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TOJDE is an open-access, peer-reviewed academic distance education journal. Although distance education has now a history of over 150 years, with the unprecedented developments in digital technologies and new paradigms, there has been an ever-increasing demand for experts and expertise in distance education.
An understanding of the complex world of distance education today clearly requires a reliable knowledge of the current state of art and data-driven projections of future. As such, it requires an ability to identify trends and persistent problems as well as establishing a relationship between particular needs, solutions to problems, and goals to be achieved. Aligned with these, TOJDE is intended to provide readers with scholarly and academic perspectives and research in the field of distance education.
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https://creativecommons.org/licenses/by-nc-sa/2.0/The Turkish Online Journal of Distance Education (TOJDE) is a peer-reviewed quarterly e-journal. International in scope, this scholarly e-journal publishes refereed articles focusing on the issues and challenges of providing theory, research, and information services regarding all forms and methods of distance education or open learning applications. TOJDE particularly strives to meet the continuing education needs of practitioners, educators and policy makers by providing a forum for the discussion of extended learning strategies, policies and practices, and trends in information technologies as they all impact the field of distance education.

Articles may be theoretical, philosophical and/or empirical analyses of distance education/open learning and teaching issues, and may take the form of case studies, research studies or general interest reports.

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- The articles submitted for publication will be evaluated according to originality, academic objectivity, and scientific quality criteria.
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- The goal of the peer-review process is to ensure that the articles that are submitted for publication remain within the scope of the journal, contribute to the literature on distance education, and to the rigor of the journal. It also provides the author(s) with complete reviews within a month after the submission of the manuscript.
- The names of the reviewers remain strictly confidential, and their reports are kept for five years.
- The manuscripts are sent to at least two reviewers. If one of the reviewers is positive and the other is negative, the manuscript is sent to a third reviewer, then, the Editor and the Associate Editor make the final decision by examining the reports of all referees.
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- All articles related to distance education are welcome.
- Articles should be either theoretical or research-based articles.
- Published articles have DOI since the first issue of 2014.
- Book reviews are also welcome.

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Dear TOJDE Readers,

Welcome to Volume 26 Issue 2 of TOJDE.

There are 15 articles in the April 2025 issue of TOJDE. 48 authors from 7 different countries contributed to the issue. These countries are Indonesia, Morocco, Sri Lanka, Turkiye, United Arab Emirates, United Kingdom and USA.

AMBIVALENT LEARNER SATISFACTION IN RELATION TO TEACHING, COGNITIVE AND SOCIAL PRESENCE IN DISTANCE EDUCATION, authored by Kadir KOZAN, Sihan JIAN and Kharon GRIMMET, is the first article. The purpose of this mixed-methods study is to investigate learners' satisfaction and presence levels in five fully online graduate courses in special education that were offered in an eight-week semester, and whether there is any teaching, cognitive and social presence differences among the levels of learner satisfaction. All these findings indicate that: (a) learner satisfaction in distance education is a complex construct having multiple dimensions; and (b) achieving positive satisfaction in distance education increases teaching, cognitive and social presence levels, which can enhance learning.

The title of the 2nd article is TOWARDS AN ADAPTIVE LANGUAGE MOOC: EXAMINING DIFFERENCES OF LANGUAGE ERROR PATTERNS ACROSS CULTURAL DOMAINS. The authors are Ozlem OZAN, Yasin OZARSLAN and Sevgi CALISIR ZENCI. This study analyzes linguistic errors as part of the Differentiated Distance Education of Turkish as a Foreign Language Project, which pursues the development of an adaptive MOOC for Turkish as a second language. According to this study, there is a relationship between error frequency and the language family of the learner's mother language.

The 3rd article, IMPROVING ONLINE LEARNING USING DEEP LEARNING AND STUDENT'S INTELLIGENCES, is written by Jamal Eddine RAFIQ, Abdelali ZAKRANI, Mohammed AMRAOUY, Said NOUH and Abdellah BENNANE. This study provides a detailed overview of the APPMLT-CBT model, its data collection methodology, and discusses its potential implications for online teaching. Results suggest that the model can serve as a robust framework for improving online teaching and learning while offering a deep understanding of the underlying mechanisms of online learning.

INVESTIGATING THE FUNCTIONALITY OF FLIPPED VIRTUAL CLASSROOM MODEL SUPPORTED BY MOBILE LEARNING ENVIRONMENTS IN CLASSICAL GUITAR EDUCATION is the title of the 4th article, and the authors are A. Aylin CAN, Umit Kubilay CAN and Kutbettin KUYUMCU. This study aims to reveal how guitar teaching with the flipped virtual classroom model supported by mobile learning environments influences the students' performance skills and the achievement of the lesson outcomes. According to the results of this study, it can be concluded that the guitar education conducted with the flipped virtual classroom model supported by mobile learning environments improved the performance of the students and contributed to their achievement of the program outcomes.

Rusen MEYLANI, Gary G. BITTER and Jane M. LEGACY are the authors of the 5th article titled IMPACTS OF PROFESSIONAL DEVELOPMENT AND IMPLEMENTATION FIDELITY ON ONLINE MIDDLE SCHOOL MATHEMATICS: A QUASI-EXPERIMENTAL QUANTITATIVE STUDY. The primary goal of this study is to evaluate the efficacy of professional development and implementation fidelity on the performance of middle school students in mathematics within an online learning environment. This research enhances the understanding of strategic professional development and its significant role in improving the effectiveness of online mathematics education.

The title of the 6th article is HOW VALID ARE OPEN UNIVERSITY EXAM PASSING STANDARDS? CONSISTENCY OF CLASSIFICATION BY CUT-OFF POINTS. Hakan BARAN and Murat AKYILDIZ are the authors. The purpose of this study is to investigate whether the minimum passing scores used in Open Education examinations differ from the currently used minimum passing scores according to different standard-setting methods and the classification consistency of the cut-off scores obtained by these methods with the currently used cut-off scores and with each other. The authors highlight that the pass or fail decisions based on academic principles differed from those based on administrative decisions.

EXPLORING THE IMPACT OF ARTIFICIAL INTELLIGENCE IN ENHANCING THE EFFECTIVENESS OF DISTANCE EDUCATION: THE MODERATING ROLE OF STUDENT ENGAGEMENT is the 7th article. Blasius Erik SIBARANI is the author. This research aims to examine the impact of artificial intelligence and student engagement in enhancing the effectiveness of distance education and to test whether student engagement strengthens the impact of artificial intelligence usage in improving the effectiveness of distance education. The study shows the importance of synergy between AI technology and student engagement, thus providing insights for educators and policymakers to optimize distance education strategies to improve the effectiveness of distance education.

The authors of the 8th article are Teti SOBARI, WIKANENGSIH, R. Ika MUSTIKA and Diena San FAUZIYA. The title is EFFECTIVENESS OF FLIPPED VIDEO-BASED FEEDBACK IN ONLINE CLASSES AND TRADITIONAL TEACHING ON THE QUALITY OF WRITING COMPONENTS AND STUDENTS' WRITING SKILLS. The aim of this research is to examine the effectiveness of video feedback in improving the quality of writing components and writing skills using flipped in online class and traditional teaching. The implication of this research is that teachers can combine feedback with media to create innovative and effective learning processes in improving product quality and student abilities.

Ibrahim GOKDAS, Fulya TORUN and Serife AK are the authors of the 9th article. The title of this article is DETERMINATION OF FACTORS AFFECTING THE SATISFACTION OF INSTRUCTORS IN DISTANCE EDUCATION USING CHAID ANALYSIS. The findings of this study indicate that the general satisfaction of the instructors is at a good level. Also, it is determined that the suitability of the course for distance education, the willingness to teach online, gender, Internet Access/speed, and age played an important role in instructors' satisfaction levels.

The 10th article which is authored by Duygu GUR and Yalin Kilic TUREL is titled BEYOND PLAY: SYSTEMATIC INSIGHTS INTO GAMIFYING EDUCATION ACROSS PEDAGOGICAL, PERSONAL, AND GAMIFICATION DIMENSIONS. In this study, authors aim to reveal current research trends regarding gamification in education, identify current research needs, and make suggestions to guide future research through the systematic review. In conclusion, they provide practical suggestions for educators and instructional designers on how to apply gamified learning environments.

MULTISTAKEHOLDERS GOVERNANCE FRAMEWORK FOR ONLINE LEARNING MARKETPLACE CONSORTIUM: POWER DYNAMIC PERSPECTIVE is the 11th article authored by Ira GERALDINA, Julia SAFITRI, Paulina PANNEN and Eka JULIANTI. This research paper uses a case study approach to explore a model that is adequate and suitable to be applied in the context of the Indonesia Cyber Education Institute, which was initiated by Universitas Terbuka, Indonesia. This study contributes to distance learning education to promote governance practices and support a high-quality distance learning education for society.

