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The Flipped Classroom Model as Applied to an Augmentative and Alternative Communication Course

Cover Page Footnote

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Introduction

Speech-language pathologists (SLPs) often serve clients who require the use of augmentative and alternative communication (AAC) (Beukelman & Light, 2020). General practitioner SLPs may have many roles within AAC service delivery including evaluation, decision-making, and implementation (Binger et al., 2012). Unfortunately, SLPs may leave graduate school believing they have not had adequate preparation in AAC (Marvin et al., 2003). Additionally, it is unclear whether pre-service training in AAC is effective (Costigan & Light, 2010). Graduate programs have also reported that half of their graduate students may be unprepared to capably provide AAC services (Johnson & Prebor, 2019). For these reasons, improving pre-service preparation for SLPs in the area of AAC is an important focus of graduate program instructors and clinicians (Goldman et al., 2021). As such, it is important to consider different andragogical models that can be used to address these important skills.

The Flipped Classroom Model. One model that has received recent attention in health care education is the “Flipped Classroom Model” (FCM). The FCM is “flipped” in that the instructor provides lecture materials for students to view outside of class and creates in-class activities to reinforce that material in class. Course content is usually presented through a variety of modalities including the use of different instructional technology tools such as videos, recorded PowerPoint presentations, and online applications (Moffett, 2015). Classroom time is spent applying the content within case studies, discussions, and practical scenarios (Sharma et al., 2015).

The FCM is grounded in constructivist theory, in which the integration and assimilation of material is facilitated through the application of information. This approach has the potential to be particularly appropriate for students in a variety of health professions because it can target skills such as problem solving, student engagement, reasoning skills, and synthesis of learning (Dehghanzadeha & Jafaraghaee, 2018; Tattersall, 2015). Additionally, becoming self-sufficient and learning how to collaborate with others are important skills that may be developed when this approach is utilized (Sanders, Culshaw, et al., 2021). These skills help strengthen the clinical reasoning abilities and interprofessional interactions of clinicians working with AAC.

The FCM in Speech-Language Pathology. In the field of communication sciences and disorders, the FCM has been implemented and studied across a variety of content areas. Studies of this model at the undergraduate level reveal positive findings. For example, Lemoncello (2015) described his use of the FCM in an undergraduate “Anatomy and Physiology for Speech-Language and Hearing” course. Utilizing this model, he found that students who spent more time watching the online lectures had higher end-of-term grades. Students also generally provided positive feedback about the course on their end-of-course evaluations. Similarly, Berg et al. (2015) implemented the FCM in an undergraduate “Introduction to Audiology” course. Here, one cohort utilizing the FCM and a cohort of students taking the same course in a traditional format were compared. Students taking the course with the FCM had higher end-of-term grades and reported higher levels of student-to-student and instructor-student engagement than students in the traditional course. Tattersall (2015) also utilized elements of the FCM in both undergraduate (“Assessment in Communicative Disorders”) and graduate (“Language Disorders in the School-Age Population”) courses. Here, each of the courses contained both flipped and traditional components. When questioned about both types of components, students showed a preference for traditional segments but also reported

enjoyment of the collaborative in-class work when exposed to the FCM. It is possible that student opinions of the FCM as a whole may have been different had the courses been fully taught utilizing this approach.

There is additional literature on graduate courses in the field of communication sciences and disorders that utilize the FCM. For example, Affoo et al. (2020) used the FCM to teach a graduate-level “Swallowing and Dysphagia” course. Here, the authors underscored the importance of the collaborative nature and peer-to-peer interactions of in-class activities and their relationship to performance on traditional exams and quizzes. Additionally, they highlighted the positive connection between environmental factors of in-class activities (e.g., enjoying working with peers) in the FCM and exam and quiz grades. Werfel and Reynolds (2020) also utilized the FCM in a course on aural habilitation and rehabilitation. Students in the course reported that they liked the collaboration during the in-class group activities and that both the online and in-class activities facilitated learning of the course material. These results point to the potential for implementing the FCM to enhance academic outcomes in graduate speech-language pathology courses.

Factors That May Impact the Effectiveness of the FCM. Although these results are generally positive, it is important to note that there are different factors that might impact the success of the FCM. For example, some students have reported a preference for in-person, traditional classes because the FCM requires more work outside of class (Bergman & Sams, 2012; McNally et al., 2017; Missildine et al., 2013). This points to the importance of students being self-motivated and independent in their learning to fully reap the benefits of this approach (McNally et al., 2017). It is also possible that student learning preferences (e.g., preferring lectures or multimedia presentations) may impact their opinion of these courses (Lemoncello, 2015; Sanders, Culshaw, et al., 2021). However, the FCM model is particularly flexible in this regard, and effective planning can enable the class to provide students multiple means of interacting with course content (Bergman & Sams, 2012).

Aspects of course organization and pedagogical practice are likely to make a difference in the success of this approach. For example, Lemoncello (2015) broke his online lectures into five- to ten-minute segments to make them easier to digest. Additionally, he utilized “backwards design” (Wiggins & McTighe, 2005) to ensure that the learning objectives of the course were targeted in all aspects of the course, including learner assessment. Careful construction of in-class activities also supported the effectiveness of the FCM. Here, it is important to create activities that are designed to be active, encourage collaboration, and foster clinical reasoning (Affoo et al., 2020; Werfel & Reynolds, 2020). Thus, the FCM can be an effective model for teaching speech-language pathology students, but instructors should take into account different student needs and aspects of course design in order to bolster its effectiveness.

