Evaluation of Student Opinions on The Implementation of The Flipped Classroom Model in Health Education

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ABSTRACT

This study investigates fourth-year students' perspectives on using the Flipped Classroom Model (FCM) in Health Education at Ataturk University. Employing a case study design, eight interns from the Family Practice department participated. Data collected via semi-structured interviews were analyzed using content analysis. When the perspectives of the participants regarding the implementation of the Flipped Classroom Model (FCM) in health education were scrutinized, it was deduced that, despite the initial anxiety experienced by students and their belief that they would be required to exert double the effort upon being informed that the instruction would occur via FCM, they articulated that the experience did not align with their expectations and was not as laborious as they had presumed. In contrast to this initial apprehension, they also conveyed a favorable outlook, asserting that the dual study requirement would ultimately enhance their learning outcomes. The students underscored that the FCM approach facilitated a more enduring retention of knowledge, contributed positively to their academic performance, and provided a level of engagement in class activities that had not been previously encountered, thus allowing for improved self-expression within this educational framework. Moreover, they indicated that their level of engagement paralleled that of the course instructor and proposed the integration of FCM into additional courses across all educational levels.

Keywords: Flipped classroom, health education, students' view

Introduction

The FCM is generally applied in the traditional education system. It is the model in which students are taught at home by the lecturer in the classroom environment, the system in which homework is given outside the classroom, and the lecture materials are prepared on the computer and the web, and the homework is taught in the classroom under the guidance of the lecturer (Bergmann & Sams, 2014). The FCM provides an environment that can be accessed via the web, from home, office, work, etc., regardless of the location, to the materials prepared by the instructor of the parts of the subjects that are suitable for individual learning outside the classroom. In the classroom, it provides an environment where learning takes place with individual or group problem-solving practices and homework. The main purpose of the FCM is to increase the quality of education in the classroom by transferring high-level cognitive activities, such as the student's assimilation and permanence of knowledge beyond memorization to the classroom environment, and the transfer of the act of learning knowledge outside the classroom regardless of time and place (Chankvetadze, 2024; Sams & Bergmann, 2014; Strayer, 2012). The main purpose of the FCM is to increase the quality of education by reversing the traditional education system. The FCM carries high-level cognitive activities such as the student's assimilation and retention of knowledge beyond memorization into the classroom environment and transfers the act of learning knowledge out of the classroom independent of time and place (Ernesto & Manlapig, 2024; Sams & Bergmann, 2014; Strayer, 2012). Since the FCM requires individual learning, individuals living in a technologically developing and changing society have to access information, where and how to use that information, share information, interpret, classify, evaluate information according to changing conditions, and confirm whether the information obtained is correct (Gençer et al., 2014). In addition, since the materials prepared by enriching with technology appeal to more than one sense organ, it will provide more enjoyable and faster learning, unlike traditional teaching (Yalın, 2003).

The FCM has its implementation steps. The FCM includes the steps listed below (McGivney-Burelle & Xue, 2013):

- The student's preparation for the lesson at home or outside the classroom environment,

- The teacher's evaluation of the student's preparation for the lesson,

- Preparing an environment for collaborative and problem-based learning as well as listening to the student and taking notes during the lesson,

- Giving immediate feedback under the teacher's guidance by allowing the student to practice.

It is also important to design in-class applications after the implementation of the extracurricular applications prepared in the FCM (Sağır & Sakar, 2017). In-class application steps designed by Frydenberg (2012) are listed in Figure 1;
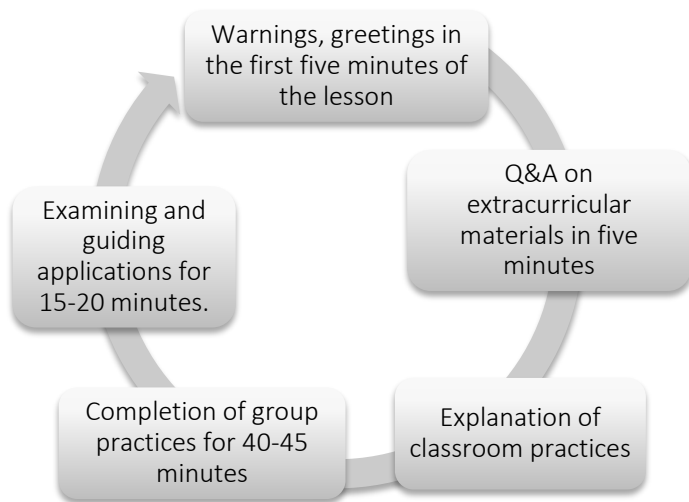

