2020

The flipped classroom in ESL teacher education: An example from CALL

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This version of the article has been accepted for publication, after peer review (when applicable) and is subject to Springer Nature's AM terms of use, but is not the Version of Record and does not reflect post-acceptance improvements, or any corrections. The Version of Record is available online at: http://dx.doi.org/10.1007/s10639-019-10082-6

Abstract

The flipped classroom is one of many technology-enhanced teaching strategies. In this approach, students are responsible for initial learning at home (often via instructional videos) and class time is used for problem-solving and activities to deepen understanding. Although research on and use of the flipped classroom in language education is growing, little work has examined its use in teacher education, particularly for language teachers. To address this gap, this study examined the flipped classroom through the eyes of pre-service language teachers to reveal what hinders them from or encourages them to adopt this approach. Data were collected from students in a Computer-Assisted Language Learning (CALL) course; they experienced two flipped class sessions (complementing the traditional instructor-led sessions) and completed a survey about their experiences. Semi-structured interviews were also conducted with a sub-set of students to examine their perceptions in greater depth. Three major themes emerged regarding benefits of the flipped classroom: learner autonomy, learning by doing with support, and preventing cognitive overload. Four challenges emerged: learners' technology access and technical ability, technical support for instructors, ambiguous student responsibility, and an inability to provide immediate clarification. Three additional notable themes emerged: heightened awareness of peers in the classroom, different reactions to content-oriented versus technically-oriented instructional videos, and student workload. These themes are discussed in detail, along with suggestions for teacher training and professional development. Also considered is the need to establish guidelines for best practices in flipped classrooms and to develop high-quality approaches to flipping without a dependence on instructional videos.

Keywords: improving classroom teaching; pedagogical issues; teaching/learning strategies; cooperative/collaborative learning; post-secondary education

The Flipped Classroom in ESL Teacher Education: An Example from CALL

1. Introduction

A majority of students are now born in or after the year 1982 and are thus considered part of the Millennial generation, which is accustomed to learning in an environment full of continuing advancements in technology (Jonas-Dwyer & Pospisil, 2004). Because of these technological expectations, current students' learning approaches are different from those of previous generations (Bishop & Verleger, 2013; Brunsell & Horejsi, 2013; Chen Hsieh, Huang, & Wu, 2017; Jonas-Dwyer & Pospisil, 2004; Savion, 2016). For instance, Savion (2016) remarks that learners' way of seeking information has been changing from relying on encyclopedias to libraries and MOOCs (massive open online courses). This proliferation of classroom technology has also overwhelmingly changed instructional approaches.

Many different technology-enhanced teaching strategies have been developed, and most have the goal of enhancing students' learning. For example, blended learning is a teaching approach that "combines traditional face-to-face classroom instruction (F2F) with online instruction—typically using a learning management system (LMS)" (Fadde & Vu, 2014, p. 2). It incorporates the advantages of traditional face-to-face classrooms and online learning: students retain the opportunity for interpersonal interaction with instructors and peers, yet can pursue autonomous learning at their own pace without the confines of time and location.

One of the most commonly used blended learning approaches is the flipped classroom model, in which students "watch lectures at home and online and faculty challenge them to solve

problems and deepen their knowledge in class" (Hotle & Garrow, 2016, p. 1). The flipped classroom is increasingly popular (Chen Hsieh et al., 2017; Goodwin & Miller, 2013; Graziano, 2017; Hotle & Garrow, 2016), and recent research has naturally focused on students' perceptions of the flipped classroom (e.g., Heyborne & Perrett, 2016; Johnson, 2013; Knight, 2016; Miragall & García-Soriano, 2016). However, it is unclear whether student perceptions vary across disciplines because the majority of studies conducted on flipped classrooms are in science, technology, engineering, and math (STEM) (Berrett, 2012; Vogelsang et al., 2019). The areas of language learning and language teacher training in particular have received little attention; Engin (2014, p. 15) states that "there have been almost no reports of the flipped classroom model in second language learning". Thus, the goals of the present study were twofold: (1) to critically examine the implementation of a flipped classroom approach in a (language) teacher training environment, and (2) to describe the perceptions of pre-service English as a second language (ESL) and English as a foreign language (EFL) teachers regarding the instructional value of the flipped classroom based on their experiences being learners in this teaching model.

2. Literature Review

2.1. What is a Flipped Classroom?

In a traditional classroom, the instructor delivers lecture during class time and assigns work for students to complete after class. In these lecture-based and teacher-centered classrooms, students are passive in their learning (McCarthy & Anderson, 2000, as cited in Avdic & Åkerblom, 2015), often resulting in low student engagement and satisfaction. Blended learning has the potential to mediate concerns about both traditional teaching approaches and online learning by enabling instructors and learners to have the convenience of online learning as well as the social contact of the classroom.

One popular application of blended learning is the flipped classroom, also known as an "inverted classroom" (Lage, Platt, & Treglia, 2000, p. 32). Lage et al., (2000) introduced this term and specified that "inverting the classroom means that events that have traditionally taken place inside the classroom now take place outside the classroom and vice versa". Although Lage et al. (2000) provide the earliest published use of the term 'inverted classroom', it did not gain popularity until it was publicized by two high school chemistry teachers, Bergmann and Sams (2012), who have been strong promoters of the flipped classroom teaching model through their publications, lectures, and professional development seminars (Heyborne & Perrett, 2016). Bergmann and Sams (2012) claimed that students could not translate content they learned through classroom lectures into applied knowledge for completing homework; furthermore, in a traditional teaching approach, students typically complete assignments individually without the assistance of instructors or peers. Bergmann and Sams (2012, p. 4) argued that "the time when students really need me physically present is when they get stuck and need my individual help". Thus, the flipped classroom is a student-centered teaching model, promoting cooperative and active learning.

Video has been the prominent medium in blended learning (Wong & Wong, 2018). In a flipped classroom, instructional videos are usually provided for students to watch prior to class; these videos serve as a content knowledge resource for students to participate in active, collaborative learning activities during class. Thus, the flipped classroom takes advantage of the fact that implementing interactive, student-centered, and collaborative learning activities enriches students' learning processes more than can be achieved by traditional teaching modes (Green, 2015; Zappe, Leicht, Messner, Litzinger, & Lee, 2009).

2.2 Theoretical Foundations

The design of the flipped classroom is based on constructivist principles (Bishop & Verleger, 2013; Green, 2015; Harrington, Bosch, Schoofs, Beel-Bates, & Anderson, 2015). Constructivist pedagogy advocates meaningful activities that engage students and cultivate their critical thinking and problem-solving abilities through reflection. Jacot, Noren, and Berge (2014, p. 24) point out that, "authentic, inquiry-based, exploratory, experiential, collaborative learning are common features of the flipped classroom".

The flipped classroom model consists of two elements: delivering instructional content through media such as videos or other out-of-class learning activities and using class time for interaction during collaborative learning activities. Both elements tie into the two primary rationales underlying the flipped model: Bloom's Taxonomy and Vygotsky's Zone of Proximal Development (Vygotsky, 1978). Bergmann and Sams (2014) argue that lower-order content can be delivered through instructional videos or other out-of-class learning activities prior to the face-to-face class time; in other words, content targeting the lower levels of Bloom's Taxonomy (acquiring or remembering information; understanding concepts; Molnar (2016) can be covered independently by students. Doing so allows class time to be devoted to cultivating learners' higher-order thinking skills.