The title of the 12th article is CRITICAL FACTORS INFLUENCING FACULTY'S SWIFT TRANSITION EXPERIENCES TO VIRTUAL LEARNING ENVIRONMENTS DURING EMERGENCIES: A MIXED-METHODS STUDY OF A SEMI-GOVERNMENT EMIRATI UNIVERSITY. The authors are Semiyu Adejare ADERIBIGBE, Maher OMAR, Hussein ELMEHDI, Laura COLUCCI-GRAY, Khaled HAMAD, Abdallah SHANABLEH, Hussein AL-OTHMAN, Mohamed Hassan TAHA and Wiam ELSHAMI. This study offers several recommendations, including customized training programs, policy revisions, reduced teaching loads, enhanced technological support, and the incorporation of innovative teaching methods.

Edgar OCTOYUDA, Hendra Sakti Putra SIAGIAN and Ivon ARISANTI are the authors of the 13th article titled CONFIGURING VIDEO-BASED LEARNING AND ONLINE LEARNING EXPERIENCE TO SHAPE STUDENTS' SATISFACTION. The results of the study offer both theoretical and practical insights that enable institutions to assess the degrees of satisfaction among students, distinguishing between those with high and low levels.

The 14th article titled THE MEASUREMENT OF UNIVERSITY STUDENT'S INTENTION TO USE THE REAL-TIME ONLINE LEARNING IN SRI LANKA is authored by Arthika RAJARATNAM. The findings of this study are beneficial specifically to the policy makers to formulate key strategies to incorporate the real-time online learning in the education system. Thus, the education will become more accessible and affordable.

The 15th article, E-LEARNING STYLES AS A PREDICTOR FOR ATTITUDES TOWARDS DISTANCE EDUCATION: A RELATIONAL RESEARCH WITH THE TEACHER CANDIDATES, is authored by Engin DEMIR and Huseyin CEVIK. The study aims to investigate whether various variables and e-learning styles predict student's attitudes towards distance education. Findings show that the preferred type of education, gender, visual-auditory learning style, and independent learning style predict the attitude toward distance education. In conclusion, this research sheds light on how student-centered distance education models can evolve in the process of digital transformation in education.

Hope to meet again in the next issue of TOJDE.

Cordially,

Dr. T. Volkan YUZER

Editor in Chief

INVESTIGATING THE FUNCTIONALITY OF FLIPPED VIRTUAL CLASSROOM MODEL SUPPORTED BY MOBILE LEARNING ENVIRONMENTS IN CLASSICAL GUITAR EDUCATION

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ABSTRACT

The main objective of this current study is to present an example of how to use the flipped virtual classroom model supported by mobile learning environments in guitar education. Within the scope of this objective, this study aims to reveal how guitar teaching with the flipped virtual classroom model supported by mobile learning environments influences the students' performance skills and the achievement of the lesson outcomes. This research falls within the scope of emancipatory/developmental/critical action research among action research types. The study group of the research consists of 5 undergraduate guitar students. The study group of the research was determined by the typical case sampling method, which is one of the purposive sampling methods. The data collection tools of the study include demographic information forms, performance observation forms, unit evaluation forms, researcher and student diaries, video recordings of online lessons, mobile learning environment evaluation forms, application messages and student portfolios. According to the results of this study, it can be concluded that the guitar education conducted with the flipped virtual classroom model supported by mobile learning environments improved the performance of the students and contributed to their achievement of the program outcomes.

Keywords: Flipped virtual classroom, flipped learning, mobile learning, mobile application, guitar education, music education.

INTRODUCTION

In learning process, the learner needs to be active in order to encode the given information in a meaningful way and to use it when required in real life. Therefore, it is contrary to the nature of learning for the learner to be completely passive in the learning process. Effective learning is only possible when qualified learning environments are provided and learners who construct knowledge actively take part in the learning process. Today, many learning theories and approaches that are based on this approach enable students to construct knowledge. Actually, with the development of technology and the effect of its use in education, learning models

such as distance learning, web-based learning, and mobile learning, learning processes that are temporally and spatially alternative to formal education are preferred across various schools (Kuyumcu et al., 2021).

The mobile learning model, which is based on the use of mobile technologies in educational processes, is a contemporary learning model that eliminates time and space limitations (Ozan, 2013; Odamar Keskin, 2011; Tanriverdi 2011; Torun & Dargut, 2015 cited in Kuyumcu et al., 2021). This model can be used to support traditional education or to provide distance education. In this model, learning activities are carried out via smart mobile phones and table computers.

When the mobile devices in mobile learning are considered, we tend to think of reasonably sized devices that are not connected to any location and are not dependent on a power source. The reason for this is the space and time independence of mobile devices (Jason, 2007 cited in Agca, 2013).

Mobile learning offers opportunities such as time and space flexibility, equal opportunities, individualized learning, easy communication, low cost, etc. in education. From this point of view, the use of mobile learning model in music education will pedagogically contribute to music education processes. The use of mobile devices, computers, virtual environments, social platforms, platforms that allow listening to music and sharing it with others, and various software and applications like mobile tools in music education, which affect every aspect of our lives in our age, provides the opportunity to access information and use this information quickly as well as providing data diversity in music education processes.

Due to the nature of music, digital media are needed in many sub-dimensions of music education such as musical hearing (ear) education, voice education, instrument education, musical movement and rhythm (weighing) education. For example, voice recorders, note transcribers, music listeners, tuners and many other programs and software can meet the various needs of learners. Taking advantage of the convenience and functionality offered by technology can enrich music education in terms of the materials used and bring quality learning processes. In addition, since resources and course materials can be easily shared and used with the support of technology, in-class lesson time can be used more effectively, and virtual learning environments such as simulations, games, etc. can both increase students' motivation and provide permanent learning. Therefore, in today's world where the use of technology has become an obligation, the use of the mobile learning model based on the systematic use of technology in music and instrument education and the creation and implementation of music curricula based on this model will have a positive effect on learners' musical behavior acquisition.

Technological products in education are sometimes used as supporting materials in some contemporary learning models. Studies show that technological products are effective when integrated into teaching processes. (Torun & Dargut, 2015), One of these models is the flipped classroom model. In brief, the flipped classroom model can be defined as a model that offers students the opportunity to learn theoretical knowledge at home on their own and apply what they have learned in the classroom.

The flipped learning model can be briefly defined as a pedagogical approach that focuses on individual learning rather than group learning. The content in flipped learning which is presented with videos prepared by the teacher provides a more meaningful and richer learning environment for the time spent face-to-face in the classroom. In flipped learning, teaching is individualized. The content is presented with videos prepared by the teacher. The videos presented to students out of class create more meaningful and richer learning opportunities in face-to-face learning time with the teacher. This is actually what provides individualized learning. Many methods, variables, student-centered learning approaches, differentiated instruction, problem-based learning, project-based learning, inquiry learning and others are more practical when combined with flipped learning (Aydin & Demirer, 2015; Kara, 2016; Sams & Bergmann, 2012).

The popularity of flipped learning model has increased in the recent years and it is basically based on the idea that learning activities such as comprehension and recalling are carried out outside the classroom with the support of videos and various materials while high-level learning practices such as application, analysis, evaluation and production are carried out in the classroom (Mok, 2014).

The flipped classroom model is also referred as flipped learning and flipped classroom in the relevant literature. There are different types of this model such as the standard flipped classroom, discussion-oriented flipped classroom, demonstration-oriented flipped classroom, group-based flipped classroom, which are supported

by face-to-face lessons in the traditional classroom, as well as the virtual example of the flipped classroom where out-of-classroom activities are carried out online in a virtual learning environment.

The flipped classroom model offers many educational opportunities in the learning process. In this model, learners have opportunities such as time and space flexibility, direct learning, questioning, practicing, more active learning activities in class time, asking the teacher while reinforcing learning and receiving instant feedback from the teacher. Students can read and watch the course content over and over again through videos and various digital tools provided. From this point of view, the use of this contemporary learning model in music and instrument education can contribute to the learning experiences of music students. In this model, individualized learning comes to the fore. The individual takes the responsibility for his/her own learning and can organize variables such as time and space in the learning process.

Individual learning activities are significant in music and instrument education. In addition, in music and instrument education, which is mostly based on practice, the fact that students are with the teacher and their peers in the classroom in applying and reinforcing processes will contribute to the correct application and reinforcement of information. This is mainly because of the fact that the learners will be able to get instant feedback from both the teacher and their peers in this process.

The flipped classroom model brings some disadvantages such as the difficulty of controlling learners in the out-of-class learning process, the inability to track whether learners have done their tasks or to what extent they have done them, and learners who are inadequate in individual learning may be left alone in the process of learning knowledge. In the mobile learning model, there may be some problems due to the lack of face-to-face meetings that are needed from time to time. Educational processes carried out with the mobile learning model are mostly carried out within the scope of distance education. This situation causes learners not to benefit from the opportunities that face-to-face education offers. Integrating the flipped classroom and mobile learning models and supporting these two models with each other will minimize the difficulties of both models. In this way, it will be possible to experience a more qualified learning process.

The relevant literature suggests that there are few studies in music and instrument education regarding the flipped classroom model. In addition, it has been revealed that the studies are carried out by only giving videos and documents to the learners, without supporting them with technology-based learning models such as mobile learning. Supporting the learning processes in the flipped classroom model with mobile learning environments can ensure that the out-of-school processes of the learners are monitored and controlled by the teacher, and that the teacher and the learners are in contact during these processes.