Figure 1.
In-Class Application Steps

As seen in Figure 1, the duration of an average lesson is about 2 lesson hours. Students are greeted by the instructor, and necessary warnings are made. Questions and answers are made about the materials that were previously delivered to the students for their evaluation outside the classroom. Then, the applications to be made in the classroom are explained and explained. Students are given approximately 45 minutes to complete their practice. During this period, necessary guidance is provided to the students in need. At the end of the period, about 20 minutes, the student's work is completely controlled, and the work done by guidance is examined.

Students in medical faculties have the competence to comprehend most of the theoretical courses in the basic

courses of medical faculties if their courses are taught with rich educational programs in the web environment (Kara, 2016). At this point, one of the current and effective methods for using technological changes and transformations in education by blending them with the traditional education model is the FCM (Bursa, 2019; Tomasouw et al., 2024). In addition, the education and training process that will be formed with the FCM is of great importance in terms of appealing to more than one sensory organ of the learners and directing the learners to the basic resources and research (Al-Zahrani, 2015; Fiqri et al., 2024). The FCM enables learners to have a very productive process in applied courses. Especially in clinical training, they stated that they see more patients taking longer clinical training in this model, where the instructor is the guide instead of long course hours. In addition, it was determined that they spent more time with the lecturer (Kara, 2016). Thus, with the FCM, learners take on their learning responsibilities and spend more time with activities in the classroom (Ernesto & Manlapig; 2024; Gençer, 2015).

There is a need for new studies to reveal the advantages and limitations of the FCM in terms of the application and dissemination of the FCM in health education courses at the undergraduate level. It is evaluated that the findings to be obtained as a result of this study will determine the students' views on the use of the FCM in health education and will provide results regarding which of the above methods will be appropriate in giving the learning outcomes related to the course content. In addition, it is estimated that this study will give an idea to the teachers and academicians giving health education about the teaching environments of the courses to be taught with the FCM, and will guide possible future studies.

Purpose of the Study
This study aims to examine the views of fourth-year students, studying at Faculty of Medicine, Atatürk University, on the use of the FCM. In this context, answers to the following research questions were sought:

- What are the students' views on the advantages of the FCM in health education?

- What are the students' views on the limitations of the FCM in health education?

- What are the students' views on the suggestions of the FCM in health education?

Method

Research Model
The case study, one of the qualitative research method designs, was used in this study. Qualitative studies aim to describe all the features in detail and to reveal the depth of meanings by making descriptions (Büyüköztürk et al., 2013). A case study is a detailed description and analysis of a limited system (Merriam & Tisdell, 2015). In case studies, determinants of one or more situations are investigated in all their aspects and in-depth research is conducted on how they affect the relevant situation and how they are affected by the relevant situation (Yıldırım & Şimşek, 2016). In addition, case studies are used when examining a topic in depth based on how questions (Yıldırım & Şimşek, 2003). For these reasons, in this study, a case study was used since students' views on the use of the FCM in health education were investigated in all aspects and how they were affected.

Study Group
The convenience sampling method, one of the purposeful sampling methods, was used in the study group. The most important reason for choosing this method is the Covid-19 outbreak, which was declared a pandemic by the World Health Organization. For the implementation of the FCM, fourth-year medical students attending face-to-face education were preferred. This research was carried out with 8 fourth-grade students studying at Atatürk University Faculty of Medicine. These students were selected because of the ease of access to students, the limited number of schools providing face-to-face education during the pandemic period, and the fact that face-to-face education continues in the fourth, fifth and sixth grades at the Faculty of Medicine. The data of the students in the study group are shown in Table 1.

