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Fatimah Alebrahim

*University of Northern Colorado*, fatimah.alebrahim@unco.edu

Heng-yu Ku

*University of Northern Colorado*, heng-yu.ku@unco.edu

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# Faculty Members' Experiences with the Implementation of Flipped Classroom Environments in Higher Education

*Fatimah Alebrahim*  
*University of Northern Colorado*

*Heng-Yu Ku*  
*University of Northern Colorado*

In the 21st century, educators and students prefer an active learning approach to the teaching and learning process. Active learning is a process that creates a positive learning impact (Bergtrom, 2011). In addition, the use of technology in education has become significant in active learning in the past few years. Educators have integrated a variety of technology tools in settings from elementary to higher education to improve teaching and learning with positive results for both students' outcome and faculty teaching (Adrian-Hollier, 2015). Current trends in higher education also indicate the traditional methods of instruction are changing to integrate more technology into teaching practices. Therefore, educators and researchers who want to improve the teaching environment by utilizing technology have enhanced classes by blending traditional face-to-face with online delivery of their courses. The name of this blended style of teaching has become known as the flipped classroom.

According to James, Chin, and Williams (2014), flipped or inverted classrooms are also known as one form of blended learning. The flipped classroom is classified as one of the pedagogical methods related to blended learning practices which work to

flip or invert traditional teaching methods. This method focuses on providing a media lesson to the students that must be completed outside of the classroom and prior to the class, after which the teacher demonstrates different activities related to the media lesson during class time. This strategy relies on technology to introduce students to course content outside of the classroom so students can engage with it on a deeper level inside the classroom (Strayer, 2012). Also, educators can design class activities which employ active learning in the flipped classroom and lead students to master participation skills (Beam, 2017).

This method works in two steps: (a) before class time, students should access the materials provided online and be knowledgeable about them; and (b) during class time, students work on applying activities and discussing the content with the instructor and peers. These activities include group projects, problem-based learning activities, experiments, class presentations, online reading assignments, and online discussions (Strayer, 2007). Gomez-Lanier (2018) stated that, "The flipped classroom provided greater opportunities for group collaboration whereby students were able to connect

with their teammates in a more meaningful learning environment” (p. 8).

According to Strayer (2012), the flipped classroom is a new model in pedagogy that has emerged in higher education over the past few years; evidenced by an increased mixture of face-to-face classroom experiences with online learning experiences, a departure from traditional on-campus classroom environments. The distinction of the flipped classroom as an instructional model in teaching has led to its study by educational researchers (Brewer & Movahedazarhouli, 2018; DeLozier & Rhodes, 2017; Kwan & Hew, 2017; Lundin, Rensfeldt, Hillman, Lantz-Andersson, & Peterson, 2018).

The flipped classroom method has become a leading interest in educational research because flipped classroom methods allow students to learn at their own pace and educators can focus on different styles of teaching through the use of media and help students rehearse information by applying different types of activities to match students’ learning styles. As the popularity of the flipped classroom method has increased, so has the number of educators who have implemented it. Chellapan and van der Meer (2015) stated, “Increasing numbers of teachers in higher education are considering implementing this model in light of the perceived benefits of a more active engagement of students in their learning” (p. 352). Utilization of online materials in flipped classrooms gives a professor the flexibility of creating different structures for necessary content. In addition, students have also expressed more confidence, greater satisfaction, and less anxiety levels in the flipped classroom learning environment (Carlisle, 2018).

The flipped classroom is a new instructional model and few studies have

addressed the perceptions of faculty members about the model. Moen and Helgevold (2015) recommended more research regarding faculty perspectives toward the effectiveness of flipped classrooms in organizing teaching and learning processes to ensure academic quality. According to Wanner and Palmer (2015), who explored faculty perceptions about flipped classrooms in higher education, faculty members shared concerns about different issues such as time commitment and the workload needed to implement flipped classrooms in their teaching instruction, the lack of support in offering professional development to implement flipped classrooms, the lack of students’ ability to be self-learners and to complete lessons, and the need for guidelines to help create the structure of the course. On the other hand, faculty members also believed flipped classrooms positively improved students’ abilities to make appropriate decisions and to be accountable, resulting in effective academic outcomes.

There is evidence that instructors who have changed their traditional classes to flipped classrooms believe their students gained greater understanding of the material (Brown, 2012), which supports the validity of this model of classroom learning. Conversion of a class to a flipped learning model increases understanding by allowing students enough time in class to practice essential skills under the facilitation of the instructor. However, this evidence pointed out the challenges of determining which teachers or instructors would be best suited to teaching with this model. For those who were not well suited, it was necessary to provide guidance and assistance in learning how to teach in this radically different way. They needed professional development to

master it effectively. Dennison (2013) conducted a study to examine factors which assisted in the adoption of technological innovations aside from time, money, and other resources. Two surveys were distributed and filled out by both faculty members and university personnel in information technology. Results showed professional development and training were not only a top priority of faculty and information technology professionals, but also executives and administrators.

One top goal of professional development in education is to develop and improve the quality of teaching and learning (Ouimet, 2011). Edenfield (2010) expressed the opinion that professors should be supported by having quality instruction from the university about teaching. Wallin and Smith (2005) also pointed out that for faculty members to be effective in their classrooms, they need to have opportunities to grow in their areas of expertise. According to Sunal et al. (2001), the best way to improve professional development is through “workshops, written descriptions of effective practice, the use of expert or peer consultation and mentoring, and involvement in a development process (such as funded course development)” (p. 248).

According to Gilboy, Heinerichs, and Pazzaglia (2015), implementation of the flipped classroom by expert educators is connected to improved student engagement, learning, and satisfaction. These positive relationships led to increased professional development opportunities for educators to gain the skills and knowledge to create suitable classroom environments which foster student engagement. In addition, Powers, Shin, Hagans, and Cordova (2015) explored the impact of providing professional development

training to teachers and its effect on student engagement.