The use of different models in education can enable the learning designers to construct a qualified learning process. As in other disciplines, the use of mobile learning and flipped learning models in music education and its sub-dimension, instrument education, will contribute to the learning experience of music students. Considering the importance of audio-visual technologies in music and instrument education, especially using technology-based mobile learning and flipped learning models will accelerate the acquisition of musical behaviors of learners.

The problem of this research is how to apply the flipped virtual classroom model supported by mobile learning environments in guitar education and how its effect will be. In line with this problem, it is desired to determine how guitar education using the related model affects students' performance skills and the achievement of the course objectives.

THE OBJECTIVE OF THE STUDY

The main objective of this study is to investigate the functionality of the flipped virtual classroom model supported by mobile learning environments in guitar education. In line with this general purpose, it is aimed to reveal how guitar teaching with the flipped virtual classroom model supported by mobile learning environments affects students' performance skills and the achievement of unit outcomes. In addition, it is also aimed to determine the views of the researcher and students regarding the application. Within the scope of these aims, the following questions were sought to be answered in the study;

1. How do student performances improve in guitar education carried out with a flipped virtual classroom model supported by mobile learning environments?
2. What is the status of students' achievement of unit outcomes in guitar education conducted with the flipped virtual classroom model supported by mobile learning environments?
3. What are the views of researchers and students on guitar education conducted with a flipped virtual classroom model supported by mobile learning environments?

This research is considered to be of original value in terms of using the flipped virtual classroom model supported by mobile learning environments in classical guitar education and there is no such study that has been conducted in this field before. Based on this idea, this is study is thought to;

- provide an original learning process in which the limitations of flipped virtual classroom model are minimized with mobile learning environments,
- provide an alternative method for guitar education.
- be important in terms of setting an example for the teaching of other instruments despite being specifically designed for guitar education

This study is limited to

- the undergraduate students in guitar education in Fine Arts Education/ Music Education Departments of Kastamonu, Mugla and Trakya Universities.
- the curriculum of the individual instrument education (guitar) course and the selected works/ etudes which were taken as the basis of the study.

In this study,

- the students worked regularly during the application process,
- the students expressed their views sincerely,
- the mobile tools used in this study was able to meet the needs of the students,
- the Internet connection and speed didn't hinder the research processes.

METHODOLOGY

This research is a study on the use of the flipped virtual classroom model supported by mobile learning environments in guitar education and it was designed as action research.

Action research is a research process in a real school or classroom setting with the aim of understanding and improving the quality of teaching or action. Action research is a systematic and organized method. It is a systematic and organized way because it allows teachers to observe their own practice or to describe a problem and the type of action that might accompany it. At the same time, action research is a type of research that is pre-planned, organized and can be shared with other people (Johnson, 2012). Buyukozturk et al. (2009) state that action research, which is one of the qualitative methods, is an important type of research that is considered among the professional competencies that today's teachers should have and requires people who are directly related to the situation to work as researchers.

Action research is a cyclical form of practice that takes place in the form of action planning, putting the plan into action, data collection and analysis, and reflection. These stages of action research do not have a linear structure; some stages can be removed, replaced or repeated if required (Mills, 2003 cited in Okmen 2020).

In this research, an action plan is designed for the use of the flipped virtual classroom model supported by mobile learning environments in guitar education. This action plan is aimed at improving guitar teaching. In this respect, the research falls within the scope of emancipatory/developmental/critical action research, one of the types of action research.

Participants

The study group of the research was determined by the typical case sampling method, which is one of the purposive sampling methods. Typical case sampling method requires determining a typical situation from a

large number of situations in the universe related to the research problem and collecting information through this sample. The main aim here is to select an average typical situation that is not unusual (Buyukozturk et al. 2009, p.90).

The study group of the research consists of a total of 5 guitar students, 2 students from Kastamonu University, Department of Fine Arts Education, Department of Music Education, 1 student from Mugla University, Department of Fine Arts Education, Department of Music Education, and 2 students from Trakya University, Department of Fine Arts Education, Department of Music Education, who are undergraduate students in the 2020-2021 academic year. The students in the study group of the research declared that they would like to participate in the study voluntarily. In this context, the participants filled out the participant consent form prepared by the researcher and submitted it to the researcher.

Two of the students in the research study group are the 1st grade, two in the 2nd grade and one in the 3rd grade. The study group of the research was not determined according to the grade levels of the students. In this respect, a mixed group was formed. While deciding the study group, information about the guitar proficiency levels of the students in the study group was obtained from the expert lecturers conducting the guitar lessons. In this context, meetings were organized by the monitoring committee of the action research and the researcher with the expert instructors conducting the courses of the students in the study group, and detailed information about the guitar proficiency levels of the students was obtained. In the following phase, the meetings were also held with the students to reinforce the knowledge obtained previously.

The study group was initially composed of 11 students; however, when the study was about to start, 6 students informed the researcher that they could not continue the study due to various personal reasons, although they had previously declared that they voluntarily participated in the study. Therefore, the application was carried out with 5 students.

Data Collection Tools

Within the scope of the research, the data collection tools that enable to obtain required data can be listed as follows:

1. Demographic Information Form
2. Performance Observation Form
3. Unit Evaluation Form
4. Researcher and Student Diaries
5. Video Recordings of Online Courses
6. Mobile Learning Environment Evaluation Form
7. Application Messages
8. Student Portfolios

Demographic Information Form

The demographic information form was developed by the researcher to obtain information about the study group, to evaluate the equivalence of the study group and to contribute to the implementation of the lesson plans.

Performance Observation Form

The performance observation form was developed by Senoglu Ozdemir (2019). After taking the necessary permissions, this observation form was used at the end of each unit during the implementation process to evaluate the performances of the study group. After the video recordings of the works and etudes played by the students were sent to 3 experts in the field of guitar education, the experts were asked to evaluate the students' performances using this observation form.

The performance observation form consists of two sub-dimensions: technical and musical. There are a total of 22 items in the form, 10 for the technical sub-dimension and 12 for the musical sub-dimension. The raters evaluate the performance by using the numbers '0, 1, 2, 3, 4' against each item. Accordingly, number 4 indicates the most successful performance and the number 0 indicates the most unsuccessful performance. Therefore, the score obtained from the performance observation form and performance success are directly proportional. The highest score that can be obtained from the performance observation form is 88 (eighty-eight) and the lowest score is 0 (zero).

Unit Evaluation Form

Unit evaluation form prepared by the researcher, covers all the learning outcomes of a unit. For each outcome, there are 5 boxes, one for each student in the study group. These boxes were filled in by the researcher using "+" (achieved) and "-" (not achieved) signs. While preparing this form, expert opinions were taken by the researcher from two researchers who are experts in the field. Necessary corrections were made in line with these comments. This process was repeated for each unit and the students' achievement of the unit outcomes was evaluated.

Researcher and Student Diaries

Throughout the research process, the researcher wrote a diary and took notes of his opinions and observations about the implementation process. These notes guided the researcher in planning his lessons throughout the research process. In addition, these notes were used as supportive data when analyzing students' opinions and evaluating their achievement of the unit outcomes. The researcher kept a diary for the entire process from 12.07.2021, the start date of the education process, to 05.10.2021, the end date of the implementation process. In these diaries, he took notes separately for each student.

The students were also asked to keep a diary every week during the research process. Necessary guidance was given for the students to write their feelings and thoughts about both the educational activities at home and the online lessons in detail in their diaries. In this regard, students were provided with guiding questions prepared by the researcher while writing their diaries. The data obtained were analyzed and both taken into account in the next action plan and put into the study report at the end of the study.

Video Recordings of the Online Lessons

The online lessons conducted within the scope of the study were recorded. These recordings were carefully watched every week and used while planning the following lessons. In addition, the researcher used these recordings to evaluate the students' achievement of the unit outcomes.

Mobile Learning Environment Evaluation Form

Mobile learning environment evaluation form was prepared by the researcher and consisted of fifteen questions, eight of which were closed-ended and seven of which were open-ended. While preparing this form, expert opinions were taken by the researcher from two researchers who are experts in the field. Necessary corrections were made in line with these comments. At the end of each unit, students assessed the mobile learning environment using this form. In this way, students' views on the mobile learning environment within the scope of the study were obtained. The data obtained were analyzed and used in the planning of the following lessons, and at the end of the study, these data were combined and presented in the study report.

Application Messages

The messages sent by the students to the researcher via mobile applications during at-home activities enabled communication between the researcher and the students. In addition, the researcher used these messages as a source of supporting data while analyzing the data related to the study.

Student Portfolios

While analyzing the data related to the research, the researcher utilized the assignments and studies prepared by the students as a source of supporting data.

Environment

The environment in which face-to-face online courses are conducted and the mobile learning environment in which out-of-school educational activities are conducted are described in detail.