The flipped model is also based on Vygotsky's Zone of Proximal Development (ZPD) (Vygotsky, 1978). The ZPD reflects the difference between students' actual developmental level, determined by independent problem-solving tasks, and their potential abilities, determined through problem-solving with guidance or collaboration with more capable peers (Vygotsky, 1978; Wertsch, 1984). The term "scaffolding" (Wood & Middleton, 1975) has become synonymous with the ZPD. According to Green (2015, p. 182), "scaffolding is an education-specific aspect of best practices in pedagogy that ensures that learners are sufficiently supported

in the learning process to bridge the gaps in their knowledge between what is known and what is unfamiliar in terms of course content". In a flipped classroom, learners are responsible for the initial learning task(s); class time is used to bridge the gaps between what has been learned this way and the ability to perform tasks that still require instructed guidance or peer collaboration. The role of the instructor is changed in the flipped classroom from "sage on the stage" to "guide on the side" (King, 1993), or from "presenter of content" to "coach" (Bergmann & Sams, 2014).

2.3 Strengths and Weaknesses of the Flipped Classroom

There are a number of advantages reported in the research on flipped classrooms, particularly regarding the use of instructional videos. Students can review content at their own pace and can watch instructional videos as many times as needed until they are confident they have a solid understanding of the content (Bergmann & Sams, 2014; Enfield, 2013; Engin, 2014; Green, 2015; Herreid & Schiller, 2013; Jacot et al., 2014; Mok, 2014). Online instructional videos also allow instructors to "speak the language of today's students" (Bergmann & Sams, 2012, p. 20). Research has shown that instructors can customize and update the curriculum more easily in a flipped classroom approach (Herreid & Schiller, 2013) and include content they may not have time to cover via traditional teaching modes (Mason, Shuman, & Cook, 2013). In addition, students are more inclined to "take ownership for their learning because the availability of the video lectures" (Mok, 2014, p. 9). Well-designed in-class activities in flipped classrooms are also beneficial because they not only engage learners in the learning process but also cultivate their problem-solving abilities through collaboration with peers (Bergmann & Sams, 2014; Enfield, 2013; Engin, 2014; Green, 2015; Jacot et al., 2014). Thus, the flipped classroom model can be viewed as a way to expand the curriculum rather than merely reorganizing course content in a digital format (Bishop & Verleger, 2013).

Several challenges of the flipped classroom must also be acknowledged. One disadvantage is the lack of timely feedback available to students while watching instructional videos. Students are unable to ask questions and get instant feedback from teachers, as during in-class lectures (Milman, 2012). This may frustrate students who prefer having questions answered promptly. Another challenge relates to the accessibility of online videos, because students may not have equal access to technology at home or may have a slow internet connection that makes it difficult to stream the videos and results in poor video quality (Enfield, 2013; Milman, 2012). Additionally, preparing videos and other classroom materials requires significant up-front time investment by instructors (Mok, 2014) which may hinder teachers' willingness to adopt a flipped approach. Finally, this pedagogy relies heavily on student ownership of their learning to complete the pre-class activities (Green, 2015; Mok, 2014).

2.4 Student Perceptions of the Flipped Classroom

Research on student perceptions of the flipped classroom has been conducted in various disciplines, including in high school math (Johnson, 2013) and engineering (Chao, Chen, & Chuang, 2015); in higher education computer science (Cieliebak & Frei, 2016), information systems (Mok, 2014), psychology (Miragall & García-Soriano, 2016), biology (Heyborne & Perrett, 2016), statistics (Peterson, 2016), and calculus (Sahin, Cavlazoglu, & Zeytuncu, 2015). This work has shown that the majority of students have positive attitudes toward the flipped classroom. The effectiveness of instructional videos has been particularly noted. Enfield (2013) found that most students reported instructional videos as being very helpful, engaging, and appropriately challenging and that students were satisfied with the ability to watch the videos at their own pace and found taking notes and working along with the videos to be effective. Mok (2014) also reported positive student perceptions about instructional videos and further found

that embedded quizzes or self-evaluation questions motivated students to watch the videos; these videos also alerted students to their knowledge gaps and thus to review the video again if necessary. Interestingly, both Enfield (2013) and Mok (2014) concluded that weaker students found the instructional videos more helpful than stronger students did; thus, "this model enabled weaker but diligent students to study at their own pace and come to class as prepared as their stronger contemporaries. This could have helped build up their confidence and enjoyment of the subject matter" (Mok, 2014, p. 10).

However, other research has found that students can have mixed or negative perceptions of the flipped classroom model (Heyborne & Perrett, 2016; Khanova, McLaughlin, Rhoney, Roth, & Harris, 2015). Chen Hsieh et al. (2017) found that, among the mixed comments they received about the flipped classroom, the majority of students were satisfied with the use of instructional videos but criticized the in-class activities (e.g., jigsaws, team teaching, modeling, discussion, data analysis, problem sets, videos) which sometimes confused them. Some learners even reflected that having group activities was a waste of time because not every student participated and the subject was still not understood by the end of the class period. Furthermore, Khanova et al. (2015, p. 4) reported that only "28% of participants agreed or strongly agreed that pre-class modules enhanced learning" and "44% agreed or strongly agreed that in-class activities enhance their learning"; the overall student comments about this course included that "most everything was self-taught" (p. 5) and highlighted the lack of guidance from instructors. These mixed or negative responses show the importance of bridging the out-of-class learning tasks with in-class activities and maintaining a good balance between these two elements.

2.5 The Flipped Classroom for Language Learning

Though the flipped classroom has been used primarily in STEM-related fields, language educators have also noted the potential for applying the flipped classroom to language learning (Brinks Lockwood, 2014; Marshall, 2017). For example, the number of flipped classroom-related presentations and workshops at the Teaching English to Speakers of Other Languages (TESOL) International Convention increased from three in 2013 to more than 15 in 2017. Studies of flipped classrooms in TESOL have been conducted for various language skills, including grammar (Al-Harbi & Alshumaimeri, 2016; Webb & Doman, 2016), writing (Afrilyasanti, Cahyono, & Astuti, 2016; Engin, 2014), and oral communication (Chen Hsieh et al., 2017; Han, 2015; Lin and Hwang, 2018; Oki, 2016), as well as in general English courses (Lee, Nakamura, & Sadler, 2016; Sung, 2015; Yuan, 2015). Similar to STEM-related studies, research has shown that students learning English have positive attitudes toward the flipped approach (Al-Harbi & Alshumaimeri, 2016; Chen Hsieh et al., 2017; Han, 2015; Oki, 2016; Sung, 2015; Webb & Doman, 2016), though its influence on performance is not always statistically reliable (Al-Harbi & Alshumaimeri, 2016; Webb & Doman, 2016).

Although research on the flipped classroom in TESOL is growing, Kostka and Brinks Lockwood (2015, p. 3) found that most ESL/EFL instructors hesitate to adopt a flipped approach due concerns such as thinking “they are not tech-savvy enough to flip their classes” and “they do not have time to create their own videos”. Thus, despite its promise for improving student engagement and learning, the flipped classroom has seen relatively limited implementation in (English) language courses.

2.6 Current Trends in Flipped Classroom Research

As reviewed above, much of the existing research on the flipped classroom has focused on learning in STEM fields (e.g., mathematics, biology, chemistry, computer science) and

healthcare education (Berrett, 2012; Vogelsang et al., 2019). Only recently has research begun to examine the implementation and effectiveness of flipped classrooms in other areas of study. In addition to language learning, these new applications of the flipped classroom range from the arts (Enfield, 2013; Horner, 2016; Rivera, 2016) to business and communication (Durst & Meyers, 2015; Knight, 2016) to history (Aidinopoulou & Sampson, 2017; DeSantis et al., 2017). Teacher education is an additional area of growth in research on the flipped classroom (Graziano, 2017; Kurt, 2017; Vaughan, 2014), as may be expected given its growing popularity.