### **Conceptual and Methodological Framework**

Rescher (2012) defined epistemology, the theory of knowledge, as investigating any related prior knowledge and concepts to understand how they are applied and their associated characteristics. Our epistemological view of the student learning process is grounded in constructivism. In an education setting, one of the foci of constructivism is group work and scaffolding. Lefrancois (2011) explained that in scaffolding, teachers are responsible for providing different activities and practices to support students as they learn. Flipped learning is a way to take the focus away from the instructor to refocus on students’ potential for constructing and retaining knowledge. In addition, with the integration of technology into courses, student learning will take place in a more active environment and become more constructivist-based. Constructivism is congruent with the purpose and goal of the flipped classroom model. In the flipped classroom, instruction moves from being extrinsically motivated (teacher-centered) to intrinsically motivated (student-centered) with guidance from the teacher.

This study utilized a qualitative evaluation approach which afforded the opportunity to examine the data descriptions deeply and in detail, both necessary to accomplish the purpose of this research. A case study approach was used to understand the flipped classroom implementation through participants’ perceptions and an evaluation lens. Case study was a suitable method because the professional development examined was designed specifically for this institution.

A constructivist lens was used to understand the process of flipped learning implementation. By evaluating the impact of flipped classroom implementation, we hoped to describe this type of implementation in higher education settings to determine how to help other educators implement flipped learning in their teaching.

### **Purpose and Research Question**

This study focused on faculty members' implementation of the flipped classroom in higher education settings using an evaluation process developed by Patton (2008). By choosing an evaluative method and analysis in this study, we wanted to improve, adjust, and provide action goals for flipped classroom implementation. The purpose of this research study was to uncover how faculty members experienced the implementation of a flipped classroom after having professional development. The research question that guided this study follows: How do faculty members who received professional development experience the implementation of the flipped classroom environment?

### **Method**

#### **Participants**

Three faculty participants (Faculty Participants A, M, and R) were chosen purposefully according to three criteria. First, they received professional development training in the flipped classroom model offered by a state university in fall 2015. Second, they had classes in the spring 2016 academic term and had integrated the flipped classroom model into their teaching. Third, these participants were chosen purposefully from different academic departments and with varied experiences of implementing a

flipped classroom. Faculty Participant A was an Anthropology faculty member who was implementing a flipped classroom for the second time after training. Faculty Participant M taught a Sociology course and had never implemented a flipped classroom before training. Faculty Participant R was an Accounting faculty who had previously implemented a flipped classroom without training and then attended the professional development training. All three courses (Anthropology, Sociology, and Accounting) were undergraduate level courses for sophomore and/or junior college students. The participants in this research reflected a variety of ages and included two males and one female. To protect their identities, each participant was assigned a pseudonym.

#### **Sources of Data**

Flipped classroom structures build on giving the lecture online before class and applying different activities during the class time, and this study had to capture the complete picture of implementation by investigating both activities. The first author designed the online observation checklist, in-class observation checklist, and interview questions. She then met with the two trainers who designed and delivered the flipped classroom professional development training to verify the integrity of those instruments. Consequently, gathered data included online observations, in-class observations, interviews, and document and artifacts.

**Online observations.** The first author conducted an online observation for one lesson through the learning management system of each of the participating faculty. She described a baseline understanding of what was happening in the learning management system by making checklists pertaining to the purpose of flipped

learning the professor provided in his/her online lecture to the students. The first author was able to observe how the students were interacting with the instructor and with other students, which helped us describe the process of the implementation. The first section of the observation checklists contained general items of the course name, participant code number, and number of students. The second section of the checklist contained two main parts (technology and materials and pre-classroom). Items under technology and materials included information regarding the list of materials, use of technology, and video information. The pre-classroom component included the eight-item professor checklists and the four-item student checklists which could be observed from the online course. Examples of items included on the online checklists were, "Provided lesson expectation and directions," "Explained the learning objectives and outcomes," and "Gave a quiz about the video provided" (see Appendix A).

**In-class observations.** In-class observation checklists were used to evaluate the implementation evaluation approaches mentioned above and how training was used in the implementation of the flipped classroom. Topics included the main components of flipped learning, technology usage, in-class activities, and support for student needs and help. The first section of the in-class observation checklist contained general information about the lessons, such as the course name, participant code number, and number of students. The checklists for in-class observations contained three main components to cover: the professor's role in the classroom, the classroom activities, and the students' role in the class. The

professor's role in the classroom included seven items which described his/her actions in the class. The activities component contained six ways the professor managed activities in the classroom. The students' role in the class listed eight ways in which students participated. All three components had sections in which to write notes and other additional information observed. Examples of in-class checklists were, "Challenging students individually or as a group," "Switching class activities or having a variety of activities to engage the student," and "Students show engagement as a group or individual in doing the activities" (see Appendix B).

**Individual interviews.** The purpose of the faculty interviews was to gain understanding about faculty members' implementation experiences of the flipped classroom in their courses. The interview questions contained three questions regarding flipped classroom implementation before class time and six questions concerning flipped classroom implementation during class time (see Appendix C). Sample interview questions included, "Describe your experience of implementing a flipped classroom," "How did you encourage students to complete the materials before the class time?" and "Within the different types of in class activities, which one did you think was the best learning experience for the students?"

**Documents and artifacts.** In addition to using observations and interviews as data resources, we also obtained a copy of online materials being used by instructors who taught the flipped classroom courses. Materials collected for the classes included any information created and offered by the professors including the course syllabus, reading assignments, projects, created videos, website links, and discussions.