Table 1.
Data of Students in the Study Group

Groups	Female (f)	Percent (%)	Male (f)	Percent (%)	Total (f)	Percent (%)
Sample	5	62.5	3	37.5	8	100

Data Collection Tool
A semi-structured interview form consisting of 14 open-ended questions developed by the researcher by scanning the literature was used to learn the students' views on the FCM. The opinions were taken from 3 experts and the interview form was finalized as a result of the evaluations to ensure the validity and reliability of the semi-structured interview form. While forming the interview questions, as Karasar (2009) mentioned in his study, it was taken into account that the questions were appropriate for the

students, fit for the purpose, and were easy to answer.

The ethical process in the study was as follows:

- Ethics committee approval was obtained from the Atatürk University Social and Humanitarian Sciences Ethics Committee (No: 56785782-050.02.04-E-2000285284, Date: 12.11.2020)

- Informed consent has been obtained from the participants.

Process
The application took 4 weeks. Each week, before the lesson, whether the students watched the videos shared on the Edpuzzle educational platform and the scores they got from the answers to the questions were shared.

Table 2.
Weekly Implementation Process

Week	Topic	Practice-Homework
1. Week	Giving information about the model to the students and registering for the Edpuzzle application. Also the creation of WhatsApp groups.	
2. Week	As part of the Healthy Child Monitoring course • Newborn screenings, • Monitoring of growth-development • Vitamin-mineral supplements As part of the Complementary Nutrition course • Breast milk, • Time to start additional food, • Principles of supplemental nutrition	• Watching lecture videos • Question-answer method performed in the classroom.
3. Week	As part of the Vaccines course • Extended immunization program • Off-schedule vaccinations As part of the Newborn Care course • Newborn's eye-navel-skin care, • Newborn bath, • Newborn feeding, • Newborn's room and clothes	• Watching lecture videos • Question-answer method performed in the classroom.
4. Week	Conducting interviews with students.	

1. Week
Edpuzzle and Whatsapp platforms were preferred in the

FCM. Edpuzzle platform was used to create classes in the virtual environment, upload videos, check whether the videos are watched or not, and check the answers to the questions embedded in the video. The Whatsapp platform was also used for quick communication with students, announcements of uploading videos to the system, and reminders to students who did not watch the videos. The students, who were informed about the FCM, were registered on the Edpuzzle platform and a class group was created in the WhatsApp application to communicate quickly. Students who had problems with their registration to the Edpuzzle platform were assisted and their problems were resolved. The videos to be watched next week and the questions to be added to these videos were reviewed and uploaded to the system together with the lecturer.

2. Week

All students attended the lesson after watching all the videos. In the Edpuzzle platform, the lessons were introduced by repeating the relevant headings according to the questions that were not understood through the answers given by the students and that the majority of them made wrong. The questions of the students who asked questions in the context of the subjects were answered. In-class application was made by using the question-and-answer technique covering the 2nd week's topics. The instructor of the course made a mini-exam using this technique and the students had the opportunity to reinforce the subject by making questions and answers among themselves. The videos to be watched next week and the questions to be added to these videos were reviewed and uploaded to the system together with the lecturer.

3. Week

All students attended the lesson after watching all the videos. The lesson was started by sharing the reports of the videos and the analysis of the answers to the questions in the videos with the class. The titles that were not understood in the video were repeated and the questions of the students were answered. In-class application was made by using the question-and-answer technique covering the 3rd week's topics. The instructor of the course made a mini-exam using this technique and the students had the opportunity to reinforce the subject by making questions and answers among themselves.

4. Week

A schedule of meetings is planned with students. In order for the students not to be affected by each other during the interview, interviews were planned in different periods according to their availability. According to this calendar, interviews were made with the students whose appointment time was voluntary. They were recorded with the permission of the students to be analyzed later and to prevent data loss.

Data Analysis

In the study, the data obtained with the semi-structured interview form were analyzed by the content analysis method. Content analysis was chosen because it helps to define the data and reveal the truths that may be hidden in the findings (Yıldırım & Şimşek, 2016). NVivo program, one of the qualitative data analysis programs, was used for content analysis.