The Current Study. Although there is a burgeoning research base investigating the FCM in speech-language pathology education, there is limited research evidence investigating its use and effectiveness in graduate-level courses. The research that does exist indicates that it has the potential to help graduate students learn and integrate content as well as develop clinical reasoning skills. These types of skills are important for their development as future clinicians. This is especially the case in fields like AAC, where students may feel unprepared to work with clients even after having completed graduate coursework (Marvin et al., 2003). As such, this study will

describe and investigate the value of the FCM in a graduate-level AAC course. In particular, the aim of the current study is to answer the following question: What are pre-service graduate students' perspectives on and experiences of the FCM in a graduate-level AAC course?

Methodology

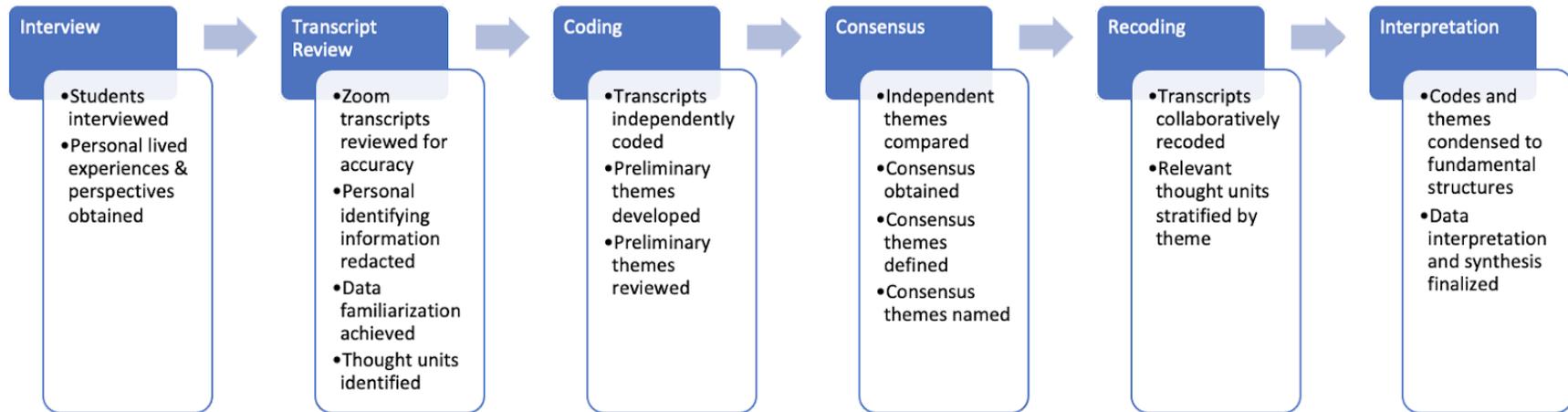
Research Design. This study assumed a qualitative, phenomenological design, as this was deemed the most appropriate means of obtaining a detailed description of the FCM experience. Semi-structured interviews were conducted in order to obtain a thorough illustration of the participants' experiences and perspectives surrounding this course. A thematic analysis (see Braun & Clark, 2006) resulted in identification of themes arising from the interview data.

Participants. All procedures for this study were approved by the University Human Subjects Institutional Review Board. Speech-language pathology students in their second year of their Master of Science program were interviewed about their experiences with the FCM in their course on AAC. All 24 students who had been enrolled in the course were given an opportunity to participate, via a recruitment email from the third author, who was not the instructor of the course, with the goal of recruiting one third of the class, a sample large enough to describe the phenomenon of interest. All 24 students were female and between the ages of 22 and 38, and none had previously completed another FCM course at the graduate level. Of the 24 students, 16 identified as Caucasian and eight identified as Hispanic. Of the 24, the first eight students that responded to the email were provided with further information and IRB-approved consent forms. All eight provided informed consent and volunteered to participate in an interview about their experiences.

Procedures. Interviews were 15-30 minutes long and semi-structured in nature. Interviewers were the third and fourth authors of this paper - rehabilitation sciences department members who taught outside of the speech-language pathology program and so did not teach the students being interviewed. The interviewers used a phenomenological approach that assumed a semi-structured conversational style during the interview. The goal was to ensure that the interviewee was comfortable communicating their personal lived experiences and perspectives (Smith, 2017). To ensure consistency of information collection between interviewers, the same guiding questions were used in each interview (see Appendix 1). Interviewers were experienced in the phenomenological approach to interviewing and assumed a conversational style, using these questions as guide, while completing member checking during the interview (e.g., asking clarification questions, validating questions, summarizing interview comments, and affirming interviewee perspectives). This was conducted online, verbally, during the interview in order to verify and authenticate the student perceptions, as expressed.

Data Preparation. To reduce the introduction of potential biases, the first author, who was also the primary instructor of the course, was not involved in the interviews or data analysis. The other three authors transcribed and qualitatively analyzed the data using interpretative phenomenological analysis (Smith & Osborne, 2003). The interviews were recorded via Zoom, and so an audio transcription was generated there. The researchers reviewed each transcript for accuracy, while listening to the audio, correcting any errors, and chunking the text into "thought units," or units of meaning.