These artifacts helped us gain a deeper understanding of the ways materials were used in course delivery of flipped classrooms.

### **Data Collection Procedures**

Before the study began, the first author met with the professional development trainers responsible for teaching faculty members who wanted to use the flipped classroom method in their classes. They discussed the possibility of this study and the trainers agreed to participate. Next, the first author was introduced to the faculty members as a researcher and her name was added to the online professional development roster along with the faculty members enrolled in training in 2015.

In the beginning of spring 2016, the first author met with the trainers again to choose three faculty members who met the criteria of the study. After getting approval from the Institutional Review Board, an email was sent to the chosen faculty members to invite them to participate, and to arrange a meeting date, time, and place, if they were interested. During the first meetings with the three faculty members, the first author performed initial data collection by conducting an online observation of lessons that was recorded on the observation checklist. Next, in-class observations were conducted using the checklists as a guide. Finally, individual interviews with faculty members were scheduled and lasted approximately 30 minutes.

### **Data Analysis**

The first step in analysis was to use descriptive statistics based on the checklists and documents to illustrate how often instructors followed flipped classroom directions to prepare their lesson plans. The next step of the analysis was to prepare the interviews of the faculty to be

transcribed. The third step was to read the transcriptions, checklists, and any other raw data multiple times and build codes based on the evaluation themes as described by Patton (2008). Then, for easy access to the data, we divided the data into separate documents for each faculty member participant.

After organizing and managing the data, the next step was to code the data. A combination of single words and phrases were coded and used for thematic analysis which was guided by utilization-focused evaluation (Patton, 2008). The observation checklists and faculty interviews were analyzed using deductive analysis. From this general model of evaluation, we created codes and organized them into themes and categories to generate an initial coding list related to the model components: a) effort, b) monitoring, c) process, d) component, and e) treatment specification.

Finally, we used three different strategies to establish the trustworthiness of the data: triangulation, member checks, and audit trail. For triangulation, we applied different data collection resources including online observation, in-class observations, individual interviews, and documents and artifacts. For member checking, we provided participants a copy of their transcripts and a summary of our interpretation of the research findings for feedback. For the audit trail, we described step-by-step details about the process of data collection and wrote thoughts about the study.

## **Findings**

### **Faculty Implementation Plans and Observed Findings**

This study was conducted with three trained faculty participants. Each

participant submitted an implementation plan as a part of the training activities. The following summaries describe each plan and its result in practice.

**Class 1: Anthropology (Faculty Participant A).** This course was an introduction to anthropology, describing the types of field and laboratory research methods used in the subject. In the past, the class was typically offered three days per week and was divided into two days for lectures and one day for laboratory assignments. The new plan was to change the meeting time to just one day per week instead of three times and add additional material to the learning management system such as videos to introduce core topics.

Faculty Participant A explained in his plan how he would work to improve student engagement in his flipped classroom implementation. He would develop effective hands-on activities, engage students in learning how to develop their application of skills, and improve their job prospects related to archeological, museum, or heritage management career tracks. In addition, he planned to create an enjoyable in-class environment and implement learning activities during lab time. After discussing his plan of implementation, the professor provided some concerns regarding the course he thought might happen. According to this professor, there were the following five possible challenges: a) some students would have difficulty focusing for a three-hour course, b) students might resist watching videos with other work they have to do, c) there might be difficulty ensuring each student would meet the course objectives through the lab and the assignments, d) anxiety might arise for students from the quizzes and other graded

work, and e) some students might not prefer to work in groups.

From our point of view, this class was ideal for implementing a flipped classroom. It was well organized in both online and in-class segments. The professor's design for the online lesson was generally easy to follow and the activities or requirements were presented clearly every week. His directions and guidance descriptions were very clear and informative (for example, how many minutes each video lasted and what students had to do). This professor was viewed as having been successful in his implementation to improve student learning.

**Class 2: Sociology (Faculty Participant M).** Faculty Participant M provided a two-semester plan for implementing a flipped classroom in her course after training. The first semester would occur immediately after the training and would be designed for a partial flip for the course and sometimes a half-flip for the lesson by using some of the flipped classroom elements such as the online component without the main video lecture. The professor planned to test the new materials, the in-class activities, and the online videos she made for the course. After getting ongoing student feedback, the professor would work during the same semester to modify the components of the class for full implementation in the second semester. The full implementation plan focused on clarification which would be provided for the students in the syllabus regarding the class format—to understand the purpose of the flipped classroom, to be aware that the videos would replace the lecture, and be given instructions regarding watching the videos. Assessment or quizzes would be conducted for the students at the beginning of each class to ensure their completion of the online work from

watching the videos or other requirements. Student attendance would also be recorded on a sheet of paper passed around in each class. The professor also listed active learning strategies which would be used including group work, exercises and games, individual and group presentations, and a research project.

In the online portion of the class, it was half-implemented to the flipped classroom model in the lesson; the lesson had reading as required, but the video was additional and not for explaining the main content of the lesson's lecture. In addition, navigating the links was confusing based on the lesson's structure and how the information was presented. It was difficult trying to figure out what the required reading and videos were; reading from the book was the main focus and there was a class discussion each week, but the readings and discussions were not required to be finished before class time. The videos were provided and made by the professor but were not as thorough as the book's content.

In the face-to-face portion of the class, most time was spent switching to different activities. Some activities began by offering creative group presentations. After finishing the group presentations, the mini lecture started. This was comprised of a list of questions and each question covered a part of the book. The students were divided into groups by the professor and most groups were very engaged and discussed the answers. The only downside for these activities was that the allotted time was more than the activities actually needed, which led to students just chatting at the end. However, the professor actively guided students by passing by each group. At the end of the class, the faculty member allowed each group to answer questions in front of all the other students. In summary,

the flipped classroom was not being implemented as it was supposed to be, especially online. In addition, the students' online responsibilities (for example, taking notes from the video lecture) were not mentioned, but the role of active learning in-class by the students helped increase student engagement.