Researcher Role

A virtual classroom named "Medical Faculty 4th Class" was created by the researcher in the Edpuzzle application. The videos prepared by the lecturer were uploaded to the system by the researcher. Afterwards, the students were contacted and added to the group by creating a group called "Flipped Classroom Model" on the WhatsApp communication platform. Necessary information has been provided for the students to register for the Edpuzzle application. The problems of the students who could not register were resolved and they were integrated into the system. The viewing status of the videos in Edpuzzle and the answers and comments in the video were followed by the lecturer. Interviews were conducted by the researcher. For the analysis of the data, categories, sub-categories, and codes were created together with the expert lecturer.

Validity and Reliability

In this study, comprehensive measures were taken to ensure both validity and reliability, with careful planning at each stage of the research process.

In terms of Validity, the role of the researcher and the use of qualitative methods for data collection were carefully considered to support the credibility of the findings. The researcher adopted a neutral observer role in interviews with students, creating an environment where students could express themselves more freely. Assumptions and limitations of the study were explicitly stated, and the methodology, participant group, data collection, implementation, and analysis processes were described in detail. To enhance the validity of the interviews, necessary permissions were obtained, and the sessions were recorded to prevent data loss.

The planning of activities and lesson design was carried out in collaboration with a field expert. The theoretical framework of the study was thoroughly developed, providing a robust foundation for the research. NVivo 12 software was utilized for data analysis, allowing a

systematic approach to coding and categorizing data. Additionally, the interview questions were reviewed by three subject-matter experts to ensure their relevance and clarity, and a language expert confirmed the accuracy and comprehensibility of the questions.

Regarding reliability, the course was conducted by a different instructor, while the interviews were carried out directly by the researcher. This approach minimized potential biases from the researcher and allowed students to feel more comfortable expressing themselves. The interview recordings were carefully preserved to prevent data loss and maintain data accuracy. The collected data were reviewed by three different field experts to ensure accuracy and reduce the possibility of overlooked elements due to researcher bias.

To enhance the reliability of the data collection tool (the interview form), revisions were made based on feedback from three field experts to ensure the questions accurately conveyed the intended thoughts and were understandable. Furthermore, data analysis was conducted using NVivo 12, which supported systematic, consistent, and replicable coding.

These measures of validity and reliability ensured that the findings of this research were obtained and interpreted in an objective, systematic manner, consistent with the theoretical foundation of the study.

Results

In this study, the views of fourth-year students at the Faculty of Medicine on the use of the FCM were examined. Findings were formed based on research questions. The findings were formed in the form of advantages and limitations of the FCM and students' suggestions for the implementation of the FCM. As a result of the analysis made, the opinions of the students of the Faculty of Medicine regarding the FCM are summarized as follows (Figure 2).
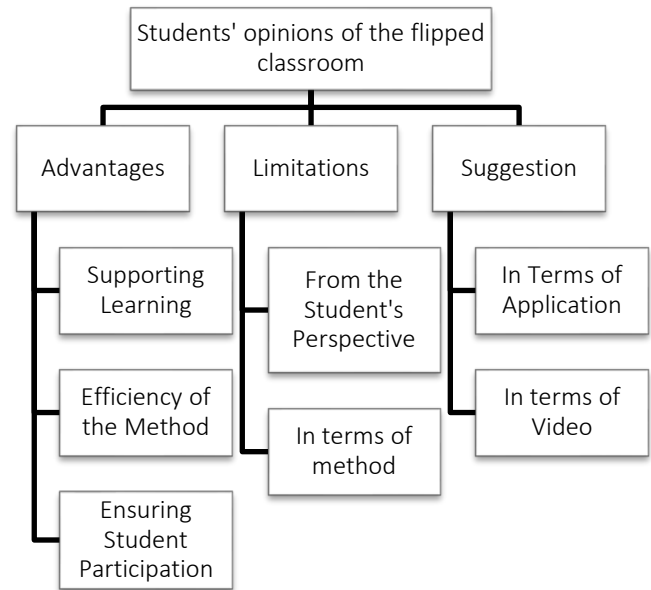

Figure 2.
General Views of Medical Faculty Students About FCM

Students' opinions on the advantages of the FCM
The advantages category consists of three sub-categories: supporting learning, the efficiency of the method, and ensuring student participation. The advantages category consists of a total of 15 codes.