Much of the existing research on the flipped classroom has focused on its direct impacts on student learning, including their achievement, motivation, engagement, and interaction (Zainuddin and Halili, 2016). This work continues to grow, particularly the focus on student-teacher and student-student interactions (Chen Hsiesh et al., 2017; McCollum et al., 2017; Sun & Wu, 2016; Zhang & Wu, 2016). However, as befits a maturing field of research, new areas of focus have begun to emerge. These include establishing guidelines for designing and developing courses using a flipped approach (Amira et al., 2019; Jiang et al., 2016; Vogelsang et al., 2019) and evaluating flipped classrooms (Amira et al., 2019; Vogelsang and Hoppe, 2018). Additionally, some researchers have begun to push beyond the standard structure of out-of-class instructional videos followed soon after by class sessions with planned in-class activities. For example, Song and Kapur (2017) proposed a "productive failure-based flipped classroom" approach that involves learners exploring new concepts in class first, and then watching videos at home *after* (rather than before). Another example is Uskokovic (2018), who has stretched out the time period that students engage with material outside of class and also focused on a highly flexible, co-creational approach to learning content during class sessions.

3. Current Study

The study described in this paper builds directly on the existing flipped classroom research. However, its goal is to expand current understanding of the flipped classroom in some of the new areas of application described above. Specifically, given the growing interest in flipped classrooms for language learning and teacher education, yet the documented hesitation by ESL/EFL instructors to implement them, it is important to examine the flipped classroom through the eyes of pre-service teachers. Such an examination can reveal the elements of a flipped classroom that hinder or encourage ESL/EFL teachers to adopt such an approach, and thus inform teacher training and professional development. Therefore, the goals of the present study were to investigate the implementation of a flipped teaching model for pre-service ESL/EFL teachers in a Computer-Assisted Language Learning (CALL) course and describe students' perceptions of the approach. The following research questions guided the investigation:

1. What are the perceived benefits of the flipped classroom, from the perspective of pre-service ESL/EFL teachers?
2. What elements of the flipped classroom are seen as challenges that may discourage pre-service ESL/EFL teachers from adopting this approach?
3. What reflections and reactions do pre-service ESL/EFL teachers have as a result of being learners in a flipped classroom?

4. Method

4.1 Context

The study was conducted in a Computer-Assisted Language Learning (CALL) course at a regional public university in the United States in spring 2017. The course is offered as an elective for undergraduate and graduate students in linguistics, TESOL, and foreign languages. This course lasted 15 weeks, with one session per week of two and half hours. Two sessions

were designated for student presentations, one class for evaluation-related content, and twelve for technical software instruction. The instructor was one of the researchers and had taught the course twice. When teaching the course using a traditional approach, the instructor prepared follow-along documents for in-class technical demonstrations, followed by in-class time for practice. Students reflected that these documents helped them both in-class and out-of-class when working on their assignments. Therefore, the researchers decided to flip two of the class sessions by using instructional videos and in-class activities designed to reinforce the content that students learned from the instructional videos, instead of doing in-class demonstrations.

4.2 Participants

All 15 students enrolled in the CALL course consented to participate. There were 8 males and 7 females with an average age of 26.27 (range: 21-38, with four participants declining to provide their age). Ten were graduate students (4 native English speakers, 6 non-native English speakers) and five were undergraduates (all native English speakers). All students were majoring in either linguistics or TESOL. One male MA-level teaching assistant (TA) with a background in learning technology also participated.

As part of the study procedure, participants were asked a series of questions about their own self-identified strengths and weaknesses with regard to technological abilities. Participants' self-assessments of their ability to handle specific, common technology tools and functions are described in Table 1.When asked to classify themselves as technology users, none of the students selected 'Beginner with support', nine selected 'Confident on my own', and five selected 'Capable of teaching others' (with one missing response). Similarly, when asked how comfortable they were using computer technology, none chose 'Poor: extremely uncomfortable and only use it when necessary'. However, four said 'Fair: uncomfortable and only use it for

basic functions', seven said 'Good: mostly comfortable and use it in several ways', and only three said 'Excellent: very comfortable and use it all the time'. In terms of their ability to design and assess lessons with technology resources, five students indicated that they would be a 'Beginner with support', six indicated they would be 'Confident on my own', and three indicated they would be 'Capable of teaching others' (with one missing response). Regarding how comfortable they would be teaching in a computer lab, one student said 'Poor: extremely challenging and likely not successful', five said 'Fair: very challenging and need extensive support', six said 'Good: mostly comfortable but need some support', and only two said 'Excellent: very comfortable'.

4.3 Procedure

Students were informed at the beginning of the term that two class sessions would be taught using a flipped classroom approach for research purposes, but that the inclusion of their data in the research analyses was voluntary. Further, participation in one-on-one interviews with the researchers was voluntary and conducted outside of class. This study was approved by the Human Subjects Committee of the research site.

Two class sessions were flipped: one was a content-oriented session and the other was a technical session. The content (design and evaluation) session focused on how to evaluate software, applications, and websites and how to appropriately design activities incorporating technology into language learning classes. The technical (class website) session focused on creating classroom websites using Wix, a freemium cloud-based web development platform. The instructor recorded nine videos, each approximately six minutes long, for the design and evaluation week and three videos, each approximately 12 minutes long, for the class websites

week. These materials were placed in the university's Learning Management System (LMS) so that students could access and/or download them from any internet-connected device.

For the in-class activities for the design and evaluation session, students were divided into four different language skill-based groups (listening, speaking, reading, writing) according to their teaching interests. Each group worked together to evaluate an online resource for language teaching, then design and present a short lesson plan using that resource to address a specific teaching scenario (see the Supplemental Materials). For the in-class activities for the classroom website session, students were again divided into four groups and evaluated websites based on a "Website Evaluation Sheet" adopted from Creating Classroom Websites with Google Sites by Leah Fullenkamp (https://tinyurl.com/ybujnhdu). Following this, they created and presented a poster describing their evaluation, and then used their evaluations as a starting point for building their own individual classroom website. Note that the same content had been covered in face-to-face format only during a previous offering of the same course and the content was not substantially changed from this version in order toto maintain overall instructional consistency across the different sessions and modalities of delivery. After the second flipped classroom session, all students in the class were invited to complete an online survey posted on the LMS, which elicited background information and student opinions of the flipped classroom experience. Individual interviews were also conducted with volunteers within three weeks after the second flipped session.

4.4 Instruments

The first section of the online survey collected demographic information from participants. The second section was designed to get an understanding of subjects' comfort level with technology; it was adapted from https://www.surveymonkey.com/r/JPRFB9C. The third

part was designed to elicit the pre-service ESL/EFL teachers' perceptions of the flipped classroom approach and the elements that would encourage or discourage them from adopting such an approach in their future classrooms. It included 18 questions that were adapted from Johnson (2013, p. 90) study and modified by the researchers to fit the context of this study. In addition, the first author conducted voluntary semi-structured interviews with five students and the TA to gain further in-depth insights on the topics addressed in the survey. The interviews were recorded on a mobile phone for later transcription and analysis and all the data were confidential. All participants are labeled with pseudonyms in this report.

5. Results

The results are presented in four sections, based around the research questions; each section reports relevant results from both the full-class survey data (n = 15 students) and the individual interviews (n = 6). The results describe numerical trends and present a thematic analysis of survey and interview responses. In addition, for survey questions that used a comparative statement about the flipped classroom, one-sample t-tests were used to determine whether participants' mean responses were significantly different from a 'neutral' response (either more positive or more negative). The split-half reliability of the survey was .92, which is considered excellent. The first section focuses on the benefits of the flipped classroom; the second describes the challenges that teachers envisioned facing if they were to adopt a flipped classroom. The third section provides further reflections from the participants on adopting a flipped classroom. The final section describes additional interesting themes that emerged from the data, but which did not clearly fall into the other categories.