Figure 1
Phenomenological Approach Flow Diagram



Note. Figure based on methods outlined by Braun & Clarke (2006)

Data Analysis. The data analysis was approached in an inductive manner, without hypotheses, and a thematic analysis approach (Braun & Clarke, 2006) was used in examining it. Independent analyses were compared and a consensus was formed regarding the overarching themes that emerged from the data. Themes were named and defined (Braun & Clarke, 2006; see Table 1 for operational definitions), and each of the three researchers re-coded the data using the agreed-upon thematic categories. NVivo qualitative coding software (Version 12, 2018; QSR International Pty Ltd., 2012) was used to code the data, and discrepancies in coding between researchers were negotiated until a consensus was reached. Figure 1 provides an overview of the data collection and analysis process. The themes and a detailed description of these, supported by quotes from participants, are outlined in the following section.

Course Overview. This AAC course was taught during the Spring 2020 semester as part of the master's degree curriculum at a small, private university in the northeastern United States. Twenty-four first-year graduate students were enrolled in the course. The course ran for 10 weeks with one in-person class session lasting three hours each week. The first seven weeks were taught previous to the university being closed for in-person classes due to the Severe Acute Respiratory Syndrome Coronavirus-2 (Sars-CoV-2) pandemic. At that point, the in-person portions of the course were moved to being presented in an online, synchronous format.

The course was taught utilizing the FCM. Backwards design (Wiggins & Tighe, 2005) was used to identify the primary learning objectives of the course and the learning objectives within each of the subject areas it covered. Each week, students were assigned readings from a text, lectures and videos that went along with the subject matter, and short answer “quiz” questions related to the lectures and the readings. The videos that accompanied the lectures were split into chunks so that no one video was more than 15 minutes long. The purpose of the quiz questions was twofold. First, they served as a learning check for some of the important background information that was deemed necessary for engagement in the in-class activities. Second, they served as a mechanism designed to increase student engagement outside the classroom.

For each topic that was covered, in-class activities that aligned with the learning objectives for each topic area were developed. The majority of these in-class activities required students to work together in small groups. Google Forms was used as a central piece of instructional technology for these activities. In one activity, students were presented with a case study that focused on AAC assessment. In this example, a five-year-old child with autism needed an AAC evaluation. Students were given a series of tasks such as writing example questions to ask parents, detailing areas that they would observe, and providing a list and explanation of formal and informal assessments they could potentially use. In groups of approximately three to five students, they recorded their responses to the questions on the form, and at least one student from each group presented the results to their classmates. Responses to the questions were then broadcast on screen during class, and the course instructor facilitated conversations based on these answers.

In this example, each group provided responses to the same prompts, while in other activities each group was tasked with a different aspect of the same topic, with responses then compiled to form a complete response (e.g., a “jigsaw”). Regardless of how the student work was obtained, exemplary answers to the prompts were compiled by the course instructor and uploaded to the LMS for students to use in preparation for their examinations.

Other technologies were also used to enhance in-class learning. For example, different videos related to aspects of AAC were shown and discussed in class. Additionally, “hands-on” activities utilizing different online resources (e.g., finding information online regarding a certain topic), communication applications on iPads (e.g., Proloquo2Go, TouchChat), low-tech tools (e.g., the development of communication boards), and software (e.g., Boardmaker [Tobii Dynavox, Pittsburgh, PA]) were created to provide students with opportunities to use tools that they might encounter in their clinical experiences. These tools were also available for students to explore outside of class if they desired. It is important to note that each of these activities was also aligned with the learning objectives for that particular topic. Guest lecturers were also invited to present during class time. For example, a device manufacturer representative presented different high-tech communication aids and access techniques so students could have hands-on experiences with these tools.

Finally, it is important to note that this course is positioned as a course within a Problem Based Learning (PBL) curriculum. PBL is a constructivist andragogy that introduces the curriculum content via case studies or problems, and students, with the guidance of a facilitator, collaborate to address learning outcomes in the context of these problems (Whitehill et al., 2014). Thus, the students in this FCM course are accustomed to a non-traditional learning style.

Results

Two hundred and sixty-five “thought units” were identified in the transcripts. In addition, the themes that emerged from these thought units included: course design, course delivery, instructor characteristics, student preferences, student characteristics, online versus in-person learning, and career relevance. These themes are described and defined with examples in Table 1, and the quantity of quotes per theme is also identified.

Course Design. All of the students noted that they appreciated the design and organization of the course. Student 3 noted that it was:

very different than like a traditional lecture where you're just getting kind of like spoon fed that information and then you leave, and you're like, okay, what do I do with this and then you kind of have to like try to apply it to stuff, but in that flipped class you're like actually able to apply it in class.

Similarly, Student 7 also appreciated the applicability of the learning:

I think because of the flipped nature of the class we learned more applicable skills. In class we had a lot, a lot of practice, a lot of time to ask questions, whereas I feel like in other classrooms where you're learning the material in that whole class portion, then you don't have as much time to ask questions, you don't have as much time to learn.