Participants expressed positive views on the advantages of the FCM. In the model, the participants said that they were as active as the lecturer, especially in the face-to-face part, because they came to the lesson prepared, especially in the face-to-face part, where working twice in the model reinforced the subject, having ideas about the subject and the lecturer with videos relieved them, and they were able to identify the issues that the lecturer attaches importance to, especially in the face-to-face part. As a result, they stated that they asked more confident questions and it was a more sincere environment.
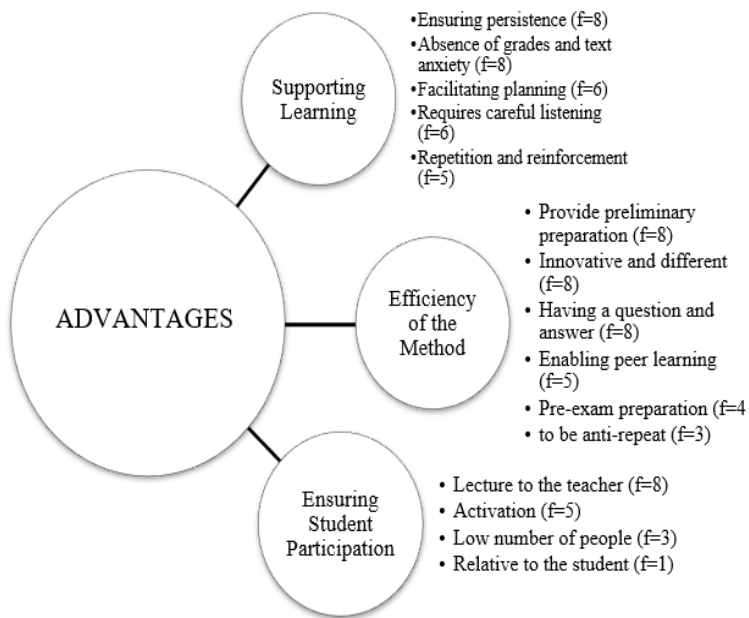
Figure 3.
Students' Views on the Advantages of the FCM

Sample participant opinions are given below.

P2: *I was more active. Traditionally, my teacher, for example, our lesson was obstetrics. The teacher asks 1-2 questions at most in the lesson, you know, he wants us to follow a logical flow. Nobody answers. Even online, no one answers. Also, our name appears there, when people say what nonsense this is, the recording is taken and it will be watched again. Now, being face-to-face is a distinct advantage here, and since we also work, the teacher asks us to do this extra. Now that we are active, we have to focus on all kinds of lessons.*

P3: *The advantages are that we can repeat it, that is, we have an idea about the teacher before the lesson.*

P4: *In the system, we normally use right now, we don't have a situation to learn the subject very much. The teacher comes and tells the lesson and then we say that we don't repeat the subject because we don't have time, but we can't repeat it even if we have time. All 4 topics are in my mind right now because I repeated them after the lesson, we asked questions, we answered, and constantly went over the topic.*

P5: *This model is better, of course, I like it more. In the other way of operation, we were going to the lesson without knowing anything. The teacher was talking there and we couldn't focus very much, so we broke up after a part of the lesson because we didn't know anything. But we listen to the teacher better because we know something because we watch it in this, I remember what the teacher tells much better.*

Students' views on the limitations of the FCM
The category of limitations consists of two sub-categories, from the students' perspective and in terms of method, and consists of a total of 6 codes.
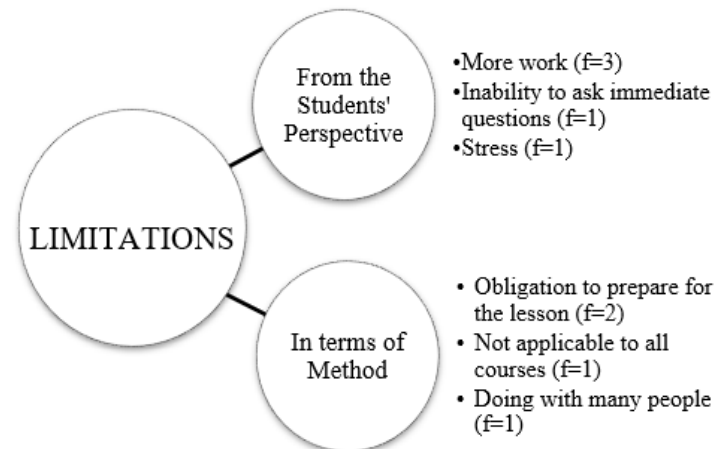