5.1 Benefits

The first research question asked about pre-service ESL/EFL teachers' perceptions of the benefits of the flipped classroom. Many responses from the survey data were quite positive. On a scale of 1 (Strongly Disagree) to 5 (Strongly Agree), the average response to whether the flipped classroom is more engaging than traditional approaches to instruction was 3.73 (*SD* = .96), and this was significantly higher than 'neutral', $t(14) = 2.96$, $p < .05$. Seven participants included the increased engagement with the flipped approach as a specific reason that they liked it, and ten participants said that they liked the approach because they could practice what they had learned from the instructional videos during in-class activities. Students also indicated that overall, they were somewhat more motivated to learn technology in the flipped classroom (mean = 3.40, *SD* = .99, though this average was not statistically different from 'neutral'), and tended to watch the assigned instructional videos regularly (mean = 3.60, *SD* = 1.06). Students tended to *disagree* with the statements that they would *not* recommend the flipped classroom to a friend (average = 2.47, *SD* = 1.13), that the flipped classroom gave them *less* class time to practice (average = 2.86, *SD* = 1.10; this response was not significantly different from 'neutral'), and that it had not improved their learning in technology (mean = 2.71, *SD* = 1.14; again, this response was not significantly different from 'neutral'). In addition to these survey data, three major themes emerged from the interviews: learner autonomy, learning by doing with support, and preventing cognitive overload. These are discussed below.

5.1.1 Learner Autonomy

A number of participants indicated that the flipped classroom encouraged students to be more responsible for their own learning. It also provided them with the opportunity to look up answers and to do their own research to fill any gaps in their knowledge. One of the benefits of the flipped approach mentioned by multiple participants was that they did not need to rely solely

on the instructors to provide information in the flipped classroom. In other words, the instructors were not seen as the only source of information. Gabriella, an international graduate student from South America, said:

> *"It is very interesting to give people opportunity to develop [their] own knowledge and to develop their own ability to do something. If you don't get something, you can just go to [the] Internet and find out so you don't rely on someone else to do things, you can do it on your own."*

She also pointed out that this ability – for students to figure things out on their own – is a crucial 21st century skill. Similarly, Jessica, a domestic undergraduate student, commented that she enjoyed the instructional videos because they allowed her to "figure it out on [her] own" through rewatching the video and "click[ing] around" to learn how to do what was being demonstrated. She admitted that during the second week, she only watched the videos during class while working on her website, but she found this helpful for being able to complete the task. Although she wasn't sure if she really learned more through the instructional videos than she did from in-class lectures, she reflected that working with the videos increased her confidence because she had already done more on her own. This is consistent with the survey results; overall students were neutral (an average score of 2.93, not significantly different from 'neutral') regarding whether they thought they would learn better if the whole class were flipped.

5.1.2 Learning by Doing with Support

Over the course of the interviews, it became clear that with the flipped approach, participants felt that the classroom became a learning community in which they learned with on-

site support to reinforce what they had learned from the instructional videos. Overall, students reported that the flipped classroom gave them greater opportunities to communicate with other students; their average response (3.67, $SD = 1.11$) was significantly higher than 'neutral', $t(14) = 2.32$, $p < .05$. Eight participants indicated directly that this was one of the reasons they liked the flipped approach. "You can ask classmates what they think, you can ask the instructor, you can ask the instructor what they think and sort of work through that with support," commented Elizabeth, another domestic graduate student. The participants were able to work through any issues they may have had while doing the in-class activities because they had support throughout the class period from the instructor, the TA, and classmates. Alan, the TA, mentioned that "there is a lot more interaction and collaboration going on in the class" when the flipped approach was implemented. The flip enabled learners to try without the fear of making mistakes. Alan continued, "You also have a support system. You have other students that you can work with, and you have the teacher there. So if you find something that is confusing you can talk to them right away." Jerry, a domestic graduate student, added that one advantage of the flipped classroom was that it allowed students to form a stronger bond with classmates, thus contributing to a greater sense of classroom community. Jessica also said that she liked hearing the different viewpoints of her classmates, and that she thought it was beneficial to work with others because group work is inevitable and being able to work effectively with others is so crucial.

Not only were participants able to reinforce in class what they had learned from the instructional videos by seeking support from classmates and instructors, but they were also able to reinforce their learning by helping one another to accomplish a project in class. For example, during the week dedicated to evaluation, participants were divided into groups for the in-class activity. Each group had a different scenario-based problem that required them to evaluate a

website and design a short lesson plan incorporating the sources they found on the website in order to help the target scenario students to improve their English ability (see the Supplementary Materials). This in-class activity was a reinforcement of the instructional videos, which covered the design of materials, evaluating materials, and walk-through demonstrations of evaluating websites. Gabriella mentioned that instructional videos allowed her to double-check and figure out some of the information that she had not understood before coming to class. She also said that she thought the in-class activities were beneficial for reinforcing the knowledge that she had learned from the instructional videos by actually applying it during in-class activities.

The use of in-class projects that asked participants to apply the content introduced in the instructional videos was also beneficial because learners were able to reinforce their skills through helping their peers. As described in Vygotsky (1978) Social Constructivist Theory, learners were able to augment their skills and knowledge through the negotiated communicative process with their peers while working on the group project. As Mark, a domestic graduate student, noted:

> *"I can help others when they need help; if I can offer it and then others have questions I can learn so it's just a lot more of like a communicative process, more community-based process which I prefer that over me individually learning things, more like a community model where everyone learns together."*

Thus, in a flipped classroom learners co-construct knowledge through active negotiation in the class, completing exercises and applying their new knowledge, as well as gaining a sense of accomplishment through helping their peers. Relatedly, a connection with previous research

(e.g., (Krentler & Willis-Flurry, 2005) that is worth noting came from participants' comments about the discussion board. Specifically, they appreciated having a discussion board on the LMS where they could share their opinions or post questions or problems they encountered when watching the instructional videos. This is especially important because, as Jerry said, "it's only the students who speak up [that] get attention in a traditional classroom".

5.1.3 Preventing Cognitive Overload

Participants reported a number of affordances of the instructional videos that reduced the cognitive load required for learning. One of these affordances was that the instructor was able to "chunk" the information into suitable "bites" for learners. As described above, in the week on design and evaluation of materials the instructor chunked information into three categories: design of materials (four videos), evaluating materials (two videos), and demonstrations of evaluating websites (two videos); these videos were six minutes long on average. In the week on creating websites, the instructor recorded three videos: one introduced websites for educational use, the second introduced and provided a step-by-step demonstration on how to use Wix to create educational websites, and the third demonstrated how to edit the website; these videos were 12 minutes long on average.

The interview data revealed that participants saw these instructional videos as particularly advantageous in the context of a long class, such as the one in this study (two and a half hours, once a week, in the evening). In the traditional approach to this class, the instructor would spend approximately 90 minutes of class time doing demonstrations and use the rest of the time for students to complete guided activities with the software or program under focus. Thus, in the traditional classroom approach, students were required to absorb the information that the instructor provided all at once, over a lengthy class period in the evening. In contrast, in the

flipped format, the information was “chunked” into multiple videos that the participants could watch at a convenient and comfortable time and place, and which did not need to be watched all at once.