**Class 3: Accounting (Faculty Participant R).** Faculty Participant R implemented his flipped classroom one year before the training; then he attended the professional development. He joined the training to get better ideas and practices for this model. His plan was to explain how he changed his previous way of teaching his flipped classroom.

The first point the professor mentioned was that he thought it was important to create videos; however, from the training, he discovered that preparing for class time and managing the schedule and the activities were also important. Secondly, he mentioned the value of introducing the new instructional model to students from the beginning of the course by putting a video online for them to view. Ideally, such a video would explain the main components of the flipped classroom instructional model.

The third point mentioned by this professor was the purpose of creating the videos. He said it was not just to offer a pre-class lecture, but it was also to create videos based on topics which were difficult to understand in class or to show some examples to use as practice problems. Most of the videos he was planning to do after the training involved creating videos by topics instead of offering a lecture. For example, instead of having a video 50-60 minutes long, he could change the length to three to four topics taking from 3-20 minutes with an average run time of 10

minutes. The final point raised by this professor was about integrating students' group work, which he was practicing before the training. Fortunately, the training gave him helpful ideas about students' group work to use in his modified implementation plan.

Overall, the professor of this class was the best of the faculty members at integrating technology and explaining the online content. The online aspect of this course was clear, as it was divided by short videos which helped students to focus. The online structure was easy to follow and was supported by a related quiz that rehearsed the information the student needed to know. The videos were interesting because the professor used software which allowed him to comment, write, and point using different colors. These features gave the students a lecture experience similar to a face-to-face lecture. However, the class time was short compared to the other classes. This limited time for students to participate in activities.

### ***Similarities and Differences Between Three Classes***

In terms of implementation, the similarities between the classes were that all three faculty members accomplished the main goal of the professional development—integrating flipped classroom components through posting videos online before class time and applying different activities such as readings, class discussion, and quizzes in the classroom. They were also similar in terms of their syllabi, which on first glance looked typical, but contained extra guidelines or descriptions and referred to additional documents to support the exams, assignments, grading criteria, or activities.

Differences were mostly seen in how the instructors organized the online

content. As the first author observed each professor's online class, she felt as if she was in diverse environments which displayed materials differently. For example, Participant A and Participant R required their students to watch the video lectures before the class, but it was optional for Faculty Participant M's students. The in-class time was also spent differently, which showed how much of a role the professor played in creating a class learning environment. Participant A and Participant R worked to align online videos with other materials to connect the students with specific and meaningful activities, while Participant M preferred to cover specific areas from the text. Another difference was that Participant A and Participant R included video time and materials required for studying by adding multiple short videos in place of lectures. Each video and accompanying material was named by topic to easily identify the material for student access. They also included clear directions to follow so students understood the requirements for the online part without any confusion.

### ***Themes Related to the Implementation Evaluation Components***

Each of the general themes explained the implementation process from a different view. *Effort* explained what the professors did to set up and implement the class. In *monitoring*, the questions asked how the trained professor made changes based on feedback. *Process* evaluated whether the professor felt like goals were being met. *Components* asked how each element worked to make the classroom successful for the professors. Finally, *treatment specification* measured the level of work sufficient to making the class successful.

**Effort.** Effort describes what the participating professors did to prepare and carry out the actual implementation.

**Setting up goals for the implementation course.** The three faculty participants explained different goals for their flipped classroom implementation.

Faculty Participant A stated his students were not taking the class as a major, so his goal was to try to keep the course interesting with the flipped classroom implementation:

To keep it interesting for them, I had to decide which were the most useful methods for them to learn and at what level they needed to learn it. I tried to focus on what I would think about as a specialist in the major, but you cannot be the master of every technique.

Faculty Participant M, who was just testing the implementation, had the following two goals for the implementation:

First, I want to be sure everyone participates, to make sure that it was a useful and efficient use of our time. I am not much for discussions going no place or people creating things just to be creating. I wanted it to be more purposeful and be a good practice on the material and have them leave the class better versed in what we are doing. Second, I wanted it to be useful and efficient, but I wanted everyone engaged.

Faculty Participant R had flipped his class prior to the professional development training. Rather than focus on his goals for flipped implementation, he explained the benefits for his role as an educator:

I believe the best way to learn the concepts are by actually doing them. By flipping the class and allowing the lectures to be heard outside of class time, it allowed the students to work on problems and projects during the class. They were able to teach and learn from other students, as well as hear explanations from myself whenever and whenever they got stuck. The students went from passively listening to actively participating. They could no longer sit idle and day dream while jotting down a few notes. They had to work on problems, answers questions, and ask questions.

**Planning for their role in the implementation course.** The faculty participants mentioned what they wanted their roles to be in the flipped classroom implementation. Faculty Participant A expressed:

My main role in the class was to get everybody up to speed on the video and introduce the class activity and explain how it connects to my lecture and the activity. Instead of that being an hour lecture, it may be a 10 minutes lecture, because they've already seen the video.

In addition, faculty Participant M preferred her role to be a minor one: "A big part of me was stepping back and not being so directive, wanting them to create and practice and interact with each other." Finally, faculty Participant R described his role:

I was no longer a lecturer, but a teacher. Instead of simply telling them

a topic, I taught them how to accomplish it as they were going through it. You also have to facilitate that students are staying on track and working on the assigned tasks.

**Defining the actual setting for the implementation.** Faculty Participant A had conducted a high level of preparation for his class. He explained his implementation setting: “For my flipped classroom, I primarily showed 10 to 20 to sometimes 30 minute videos online that went with a quiz most of the time.”