Figure 4.
Students' Views on the Limitations of the FCM

Participants expressed fewer views on the limitations of the FCM. Except for one participant, all the other participants mentioned a different limitation, only two participants said that the obligation to prepare for the course was a limitation. Other participants stated that it would be difficult to apply the FCM to the whole course, there would be deficiencies even if it was applied, it would not be efficient in this way, it was a limitation not to ask questions immediately in the pre-lesson preparation part, and it would not be efficient to use this model with many people. When the participants' views were evaluated, they realized that the participants were stressed at first, thought they would work harder, and later became more active and learning was permanent.

Sample participant opinions are given below.

P1: *You need to work harder. Of course, we were stressed at first because you would say that in front of your teacher and you would go out with that thing. In the second, we were not stressed, it was a comfortable environment, but yes, so the first week was stressful. It had no other limitations, so it was generally advantageous.*

P7: *You know, I couldn't see limitations, I liked it very much, I really couldn't see any limitations.*

P5: *Before you go to school, watching videos before going to school was very difficult. In other words, it was for my good that I would go to work even if it was normal, it actually felt bad for me that evening from that point of view, but the teacher's seeing what percentage of his videos I didn't always watch impressed me.*

P4: A problem arises, since we have a lot of lessons, it may be difficult to apply this to all lessons because if we teach 8 lessons that day, we may not be able to allocate them for 2 hours.

Students' suggestions for the implementation of the FCM

The suggestions of the participants for the implementation of the FCM consist of two categories: method and application. There are 6 codes in total in the suggestions category.
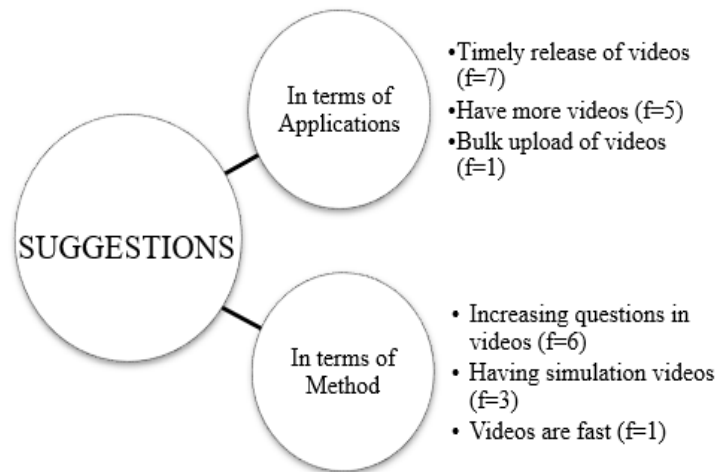

Figure 5.
Students' Suggestions for the İmplementation of the FCM

Participants presented suggestions for the implementation of the FCM. They emphasized that it is important to publish the videos on time, especially for the application, and that more videos should be used in the application. In addition, they stated that it would be good for the effectiveness of the application to upload videos collectively in the application. In their suggestions for the FCM, they stated that the questions in the video should be more and they should be added in the simulation-style videos. They also suggested adding features such as 1.25, and 1.50 playback speeds to make the videos progress faster.

Sample participant opinions are given below.