This highlights another affordance of the instructional videos: students could decide for themselves the amount of information they wanted or were able to take in over a period of time. This was commented upon in both the survey and the interview data. On the surveys, most participants agreed that they liked the fact they could learn at their own pace with the videos (mean = 4.07, *SD* = .62), and eight participants specifically indicated this as one of the reasons they liked the flipped classroom. In addition, participants also found it easier to pace themselves when learning technical content in the flipped approach; their mean response (3.64, *SD* = .74) was significantly higher than ‘neutral’, $t(14) = 3.23$, $p < .01$. In her interview, Gabriella noted that the professor didn’t have to pack all the information that she wanted students to learn into a single two-and-a-half hour class and that the participants had the option of watching the instructional videos again after class in order to review.

Thus, a third affordance of the instructional videos was the ability for participants to pause, rewind, rewatch, and even adjust the volume of the presentation. This functionality was beneficial for students because it gave them time to internalize the information in the instructional videos. For example, Jessica said, “when I watch a video, it’s a lot more useful, because I can just stop, do what they tell me to do, and then play, and then continue on so I can follow better.” Elizabeth also mentioned that, “the advantage of [the videos] would be that you could go back and watch or listen to it again.” Gabriella pointed out that such instructional videos may be particularly beneficial for non-native English-speaking students, who may struggle to understand a real-time lecture. Even one student who expressed disliking lectures in

general, regardless of format, indicated that one advantage of the instructional videos was the ability to go back and listen again. As he said, “I kind of forget a lesson the first time I hear it anyway, so with video you can go back and play back. So that’s one of the great things about the instructional video, you have opportunities to play it more than once.” This finding echoes those of Schwan and Riempp (2004), who demonstrated that video playback functions (e.g., stop, replay, or speed change) have positive benefits on learning.

Interestingly, on the survey, the students reported overall neutral responses regarding their attitudes toward the instructional videos specifically. The average response was 3.47 (between ‘Neutral’ and ‘Agree’; *SD* = 1.06) to “I like watching the lessons on video”. The average response was 3.20 (*SD* = .94) to “I would rather watch a traditional teacher-led lesson than a lesson video” (not significantly different from ‘neutral’), and 3.33 (*SD* = .90) to “I would rather have the entire class moving at the same pace in a teacher-led lesson” (again not significantly different from ‘neutral’).

5.2 Challenges

The second research question asked about the elements of the flipped classroom approach that may discourage pre-service ESL/EFL teachers from adopting this model in the future. Four major themes emerged: technological accessibility and the technical ability of learners, technical support for instructors, ambiguous student responsibility, and an inability to provide immediate clarification.

5.2.1 Learners’ Technology Access and Technical Ability

One of the issues that pre-service teachers expressed caution about was the technological access that their future students may or may not have. A number of the participants in this study already had, or likely would, teach English outside of the United States in their careers. They

expressed concern that Internet access and general technological accessibility vary from country to country, impacting their ability to adopt a flipped classroom. Gabriella pointed out that, “of course here in U.S. everybody has Internet but that’s not always happen worldwide, right?” She thought that it would be impossible to develop a class in a flipped format where students do not have Internet accessibility. Elizabeth added, “we had a group of students who didn’t have consistent access to technology in [our intensive English program] last term. Trying to do flipped with them would have been a nightmare.” Thus, even within a single country where technological access is typically widespread, teachers may still have to face the issue of fairness because not all students may have equal access to technology. Although the TA mentioned the possibility of using alternatives to video, such as readings and CDs, most participants indicated that they saw videos as a central component of the flipped classroom. We return to this point in the discussion.

The technical ability of learners themselves may also be a problem. As Jerry said, “students might have trouble opening or downloading the file, or something like that, so they might not get lecture.” Gabriella added that some people are not comfortable managing technology and learning with a computer, even if you provide a lot of guidance, and they still need the teacher to tell them exactly what to do. It is possible that students could get anxious and nervous when they cannot get access to the materials online and eventually feel negative about this teaching approach. In these cases, the motivation of these pre-service teachers to flip their classrooms could be diminished because they would not only need to spend time redesigning the courses in a flipped format but would also have to look for solutions to solve the accessibility and technical problems faced by their students. The result would be that the workload for teachers would be substantially increased.

5.2.2 Technical Support for Instructors

In addition to their concerns about possible issues with technological accessibility and their students' technical skills, some of the participants also expressed a lack of confidence in their own ability to handle the technology they viewed as necessary for implementing a flipped classroom. Specifically, most participants viewed videos as central to the flipped classroom, but to have instructional videos teachers would need to either record them themselves or locate them on the Internet. Jerry said that he wasn't sure how a flipped classroom would work for teachers who do not typically teach with PowerPoint, and that it is not easy to guarantee the quality of instructional videos. As he noted:

> *"If you are making like, a software, like Duolingo or Rosetta Stone, you maybe have like three hundred people working at your company, and they're all going to double and triple check everything to make sure it works. But with this kind of flipped lecture, you don't have that kind of check. There's not like a corporation behind you, like making sure you make an awesome product to go out there on the computer."*

The participants were also concerned about the time and effort they would have to invest in order to design a quality flipped classroom, especially if they could not get course-redesign and software assistance from others (e.g., their school and colleagues). At many universities there are instructional designers on-site to assist instructors with transforming conventional courses into hybrid/blended learning courses. However, instructional designers are not always available, especially in other educational contexts. In these cases, instructors may have limited

assistance and have to rely on themselves. This is can be challenging and overwhelming for teachers who do not have such experience.

5.2.3 Ambiguous Student Responsibility

As noted above, the participants recognized that effective in-class activities in the flipped classroom rely on students taking responsibility for their own learning, for example by watching the assigned instructional videos before coming to class. Although the participants indicated that this feature of the flipped classroom was positive from their current viewpoint as students, they simultaneously expressed concern that if their future students did not watch the instructional videos at home, they might not be able to participate and contribute in class. One participant, Jessica, noted that group work can sometimes feel unbalanced because not everyone may pull their weight during the in-class activities. She commented that she enjoyed the group project in the flipped CALL classroom under investigation, in large part because a majority of the students were graduate students and thus she felt that her group members were eager to learn and contributed a great deal. However, she worried that this atmosphere might not be the same in different types of classes (e.g., with younger students, or at a less advanced degree level). Another participant, Elizabeth, added that, “if a student doesn’t watch the videos before they come to class then that’s a big disadvantage, they are not prepared to do the work that’s gonna be done in the class.”

5.2.4 An Inability to Provide Immediate Clarification

Another concern that emerged was that teachers would not be able to provide immediate feedback or clarification to their future students while they were watching instructional videos outside of the classroom. This was different from their concern about future students’ possible lack of technological access or technical ability; rather, in this case the pre-service teachers

worried that they would not be able to provide clarification in a flipped classroom if students did not understand something. For example, Elizabeth said, “I think [the students would] be less likely to ask a question later. You know if it’s not immediate, they just wouldn’t ask. That’d be my fear.” This concern was also reflected in the survey data: three different participants indicated that not being able to receive immediate feedback was one reason that they did *not* like the flipped approach. Elizabeth pointed out that it may be a particular challenge for non-native speakers, who may not understand some of the language used in the videos yet cannot ask questions to get immediate clarification. Jessica acknowledged that email could still be used to ask questions but thought it would be less likely to be used. This is because asking questions in class is a one-step process but writing email for clarification requires multiple steps, without the benefit of an immediate response: recording confusion while watching the videos, drafting an email to the instructor, and waiting for a reply. Thus, the likelihood that students would write emails asking questions or for clarification is not very high.