Faculty Participant M defined her flipped classroom implementation as:

Three units divided into 15 weeks so there is sort of a starting and stopping point. If they [students] do get behind they know how much they have to do to catch up. The units gave them an end point so they were a convenient way of chopping up the semester for them. It wasn't anything theoretical about the three units. And they ended with an exam. Having them have to do more critical analysis, creative stuff, thinking about the material in new ways that they hadn't thought about before. Sort of being pushed to doing new work or but also being required in the exercises to practice what they should have come prepared with—the basic supplies.

Faculty Participant R explained his class implementation:

It is additional work on the part of the professor and there is a bit of a learning curve around the technology, but the benefit it provides for the

students vastly outweighs the additional time spent. I was fortunate enough to use Panopto as a recording device for the students and it was a very seamless process once it was understood.

**Online videos.** All faculty participants explained their experiences of creating the videos and the proficiency they gained from the training. Faculty Participant A said, “The trainers sort of showed us how to make the videos, but really I just got the software (Camtasia) and I practiced with it.” He added he always evaluated the purpose of the videos before he posted them to his class: “Is the video teaching them something? Is this connected to the knowledge I am trying to impart? Is it interesting? Is it not boring?”

Faculty Participant M related her experience:

I began just reading some articles about flipped classrooms and I tried a few exercises in a class a couple of semesters ago and it didn't work so well. My technology preparation included taking that semester long flip learning [Professional Development] experience and I learned [about the software to create videos]. I had done some video creation before using [different software], but the software from the training was new and so I could create some videos, but they were not easy for me to do because I didn't know which [content to present]. There were, so many things I could talk about and so many points.

Also, Faculty Participant R mentioned how the type of software (Panopto) he used

to create his videos made grading his videos easy:

This is where “Panopto” was a key, because it tracks students’ viewing time. So, I assign some points over the course of the semester to all of the lectures in videos and then track who does and does not watch them and they receive points accordingly.

**Quiz effectiveness.** Both Faculty Participants A and R required quizzes after watching and doing each lesson in the online materials, but Faculty Participant M described the experience of not constantly requiring quizzes:

I didn’t do a quiz for every chapter. For every chapter I wanted to know, “Had they read the chapter and what did they know? They didn’t really do very well in the chapters. Some of them said, “Yeah I didn’t read it this week.” So it was a little bit of a culture shock in that they would be expected to know the materials every week. So they were not as prepared as they wanted to be even with a point task and the quizzes.

Faculty Participant M described a different way of organizing classroom time:

So, the idea would be, they [view] the material outside of class, the chapters, and the videos, and come to class prepared to practice it. The next week, they do the same thing and then they’d be quizzed on everything, videos, chapters, and what they had done in class. So it was kind of cumulative, and then they could start fresh in units two

and three. The units were just a way to organize the class.

**Group activities.** This sub-theme was implemented differently by faculty participants. Faculty Participant A stated:

I had 28 people in the class. Usually I have 20 to 25, so the biggest challenge I had in that regard was getting enough materials. A lot of these labs involve sorting artifacts and things like that. You need a lot of groups of things that people can work. Usually I had them in groups. Like, 5 or 6 groups of 4 to 6 people. Once they got started, I would go around and try to make sure they are engaged in the task and answer questions.

Faculty Participant M also explained some activities used in her classroom:

I had them do some thinking, sort of processing themselves writing exercise. So I had them do the writing exercise and then share it with someone else, or some variation of that. I did a mini-lecture a few times. I paired them with one or two other people in a group take one of the concepts. I gave them 10-15 questions for each chapter in advance. They had them on [Blackboard], they could prepare in advance so they’d be ready for the quiz and have all the materials simulated and ready to share in the group. The idea was new examples, new ways to explain to someone else in the big group. That was the big exercise that they did. Sometimes they liked it and sometimes they didn’t. Not so much problem-solving activities. I tried to come up with problems but was more

focused on group discussion, peer to peer, and then presenting to each other.

Faculty Participant R described his way of using in-class activities: “I used problems and cases in both an individual and group setting. The students had time to work on these, then discuss with nearby students, then we went over the answer as a class.”

**Monitoring.** Monitoring is a part of the formative evaluation for implementation: showing the changes that happened during the flipped classroom implementation, showing whether or not the students had any chance to offer feedback, and whether the professor made changes based upon the feedback.

Faculty Participant A stated, “I think, overall, it seemed to go well. The students seemed to enjoy it. Nobody was complaining. I thought I might have some complaints about it but people seemed to like it.” Faculty Participant R agreed by observing, “The students like group work problems the best. It allows them to have more heads to figure out the answer and keeps them more active.”

On the other hand, Faculty Participant M stated:

I feel like so far, I have a better feel for what they [the students] want in the video, what’s going to be really helpful to them, in terms of really putting the descriptive stuff outside of the classroom and I think I have some better but not enough feedback from students about in class exercises. I feel I know a little bit about what they won’t do well, what they won’t tolerate, and what they prefer.

**Process.** Process explains the outcomes of the flipped classroom implementation.

Faculty Participant A stated the effectiveness of the implementation from the view of meeting the goals of full implementation:

It improved the teaching experience for me, and the grades seemed to be better. I am going to look at the class the last time I taught a few years ago and just see, but it seemed like people did better, like they retained information better.

Faculty Participant R, who implemented fully, commented similarly that “Students’ retention of the course materials seems to be improving compare to the traditional lecture format.”

