following are representative responses from the participants.

Motivate and Make Sure Students Have Learned Before Class

As mentioned previously, a critical factor for making an effective flipped course is that the students have learned the knowledge in the pre-class learning. All of the instructors were concerned with motivation of students toward preparation and learning before coming to class.

“The main obstacle is the fact that sometimes students do not read the material before class” (F1).

“My biggest concern is students [might] come to class without doing the video lecture at home, not be prepared enough to do whatever I have planned on that day, and get stuck in class” (PF1).

“I have tremendous trouble getting them to do assigned readings...Some of the work will be assessed, but some not, so how to generate incentive for students to do the outside classwork becomes a big challenge” (F2).

“I felt disappointed because it (the flipped classroom) put a lot of responsibility on students, but they show up not prepared...students have never been or really expect to be held accountable to that level of preparation...students will get lost, frustrated if they come into class without preparation” (F3).

Expressions such as “main obstacle”, “biggest concern”, “a big challenge”, and “tremendous trouble” illustrated instructor’s concerns they had about a lack of student engagement in the in-class learning activities. This was attributed to a concern about the possible lack of pre-class preparation by students.

F3 described that the instructors were very disappointed upon finding students “not accountable to the level of preparation” prior to class. This reduced the instructional effect of the in-class active learning activities. Students were not able to keep up and participate in the activities which required the knowledge that was supposed to be acquired before class.

During the interviews, several instructors shared their strategies to motivate students to prepare before class. These strategies included, checks of students’ basic knowledge learning through the use of clickers at the beginning of class, requirements of students to post their foreign language writing journals online, and calculating students’ pre-class quiz scores and note taking performances in final grades. F3 also shared the experience of letting students know how to prepare for in-class sessions and the amount of time that should be invested.

Not All Students Like Active Learning

Two instructors indicated that it was a challenge for them to implement the flipped classroom model because not all the students liked active learning format. Students, in general are used to a passive learning format.

“They are more used to the traditional lecture in which instructors stand in the front of the classroom and explain everything. They don’t ask questions when they have difficulties” (F2).

How to turn passive learners into active learners remains a challenge. This is especially true when instructors did not know whether the students who kept silent even if they had difficulties in learning, had acquired the required knowledge or not.

Instructors described ways they tried to motivate these passive learners to engage in active learning. F2 indicated that instructors should try to convince students from the beginning of the semester that active learning is good for them. In practice, F2 focused more on how to acquire “silent” students’ feedback. F2 suggested that it would make these students feel more comfortable if the instructor could give students feedback about the questions they asked in the journals they submitted, so instead of asking directly in class, students were “forced” to submit journals every week. PF4 in anticipation of flipping the classroom believed that there might have been a few students not used to it, because “the flipped classroom is new to students”. PF4 suggested that instructors should “gauge how students are receiving it [the flipped classroom model]” first, then “doing [implement] it [the flipped classroom model] in gradual stages”, giving students more and more responsibilities in the in-class learning

activities. The staging approach would give the instructor more time to evaluate how well students were buying into the idea the flipped classroom model. It would also help the instructor gain from the experience in how to improve future instruction.

Improve Students' Collaboration

Although the participants commented that the in-class active learning activities could bring students into a more in-depth learning, motivate students' learning interest, and provide convenience for students to refer to help in class, several instructors were concerned that students did not collaborate well in the in-class active learning activities.

"My challenge now is to create activities that force them [students] to work together, but some students would choose to do [the course work] by themselves" (PF1).

A concern of PF1 was that the students would not collaborate in class because they were used working alone. PF1 planned to use the "jigsaw technique" to promote collaborative activities in the classroom. The "jigsaw technique" requires students to do something on their own and then to work together. The aim is "getting everybody working together" and "learning from each other".

In contrast to PF1, F1 felt the jigsaw method of putting students' individual works together was a low level of collaboration. This was described as "working on their own and simply putting individual work together on their own, but never coming back for reflection, revision, or reviewing others' contributions." F1 expected students to learn not only how to do work, but also learn how to integrate, revise, and reflect on the work and learning done.

Huge Time and Effort Investment

All instructors indicated that time and effort investment on preparing using the flipped classroom in instruction was an additional challenge in comparison to traditional lecture, especially when instructors implement this model for the first time.

"Time is a major problem because I had to create the videos and at the end of the semester, but I didn't have time to finish" (F2).

"Making videos involves lots of time and effort to prepare, such as writing script, and practice... A lot more pre-thinking has to be used to put what you already do into an online video, which leaves out all the questions, and to provide the student what you might do in a lecture plus Q and A or in a hands-on environment... You must have lots of thinking about the outcomes and how to structure things in order to create those outcomes, but then be able to verify in some way whether they were achieved or not... Lots of more things to improve the course, more on editing the videos, and for future use" (PF2).

"Time is a big limitation for a new faculty member teaching four classes to prepare for FLIP, particularly the videos" (PF4).

The above statements demonstrate some instructors thought video creation was costly in both time and energy. This was true with both the process of technical creation and revision and also with the designing of the videos. Thinking and reflecting about what to put into the videos, how to combine the videos with the in-class activities, what the instructor expects students to achieve and how to help them achieve with the videos, all required large quantities of time and energy. Additionally, revising the videos to improve the instruction for future use would require yet more time.

"One of the things I would like to do but [would] not have time completely is to create mechanics to make sure that they do what they need to do" (PF2).