Individual Online Lesson Environment

Within the scope of the study, one individual online lesson was conducted with all students for one hour each week. In the online lessons, activities that reinforced students' learning were carried out within the scope of the flipped virtual classroom model, and students were provided with the necessary feedback about what they learned. Online lessons were conducted with students via *Zoom* platform.

Mobile Learning Environment

In the study, out-of-school education processes carried out within the scope of the flipped virtual classroom were supported with mobile learning environments. The mobile learning environment of the study consists of an educational social network platform (Edmodo) and 13 mobile applications that students can benefit from. Nine of these mobile applications are related to music, and Edmodo and the remaining three applications are non-musical applications.

In the study, first of all, a virtual classroom environment was created on the Edmodo social network platform and students were added to this classroom. The information about how and for what purpose the mobile applications selected by considering the needs of the students would be used was explained to the students with a presentation at the beginning of the 12-week implementation process. Information about the mobile applications to be used was also shared in the virtual classroom environment with their links so that students could download them onto their devices. In addition, two videos on the use of Edmodo were shared with the students so that they could use the virtual classroom environment, Edmodo, effectively. Then, resources and course content (pdf, word, video, and visuals) that students may need were shared with students in this platform. Within the scope of the course, all the activities that the students did at home were followed by the researcher in the mobile environment. In particular, instant communication was provided through the *WhatsApp* group to which the whole study group was added and it was also helpful for individual communication from time to time. The researcher shared his announcements to the students both through Edmodo and the *WhatsApp* group.

Within the scope of the study, *rhythm engineer lite, notate me, muse score, music dictionary, basic music information, music speed changer, metronome beats, datuner* and *spotify* were used as music-related applications/software; *edmodo, whatsapp messenger, translator* and *cam scanner* were used as non-musical applications/software.

Action Research Monitoring Committee

In this study, the researcher is the executor of the action plans by actively participating in the process. However, the monitoring committee of the action research followed the process in determining and executing the action plans, analyzing the data, and taking precautions against the problems experienced during the process, and guided the research.

The monitoring committee of this action research consists of two expert faculty members who are also the advisors of the thesis.

Implementation Process

In the study, an action plan covering the whole implementation process was prepared by the researcher. This plan could be revised during the process. Within the scope of the action plan of the study, a guitar lesson curriculum that can be conducted using a flipped virtual classroom model supported by mobile learning environments was prepared to be used in guitar education. This plan served as the general action plan of the research.

Before starting the development of the program, the researcher and two faculty members who are experts in the field examined the outcomes of the individual instrument (guitar) course of the music teaching undergraduate program prepared by the Council of Higher Education (YOK), and the outcomes that the students were expected to achieve within the scope of this study were determined. Then, 3 works and 1 etude covering these outcomes were selected from the guitar teaching repertoire. Each of these works and etudes was organized within the framework of a unit plan and a total of four units were created. The units include all the activities that the learner will do at home within the scope of the flipped virtual classroom model and all the learning activities to be carried out in the online course. The implementation process of the research was planned to be twelve weeks.

Prior to the beginning of the implementation of the study, the researcher and the members of the monitoring committee of the action research held meetings with the guitar instructors at the universities where the students in the study group were located and with the students in the study group, which was 11 people at the beginning. In these meetings, the students were informed about the whole study process. In addition, the students were also consulted about the start date of the implementation and their opinions were taken into consideration when determining the start date of the implementation. After all these processes, it was decided to conduct the research in the summer semester of the 2020-2021 academic year. On the start date of the implementation, 6 students in the study group stated that they could not participate in the implementation process for various reasons, and therefore the study group completed the implementation process with 5 students.

A comprehensive presentation was made by the researcher to the students about the implementation process and the use of the applications to be used in this context before the process of implementation started. Afterwards, students were added to the virtual guitar class in the Edmodo platform. During the implementation process, materials and resources related to the course as well as the forms sent to the students for data collection were shared on this platform. This platform was also used from time to time to make announcements and communicate with students. Later on, within the scope of the mobile learning environment of the study, the researcher established a *WhatsApp* group to which the study group was added. During the implementation process, instant communication and correspondence with the students were generally made through this platform. During the process, communication with the students was provided both from this group and through individual *WhatsApp* messages.

The implementation process of the twelve-week study started on 12.07.2021 and ended on 05.10.2021. In the study, the researcher had a participatory, reflective role and actively participated in the process. In this process, the researcher conducted the lessons.

In the implementation process, the first action plan was initially conducted for 6 weeks. Two units were covered in the first action plan, and the data obtained at the end of the action plan were evaluated and used in the preparation and implementation of the next action plan. During this process, both the problems experienced and the data obtained were shared by the researcher with the monitoring committee of the action research, and decisions regarding the research were taken in collaboration.

The data obtained from the first action plan showed that there was no need to make comprehensive changes in the curriculum. Nevertheless, measures were taken to address the difficulties expressed by the students and thus the second action plan was initiated. The second action plan was implemented for 3 weeks and one unit was covered in this action plan. The data obtained at the end of three weeks were re-evaluated. When the data obtained were evaluated, the third action plan was not needed, the remaining unit was added to the second action plan and the 12-week implementation process was completed. All the processes of the study were completed in 12 months. The work/time schedule of the study is presented in Table 1.

Table 1. Work/Time Schedule

	Work Done	Months		
		1	2	3
1	Literature review	X		
2	Establishing the program		X	
3	Identifying the data collection tools and the study group		X	
4	Data collection and implementation process			X
5	Data analysis		X	
6	Writing the thesis		X	

Data Collection

The data for the first sub-objective of the study were obtained from the performance observation form. One piece for three units of the curriculum and one etude for one unit were studied. At the end of each unit, the students recorded the piece/ etude they learned within the scope of the unit using a video camera and sent it to the researcher. The researcher sent these videos to three faculty members who are experts in the field of guitar education to evaluate the students' performances. The experts used a previously developed performance observation form to evaluate these performances.

The data for the second sub-objective of the study were obtained from the unit evaluation form. In this regard, the students' achievement of the cognitive, affective and kinesthetic outcomes of the unit was examined. Using the unit evaluation form prepared by the researcher, the students' realization of the unit outcomes was evaluated.

The data for the third and the last sub-objective of the study were obtained from the diaries and the mobile learning environment evaluation form. The researcher kept a diary throughout the whole process. He took notes about each student separately in these diaries. Throughout the research, students also wrote their feelings and thoughts about the whole education process in their diaries every week. In order to obtain detailed student opinions about each stage of the research, the researcher asked the students to benefit from some guiding questions he prepared while they are writing their diaries.

In the study, students were asked to assess the mobile learning environment. For this purpose, the researcher prepared a mobile learning environment evaluation form and asked the students to evaluate the mobile learning environment by using this form at the end of each unit. This form consisted of fifteen questions, eight of which were closed-ended and seven of which were open-ended. Each student evaluated the mobile learning environment four times using this form. The purpose of the students' re-evaluation of the same environment at the end of each unit was to check the functionality of this environment separately for four units consisting of different contents. However, students generally responded in the same direction. Therefore, although these data were analyzed separately at the end of each unit, they were combined and presented at a unified manner in order to avoid repeating the same data over and over again in the findings of the study.

Data Analysis

Within the scope of the first sub-objective of the study, the average of the total scores obtained by the students with the evaluations of three different faculty members who are experts in the field was calculated and this score was accepted as the success score obtained by the students. Cut-off points were created to evaluate the success status of the students. Accordingly, students with 0-22 points were considered unsuccessful, students with 23-44 points were considered average, students with 45-66 points were considered successful, and students with 67-88 points were considered very successful.

For the second sub-objective of the study, the data obtained from the unit evaluation form were analyzed. This form, prepared by the researcher, covers all the learning outcomes of each unit. There are 5 boxes opposite each outcome, one for each student in the study group. These boxes were filled in by the researcher using "+" (achieved) and "-" (not achieved) signs. The researcher evaluated the students' achievement of the unit outcomes by examining the video recordings of the online lessons, student diaries, researcher's diary and students' performance records. This process was repeated for each unit.

In the third and final sub-objective of the study, the diaries were subjected to content analysis. Within the extent of the students' views on the mobile learning environment, closed-ended questions in the mobile learning environment evaluation form were subjected to percentage frequency calculation and open-ended questions were subjected to content analysis.

The content analysis was conducted using *NVivo* data analysis program. The raw data were uploaded to the program and then codes and themes were created from these data. These themes were evaluated by quoting from the answers given by the students.

Validity and Reliability of the Study

The data in this study were analyzed through qualitative methods. Regarding validity in qualitative research, Yildirim and Simsek (2013) mention two sub-elements of validity. These are called credibility (internal validity) and transferability (external validity).

In the validity study of this research, every stage of the study from the beginning to the end study explained in detail for the credibility (internal validity) sub-dimension of validity was. In the process, expert opinions were taken both when determining the data collection tools and when evaluating the data, and the expert opinions received contributed to the quality of the study. For the transferability (external validity) sub-dimension of validity; the research model, study group, data collection tools, data collection process, data analysis and organization of the findings were explained in detail. The data were organized in a way that other researchers could easily understand.