Faculty Participant M, who partially implemented the half-flipped classroom in her lesson, stated she experienced some negative reactions while implementing the instructional model:

There is no straight lecture or lecture discussion so a lot happens on the fly in class. It doesn’t feel as straightforward as science and math in terms of what to do... Like, this is how we do the problem, this is the calculation, and it just seemed like you could talk about this, or you could talk about that, so I went around and around with myself what to include? I did a terrible job I think. So in terms of the experience, it has been a lot of hard work to get very little done.

**Components.** This theme related to how the elements worked together to make the implementation successful. Faculty Participant A stated, “I just need to expand

a few more activities and modify some films [videos] each year. I should not have to build it from scratch every year. I just always change the content a bit. Yeah. Good experience.”

Faculty Participant R explained the components he used which worked successfully together in this implementation:

Seemed like it worked pretty well. The lectures were prepared in advance by me and watched by the students prior to walking into class. I had the problems ready for them when they came in. We would spend a quick 5 minutes at the beginning of class talking about what they were going to do. Then I would let them loose.

Faculty Participant M, who implemented the partially flipped classroom, stated:

I just did a little bit of each. I did the exercises, but it was a three hour period. Some of it was lecture/discussion or we'd do something else; the second half or first half of the period and then online. You know, they had the discussion board where they could build their own stuff around it. They had the videos online, and I know how I could have put them all together. I don't think I did this. I just did some of them and then I did give them a schedule frequently and every so often I'd put a schedule on the document camera and I'd say, "This is what we have done. Here is where we are going. Here is what is included in the unit." It was dynamic. I didn't know in advance what exactly would

happen, if it was going to work. If it didn't [work], I thought, "OK, I'm not going to do this again."

**Treatment specification.** This aspect clarified the elements that needed different levels of work to reach the desirable outcomes. Each faculty participant expressed this theme differently. Faculty Participant A stated:

I think the main weakness is sometimes you are worried you are not covering as much material or not explaining enough. What if they did not understand part of the reading? I think I did see the reflected in their grades.... It's challenging to stay ahead. Some weeks I was struggling to get the video together in time. As I said, the next time I do it, I should be able to reuse quite a few of the videos, and then modify or add new ones, but I will see that coming in advance, so I can fix that.

Faculty Participant R expressed:

One weakness is that with the lectures out there, it is possible for students to not attend class and they are likely to miss learning by doing in the classroom. I didn't have an excessive problem with this, but could foresee it happening...

Faculty Participant M, who was just testing the implementation, said:

I wasn't successful in getting them to prepare in advance of the class which is the only way the practice component works. The differential of preparing ahead was really problematic for the

students and for me. I do think they were more cohesive than a lot of groups. They knew everyone's name, they were familiar, they were comfortable, they felt safe, felt good, and they knew they were coming to work. They had to show up and even if they hadn't prepared their homework and research, they had their book out scrolling through it before class, which is better than saying, "I don't know anything, I don't need to know anything, in fact, I might be doing something else right now." I liked that there was a community around it. They know they are going to work, prepared or not, and we were all going to do it together. That was a definite strength.

## **Discussion**

The findings showed faculty participants implemented the flipped classroom using a systematic process. Professional effort and a desire to connect the pieces of the class in high quality ways which had value for students were characteristics of the preparation process. Faculty participants expressed four essential planning components which affected the ease of implementation and evaluation of their flipped classrooms: a) sufficient effort in preparing materials, b) deciding goals, c) reviewing materials, and d) preparing for online content.

The first finding showed that faculty planning to use flipped classrooms as the teaching model in their courses needed to commit to the effort required to do so. This finding was consistent with previous research; professors who were planning to implement flipped classroom process had to put in the effort to prepare materials, create videos, and design quizzes for each

lesson (Enfield, 2013). If a faculty member was a novice in flipped classroom management, the conversion needed additional effort and time to be successful.

Determination of specific goals for the flipped classroom implementation was the second preparation before the implementation. According to Smith and Ragan (2004), learning goals are statements of purpose or intention, what learners should be able to do at the conclusion of instruction" (p. 64). Therefore, goal definition helps faculty members focus on the purpose of flipped classroom, which is likely to lead to a successful educational experience for both faculty and students. The findings indicate that although the three faculty participants had different goals for the implementation, they all wanted their students to have positive learning experiences and outcomes. This finding is supported by the work of Naccarato and Karakok (2015) who reported faculty members implemented flipped classrooms with different goals and purposes.

The third step of preparation was to review existing materials and learn needed software for recording videos. The faculty participants spent time reviewing and highlighting the most important content to teach to students. They then learned technology tools and software to record and edit their video lectures. As two of the faculty participants mentioned, the most effective way of recording video lectures was through the use of multiple short videos separated by topics. In addition, faculty participants expressed needing time and effort to create, prepare, and evaluate different activities for use in class time. This finding was in harmony with previous research concerning faculty perceptions about the

time commitment and workload needed to implement flipped classrooms in their teaching instruction (Wanner & Palmer, 2015).

The fourth element needed before implementation of a flipped classroom was to prepare for online content by recording videos. The participants needed to create video lectures which connected the video lecture content to group activities in class for each lesson in the course. The three faculty participants prepared videos, but not all of them acknowledged them as a main resource for students. These three faculty participants worked independently to create videos and used different types of software, but the issue that affected the video lectures most was whether or not the posting was used as a primary or additional resource. In this study, data indicated it was important to use the video lectures as a main resource in order for them to contribute to the success of interrelated group activities in the class time. This finding was broadly in line with previous research which claimed the strength of flipped classroom implementation came from designing class activities to be related to what students learned from the online materials (Carbaugh, 2016; Enfield, 2013; Tuna, Dey, Subhlok, & Leasure, 2018).