"For a fairly new faculty member, I think at least initially for me it's going to be a pretty steep learning curve" (PF4).

"From a time standpoint it [the flipped classroom] can consume you. I can't imagine if my department hadn't given me two years to set this course in place and get those things. It is a learning curve about really knowing how much is doable, hoping this semester my time investment is going to be less" (F3).

The phrase a "steep learning curve" was used by PF4 to express concern for the anticipated time and energy investment in learning and exploring to use the flipped classroom model in instruction. Similarly, F3 was astonished with the amount of time needed to initiate the flipped classroom model. However, F3 illustrated that it was a learning process for instructors and hoped that future time investment might be decreased with future classes and more time in-class would be freed up due to flipping.

“[Instructor’s time management] is about creating more time in the class to be able to cover more material...having better discussions and getting students really involved in a deeper layer of conversation” (F4).

F4 did not think time to be a disadvantage with the flipped classroom model, but a challenge, specifically with the belief that more time would be freed up for the instructor and the GTAs to prepare activities and to evaluate each student. (F4)

Overall, instructors believed that while preparation for using the flipped classroom model actually consumed more time than for the traditional lecture passive classroom that it was worth it, because the created materials could be used for future classes. They also believed that they would not have to spend so much time in future class development due to the experience gained with initial flipping preparation both of videos and in-class activities.

Support

All of the participants indicated that they had some support to use the flipped classroom model in their courses. This support came in the form of either, (a) online resources about the flipped classroom; or, (b) other instructors’ peer assistance.

Some instructors received good ideas from Internet resources, such as the online posts about other instructors’ teaching experience in the flipped classroom model on wikis and blogs. These ideas were modified for use in their own classrooms. Other instructors read journals on instructions of their fields, especially the papers on active learning with the same subject matter in the classroom. Even though some instructors commented that reading could help to provide some basic ideas, they indicated that peer assistance from other instructors was more useful and important to them.

F1 and PF2 participated diverse disciplines pedagogy groups. In these groups, they shared and read articles about teaching. These groups regularly met to discuss teaching, share ideas and challenges, and help each other to solve problems about teaching.

PF3, F3, and F4 asked the colleagues in their departments for suggestions and support because they felt more comfortable speaking with people in their fields. PF1 indicated very good collaboration with GTAs on instructional design as well. PF2 was more comfortable to ask support from a nephew and a sister who both used the flipped classroom model in K-12 schools.

All instructors participated in the same Summer Teaching Institute sponsored by the Teaching and Learning Center at UTK. They commented that the workshops and counseling services provided them with great ideas in teaching. They felt, however, that what was even more valuable to them was the opportunity for peer communication, reflection, and learning from each others about the flipped classroom model provided them by the Summer Teaching Institute.

Discussion

Research has shown that the flipped classroom model can improve students’ learning motivations, higher-order thinking skills, and problem-solving skills. The flipped classroom model can provide students opportunities for engagement in student-centered active-learning experiences. Warter-Perez and Dong (2012) state that the fundamental idea behind the flipped classroom is that more class time can be devoted to active learning and that the instructor can provide immediate feedback during the active learning session. All interviewees in this study highly praised the in-class learning activities’ role in motivating students to apply the knowledge they gained. This study indicates that instructors viewed motivating students to prepare for the in-class activities a most essential component of the flipped classroom model. This study also demonstrates that instructors perceived how to motivate students get engaged in pre-class learning as a major challenge in implementing the flipped classroom model in instruction. Most current research is on the investigation of the in-class activities, and there is little research on the pre-class learning in the flipped classroom model. This study highlights the importance of the effectiveness of the pre-class learning activities.

Current research on the flipped classroom centers on the instructional benefit of the flipped classroom model through students’ perspectives. Findings from the current research shows students’ attitudes toward their learning experiences in the flipped classroom courses, and their learning gains. In contrast, the present study centers on training of instructors and their observations of the critical instructional design connected with flipping. In interviews, instructors were not only concerned with the instructional performance of the flipped classroom, but also on how they would effectively prepare and use this model in a time-saving and effort-saving way. This study indicates the need for helping students to be prepared before class and for the provision of proper motivation toward

that goal. Instructors must be well organized in their instructional goals and design, must be able to think like students (viewing objectives from their perspective). They must also provide students with timely support in class. Instructors believe it takes large quantities of time and energy to prepare for the flipped classroom model for the first time. However, they believe it is probable that less time and energy would be required in future classes because they had already gained both learning materials and instructional experience. Ultimately, support and training of instructors on how to use the flipped classroom model efficiently will prove critical to the acceptance of this model. Future research should focus on instructor's support and training in adopting the flipped classroom model.

In the investigation into the support instructors had for using the flipped classroom model, this study revealed that peer communication and assistance between instructors, such as peer assistance among pedagogy groups, and communication with experienced colleagues, were perceived by instructors as an efficient support approach for helping them to use the flipped class by the instructors. Based on this, future training may need to provide opportunities for instructors to have peer assistance, and support in a more flexible and more comfortable way.

A limitation of this study is that all the participants were from the same university and had the training in the same Summer Teaching Workshop, so their backgrounds were similar. Future studies on training for using the flipped classroom model need to draw upon instructors from more diverse backgrounds. Future research might investigate how universities can better support faculty members in gaining knowledge and skills required for building more active, effective, and multi-modal learning environments and a faculty peer-assisted learning community.

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