Reliability in qualitative research is ensured by consistency (internal reliability) and confirmability (external reliability). The internal reliability (consistency) of this study was achieved. In this context, since the beginning of the study, all processes of the study such as the preparation of the curriculum, determination of data collection tools, planning and execution of the implementation process were observed by both thesis advisors and jury members in the thesis monitoring committees. Thus, the consistency of the researcher was examined. In addition, the codes and themes created within the scope of content analysis were examined by two expert faculty members by comparing them with the raw data. In addition, the monitoring committee of the action research was involved in the process while generating findings for all sub-objectives

In order to ensure the external reliability (confirmability) of the research, detailed explanations about the basic stages of the study were listed and the raw data obtained from the research were kept in order to make comparisons with other similar studies in the future.

In addition to these, while analyzing the findings, direct quotations were made from the students' opinions to contribute to the validity and reliability of the research. When quoting from the students, the students were indicated as S1-S2-S3-S3-S4-S5. In the study, the initials of the students' names were listed alphabetically and the students were numbered from 1 to 5.

Within the scope of another reliability study of the research, the coefficient of concordance of the ratings of 3 field experts who evaluated the student performances obtained for the first sub-objective was examined. In this context, the Krippendorff Alpha reliability coefficient of the field experts was calculated using the SPSS data analysis program. Krippendorff Alpha statistic (Krippendorff, 1995. cited in Bikmaz Bilgen and Dogan) was first developed to determine the measure of agreement between coders in content analysis. As a concordance statistic, it is also used to determine the agreement between raters. The value ranges for the interpretation of the Krippendorff's Alpha coefficient are <0.67 Poor 0.67 - 0.80 Medium 0.80 - 1.00 High. The Krippendorff Alpha coefficient of concordance of 3 field experts who evaluated the performances within the scope of the study is presented in Table 2.

Table 2. Krippendorff Alpha Coefficient of Concordance

Unit Performances	Krippendorff Alpha Reliability Estimation					
	Alpha	LL95%CI	UL95%CI	Units	Observers	Pairs
Unit 1 Performance	0,8436	0,7683	0,9068	5.0000	3.0000	15.0000
Unit 2 Performance	0,6909	0,4496	0,8923	5.0000	3.0000	15.0000
Unit 3 Performance	0,6901	0,5344	0,8256	5.0000	3.0000	15.0000
Unit 4 Performance	0,2689	-0,1874	0,6680	5.0000	3.0000	15.0000

When Table 2 is examined, the coefficient of concordance for Unit 1 performance evaluations of 3 field expert raters according to the reference intervals of Krippendorff Alpha coefficient of concordance is high, the coefficients of concordance for Unit 2 and 3 performance evaluations are moderate, and the coefficient of concordance for Unit 4 performance evaluations is weak.

In the light of these data, it can be stated that the raters gave scores close to each other for the student performances of the first, second and third units within the scope of the study. However, it is evident that the raters did not give close scores for the student performances of the fourth unit. The work of the fourth unit is a work in Soleares form in the Flemenco genre, which has many different technical features from the guitar education repertoire and is widely used. It can be thought that this piece may cause variations in the performance evaluations of the raters due to the fact that they have different expectations.

FINDINGS

In this section, the findings obtained for the sub-objectives of the study are presented.

Findings Related to the Sub-Objective 'How Do Student Performances Improve in Guitar Education Conducted with A Flipped Virtual Classroom Model Supported by Mobile Learning Environments?'

Findings Related to the Unit 'Performing Prelude No I'

The success of the students in the performance evaluation of Prelude No 1, which they learned in the first unit of the curriculum, is presented in Table 3.

Table 3. Student Performances in Prelude No I

Students	S1	S2	S3	S4	S5
Student Performance	Average	Very successful	Successful	Very successful	Successful

Regarding the success of the students in Prelude No I, Table 3 indicates that there were no unsuccessful students, two students were very successful, two students were successful and one student was average.

Findings Related to the Unit of 'Performing of Askaroz Deresi'

The success of the students in the performance evaluation of the piece named Askaroz Deresi, which they studied in the second unit of the curriculum, is presented in Table 4.

Table 4. Student Performances in Askaroz Deresi

Students	S1	S2	S3	S4	S5
Student Performance	Successful	Very successful	Successful	Very successful	Successful

Examining Table 4, it is observed that there are no unsuccessful and average students, two students are very successful and three students are successful regarding the performance status of the students for the piece titled Askaroz Deresi.

Findings Related to the Unit 'Performing Gangi Study No I'

Table 5 presents the students' performance evaluations of Gangi Study No I, which they learned in the third unit of the curriculum.

Table 5. Student Performances in Gangi Study No I

Students	S1	S2	S3	S4	S5
Student Performance	Successful	Very successful	Very successful	Very successful	Very successful

As can be seen in Table 5, it is revealed that there are no unsuccessful and average students, four students are very successful and one student is successful in Gangi Study No I.

Findings Related to the Unit of 'Performing Soleares'

The performance evaluations of Soleares, which the students studied in the fourth unit of the curriculum, are presented in Table 6.

Table 6. Student Performances in Solearas

Students	S1	S2	S3	S4	S5
Student Performance	Average	Very successful	Very successful	Very successful	Successful

According to Table 6, it is found that there were no unsuccessful students, three students were very successful, one student was successful and one student was average in terms of students' performance in Soleares.

Based on these findings, students' performance in all units is presented in Table 7.

Table 7. Student Performances in All Units

Unit Perfomances	**Students**				
	S1	S2	S3	S4	S5
Unit 1	Average	Very successful	Successful	Very successful	Successful
Unit 2	Successful	Very successful	Successful	Very successful	Successful
Unit 3	Successful	Very successful	Very successful	Very successful	Very successful
Unit 4	Average	Very successful	Very successful	Very successful	Successful

When Table 7 is analyzed, according to the evaluations of three field expert faculty members, regarding the achievement of the students for all units can be summarized as follows;

- S2 and S4's performance achievement for all units was very successful,
- S1's performance achievement level for the first and fourth units was average, while his performance achievement level for the second and third units was successful,
- S3's performance achievement for the first and second units was successful, and her performance achievement for the third and fourth units was very successful,
- It is seen that S5's performance achievement status for the first, second and fourth units was successful and his performance achievement status for the third unit was very successful.

In the light of these findings, it can be concluded that the students' performance achievement for the units was not unsuccessful, and although only one student's achievement for the first and fourth units was average, the students' achievement for the unit performances was successful and very successful.

Findings Related to the Sub-Objective 'How Are the Students' Realization of The Unit Outcomes in Guitar Education Carried Out with The Flipped Virtual Classroom Model Supported by Mobile Learning Environments?

Findings Related to the Unit 'Performing Prelude No I'

This unit, which is the first unit of the curriculum, has 14 cognitive, 12 affective and 7 kinesthetic domain outcomes. The students' realization of the cognitive domain outcomes of the unit is presented in Table 8, the students' realization of the affective domain outcomes is presented in Table 9, and the students' realization of the cognitive domain outcomes is presented in Table 10.

Table 8. Students 'Achievement of the Cognitive Domain Outcomes of the Unit 'Performing Prelude No I'

Domain	No	Outcomes	Students				
			S1	S2	S3	S4	S5
Cognitive Domain Outcomes	1	*Tells/writes the basic concepts related to tone.*	+	+	+	+	+
	2	*Tells/writes the principles related to tone.*	+	+	+	+	+
	3	*Tells/writes the basic concepts related to F sharp minor scale.*	+	+	+	+	+
	4	*Tells/writes the principles related to the F sharp minor scale.*	+	+	+	+	+
	5	*Tells/writes the basic concepts related to the A major scale.*	+	+	+	+	+
	6	*Tells/writes the principles related to the A major scale.*	+	+	+	+	+
	7	*Tells/writes the basic concepts related to the prelude form.*	+	+	+	+	+
	8	*Tells/writes the principles related to the prelude form.*	+	+	+	+	+
	9	*Tells/writes information about the composer and period of Prelude No I.*	+	+	+	+	+
	10	*Tells/writes information about the rhythmic and harmonic structure of Prelude No I.*	-	+	-	+	-
	11	*Tells/writes the basic concepts of apoyando, tirando, arpeggio and legato.*	+	+	+	+	+
	12	*Tells/writes the principles of apoyando, tirando, arpeggio and legato.*	+	+	+	+	+
	13	*Tells/writes the basic concepts related to the musical expressions in Prelude No I.*	+	+	+	+	+
	14	*Tells/writes the principles related to musical expressions in Prelude No I.*	+	+	+	+	+
		Total Outcomes Achieved	**13**	**14**	**13**	**14**	**13**

According to Table 8, it can be asserted that S2 and S4 realized all the cognitive domain outcomes of the unit. However, it is seen that S1, S2 and S3 could not realize one cognitive domain outcome of the unit, and this outcome is the outcome of telling/writing information about the rhythmic and harmonic structure of Prelude No I.