Furthermore, the students noted that the course design meant it was possible to learn from their peers as they had “time to reflect in our groups” (Student 4) and learn from others: “Everybody [was] sharing their own research on different devices, so that was really helpful” (Student 8). Student 2 discussed the flipped classroom approach in the context of the whole curriculum. She noted that students in this program were familiar with the nature of the problem-based curriculum,

and because they were accustomed to team-based learning, the flipped classroom worked especially well:

I think a lot of us are used to that, like, case study type learning because that's how our program's based on, so we kind of like, look for that and gravitate towards that. So it's nice to be able to like apply that conversation, rather than like just a straight up like lecture back and forth... I think the flipped classroom, along with the whole ideology of our program is with that case based piece, so I think in a sense that this was just an extension of that whole application for sure.

Course Delivery. During the interviews, students frequently addressed the course delivery and tools used to facilitate their learning. Multiple students mentioned the use of Google Forms, PowerPoint presentations, AAC applications, quizzes, classroom technology, discussions, breakout rooms, guest lectures, class activities, interprofessional opportunities, course topic objectives, and overall organization as conducive to supporting their learning. Of the Zoom discussions, Student 5 stated, "I enjoyed the breakout rooms." Student 2 appreciated the interdisciplinary aspects, noting "We actually did stuff with occupational therapy, so we learned how to kind of like work with other professionals, that interprofessionalism piece." Student 3 also praised the course components: "I always learned so much from guest lectures, and um, the hands-on activities." The following is a longer quote that also exemplifies this appreciation for the delivery:

Like Google Docs [forms], for example, having our group using that I think that was another great part of it. I was able to see other people's opinions on the use of certain things, how they would approach certain things in cases. (Student 4)

All students discussed the video lectures that were assigned to students to watch prior to the class periods. While some, like Student 5, discussed the self-motivation required for learning outside of the class period ("It can be really distracting to have basically the world at your fingertips during a small 15 minute lecture"), most reported that it was helpful to their learning process to have such access to these PowerPoint presentations, as they had the ability to manipulate, review and process them: "I could pause, I could rewind" (Student 7).

Instructor Characteristics. Students all noted that the instructor significantly impacts the course: "I think it [flipped classroom] works really well, depending on the instructor" (Student 1). Many students expressed feeling comfortable with the instructor, and implied that comfort was an integral component of the flipped classroom approach: "It's just like a good comfortable environment where I just feel like I could say anything, and we'll talk about it as an entire group or as an entire class" (Student 4). One student highlighted her perception that teachers who are open to offering a flipped classroom experience may have an overall approach to education that is less traditional and more responsive to individual student experience:

Yeah, that's, that's a lot coming from my personal experience, but I think perceptually if you offer a flipped course or some type of you know, alternate to like the traditional teaching, I think as a professor, you're definitely a little more fluid and looking to really have the students like get a good experience and get the information rather than just like the traditional push the information. (Student 2)

Table 1
Themes and Operational Definitions with Examples

Theme	Definition	Quotes	Quantity*
Course Design	Specifically, those elements related to the FCM, as well as course organization and structure.	“I just felt like it was better use of our class time to get the lectures outside of class. And then when we come in, we get to apply the information we learned.”	54
Course Delivery	The elements (e.g., guest speakers), tools (e.g., Google Forms) and strategies (e.g., discussions) that are specific to the course execution.	“A list of learning objectives are questions to be thinking about while watching his lectures and then he'd have us answer those at the end or have them answered for class.”	54
Instructor Characteristics	Actions of the instructor; traits, aspects, mannerisms.	“He [the instructor] was really good at [<i>sic</i>] laying out what he wanted us to gather from each lesson. So it was very explicit.”	35 (5)
Student Preferences	Modalities, processes, elements explicitly indicated as preferred or not preferred by the student.	“I enjoy learning through experience.”	89
Student Characteristics	Actions of the student; personal learning approaches.	“If it's an in-person lecture, I will take notes on my laptop. Um, I find that I type a lot quicker than I write. Um, so I tend to do that. And then, but with asynchronous classes. I tend to write my notes by hand.”	61
Online vs. In-Person Learning	Comparisons between online learning and in-person learning; distance learning elements related to COVID-19 adaptations.	“Because of the pandemic, it was definitely harder to do hands-on activities in a Zoom setting.”	30
Career Relevance	References to utilizing aspects of the course in clinical practice and in future “real life” settings.	“We had to, you know, go find your own answers and go connect the dots on our own and figure out what we would do, because we're not always going to have someone else to lean on in our clinical practice.”	9 (2)

*Quantity designates the number of quotes identified for each theme. In cases where not all students use quotes representative of the theme, the number of students is included in parentheses.

Interviewees identified positive and negative instructor characteristics that contributed to their experience of the flipped classroom approach. Organization and preparation were deemed important: “So I think there were several weeks when the lectures went up a little bit later than some of the students wanted, like ahead of time before class” (Student 6), “I think something that he does really effectively is he outlines, what's going to be targeted, so he would give you these objectives” (Student 1). Similarly, they appreciated the instructor relating to them as a person, especially during online class components. One referenced the instructor using humor, incorporating his cat’s appearance in one of the videos:

He would kind of ad lib where if the cat jumped on the desk and it kind of created this more natural context of learning and it almost made it seem like we were in the classroom with

him or more personable. It was, he's just very, he does incorporate a lot of humor, which I think really is a huge component of him as a teacher in general. (Student 1)

Finally, multiple students commented that within the context of the flipped classroom the instructor modelled an environment of inclusivity that is directly relevant to their future clinical practice:

I think I enjoy discussions with his class because he also is a really great facilitator in validating people's opinions and, and trying to incorporate what one person says to another remark and kind of linking it all together, which is also something that's really hard to do as a teacher. He does a really great job of validating everything that everyone says, and he's so inclusive. I, we talked about that all the time. He's such an inclusive professor, um, he tried to bring in different disorders within the articles that we could critique or different, diverse populations, so that we're not losing sight of the fact that we need to be culturally competent and culturally aware when working with any population. (Student 1)

Student Preferences. Many students emphasized preferences related to time. The first of these was the timing and scheduling of the course:

Depending on, like, where they are placed during the week, they're either really helpful or they're kind of really stressful because I have a flip class now where it's at two, if we have it on a Tuesday. So I have a lot of work I have to do on the weekend for our other classes. So it's like, always kind of stressful, just like organizing the time I have to do the work for that flipped class, but with Dr. X's class it's at the end of the week. So I kind of have like that five days to get all that work done. (Student 3)

However, there were conflicting opinions about this scheduling, and Student 4 was not in agreement about the Friday course being optimal: "Like I said earlier, if it wasn't a Friday. That's probably the only thing that I could be like ah, but I still love going to it every day, even though it was on a Friday." Some students noted that the flipped classroom model made better use of their time: "In my opinion, a better use of the time because you know at this level, like we all can read a textbook and take the definitions like that is not the problem" (Student 2). They also enjoyed the flexibility of the model, stating that they felt in control of their learning process: "The flexibility is really nice because you can get the content down again on your own time" (Student 1). Similarly, it meant that they were able to save time during video lectures and note-taking. Student 6 summarized, "I just feel like overall the Flipped Classroom is, it's a better use of the time."

As was clear from the course delivery information, the video delivery was frequently discussed in students' comments on their preferences. Most students discussed how the short videos were motivating, as exemplified in Student 7's quote:

It's, I think a little bit more motivating for me. If I look and I say, Oh my gosh, I have an hour-long video I have to watch, it's almost dreadful, but the videos, he kept them maybe at the longest 20 minutes so it was a real quick, easy thing and then I felt like I could spend more time on it.

However, Student 3 did explain that she would have preferred a single longer video lecture over multiple shorter ones, stating "I think I would have rather preferred just one 40-minute video

because then I would have known, I have to dedicate 40 minutes as opposed to, like, not knowing that all five videos were exactly seven minutes.”

Other preferences were highlighted in relation to the quizzes and worksheets:

Yeah, I think that having those little, like, he would have us do quizzes afterwards or, like I said, the one I'm in right now, we do like a little participation worksheet. I think having a little activity helps to like, for anybody that maybe doesn't take it seriously or doesn't take notes. I do think it helps. And it helps to kind of remember what you went over [at] the beginning of the lecture. And I like to look back at them as well. (Student 7)

Similar preferences were outlined as related to the discussions:

Having things already set in my mind for questions and just it allowed us to open up discussion more during class. And really, like, thoughtfully. Think about the material, rather than being lectured at in class and then you know going home with questions that maybe we weren't able to answer during class and having confusion. So it really helps to, like, solidify the information at hand. (Student 8)

Many students emphasized a preference for applied learning. Student 5 reported, “It helped me kind of marinate with what I read so I could figure out better questions to ask in class.” Student 2 said, “I like to apply things that I'm learning and understand how to, how I would use this in the future ... It allowed for, like, more preparedness to apply the information clinically.”

Student Characteristics. Active participation of students emerged as a key characteristic of the FCM. Students often spoke about what they did and how they learned in this course, and their active engagement was deemed especially important to the learning process. For example, Student 3 talked about how she processed the lecture information:

[I could] go through the PowerPoint lecture on my own time so if I had difficulty I could like go back and listen to it. If I just needed to hear it repeated a few times and it was a lot like it allowed me to take notes at my own speed because I, I've realized in my like six years of college that I can't always take notes at the speed that the professor is talking.

The group learning component of the course was greatly appreciated, and often tied to how students learned and processed information. Student 4 described succinctly how working in groups supported her learning: “It's just a great opportunity to see how other people have learned in, like, their undergrad and bringing in what they've learned into like our class.” She added that group work aided in her own self-reflection on her participation, “Practicing how I could reflect in, like, teamwork and, like, collaborate more” (Student 4). Similarly, the hands-on learning was emphasized as important by a number of students, as exemplified by Student 6:

So we're able to actually like look at AAC devices, we're able to have, like, guest speakers come in to talk about their companies, their devices, and their experiences. So I think those, like, activities helped apply the knowledge of what you're learning in the lectures.

Finally, additional general comments provided an overarching perspective of how students managed the learning experience in relation to engagement: “It just made me overall more engaged” (Student 4); “Coming to class, it's more engaging, to be able to have those discussions about what we've just learned, rather than just having it lectured to you” (Student 7); preparation

“You felt prepared” (Student 8); responsibility and ownership of the learning “We're responsible” (Student 5); and comfort level in this model “I feel a little bit more comfortable ... just sitting and reading textbooks does not work for me” (Student 1).