5.3 Reflections on Flipping the Classroom

Overall the pre-service teachers interviewed in this study expressed a general interest in adopting the flipped classroom approach in their future classrooms. A number of individuals mentioned that they thought a “mixed” approach would be a good way to start. A mixed approach to flipping the classroom would mean that instead of flipping the course for an entire semester, the instructors would choose to flip just a few sessions of the class, possibly based on their content, to change the pace of the class and better accommodate students’ learning styles. For example, Mark mentioned that before the two flipped sessions, they had been working on their projects individually; he enjoyed the change of pace to being able to work collaboratively.

Jerry also said that having several class sessions flipped at a certain point in the semester is a good way to break the monotony of class.

Alan mentioned that a mixed approach would also better accommodate various learning styles:

> *"Somebody who is more comfortable with listening, like just sitting and listening to the lectures on their own without need for clarification. Those students are going to do better with the flipped classroom. Because they don't require more scaffolding or help with, to understand the lecture. Whereas students who have clarifying questions about the lecture often would prefer to ask the teacher about them in class. Mix it up a bit, so that everybody has their strengths played to."*

Despite the overall positive response to the flipped classroom in this study, a different preference was still noted: seven different participants indicated on the survey that one reason they did not like the flipped classroom was because they prefer to have teacher-led lectures. This issue may be particularly relevant in ESL/EFL classrooms. ESL/EFL learners vary in their cultural and educational backgrounds, and may be resistant to doing interactive or collaborative activities in class instead of lecture (Van Nguyen, 2010). In addition, two other students (both domestic) also said that they preferred being able to see a body, face, and gestures during instruction, rather than just hearing a voice (as in the instructional videos implemented in this study). Because the traditional teaching style is the most familiar instructional approach for most learners, flipping a whole course might create resistance or insecurity in learners who have never experienced a flipped classroom before. Thus, adopting a mixed approach to flipping a class

would not only be more flexible for accommodating various learning styles and cultural and educational backgrounds, but would also give students the opportunity to experience this teaching style in a less threatening way.

Four of the interviewees, Elizabeth, Jerry, Alan, and Gabriella, all said that the content of the course is one of the major factors that they would consider when deciding whether to flip a class or not. This is consistent with the survey data, which indicated that participants felt the flipped approach was effective for learning technical content (mean = 3.73, *SD* = 1.03). Alan said, "I think in a class like CALL, where everybody is working on technology-based stuff, it's kind of a safe bet [to flip]. When you have a topic like that, I think flipping really plays the strength of that topic." Gabriella added that some topics or units (e.g., core courses) are better for the flipped classroom, whereas for others (e.g., those that might need a lot of explanation and for which students being able to ask questions in real-time is important) a traditional approach would be better. Both Mark and Alan mentioned that it is particularly suitable to use instructional videos to present content that is process- or procedure-related (e.g., syntax tree diagramming or demonstrating phonological processes). Jerry also pointed that instructional videos could be useful for math or information that needs to be memorized because learners could review the videos over and over again. He also suggested that instructional videos are less necessary for content that requires critical thinking. This finding ties in with another theme that emerged, regarding the usefulness of lecture videos for content- versus technology-oriented material, discussed further below.

5.4 Additional Themes

In addition to major points addressed above, three additional notable themes emerged from the interviews: participants' heightened awareness of their peers in the classroom, different

reactions to the content-oriented vs. technically-oriented instructional videos, and issues of student workload.

5.4.1 Heightened Awareness of Peers

Tying in with the theme of the flipped classroom increasing student autonomy, our interview data showed that the participants had a heightened awareness of their classmates and their responsibilities to them. Participants were highly aware that they had to watch the instructional videos before coming to class because if they didn't, they would not be able to contribute to the group activities in the class. They did not want to let their peers down. As Jessica said, "I think a flipped classroom makes students more accountable for the materials, because you have to come in prepared or else you don't know what's going on, and then you become like the weak link of your group, and you don't want that to happen." Thus, the collaborative in-class activities not only made participants feel more responsible for their own learning, but also made them more aware that they were accountable to others in the class for contributing to the in-class activities.

The collaborative activities required the participants to engage in conversation with their peers instead of sitting passively, listening to lectures and demonstrations, despite the fact that it was an evening course and participants were frequently tired at the start of class. As Mark said, "at 5 pm on Monday, I might be a little bit tired but [for] an activity like that you have to collaborate, you really want to seem like you are contributing to the group activity. You want to seem like you know what you are talking about, you just want to be on top your game." These comments further suggest that designing collaborative projects for in-class activities can be used to encourage students to watch instructional videos and come prepared for class.

In addition to their awareness of the need to come prepared to class in order to 'pull their weight' in group work, participants indicated a heightened awareness of their peers in a number of other ways. For example, Mark commented on the need to be polite, act normally, dress nicely, and generally be aware of the others around you because the class has to address everyone's needs, not just those of one student. Elizabeth added that in traditional, lecture-based classrooms it is obvious if a student is not paying attention, and that paying attention is expected. In contrast, with instructional videos no one is there to see if a student is not paying attention.

Another way that participants' awareness of others was reflected related to asking questions in front of the class, as often occurs in traditional classrooms. As Mark put it, "This question that I have might not be relevant at all to anyone else. So if I asked that question in the class, I don't want to feel like I'm wasting everyone else's time. I don't want to feel like this guy always asking about all dumb questions or something." Along similar lines, Jessica commented that classmates' questions can sometimes go down a bit of a rabbit-hole, ultimately leading to greater confusion rather than clarity among students. Others mentioned that problems can arise when classmates fall behind and ask questions that end up wasting time or confusing others. Thus, the participants in this study showed an impressive level of awareness of the dynamics of the classroom, the needs of others, and their own desire not to create problems for their peers. In some ways, the adoption of a flipped approach led to better outcomes (e.g., students feeling more comfortable asking questions, of peers or the instructor), but it also increased the stakes for students (e.g., highlighting their need to come to class prepared for group work).

5.4.2 Content-oriented vs. Technically-oriented Instructional Videos

The two class sessions that were flipped differed in their instructional focus. The first was content-oriented, focusing on designing and evaluating technological tools for use in the

language-learning classroom. The instructional videos for this content-oriented session tended to use a traditional lecture format. The topic for the second session was technically-oriented, focusing on creating and designing websites. The instructional videos for this session were less focused on lecture and included more step-by-step demonstrations.

Both the survey and the interview data indicated differences in student perceptions and responses to these two instructional foci. Based on the interviews, participants paid more attention to the technically-oriented instructional videos than to the content-oriented ones. The participants reported that when watching the content-oriented videos they tended to listen to them like a podcast, playing them in the background while doing something else: Mark said, "I feel like the first video [content-oriented] was more like I can listen to [it] in the background, like radio." In contrast, multiple participants indicated that they paid more attention to, and followed along with, the demonstrations on the technically-oriented videos. Mark continued:

> *"When it comes to learning to how to make a website, it's less about me being introspective and thinking hard about what I believe. It's much more objective, so there are like right or wrong answer, right or wrong ways to do things and so I definitely like to watch those videos to make sure I was doing things correctly."*

As mentioned above, on the surveys participants indicated that it was easier to pace themselves on the technical content in the flipped approach (mean = 3.64), and that the flipped model was effective for learning technical content (mean = 3.73). In addition, participants also tended to agree that it was easier to follow the demonstrations on video (mean = 3.47, *SD* = 1.19, though this was not significantly different from 'neutral'). Interestingly, two participants (Mark

and Elizabeth) suggesting providing explicit instruction about what students should be doing while watching the videos. Mark reported that when he was watching the videos, he didn't know whether he should just watch or follow the steps demonstrated in the videos, especially for the technically-oriented ones.