Table 9. Students' Achievement of the Affective Domain Outcomes of the Unit 'Performing Prelude No I'

Domain	No	Outcomes	Students				
			S1	S2	S3	S4	S5
Affective Domain Outcomes	1	*Is attentive to practicing/performing the F sharp minor scale in learning environments*	+	+	+	+	+
	2	*Is willing to practice/perform the F sharp minor scale in learning environments.*	+	+	+	+	+
	3	*Is attentive to practicing / performing the A major scale in learning environments.*	+	+	+	+	+
	4	*Is willing to practice / perform the A major scale in learning environments.*	+	+	+	+	+
	5	*Is attentive to practicing/performing the F sharp minor arpeggio exercise.*	+	+	+	+	+
	6	*Is willing to practice/perform the F sharp minor arpeggio exercise.*	+	+	+	+	+
	7	*Is attentive to practicing/performing the A major arpeggio exercise.*	+	+	+	+	+
	8	*Is willing to practice/perform the A major arpeggio exercise.*	+	+	+	+	+
	9	*Is attentive to practicing/performing the Prelude No I.*	+	+	+	+	+
	10	*Is willing to practice/perform the Prelude No I.*	+	+	+	+	+
	11	*Is attentive to practicing/performing the musical expressions in the piece.*	+	+	+	+	+
	12	*Is willing to practice/perform the musical expressions in the piece.*	+	+	+	+	+
		Total Outcomes Achieved	**12**	**12**	**12**	**12**	**12**

Examining Table 9, regarding the students' achievement of the affective domain outcomes of the unit, it is seen that all five students in the study group achieved all the affective domain outcomes of the unit.

Table 10. Students' Achievement of the Kinesthetic Domain Outcomes of the Unit '*Performing Prelude No I*'

Domain	No	Outcomes	Students				
			S1	S2	S3	S4	S5
Kinesthetic Domain Outcomes	1	*Performs the F sharp (melodic) minor scale in three octaves on the guitar.*	+	+	+	+	+
	2	*Performs the A major scale in three octaves on the guitar.*	+	+	+	+	+
	3	*Performs apoyando, tirando, arpeggio and legato techniques on guitar.*	+	+	+	+	+
	4	*Performs the F sharp minor arpeggio exercise on the guitar.*	+	+	+	+	+
	5	*Performs the A major arpeggio exercise on the guitar.*	+	+	+	+	+
	6	*Performs Prelude No I at the desired level.*	-	+	+	+	+
	7	*Performs the musical expressions in the piece at the desired level.*	-	+	+	+	-
		Total Outcomes Achieved	**6**	**7**	**7**	**7**	**6**

When Table 10 is examined, it can be concluded that S2, S3 and S4 achieved all the kinesthetic domain outcomes of the unit in terms of students' achievement of the kinesthetic domain outcomes of the unit. However, it is seen that S1 could not realize two kinesthetic domain outcomes of the unit, these outcomes were 'Performs Prelude No I at the desired level' and 'Performs the musical expressions in the piece at the desired level', and S5 could not realize one kinesthetic domain outcome of the unit, this outcome was 'Performs the musical expressions in the piece at the desired level'.

In the light of these findings, it can be asserted that the students realized most of the cognitive affective and kinesthetic domain outcomes of the unit 'Performing Prelude No I'.

Findings Related to the Unit of 'Performing Askaroz Deresi'

As the second unit of the curriculum, this unit has 13 cognitive, 12 affective and 6 kinesthetic domain outcomes. The students' achievement of the cognitive domain outcomes of the unit is presented in Table 11, the students' achievement of the affective domain outcomes is presented in Table 12 and the students' achievement of the kinesthetic domain outcomes is presented in Table 13.

Table 11. Students' Achievement of the Cognitive Domain Outcomes of the Unit '*Performing Askaroz Deresi*"

Domain	No	Outcomes	Students				
			S1	S2	S3	S4	S5
Cognitive Domain Outcomes	1	*Tells/writes the basic concepts related to the B minor scale.*	+	+	+	+	+
	2	*Tells/writes the principles related to the B minor scale.*	+	+	+	+	+
	3	*Tells/writes the basic concepts related to the D major scale.*	+	+	+	+	+
	4	*Tells/writes the principles related to the D major scale.*	+	+	+	+	+
	5	*Tells / writes the basic concepts related to the concept of folk song.*	+	+	+	+	+
	6	*Tells / writes the principles related to the concept of folk song.*	+	+	+	+	+
	7	*Tells / writes information about the work named Askaroz Deresi.*	+	+	+	+	+
	8	*Tells/writes information about the composer of the piece named Askaroz Deresi..*	+	+	+	+	+
	9	*Tells / writes information about the rhythmic and harmonic structure of the piece named Askaroz Deresi.*	-	+	+	+	+
	10	*Tells / writes the basic concepts of baring and ornamentation techniques.*	+	+	+	+	+
	11	*Tells / writes the principles of baring and ornamentation techniques.*	+	+	+	+	+
	12	*Tells / writes the basic concepts related to the musical expressions of Askaroz Deresi.*	+	+	+	+	+
	13	*Tells/writes the principles related to the musical expressions in Askaroz Deresi.*	+	+	+	+	+
		Total Outcomes Achieved	**12**	**13**	**12**	**13**	**12**

Regarding the students' realization of the cognitive domain outcomes of the unit, when Table 11 is examined, it can be stated that all students except T1 realized all the outcomes of the unit. However, it is seen that S1 could not realize one cognitive domain outcome of the unit, and this outcome is the outcome titled "tells/writes information about the rhythmic and harmonic structure of the piece named Askaroz Deresi".

Table 12. Students' Achievement of the Affective Domain Outcomes of the Unit '*Performing Askaroz Deresi*"

Domain	No	Outcomes	Students				
			S1	S2	S3	S4	S5
Affective Domain Outcomes	1	*Is attentive to practicing/performing the C minor scale in learning environments.*	+	+	+	+	+
	2	*Is willing to practice/perform the C minor scale in learning environments.*	+	+	+	+	+
	3	*Is attentive to practicing / performing the D major scale in learning environments.*	+	+	+	+	+
	4	*Is willing to practice / perform the D major scale in learning environments.*	+	+	+	+	+
	5	*Is attentive to practicing/performing the B minor arpeggio exercise.*	+	+	+	+	+
	6	*Is willing to practice/perform the B minor arpeggio exercise.*	+	+	+	+	+
	7	*Is attentive to practicing/performing the D major arpeggio exercise.*	+	+	+	+	+
	8	*Is willing to practice/perform the D major arpeggio exercise.*	+	+	+	+	+
	9	*Is attentive to practicing/performing the piece titled Askaroz Deresi.*	+	+	+	+	+
	10	*Is willing to practice/perform the piece titled Askaroz Deresi.*	+	+	+	+	+
	11	*Is attentive to practicing/performing the musical expressions in the piece.*	+	+	+	+	+
	12	*Is willing to practice/perform the musical expressions in the piece.*	+	+	+	+	+
		Total Outcomes Achieved	**12**	**12**	**12**	**12**	**12**

When Table 12 is examined, it is clearly seen that all five students in the study group achieved all the affective domain outcomes of the unit.

Table 13. Students' Achievement of the Kinesthetic Domain Outcomes of the Unit '*Performing Askaroz Deresi*"

Domain	No	Outcomes	Students				
			S1	S2	S3	S4	S5
Kinesthetic Domain Outcomes	1	*Performs the B (melodic) minor scale in three octaves on the guitar.*	+	+	+	+	+
	2	*Performs the D major scale in two and three octaves on the guitar.*	+	+	+	+	+
	3	*Performs baring and ornamentation techniques on guitar.*	+	+	+	+	+
	4	*Performs exercises prepared for baring and ornamentation techniques.*	+	+	+	+	+
	5	*Performs the piece named Askaroz Deresi at the desired level.*	+	+	+	+	+
	6	*Performs the musical expressions in the piece at the desired level.*	-	+	+	+	+
		Total Outcomes Achieved	**4**	**6**	**6**	**6**	**5**

According to Table 13, regarding the students' realization of the unit's cognitive domain outcomes, it is seen that all students except S1 realized all the outcomes of the unit, S1 could not realize one cognitive domain outcome of the unit, and this outcome was the outcome of " Performs the musical expressions in the piece at the desired level".

In the light of these findings, it can be argued that the students realized almost all of the cognitive affective and kinesthetic domain outcomes of the unit 'Performing Askaroz Deresi'.

Findings Related to the Unit 'Performing M. Gangi Study No I Etude'

This unit, which is the third unit of the curriculum, has 13 cognitive, 13 affective and 7 kinesthetic domain outcomes. The students' achievement of the cognitive domain outcomes of the unit is presented in Table 14, the students' achievement of the affective domain outcomes is presented in Table 15 and the students' achievement of the kinesthetic domain outcomes is presented in Table 16.