In summary, each faculty participant used different components of the flipped classroom instructional model, depending on the course, the nature of its information, and faculty preferences. The two main components (online and in class) were systemic, so faculty participants needed to sensitively organize both parts and connect them to one another. These connections were considered an indicator of whether or not the faculty participants were striving to meet the ideal model of flipped classroom practice. In this study, the faculty

participants included both the online and in class components of the flipped classroom model, but they used different teaching strategies designed to fit their courses for each.

Finally, data collection in this case study was limited to three specific disciplines in undergraduate higher education. While the disciplines were intentionally chosen because they have been rarely reported in previous flipped classroom studies, this is still counted as a limitation. The findings and conclusion of this study cannot be generalized to wider populations due to the study's qualitative nature and small sample size. Suggested further research includes exploration of additional academic disciplines and both graduate and undergraduate level courses in higher education.

**Fatimah Alebrahim**, Ph.D. is an adjunct faculty in the Department of Applied Statistics and Research Methods, College of Education and Behavioral Sciences at the University of Northern Colorado, and a junior course developer in the Center for Teaching, Learning, and Design at Metropolitan State University of Denver. She can be contacted at [fatimah.alebrahim@unco.edu](mailto:fatimah.alebrahim@unco.edu).

**Heng-Yu Ku**, Ph.D. is a Professor in the School of Teacher Education, College of Education and Behavioral Sciences at the University of Northern Colorado. He can be contacted at [heng-yu.ku@unco.edu](mailto:heng-yu.ku@unco.edu).

## References

- Adrian-Hollier, L. M. (2015). *Teaching with technology in the higher education classroom to affect student engagement and success: An action research study*. (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 3717980)
- Beam, A. S. (2017). *The flipped classroom: A program preparing faculty to implement theory into practice* (Order No. 10757031). Available from ProQuest Dissertations & Theses Global. (1986858022).
- Bergtrom, G. (2011). Content vs. learning: An old dichotomy in science courses. *Journal of Asynchronous Learning Networks, 15*(1), 33-44.
- Brown, A. F. (2012). *A phenomenological study of undergraduate instructors using the inverted or flipped classroom model*. <http://pepperdine.contentdm.oclc.org/cdm/ref/collection/p15093coll2/id/348>
- Brewer, R., & Movahedazarhouligh, S. (2018). Successful stories and conflicts: A literature review on the effectiveness of flipped learning in higher education. *Journal of Computer Assisted Learning, 34*(4), 409-416.
- Carbaugh, E. M. (2016). *Differentiated flipped classroom: A practical guide to digital learning*. Thousand Oaks, CA: Corwin Sage.
- Carlisle, C. S. (2018). *How the flipped classroom impacts students' math achievement* (Order No. 10817518). Available from ProQuest Dissertations & Theses Global. (2065145464).
- Chellapan, L., & van der Meer, J. (2015). Challenges in implementing the flipped classroom model in higher education. In J. Keengwe & G. Onchwari (Eds.), *Handbook of research on active learning and the flipped classroom model in the digital age* (pp. 352-365). Hershey, PA: IGI Global.
- DeLozier, S. J., & Rhodes, M. G. (2017). Flipped classrooms: A review of key ideas and recommendations for practice. *Educational Psychology Review, 29*(1), 141-151.
- Dennison, T. W. (2013). *Critical success factors of technological innovation and diffusion in higher education*. [https://scholarworks.gsu.edu/cgi/viewcontent.cgi?article=1130&context=msit\\_diss](https://scholarworks.gsu.edu/cgi/viewcontent.cgi?article=1130&context=msit_diss)
- Edenfield, G. (2010). *A utilization-focused evaluation of a community college adjunct faculty professional development program*. <https://eric.ed.gov/?id=ED516175>
- Enfield, J. (2013). Looking at the impact of the flipped classroom model of instruction on undergraduate multimedia students at CSUN. *TechTrends: Linking Research and Practice to Improve Learning, 57*(6), 14-27.
- Gilboy, M. B., Heinerichs, S., & Pazzaglia, G. (2015). Enhancing student engagement using the flipped classroom. *Journal of Nutrition Education and Behavior, 47*(1), 109-114. doi:10.1016/j.jneb.2014.08.008
- Gomez-Lanier, L. (2018). Building collaboration in the flipped classroom: A case study. *International Journal for the Scholarship of Teaching and Learning, 12*(2), 1-9. doi:10.20429/ijstl.2018.120207