P1: *I think the videos were very instructive. It was very instructive. That was nice. For example, it could be shown how the heel blood was taken with video. It's better than this online course, it's definitely better than it because when we stop, you don't miss it, you can take it back. You can watch it again, I took it back and watched it again and again. It has such advantages, I think, compared to an online course, you can't miss any place, you can learn everything in detail. As I said, it could have been a video; it could have been supported with additional videos, with simulations or something.*

P2*: There's no way I can stop it. For example, traditionally, if I listen to my teacher for the first 15-20 minutes, I listen, after that, it breaks. But since we have a chance to stop it, it is a huge advantage, especially for someone like me. I can stop. I can restart. And I don't miss a place by focusing more. Even if I watch it in one go, I can understand many places, but we don't have such a chance in traditional. You know, the teacher is not in the mood to sit and wait for you.*

P5: *There is no application after the online lessons, a face-to-face application, so it is not very permanent. We watch, but after a while, we get bored, we stop, we don't feel compelled to watch, we can leave the computer on and deal with other things. But we have to listen to that too, I felt it. It was a driving force for me. That's why online classes were very right for me. Asking questions in between, not knowing when it would come, and not being able to continue when the question was not answered. It also encourages you to watch. And then having a face-to-face interactive lesson is better the next day.*

P6: *As I said, it happens in online classes as well, but then there is no opportunity to leave the lesson, there is no opportunity to rewind, and I do not hear a sentence, for example, I was taking notes, it was at this moment that I did not understand, so that I could look at the recording again, of course, from time to time, distraction or something stuck in your head or something else. I have a job, and that is my biggest problem in online classes. It is not clear when the lesson will take place. I'm just getting ready, I'm going to go out, they text me, for example, the teacher will start the lesson, you know, I have to go out, I listen to the lesson on the bus, so you know, it's more productive that way, I watch when I'm available.*

Discussion

Students' Views on the Advantages of the FCM

Participants stated that working twice in the model ensures permanence and reinforces the subject and that they can determine the subjects that the lecturer attaches importance to with the question and answer method. In addition, they stated that they were as active as the lecturer, especially in the face-to-face part, because they came to the lesson prepared, they asked more confident questions as a result of the pre-class preparation, and it was a more sincere environment. It is also stated in the literature that the FCM provides academic success and contributes in terms of responsibility (Baepler et all, 2014; Bursa, 2019, Elian & Hamaidi, 2018; Fautch, 2015; Galway et all., 2014; Gillispie, 2016; Gong et al., 2024; Güç, 2017; Kara, 2016, Lee & Wallace, 2018; Pierce & Fox, 2012; Samadi et al., 2024; Touchton, 2015; Tune et all. 2013). In the same way, it was stated that the FCM was interpreted as a self-confidence-increasing model, ensuring the

permanence of learning, activating the learners, and strengthening the audio-visual memories by learning in accordance with the individual pace of the learners (Topalak, 2016).

Galway et al. (2014), emphasized that students should be given a quiz on the subjects they learned outside of school in to provide motivation. McLaughlin et al. (2014) also stated in their study that classroom discussions improved their learning, thus reducing this burden by studying less for exams. The students stated that in this way, they are not nervous, they can concentrate better on the lesson as they are not nervous, and as a result, they will tell the teacher, that is, they work more carefully and understand the logic of the question and answer method they will do in the classroom, and because they come to the lesson by making preliminary preparations, the information is more permanent in this way.

The absence of grades and test anxiety was seen as the advantage of the model by the students. It shows that these findings are in line with the study by Ökmen (2020). Ökmen (2020) concluded that out-of-school tasks make it easier for students to do in-class practices so that out-of-school tasks are beneficial for students. The students stated that in the face-to-face part if the subject could not be fully understood while watching the video, the lecturer and their friends made up for this deficiency in the classroom.

McLaughlin et al. (2014), in the study conducted to determine student experiences within the scope of the Basic Pharmacy II course, stated that students who were educated with the FCM participated more in classroom discussions and that the questions and answers they made with their classmates contributed to the learning of the discussions. Johnson et al. (2014) stated that in the ideal classroom environment, all learners work together with other learners, participate in the education process with other learners with pleasure, and take responsibility for their self-independent learning. On the other hand, Cummins-Sebree and White (2014) stated in their study that for the students in the statistics course they teach with the FCM, the learning they do before the lesson increases their motivation to attend the lesson. The use of pre-class materials, often in video format, provides flexibility for students to learn at their own pace. This flexibility is appreciated by students, as it allows them to manage their learning more effectively (De-Brito & Terrado, 2024).