Online vs. In-Person Comparisons. The flipped classroom approach typically includes some asynchronous online components that accompany the face-to-face classroom time. This research was conducted during Fall 2020, in the midst of the Sars-CoV-2 pandemic. A little more than halfway through the semester, the course changed to a completely online delivery, with both synchronous and asynchronous components. Therefore, student perspectives of how the FCM utilizes these modalities were of particular interest. Many described how the flipped classroom was easily adaptable to this online environment and used terms such as “wonderful” and “good experience” in highlighting this:

I think being able to have that flipped portion where you know you're doing stuff on your own on your own schedule and you can do it [at] two o'clock in the morning. If you need to, um, and then coming back in and having that discussion to tie everything together. I think it's helpful. (Student 2)

Some even went so far as to say that they would prefer their other online courses to be in the flipped format, while recognizing that the online discussion format could be improved:

The only difference is that the discussion piece will just have to be more fluent through Zoom. So maybe like thinking of ways to make that discussion more fluent, since you're not in person. And it's difficult to talk over each other, you know, on Zoom. So having maybe a system for that. But otherwise, I think it's pretty transferable (Student 8).

They also expanded on the benefits of this approach, which included re-watching lectures, having additional class time for discussion, and gaining enhanced opportunities to cover content. “I think it's definitely more beneficial in the Zoom world to do a flipped class” (Student 3), and “You could repeat it as many times as you want and then you go in and you could discuss it” (Student 4). Finally, Student 3 summed up this idea by saying “With everything being on Zoom you have less time on Zoom, but you're still learning everything that you need to know and you're still getting that application skill.”

One student described a seamless transition between the in-person and virtual environments, stating that the instructor “...created this more natural context of learning and it almost made it seem like we were in the classroom with him” (Student 1). Nevertheless, some disadvantages were also outlined. Students noted that self-motivation and accountability were even more necessary than usual for learning in this online environment. Self-motivation among students is key to the success of the flipped classroom approach, and increased demand for self-motivation in this model may affect some students negatively:

You're just with your computer so no one's holding you accountable and it can be really distracting to have basically the world at your fingertips during a small 15-minute lecture. So that's something that I personally struggled with. (Student 1)

Similarly, the process of online learning naturally limits the hand-on experiences and opportunities to physically interact with devices, an integral part of learning about AAC. This drawback was

highlighted by Student 6: “That was super important to me and just like those hands-on aspects [trialing devices] we would have been missing out on because of the virtual aspects of it.”

Career Relevance. Two of the eight students discussed how the flipped classroom approach related to their career. In particular, they mentioned how the course discussions and case studies facilitated clinical experiences: “This type of patient walked in and I was like okay, I kind of seen this before, um, which really was helpful for me” (Student 2). Similarly, both students saw the flipped classroom as supporting their independent learning and their future autonomous careers as SLPs. Student 1 acknowledged, “It's ultimately up to me how involved I want to be and how much I want to learn,” and Student 2 stated of the approach, “I think it teaches you, I mean even looking back from the first semester that I was in this program like I didn't know how to do research. I didn't know how to find my own answers, like, it was just kind of like foreign, um, and I think the flipped classroom, along with the whole ideology of our program is with that case-based piece, we had to, you know, go find your own answers and go connect the dots on our own and figure out what we would do, because we're not always going to have someone else to lean on in our clinical practice.” Student 2 even went so far as to equate the flipped classroom to “grad school being done right” in relation to career preparation: “I feel like if grad school is done right and you're prepared well you should gain a lot of these skills to be critical or to, you know, be connecting the dots between different pieces of information. Because realistically, that's going to be our career.”

Discussion

The purpose of this study was to investigate pre-service graduate students' perspectives and experiences of the FCM in a graduate-level AAC course. Investigating new methods of andragogy in this area is critical because of concerns related to the effectiveness of pre-service AAC instruction. The students who participated in the study shared important points regarding their experiences through semi-structured interviews. It is evident from the results that in the development of an FCM course instructors needed to consider aspects of both course design and delivery that may impact student engagement and learning. Closely related to this, both instructor and student characteristics may impact the effectiveness of this type of class. Students also identified important points related to how this type of andragogical model compares to traditional, in-person courses and may be related to the clinical skills necessary to be successful after they graduate. These findings are discussed below relative to extant literature, course construction, and improving graduate-level, pre-service AAC instruction. Appendix 2 provides a succinct summary of some of the best practices discussed here.

In terms of course design and delivery, students identified aspects they found beneficial to their experience with the FCM. As an overarching point, course organization was identified as critical for success by some of the students. For example, they expressed a preference for the learning objectives that were presented for both the online lectures and in-class activities. Being explicit with these objectives was an important part of the backwards design process used to construct the course and has also been identified as a key component of FCM classes (Lemoncello, 2015). For this type of model to be successful at the graduate level, it is likely important to be explicit in how out-of-class work is related to in-class work. Instructors can do this by demonstrating how the same learning objectives are being addressed across both of these settings.

Additionally, the course was constructed in such a way that it was consistent across the different AAC topics (e.g., learning objectives were always presented, length of videos was consistent, group work was a component). Organizing learning materials in this way is suggested as an important component of course design (Tainsh, 2016) and may be preferred by adult learners in general (Bourdeaux & Schoenack, 2016). In particular, students expressed a preference for consistency with timing of material distribution. Organization and consistency are hence likely important to ensuring that students do not feel overwhelmed when learning in a course that deviates from the typical lecture format. This is particularly important for teaching an AAC course due to the diverse nature of topics. For example, in this class topics as diverse as working on literacy, implementing AAC with beginning communicators, and implementing AAC with individuals with progressive impairments was targeted. Consistency and organization appears to be an important component of the FCM, especially in classes that have a wide range of focus areas.