5.4.3 Student Workload

Finally, the interview data showed that participants worried about the workload not only for instructors, but also for students in a flipped classroom. Two individuals, Elizabeth and Jerry, both expressed their concerns about the potential for increased student workload because they need to watch videos *and* do homework outside of class. For our two flipped sessions, the participants were required to complete assigned readings (though the amount was greatly reduced compared to other weeks) and watch the instructional videos before coming to class and also had an individual assignment to complete after class. Jerry opined that students should not have to do reading, plus watch instructional videos, attend class, and do homework; rather, instructors should stay reasonable with the expected workload outside of class. On the survey, five participants indicated that having to spend more time on preparation before class was one of the reasons they did not like the flipped approach. Thus, it is important for instructors who plan to adopt a flipped classroom to find a balanced workload for their students. Jerry suggested that instructional videos should be part of students' credit hour time. Instructors might also cut down the assigned readings or use part of class time to let students do their individual homework.

6. Discussion

The majority of research on the flipped classroom is in STEM-related fields (Engin, 2014), and although research on the flipped classroom in TESOL is growing, research in the context of teacher education, especially for pre-service ESL/EFL teachers, is scarce. This study

examined the implementation of a flipped classroom in an ESL/EFL teacher-training environment to gain a better understanding of the instructional value and challenges of the flipped classroom. These were identified from the perspectives of pre-service ESL/EFL teachers' experiences being learners in this teaching model. Specifically, the research questions asked (1) what the perceived benefits of the flipped classroom are, from the perspective of pre-service ESL/EFL teachers; (2) what challenges exist that may discourage pre-service ESL/EFL teachers from adopting the flipped classroom; and (3) what additional reflection pre-service ESL/EFL teachers have based on their experience learning in a flipped classroom. Using data from surveys and interviews, the results both directly address these questions and have the potential to inform teacher training and professional development.

Overall, the ESL/EFL teachers were quite positive in their perceptions of the flipped classroom and its benefits. Most participants agreed that the flipped classroom was more engaging than traditional approaches to instruction; some even said that it was much more creative and fun. This was in part due to the increased level of student engagement via the opportunities to practice during in-class activities what students had learned from the instructional videos. Participants also indicated that they were somewhat more motivated to learn technology in the flipped approach, and that they tended to watch the assigned instructional videos regularly. On the other hand, participants tended to *disagree* with statements saying that they would *not* recommend the flipped classroom to a friend, that it gave them less class time to practice, and that it had not improved their learning in technology.

The interview data also revealed three major benefits of the flipped classroom: learner autonomy, learning by doing with support, and preventing cognitive overload. A number of participants commented that the flipped classroom encouraged them to be more responsible for

their own learning, such as doing their own research to fill any gaps in their knowledge; they did not need to rely solely on the instructors to provide information in the flipped classroom. This finding echoes other flipped classroom studies (Fautch, 2015; Mok, 2014; Vaughan, 2014) showing that students are more willing to take ownership of their learning in a flipped classroom.

Participants also said they felt the classroom became a learning community in which they were able to reinforce what they had learned from the out-of-class instructional videos, with on-site support both from the instructor and their peers. In addition to the in-class interaction, participants also appreciated having a discussion board to share their opinions and post questions or problems they had encountered before or after class. This use of the discussion board was somewhat similar to that of Fautch (2015). She used the discussion board to track learners' understanding of the content introduced in the instructional videos by requiring students to post questions after watching the videos. However, in that study it was unclear whether students appreciated the use of the discussion board in a flipped classroom, whereas the current data show that incorporating a discussion board in the flipped classroom was indeed seen as beneficial by learners.

Three major affordances of the instructional videos were found, which should also be mentioned as benefits identified by the pre-service teachers: information is "chunked" into suitable "bites"; learners can pause, rewind, and re-watch the instructional videos; and learners can decide on the amount of information they want to take in over a specific period of time. Participants saw the instructional videos as particularly advantageous in the context of a long evening class because they were not under the pressure to digest all the information at once; instead, they were able to control the amount of information they wanted to take in. Most participants agreed that they liked being able to learn at their own pace and found it easier to

pace themselves when learning technical content in the flipped approach. These findings are again consistent with previous research: learning at students' own pace is well-documented as one of the biggest advantages of the flipped classroom (Horn, 2013; G. Lee & Wallace, 2018; Roehl, Reddy, & Shannon, 2013; Schultz, Duffield, Rasmussen, & Wageman, 2014). The current study expands our understanding of this advantage by further identifying that the learners prefer having technical content demonstrated through instructional videos because they can follow the steps at their own pace.

In contrast, four major elements of the flipped classroom were identified as challenges that may discourage ESL/EFL teachers from adopting it in their future classrooms: learners' technology access and technical ability, technical support for instructors, ambiguous student responsibility, and an inability to provide immediate clarification. Regarding learners' technology access and technical ability, participants expressed concern that Internet access and general technological accessibility could vary across countries and learners could get frustrated or anxious when they could not get access to the materials online. This could lead to increased teacher workloads, for not only needing to redesign courses in a flipped format but also needing to look for solutions to these accessibility and technical problems. Along a similar line, some of the participants expressed a lack of confidence in their own ability to handle the technology.

Again, the challenges identified in this study are consistent with those noted by others. Technology accessibility and technical ability issues are two well-documented difficulties in the flipped classroom (Ash, 2012; Enfield, 2013; Horn, 2013; Milman, 2012; Schultz et al., 2014; Vaughan, 2014). These issues arise in part because many people consider instructional videos a 'must' for the flipped classroom, yet teachers' fear that they can't get enough course-redesign and software assistance (e.g., instructional designers or colleagues). Some researchers have

provided suggestions to potential “flippers” needing to address the issue of learners’ technology accessiblity, such as surveying students early to find out what technology they have at home (Ash, 2012). If learners have unstable Internet access, burning the videos onto DVDs (Ash, 2012) or reserving space in a computer lab (G. Lee & Wallace, 2018) could work.

Alternatively, we can reconsider whether videos are really a ‘must’ to flip a classroom. Mehring (2018, p. 1) stresses that “technology is not required for flipping your class. People usually associate the flipped classroom with videos, but it is possible to flip your classroom without videos and technology”. Brinks Lockwood (2014) used various types of materials for her class, including readings from the course textbook, teacher-developed worksheets, and videos available online, and found that it was not necessary to record video lectures for every lesson. In the end, Brinks Lockwood (2014) observed that her students started taking responsibility of their own learning. Even (Bergmann & Sams, 2012), who say they would not try to flip a classroom without videos, emphasize that many teachers flip successfully without depending on instructional videos. Therefore, we suggest that proponents of the flipped classroom continue to develop and promote approaches to flipping that do not depend on instructional videos.

Educators should not be intimidated and choose not to flip simply because of the Internet accessibility of their learners. As Clark (1983, p. 445) stated, “media are mere vehicles that deliver instruction but do not influence student achievement”. Thus, educators should put more emphasis on designing materials that are engaging and motivate learners to become autonomous instead of looking for a “perfect” media to deliver instruction.

A third challenge that emerged was the issue of ambiguous student responsibility. In other words, participants recognized that the effectiveness of in-class activities relies on learners taking responsibility of their own learning; they were concerned that if their future students did

not watch the instructional videos before coming to class, students might not be able to participant in class. As a possible solution, Vaughan (2014, p. 32) suggests that a discussion board could be used by instructors to track whether students are prepared for class. For example, they could read through "the postings and gain an instant idea of what the students took away from the lecture, where they needed support and what misconceptions needed to be addressed". Indeed, it is important for instructors to have an understanding whether their students are prepared for in-class activities regardless the content delivery method. Discussion boards are one such method (Gillboy, Heinerichs, & Pazzaglia, 2015); worksheets could be another (Brinks Lockwood, 2014).