Table 14. Students' Achievement of the Cognitive Domain Outcomes of the Unit '*M. Gangi Study No I*'

Domain	No	Outcomes	Students				
			S1	S2	S3	S4	S5
Cognitive Domain Outcomes	1	*Tells/writes the basic concepts related to the A minor scale.*	+	+	+	+	+
	2	*Tells/writes the principles related to the A minor scale.*	+	+	+	+	+
	3	*Tells/writes the basic concepts related to C major scale.*	+	+	+	+	+
	4	*Tells/writes the principles related to the C major scale.*	+	+	+	+	+
	5	*Tells/writes the basic concepts related to the concept of etude.*	+	+	+	+	+
	6	*Tells/writes the principles related to the concept of etude.*	+	+	+	+	+
	7	*Tells/writes information about the period of the etude named Study No I.*	+	+	+	+	+
	8	*Tells/writes information about the composer of the etude named Study No I.*	+	+	+	+	+
	9	*Tells/writes information about the rhythmic and harmonic structure of the etude named Study No I.*	-	+	-	+	+
	10	*Tells / writes the basic concepts of barre and ornamentation techniques.*	+	+	+	+	+
	11	*Tells / writes the principles of barre and ornamentation techniques.*	+	+	+	+	+
	12	*Tells/writes the basic concepts related to the musical expressions in the etude named Study No I.*	+	+	+	+	+
	13	*Tells/writes the principles related to the musical expressions in the etude named Study No I.*	+	+	+	+	+
		Total Outcomes Achieved	**12**	**13**	**12**	**13**	**13**

Regarding the students' realization of the cognitive domain outcomes of the unit, it is seen that S2, S4 and S5 realized all the outcomes of the unit, whereas S1 and S3 could not realize one cognitive domain outcome of the unit, and this outcome was the outcome of " tells/writes the information about the rhythmic and harmonic structure of the etude named Study No I".

Table 15. Students' Achievement of the Affective Domain Outcomes of the Unit '*M. Gangi Study No I*'

Domain	No	Outcomes	Students				
			S1	S2	S3	S4	S5
Affective Domain Outcomes	1	*Is attentive to practicing/performing the scale in A minor.*	+	+	+	+	+
	2	*Is willing to practice/perform the scale in A minor.*	+	+	+	+	+
	3	*Is attentive to practicing/performing the scale in C major.*	+	+	+	+	+
	4	*Is willing to practice/perform the scale in C major.*	+	+	+	+	+
	5	*Is attentive to practicing/performing the A minor arpeggio exercise.*	+	+	+	+	+
	6	*Is willing to practice/perform the A minor arpeggio exercise.*	+	+	+	+	+
	7	*Is attentive to practicing/performing the C major arpeggio exercise.*	+	+	+	+	+
	8	*Is willing to practice/perform the C major arpeggio exercise.*	+	+	+	+	+
	9	*Is attentive to practicing/performing barre and ornamentation techniques.*	+	+	+	+	+
	10	*Is attentive to practicing/performing Study No I.*	+	+	+	+	+
	11	*Is willing to practice/perform Study No I.*	+	+	+	+	+
	12	*Is attentive to practicing / performing the musical expressions in the etude.*	+	+	+	+	+
	13	*Is willing to practice / perform the musical expressions in the etude.*	+	+	+	+	+
		Total Outcomes Achieved	**13**	**13**	**13**	**13**	**13**

When Table 15 is examined, it is seen that all five students in the study group realized all the affective domain outcomes of the unit.

Table 16. Students' Achievement of the Kinesthetic Domain Outcomes of the Unit '*M. Gangi Study No I*'

Domain	No	Outcomes	Students				
			S1	S2	S3	S4	S5
Kinesthetic Domain Outcomes	1	*Performs the A (melodic) minor scale in three octaves on the guitar.*	+	+	+	+	+
	2	*Performs the C major scale in three octaves on the guitar.*	+	+	+	+	+
	3	*Performs barre and ornamentation techniques on guitar.*	+	+	+	+	+
	4	*Performs the A minor arpeggio exercise on the guitar.*	+	+	+	+	+
	5	*Performs the C major arpeggio exercise on the guitar.*	+	+	+	+	+
	6	*Performs Study No I at the desired level.*	+	+	+	+	+
	7	*Performs the musical expressions in the etude at the desired level.*	-	+	+	+	+
		Total Outcomes Achieved	**5**	**7**	**7**	**7**	**7**

When Table 16 is examined, it is seen that all students except S1 realized all the objectives of the unit, and S1 could not realize one of the objectives of the unit, and this objective was the objective of "Performs the musical expressions in the etude at the desired level".

In the light of these findings, it can be said that the students achieved almost all of the cognitive affective and kinesthetic domain outcomes of the unit 'Performing M. Gangi Study No I'.

Findings Related to the Unit of 'Performing Soleares'

As the fourth unit of the curriculum, this unit has 13 cognitive, 13 affective, and 7 kinesthetic domain outcomes. The students' achievement of the cognitive domain outcomes of the unit is presented in Table 17, the students' achievement of the affective domain outcomes is presented in Table 18 and the students' achievement of the kinesthetic domain outcomes is presented in Table 19.

Table 17. Students' Achievement of the Cognitive Domain Outcomes of the Unit '*Performing Soleares*'

Domain	No	Outcomes	Students				
			S1	S2	S3	S4	S5
Cognitive Domain Outcomes	1	*Tells/writes the basic concepts related to E minor scale.*	+	+	+	+	+
	2	*Tells/writes the principles related to E minor scale.*	+	+	+	+	+
	3	*Tells/writes the basic concepts related to the G major scale.*	+	+	+	+	+
	4	*Tells/writes the principles related to the G major scale.*	+	+	+	+	+
	5	*Tells/writes the basic concepts related to Soleares form.*	+	+	+	+	+
	6	*Tells/writes the principles related to Soleares form.*	+	+	+	+	+
	7	*Tells/writes information about the period of the work Soleares.*	+	+	+	+	+
	8	*Tells/writes the information about the composers of the period of Soleares.*	+	+	+	+	+
	9	*Tells/writes information about the rhythmic and harmonic structure of Soleares.*	+	+	+	+	+
	10	*Tells/writes the basic concepts of tremolo, rasguado and tambur techniques.*	+	+	+	+	+
	11	*Tells/writes the principles of tremolo, rasguado and tambur techniques.*	+	+	+	+	+
	12	*Tells / writes the basic concepts related to the musical expressions in Soleras.*	+	+	+	+	+
	13	*Tells/writes the principles related to the musical expressions in Soleares.*	+	+	+	+	+
		Total Outcomes Achieved	**13**	**13**	**12**	**13**	**13**

As seen in Table 17, regarding the students' achievement of the cognitive domain outcomes of the unit, it is evident that all five students in the research group achieved all cognitive domain outcomes.

Table 18. Students' Achievement of the Affective Domain Outcomes of the Unit '*Performing Soleares*'

Domain	No	Outcomes	Students				
			S1	S2	S3	S4	S5
Affective Domain Outcomes	1	*Is attentive to practicing / performing the E (melodic) minor scale.*	+	+	+	+	+
	2	*Is willing to practice/perform the E (melodic) minor scale.*	+	+	+	+	+
	3	*Is attentive to practicing/performing the G major scale.*	+	+	+	+	+
	4	*Is willing to practice/perform the G major scale.*	+	+	+	+	+
	5	*Is attentive to practicing/performing the arpeggio exercise in E minor.*	+	+	+	+	+
	6	*Is willing to practice/perform the arpeggio exercise in E minor.*	+	+	+	+	+
	7	*Is attentive to practicing/performing the G major arpeggio exercise.*	+	+	+	+	+
	8	*Is willing to practice/perform the G major arpeggio exercise.*	+	+	+	+	+
	9	*Is attentive to practicing/performing tremolo, rasguado and tambour techniques.*	+	+	+	+	+
	10	*Is attentive to practicing/performing Soleares.*	+	+	+	+	+
	11	*Is willing to the practice/perform Soleares.*	+	+	+	+	+
	12	*Is attentive to practicing/performing the musical expressions in the piece.*	+	+	+	+	+
	13	*Is willing to practice/perform the musical expressions in the piece.*	+	+	+	+	+
		Total Outcomes Achieved	**13**	**13**	**13**	**13**	**13**

According to Table 18, regarding the students' realization of the affective domain outcomes of the unit, it is seen that all five students in the study group realized all the affective domain outcomes of the unit.

Table 19. Students' Achievement of the Kinesthetic Domain Outcomes of the Unit 'Performing Soleares'

Domain	No	Outcomes	Students				
			S1	S2	S3	S4	S5
Kinesthetic Domain Outcomes	1	*Performs the E (melodic) minor scale in three octaves on the guitar.*	+	+	+	+	+
	2	*Performs the G major scale in three octaves on the guitar.*	+	+	+	+	+
	3	*Performs tremolo, rasguado and tambur techniques on guitar.*	+	+	+	+	+
	4	*Performs the arpeggio exercise in E minor on the guitar.*	+	+	+	+	+
	5	*Performs the G major arpeggio exercise on guitar.*	+	+	+	+	+
	6	*Performs Study No I at the desired level.*	+	+	+	+	+
	7	*Performs the musical expressions in the piece at the desired level.*	+	+	+	+	+
		Total Outcomes Achieved	**4**	**6**	**6**	**6**	**5**

As seen in Table 19, regarding the students' realization of the unit's kinesthetic domain outcomes, it is clear that all five students in the study group realized all kinesthetic domain outcomes of the unit.