Another important consideration in using the FCM is the need to integrate instructional technologies. Students used and often reported a preference for the use of technological tools in the FCM, such as Google Forms and online videos. It is important to note that these commonly used tools usually do not involve the use and mastery of new technology. The use of tools that are unfamiliar may be intimidating for both students and instructors (Lemoncello, 2015; Sharma et al., 2015). By using common tools in this particular course, students were able to reap the benefits that technology can provide in this type of format without intimidation.

Some students also shared their preferences regarding aspects of the video lectures that were posted for them to view outside of class. The length of the videos emerged as important to students. Although it was possible that students had to view many videos, they were distributed in segments no longer than 15 minutes each. While most students favored the shorter videos, it is possible, as in this study, that preferences vary. The utilization of shorter online videos is consistent with other studies of the FCM in communication sciences and disorders and appears to be an important factor to consider when designing this type of course (Affoo et al., 2020; Berg et al., 2015; Lemoncello et al., 2015).

The results indicated that there are other important student preferences that may be key components of the FCM model. For example, some students appreciated the quizzes that were utilized for each topic after it was presented online. These students found it beneficial to have a mechanism like this to help with accountability and engage them with the content outside of class. Similar types of learning checks have been used in other studies of the FCM (Lemoncello, 2015; Sanders, Culshaw, et al., 2021). There are a variety of these types of learning checks that instructors can use in the FCM. For example, rather than using more formal mechanisms like quizzes, instructors could ask students to come to class with questions prepared or to write a reflection about the content that was presented outside of class. It is important to note that these types of learning checks are utilized in a variety of course formats (e.g., face-to-face instruction, asynchronous online instructions). However, in the case of the FCM in particular, using tools like these may help students feel more comfortable before they participate in in-class activities and also increase compliance in doing the work outside of class.

In terms of in-class activities, some students shared their appreciation for the collaborative opportunities. In particular, they appreciated learning from their peers through the discussions and

reflections that would surface within those groups. This is consistent with other research on the FCM that has recognized the value of both learning from and teaching to peers (Affoo et al., 2020; Werfel & Reynolds, 2020), and has been shown to be related to success on course exams and quizzes (Affoo et al., 2020). Collaboration is a key component of AAC service delivery in a variety of settings (e.g., Binger et al., 2012). The opportunity to learn valuable interprofessional and problem-solving skills as part of a group in activities such as these may have a positive impact on the ability to execute similar activities when providing services for clients who require AAC. Related to this, as part of the course design, there were opportunities to learn from guest lecturers from other disciplines, such as occupational therapy. As is evident from the results, students appreciated these opportunities. These types of interdisciplinary experiences have also been recognized as important for success in AAC service provision (Costigan & Light, 2010).

Students also reported that they valued the applied nature of the in-class activities. This is not only aligned with the constructivist nature of the FCM but also important for the development of clinical skills necessary to work with clients who utilize AAC. Werfel and Reynolds (2020) found that in-class activities based around cases were beneficial for their graduate students because they provided an opportunity to scaffold clinical decision making. The case studies and other applied activities utilized in this class also focused on making these types of decisions. Students in this study reported that they felt prepared to engage with these course activities and attributed this success to the structure of the FCM and the pre-class preparation involved. It is important to note that the points the participants made about the in-class activities such as collaboration, hand-on activities, and inviting different guest lecturers could be important components of a traditional in-class course. However, one reason the participants may have been particularly enthusiastic about these experiences in this FCM course is because they were confident about the related background content prior to engaging in the in-class portions. Additionally, these types of activities are particularly important for an AAC course, as they provide hands-on opportunities similar to those they will see clinically. As SLPs may feel unprepared to work with individuals who use AAC when they graduate (Marvin et al., 2003), the FCM may be particularly advantageous because the in-class portion can be utilized to focus on more “real-world” skills while background knowledge can be targeted outside of the classroom.

Some students noted a connection between their experience in the FCM and the types of skills they would need as a speech language pathologist working with clients who use AAC. As noted before, the collaborative nature of the activities is similar to what they might see when working clinically. The inverse of this is also true. Many of the in-class activities required students to find information independently and share it with their groups. In AAC service provision, it is particularly important to have this sense of autonomy, especially as it is a field that is ever changing in terms of technology. In fact, many SLPs struggle with clinical confidence due to the need to keep abreast of changes in technology (Sanders, Page, et al., 2021). The skills modeled in the types of in-class activities utilized in the FCM, such as problem solving and independent information seeking, may translate to more confidence in real-world clinical work with clients who use AAC.

Just as with a traditional in-person course, the role of the instructor appears to be important. Aspects of the instructor’s role were discussed previously in relation to organization and consistency. However, some students mentioned other preferences related to instructor qualities and characteristics such as inclusivity, humor, and respecting a diversity of viewpoints, indicating

that these help undergird the success of the FCM. This finding is consistent with Lemoncello's (2015) experience with the FCM, as he underscored the importance of fostering personal relationships with students even though there is a substantial online component. Related to this, some skills necessary for implementing the FCM may be different than for other course structures. For example, instructors may need to intentionally facilitate conversation and discussion among students, as opposed to assuming a more traditional role as lecturers.