The final major challenge that emerged from this study was an inability to provide immediate clarification to students who had questions while watching the instructional videos. Although our participants acknowledged the possibility of contacting instructors via email, though thought that the likelihood of students writing emails asking questions or for clarification is not very high because they have to go through more steps than simply raising their hand in class. This issue has also been identified in other studies (Gillboy et al., 2015; Milman, 2012; Missildine, Fountain, Summers, & Gosselin, 2013). Milman (2012) states that just-in-time questions can help learners to comprehend the materials while watching instructional videos; however, these are difficult to coordinate because the instructor should be available during the viewing. Instructors are recommended to set up a discussion board that send out alerts when learners post questions (Gillboy et al., 2015) or incorporate programs such as VoiceThread (https://voicethread.com/) that enable learners to add questions or comments on the video while watching. Bergmann and Sams (2012) also suggest specifically teaching students to use the affordances of videos (e.g., pause, rewind), put away distractions, take notes effectively, and

summarize their learning in order to reduce the negative effects of not being able to ask questions immediately.

Roehl et al. (2013, p. 47) suggest that "when the focus of the flipped classroom is on giving students the freedom to interact with the content according to their own learning style, the flip seems to be more successful". This perspective is consistent with participants' attitude in this study: they expressed a general interest in adopting the flipped approach in their future classrooms, but many suggested that a "mixed" approach to flipping a classroom would be a good starting place for teachers who are new to it. This would mean flipping a few course sessions, possibly based on content, rather than flipping the course for an entire semester. Similarly, Ash (2012) suggests that instructors should "be intentional about when to flip and clear about what the benefits will be for students". In a study of students' perspectives on a flipped learning model and associations among personality, learning styles (based on Kolb's theory of Learning Styles, Kolb, 1981), and satisfaction, Kim (2013) found that Assimilators (skilled in abstract conceptualization and reflective observation) had the highest satisfaction scores whereas Divergers (skilled in concrete experience and reflective observation) had the lowest satisfaction scores with the flipped classroom. Thus, a mixed approach to flipping the classroom could not only better accommodate students' learning styles but also accommodate learners' cultural differences in preferences for instructional mode. Some ESL/EFL students might be resistant to doing interactive or collaborative activities due to their cultural and educational backgrounds (G. Lee & Wallace, 2018; Van Nguyen, 2010). G. Lee and Wallace (2018, p. 79) suggest that East Asian students "need sufficient time to adjust to a new instructional mode because of the different learning environment" due to most East Asian

students being used to “passively listening to lectures and therefore may be unaccustomed to being in an active and autonomous learning environment”.

Finally, three additional reflections and reactions of pre-service ESL/EFL teachers were identified in the interviews: a heightened awareness of peers, differences in attitudes toward and perceptions of content-oriented vs. technically-oriented instructional videos, and student workload. The interviews indicated that the motivation for participants to watch the instructional videos before coming to class was not only because they knew they were responsible for their own learning, but also that they had a responsibility to their peers. Participants did not want to let their peers down and wanted to ‘pull their weight’ in group work. Overall the participants in this study demonstrated an impressive level of awareness of the dynamics of the classroom, the needs of others, and their own desire not to create problems for their peers. This heightened awareness of peers could be used to underscore for learners the importance of preparing before class. Instructors should clearly communicate to students how the learning materials assigned for outside of class connect to the in-class activities and how their individual contributions are critical. Collaborative in-class activities are suggested in order to utilize “the heightened awareness of peers” to encourage learners to prepare before coming to class.

In this study, the two flipped sessions differed somewhat in their instructional focus: the first was contented-oriented whereas the second was technically-oriented. Both the survey and interview data showed some differences in student perceptions to these two instructional foci. In interviews the participants indicated that they paid more attention to the technically-oriented instructional videos than to the content-oriented ones; the survey data also showed that the participants agreed that it was easier to pace themselves on the technical content and easier to follow the demonstrations in the instructional videos. Indeed, procedural knowledge is suggested

to be “the best type of knowledge to teach using the flipped classroom strategy” (Milman, 2012, p. 86) However, other types of knowledge (e.g., factual, conceptual, metacognitive) can also be taught using the flipped classroom if different teaching strategies are used. For example, instructors could ask more questions during the videos to help learners reinforce their understanding when using instructional videos to teach content-oriented material.

The final interesting theme that emerged was that participants worried about the workload not only for instructors, but also for students in a flipped classroom. Two participants expressed their concerns about the potential for increased student workload in a flipped classroom; they suggested instructors should stay reasonable with the expected workload outside of class. The potential for increased student workload was found to be an issue in other studies as well (McLaughlin et al., 2013; Rotellar & Cain, 2016; Tune, Sturek, & Basile, 2013). We suggest instructors take the contact/study hours into consideration when designing flipped class sessions, communicate the rationale behind the flipped strategy to students in terms of the long-term advantages for learning, and be flexible with possible changes to student workloads.

6.1 Implications

The most common implementation of the flipped classroom involves asking students to watch videos before class then doing collaborative activities in class (Bergmann & Sams, 2012). In this approach, videos are used to deliver content before class in order to free up class time for collaborative activities. They also provide the freedom for learners to learn whenever, wherever, and whatever amount of information they prefer. However, videos can create many hurdles for instructors, some of which were emphasized in this study. These include learners’ technology access and technical ability, potential increases in instructor workload to record and edit videos, and the inability to provide immediate clarification. Combined with the recent suggestions that

videos need not be central to a successful flipped classroom (e.g., (Brinks Lockwood, 2014), these challenges highlight the lack of evidence regarding the effectiveness of using video to deliver content. We suggest practitioners put more emphasis on the design of in-class activities that enable learners to research and discover solutions with their peers instead of spending most of their effort on making perfect instructional videos. We also suggest that practitioners should consider having a "mixed" flipped classroom instead of flipping a class for a whole semester. This approach has the advantage of a less overwhelming workload for instructors and more time for learners to adjust to learning in a flipped classroom.

6.2 Limitations & Suggestions

As in any study, the current research faces a number of limitations. First, the sample size was small with 16 total participants (15 participants completed the survey and 6 volunteered for interviews). Similarly, another limitation is that only two class sessions were flipped and some of the learners had never experienced the flipped classroom before. Thus, their perceptions could be just the first impression of this teaching approach, and they might have different perceptions after they are used to it. Although participants overall had positive views of the flipped classroom, no data were collected to address whether the flipped classroom significantly improved the performance of learners. To remedy these issues, future research should be sure to implement the flipped strategy with a larger sample size and directly examine the impact on learners' achievement. In addition, future work should focus on establishing practitioner guidelines and recommendations for flipping a classroom, such as recommendations for when best to implement a flip in relation to different kinds of content (technically-oriented vs. content-oriented) and high-quality alternatives to time- and technologically-demanding instructional videos.

7. Conclusion

To conclude, the current study demonstrates a wide range of both benefits and challenges for implementing a flipped classroom, many of which are consistent with those of previous research. The particular value of this work is in the way it has extended research on the flipped classroom to under-emphasized content domains (teacher training, language learning) and also examining the unique perspective of students as future teachers (pre-service ESL/EFL instructors) – such contexts and perspectives have rarely been considered in research on the flipped classroom. The results of this study particularly raise concerns regarding increased workload and potential technical challenges, for both instructors and for students; these highlight the need for the field to establish guidelines for best practices in flipped classrooms and especially to develop high-quality approaches to flipping *without* a dependence on instructional videos. Future work in these areas will build on existing trends in research and development for the flipped classroom, and will also have valuable, practical applications for all those interested in blended learning.

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