However, in some studies, unlike the current study, it was concluded that there was no statistically significant difference in the academic achievement of students (Çarpıcı, 2019; Davies 2013; Harrington et all., 2015; Yong, 2015). It is thought that these differences may be related

to lesson planning, the teacher's approach to students, and students' self-discipline. In addition, Kara (2016) stated in his study that the FCM can be used successfully in clinical education with an instructional design that suits the needs.

Students' Views on the Limitations of the FCM
Participants expressed limitations in terms of themselves and the method. He said that it requires more work and the necessity of preparing for the course is a limitation. They also stated that not being able to ask questions immediately in the pre-lesson preparation part is a limitation, and it would not be efficient to use this model with many people. When the participants' views were evaluated, the participants stated that they were stressed at first and that they thought they would work more. Students later realized that they were more active and learning was permanent. These findings are in line with other studies in the literature in which the FCM is applied. Avery et al. (2018) determined that the students stated that the FCM imposes more responsibilities than the traditional model. In the study conducted by Al-Zahrani (2015), it was stated that the FCM requires a lot of work. De Brito & Terrado (2024) report that the FC model requires significant time and effort to prepare for classes, as they must engage with pre-class materials extensively. Mason et al. (2013) stated that lecture videos require a lot of time, while Yacout and Shosha (2016) stated in their study that 4.8% of students did not immediately ask questions and get feedback while watching videos outside of the classroom, which is a limitation. In the study conducted by Turan and Göktaş (2015), students mentioned similar limitations and said that the necessity of watching videos, having to prepare lessons, not being able to ask questions to the instructor immediately, and the need to work harder is the limitations of the model. In the study conducted by Alsancak Sarıkaya (2015), students stated the limitations of the FCM by stating that the increase in out-of-school duties and responsibilities cannot be taken by every student.

Students' Suggestions for the Implementation of the FCM
The participants stated that they were satisfied with the questions embedded in the video and that these questions should be added and increased after each topic. There are studies in the literature that support this finding. In the study conducted by Kara (2016), students suggested interactive applications such as asking questions more frequently and giving a grade immediately when these questions are answered. In the study conducted by Bursa (2019), they stated that the factors underlying the success of the students are the videos they watch outside of school, the ability to watch these videos repeatedly, and the effectiveness of the questions embedded in the video.

Wilson (2016) tried to reveal the usefulness of the questions embedded in the videos he used on the Edpuzzle platform and concluded that the students who watched the videos in which the questions were embedded improved their learning compared to the students who watched the videos without the questions. Deng et al., (2023) study found that embedding questions in pre-class videos significantly improved learning performance. This was attributed to increased engagement with the material, as students were prompted to think critically and reflect on the content. Vivianingsih et al., (2023) research demonstrated that using Edpuzzle-assisted interactive videos positively impacted student learning outcomes, suggesting that such tools can serve as effective alternative learning resources. This finding is research that supports our current study. It was concluded that watching the videos and the question-answer method in the classroom contributed to their careful listening. Participants concluded that it is a negative situation that the videos for the videos cannot be forwarded. In the suggestion subcategory, they stated that the theoretical information is sufficient, but additional video and applied lessons may be more productive, otherwise, the subject may remain in the air. In addition, it was concluded that simulations should be used if possible, that the playback speeds should be added to 1.25, 1.50 for the videos to progress faster, and the videos should be uploaded at least 4 days before the lesson.

Conclusion and Recommendations

In conclusion, the Flipped Classroom Model (FCM) offers numerous advantages for enhancing student learning, including increased engagement, self-confidence, and academic responsibility. Students found the model beneficial in promoting active participation, reinforcing knowledge retention, and creating a more relaxed, collaborative learning environment. However, certain limitations such as increased workload, the need for better preparation, and the inability to ask immediate questions during pre-class preparation were identified. To address these concerns, participants suggested incorporating more interactive elements in the videos, such as embedded questions, increasing the availability of practical applications like simulations, and allowing for faster video playback options. Based on these findings, it is recommended that instructors enhance the FCM by integrating more dynamic and flexible learning tools while ensuring that students are well-supported during the pre-class preparation phase. This approach could further improve student satisfaction and learning outcomes.

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