Since this class transitioned to a completely online format during the semester due to the Sars-CoV-2 pandemic, students acknowledged the smooth transition of moving the synchronous portion to the online, Zoom platform. In fact, some students preferred this model to both synchronous and asynchronous online classes that they had experienced. Although students largely reacted positively to the shift, there are important caveats that instructors should keep in mind for future implementations. For example, transitioning from in-class group work to group work in “breakout rooms” on Zoom requires fluidity with the technology from both the instructor and the students. Here, the transition in this class was made easier because students were already using Google Forms as part of their in-class work. Additionally, the online component in a class like AAC can present difficulties because of the hands-on nature of some of the instruction. For example, activities such as creating communication boards collaboratively or learning about how some devices are programmed proved to be difficult when moved fully online. This challenge is something that the instructor should address if the FCM is delivered in a fully online platform.

Future Directions and Limitations. There are important limitations to this study and associated future directions that should be considered. First, it is possible that the course content contributed to student opinions about the FCM. Student opinions about the FCM may have been different if it had been used in courses focused on areas such as aphasia or research methodology, as opposed to AAC. Future research could compare the differences of student perspectives in other disciplines within speech-language pathology. Another area of future study could be to examine the FCM in relation to AAC content more specifically. For example, student perspectives about the FCM for teaching basics of AAC assessment might be different than when it was used for teaching about AAC intervention for individuals with aphasia.

It is also important to note that this study was focused on one instructor of a single class. Instructor characteristics were a contributing factor to the student perspectives, and it is possible that perspectives about the model in general would have been different had there been a different instructor. An important area of future research could be to examine instructor contributions in a more in-depth fashion. Another point of interest is that the students who participated in this study were enrolled in a graduate program that uses a Problem-Based Learning approach for the majority of its graduate curriculum. Therefore, they were already used to being flexible in terms of andragogical methods and working collaboratively with peers. The perspectives that were shared may have been different had students not already had these experiences.

It is important to also empirically examine whether the skills learned in the FCM translate into increased clinical skill post-graduation. The students in this study pointed out that they believed that the skills learned through this model would be beneficial to their clinical work, but it is important to see if this is, indeed, the case. It would also be interesting to see how this model could be applied to postgraduate education. For example, continuing education that is presented in this

way may have the potential to be more effective than other current models. Finally, it is important to note that this course was taught as the Sars-CoV-2 pandemic emerged. Therefore, the in-class portions were partially presented in-person and partially online. It is possible that our results may have been different if the in-class portions had been taught fully online or in person.

Conclusion. Pre-service education in the area of AAC is recognized as an important topic, because SLPs may leave graduate school without skills necessary to serve clients who use AAC. As such, studying new andragogical models for this particular content area is necessary. In this study, the FCM was used as a method for pre-service speech language pathology graduate students. Students shared their perspectives and identified points related to course design, course delivery, instructor characteristics, student preferences, student characteristics, online versus in-person learning, and career relevance that could be important for successfully implementing this model. This is an important first step in not only increasing our knowledge of andragogical models for this important area but also in refining and improving how this particular model can be implemented.

Disclosures

Eric J. Sanders, Louise C. Keegan, Mary Culshaw and Colin Tomes are employed by Moravian University and have no other relevant financial relationships to disclose. They have no non-financial relationships to disclose.

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Appendix 1

Interview Guide

These questions serve as a guide for the conversational interaction and are not required to be asked in order or as written.

- How was your experience of the flipped classroom?
- How did you think the activities and tools (e.g., classroom discussion, technology) used in the flipped classroom approach impacted your learning?
- How did this experience compare to traditional in-person courses you have taken in the past?
- What was your favorite aspect or aspects of this course?
- What do you think could be done to improve the course?
- Can you discuss your perspective of the online lectures?
- Discuss your thoughts on whether a flipped classroom is conducive to the online pandemic environment.

Appendix 2

Effective practices of the FCM

Course design (Structural components)

- Online outside of class lecture
- In-class activities (related to the outside of class lectures)
- Expectations of students to come prepared to the in-class lectures
- Clear aligned learning objectives for the outside of class lecture and related in-class activities
- Assigned activities and learning checks outside of class

Course delivery (elements, tools, and strategies for execution)

- Use of screencasting software outside of class lectures
- Online lectures chunked into 5 to 15 minute videos
- Organized and consistent use of Learning Management System for the different topics and communication of learning objectives
- Guest speakers
- Instructional technology: Google Forms, Google Docs, Online Quizzes
- Guided discussions
- AAC applications
- AAC software
- Classroom technology (e.g., monitors available for each group in class)
- Interprofessional opportunities

Instructor characteristics (traits, mannerisms)

- Organization for both outside of class and inside class portions (e.g., consistency)
- Clear communication (e.g., expectations for activities expressed)
- Respect (e.g., demonstrating appreciation for student ideas)
- Timeliness (e.g., posting materials in advance)
- Relatability (e.g., sharing clinical stories, using humor)
- Inclusivity (e.g., acknowledging multiple perspectives)

Student characteristics

- Responsibility/Preparation (e.g., completing work outside of class)
- Engagement (e.g., active participation during in-class activities)
- Autonomy (e.g., seeking information independently)
- Collaborative skills (e.g., working with classmates)
- Motivation (e.g. interest in applying learned information clinically)
- Flexibility (e.g., adapting to different andragogical styles)