- James, A. J., Chin, C. K., & Williams, B. R. (2014). Using the flipped classroom to improve student engagement and to prepare graduates to meet maritime industry requirements: A focus on maritime education. *WMU Journal of Maritime Affairs, 13*(2), 331-343.
- Kwan, C., & Hew, K. H. (2017). A critical review of flipped classroom challenges in K-12 education: Possible solutions and recommendations for future research. *Research and Practice in Technology Enhanced Learning, 12*(4), 1-22.
- Lefrancois, G. (2011). *Theories of human learning: What the professor said* (6th ed.). Belmont, CA: Wadsworth.
- Lundin, M., Rensfeldt, A. B., Hillman, T., Lantz-Andersson, A., & Peterson, L. (2018). Higher education dominance and siloed knowledge: A systematic review of flipped classroom research. *International Journal of Educational Technology in Higher Education, 15*(20), 1-30.
- Moen, V., & Helgevold, N. (2015). The use of flipped classrooms to stimulate students' participation in an academic course in initial teacher education. *Nordic Journal of Digital Literacy, 9*(1), 29-42.
- Naccarato, E., & Karakok, G. (2015). Expectations and implementations of the flipped classroom model in undergraduate mathematics courses. *International Journal of Mathematical Education in Science and Technology, 46*(7), 968-978. doi:10.1080/0020739X.2015.1071440.
- Ouimet, J. A. (2011). Enhancing student success through faculty development: The classroom survey of student engagement. *Journal of Higher Education and Lifelong Learning, 18*, 115-120.
- Patton, M. Q. (2008). *Utilization-focused evaluation* (4th ed.). Thousand Oaks, CA: Sage Publications.
- Powers, K., Shin, S., Hagans, K. S., & Cordova, M. (2015). The impact of a teacher professional development program on student engagement. *International Journal of School & Educational Psychology, 3*(4), 231-240.
- Rescher, N. (2012). *Epistemology: An introduction to the theory of knowledge*. New York: SUNY Press.
- Smith, P. L., & Ragan, T. J. (2004). *Instructional design*. New York: Wiley/Jossey-Bass Education.
- Strayer, J. F. (2007). *The effects of the classroom flip on the learning environment: A comparison of learning activity in a traditional classroom and a flip classroom that used an intelligent tutoring system*. [https://etd.ohiolink.edu/!etd.send\\_file?accession=osu1189523914](https://etd.ohiolink.edu/!etd.send_file?accession=osu1189523914)
- Strayer, J. F. (2012). How learning in an inverted classroom influences cooperation, innovation and task orientation. *Learning Environments Research, 15*(2), 171-193.
- Sunal, D. W., Hodges, J., Sunal, C. S., Whitaker, K. W., Freeman, L. M., Edwards, L., & Odell, M. (2001). Teaching science in higher education: Faculty professional development and barriers to change. *School Science and Mathematics, 101*(5), 246-257.

- Tuna, T., Dey, T., Subhlok, J., & Leasure, L. (2018). Video supported flipped classroom. *Journal of Educational Multimedia and Hypermedia*, 27(4), 529-548.
- Wallin, D. L., & Smith, C. L. (2005). Professional development needs of full-time faculty in technical colleges. *Community College Journal of Research and Practice*, 29(2), 87-108.
- Wanner, T., & Palmer, E. (2015). Personalising learning: Exploring student and teacher perceptions about flexible learning and assessment in a flipped university course. *Computers & Education*, 88, 354-369.  
doi:10.1016/j.compedu.2015.07.008

## **Appendix A**

### **Online Observation Checklist**

**Course Name:**

**Participant Code#:**

**Number of Students:**

#### **I. Technology and Materials:**

\_\_\_\_\_ List of the materials posted from the professor in the lesson.

\_\_\_\_\_ Usage of technology in the lesson: video recording from the professor, YouTube from the internet, links to website, video conference.

\_\_\_\_\_ Video time and number of the materials required for studying.

Others:

#### **II. Pre-Classroom:**

##### **The Professor:**

\_\_\_\_\_ Introduced the topic.

\_\_\_\_\_ Had a lesson plan.

\_\_\_\_\_ Provided lesson expectations and directions.

\_\_\_\_\_ Explained the learning objectives and outcomes.

\_\_\_\_\_ Posted new instructional materials and resources for the lesson.

\_\_\_\_\_ Gave a quiz about the video provided.

\_\_\_\_\_ Revised student work before the class.

\_\_\_\_\_ Graded student work or gave points for completion before the class.

Others:

##### **The Students:**

\_\_\_\_\_ Student signed in for the lesson.

\_\_\_\_\_ Student posted questions for the professor.

\_\_\_\_\_ Student actively participated in the discussion.

\_\_\_\_\_ Student completed the quiz before the class time.

Others:

## **Appendix B**

### **In-Class Observation Checklist**

**Course Name:**

**Participant Code#:**

**Number of Students:**

#### **I. The Professor's Role in the Classroom:**

- Walking around the classroom and guiding the discussions.
- Asking questions to confirm students' understanding and to draw out more discussion.
- Answering questions that students bring to the class or raise during the class.
- Having tactics of the dividing students to the group and giving role for each group or individual.
- Supervising class discussion for the groups.
- Challenging students individually or as a group.
- Encouraging the student to be engaged, motivated, and confident.

Others:

#### **II. Demonstrate the Activities:**

- Giving time at the beginning of the class to answer any questions student have about the lesson.
- Addressing the students' difficulties based on questions students bring to class based on the materials they have read or watched prior to class.
- Applying in-class activity strategies by providing clear directions to the students.
- Following the timeline as planned by the professor and guiding the students to keep them on track.
- Switching class activities or having a variety type of activities to engage the students.
- Reminding students about their responsibilities after the class that are related to the lesson.

Others:

#### **III. The Student's Role in the Class:**

- Students ask questions in the beginning of the class regarding the content of the lesson.
- Students express any opinions about the lesson or technical problems related to the online lesson.
- Students show readiness for answering questions and reacting with the professor.
- Students repeat questions about the activity strategies to be clarified.
- Students join in groups to work flexibly and without rejection.
- Students show engagement as a group or individual in doing the activities.
- Students complete the task required as a goal for the class.
- Students ask the professor questions after class.

Others:

## **Appendix C**

### **Faculty Interview Questions**

#### **Flipped Classroom Implementation (Before the Class Time)**

1. Describe your experience of implementing a flipped classroom, including technology preparation.
2. Describe the criteria you used to build the activities for each lesson before the class time. What was the main purpose of using these criteria?
3. How did you encourage students to complete the materials before the class time?

#### **Flipped Classroom Implementation (During the Class Time)**

1. Describe your role as a professor in the flipped classroom during the class time.
2. Describe the role of your students in the flipped classroom during the class time.
3. Describe the activities you used in the class time to provide different learning experience (group discuss, problem-solving, peer-to peer)?
4. Within the different types of your in-class activities, which one did you think was the best learning experience for the students?
5. How did you fit all the flipped classroom components together?
6. Describe the strengths and weaknesses (or benefits or challenges) of implementing a flipped classroom?