From the findings obtained, it can be asserted that the students achieved all of the cognitive, affective and cognitive domain acquisitions of the unit 'Performing Soleares'.

Findings Related to the Sub-Objective 'What Are the Views of Researchers and Students on Guitar Education Conducted with The Flipped Virtual Classroom Model Supported by Mobile Learning Environments?

Insights from the Diaries

Views on the Pre-Course Process

Based on the results of the analysis of the student diaries, the most common statements about the efficiency of the resources provided were "more than enough" and "everything is as it should be". Regarding the course materials, the students stated that the resources consisted of very useful, complementary and supportive notes that a guitarist should have. The students almost expressed the same opinions for all four units of the curriculum during the twelve-week training period.

The following opinions of the students regarding the efficiency of the resources offered can be given as examples:

> *S1: I think the resources are quite sufficient. The lecture notes are very useful and should be in the hands of a guitarist.*
>
> *S2: The course materials shared were complementary and very supportive in the subjects I needed and lacked. Because I can access all the information I need. Thanks to the course materials, I feel that I am progressing more comfortably while practicing the piece.*
>
> *S3: I think the resources before the lesson are sufficient, everything is easily visible and oriented towards the lesson.*
>
> *S4: I think the resources are quite sufficient.*
>
> *S5: I think the resources are quite sufficient. All materials are available according to the needs.*

On the basis of the opinions written by the students in their diaries, it can be stated that the resources provided met the needs of the students in their learning processes at home and that these materials provided effective content for learning the subject of the course.

Observation data, application messages and the researcher's diary support these views. As a matter of fact, expressions parallel to these views can be observed both in the correspondences made with the students during the home education processes and in the student feedback in the online lessons. During the implementation process, students did not give any negative feedback about the resources shared within the scope of the course. Students were able to fulfill both weekly and unit tasks during the home education process. The fact that they were able to complete these tasks using the course materials supports the view that the resources were sufficient.

According to the results of the analysis of student diaries, all students expressed opinions about the unit contents and all students wrote positive opinions in their diaries.

Students wrote the following opinions about the content of the unit in their diaries:

S1: The piece we are practicing is great.

S2: The content consists of very useful information.

S3: The topics arouse curiosity and I am very interested in the content. The information before the lesson is helpful during the lesson.

S4: The topics arouse curiosity.

S5: The topics consist of very useful information.

The researcher's diary and video recordings of the lessons support these views. In each unit, the researcher verbally asked students' opinions about the content of the unit. In their answers, students expressed opinions parallel to the opinions they wrote in their diaries. The researcher wrote their thoughts about this verbal communication in the diary.

According to the results of the analysis of the student diaries, the students intensively used the expression "I do not have any difficulties" about the difficulties they encountered in the pre-lesson process. This statement was used by all five students in the research group.

The following opinions of the students in this regard can be given as examples:

S1: I have no difficulty with the theoretical knowledge.

S2: I do not encounter any difficulty.

S3: I do not have any difficulty after I show the required effort.

S4: I do not experience any difficulty.

S5: I do not have any problems.

However, although the students stated that they did not experience difficulties in an intensive way, they expressed some difficulties they experienced from time to time during the twelve-week education process. These difficulties are as follows: *I have difficulty in allocating time for studying, I have forgetfulness problems due to not repeating enough, I have some difficulty in deciphering, I have some difficulties because there are new techniques in the piece, I have learned enough theoretically but I have some difficulties in practice.*

Two of the difficulties encountered by the students (I have difficulty in allocating time for studying, I have forgetfulness problem due to not repeating enough) are related to not being able to allocate enough time for studying and these views were expressed by S1, S2, S3 and S4 from time to time.

In this regard, the following opinions written by S1, S2, S3 and S4 in their diaries can be given as examples:

S1: I usually do not practise enough because I have little time, but I have no difficulty with theoretical knowledge.

S2: Sometimes I have difficulty in allocating time for studying.

S3: Sometimes I experience forgetfulness due to lack of repetition.

S4: Sometimes I have difficulties in finding time to study.

Although these views were not frequently expressed, the researcher conducted interviews with the students in order to take precautions to eliminate these difficulties in the following weeks during the process. In the interviews, it was revealed that these students sometimes had difficulties in finding time to study because they worked in various places since it was the summer semester.

The other three difficulties encountered *(I have some difficulty in deciphering, I have some difficulty because there are new techniques in the piece, I have learned enough theoretically but I have some difficulties in practice)* are related to the program content and these difficulties were expressed by S1 and S2.

On this issue, S1 and S2 expressed the following views:

> *S1: Since there are new techniques in the piece, I have some difficulties in deciphering. Unfortunately, I could not finish the deciphering of my piece. I should make a little more effort.*
>
> *S2: I am practicing a flemenco piece for the first time and I have difficulties in applying the techniques that I have not practiced before. I have learned enough theoretically, but I have some difficulties in practice.*

S1 and S2 wrote these difficulties in their diaries in the first week of the 4th unit. As a result of the interviews with the students; the students stated that they had not studied flemenco before, they did not know the tambour and rasguado techniques in the piece, and therefore they could not decipher the piece. During the online lesson with the students, these techniques were studied in detail and necessary precautions were taken to prevent students from experiencing these difficulties in the following weeks.

Observation data, application messages and the researcher's diary confirm these views. Indeed, expressions parallel to these views can be observed both in the correspondence with the students during the home education processes and in the student feedback during the online lessons.

According to the results of the analysis of the student diaries, students wrote almost the same opinions about their emotional states in their diaries for all four units of the curriculum during the twelve-week training process. These views are mostly positive expressions. The opinions of the students such as "I feel as ready as possible for the lesson and equipped about the subject", "Learning new techniques and information makes me feel pleasant and happy", "I feel very good, happy and informed" are noteworthy in terms of evaluating their learning of the course content. These statements are important in terms of indicating that students are both informed and aware that they are informed.

The following views of S4 and S5 can be given as examples in this regard:

> *S4: I feel very good, happy and informed.*
>
> *S5: I feel as ready as I can be for the lesson and equipped about the subject. As each lesson passes, I am happier and happier to be able to see what I need to pay attention to in a string and what will speed me up even more. I feel lucky to be in this course.*

In addition, S1 and S2 expressed the following views on this issue:

> *S1: I am happy that I have completed my scales and arpeggios.*
>
> *S2: I finished the transcription of the piece and I can play it, so I feel very good. Learning new information and new techniques makes me feel happy.*

In addition, the statements "I feel lucky to be in this class" and "I am very excited to learn a new piece" are other positive expressions of students' moods.

S3 recorded the following statements in his diary on this subject:

> *S3: It feels pleasant to learn new things. Our lessons are very productive and informative. This makes me feel happy. I feel good.*

The students mentioned these opinions frequently in their diaries. Observation data, application messages and the researcher's diary support these views. As a matter of fact, expressions parallel to these views can be observed both in the correspondence with the students during the home education processes and in the student feedback in the online lessons. In the online lessons conducted at the end of each week, it was observed that the students completed the tasks of the week with the question-and-answer activities carried out to evaluate the learning status of the students during the week.

The results of the analysis of the student diaries indicated that the students evaluated the educational process and themselves while expressing their opinions about the educational process before the lesson. Students used positive expressions about the educational process and learning experiences. During the twelve-week education process, the students wrote almost the same opinions for all four units of the curriculum in their diaries, and the diary data revealed the following opinions: *I am having a pleasant and informative process, I feel that I have gained good and permanent information, my guitar technical and theoretical situation is getting better day by day, I think this study has been very productive.*

While expressing their opinions about this process, students generally mentioned that they were informed. For example, S1, S2 and S3 wrote the following opinions about the education process in their diaries:

> *S1: I learn useful information.*
>
> *S2: I think the lesson conducted in this way is very productive. I feel that I am progressing.*
>
> *S3: I think the education organized in this way is very efficient. We acquire good information and this makes us feel very special.*

S4 and S5 who wrote their thoughts on this subject in more detail in their diaries, wrote the following opinions on this subject in their diaries:

> *S4: I think this study was very fruitful.*
>
> *S5: The education in this way is very effective and I see that I improve more and more every week and I learn permanent information about the theoretical knowledge I will encounter in the future. In addition, I see that my guitar technical and theoretical situation is getting better day by day. I will improve more and more as I learn different information and I am sure that this information will contribute a lot to my academic studies.*

When these opinions of the students are taken into consideration, it can be argued that the training process within the scope of the research was effective for the students. Students frequently stated that they improved and learned new information in this process. As a matter of fact, observation data, application messages and the researcher's diary support these views. The correspondence with the students, student feedback in the online lessons and the question-and-answer activities conducted by the researcher every week to evaluate the learning status of the students confirm these views.

Views on Online Courses

According to the results of the analysis of the student diaries, it is apparent that the students evaluated the online courses while expressing their opinions about the online courses. During the twelve-week training period, students who wrote almost the same opinions for all four units of the curriculum in their diaries used positive expressions about online courses.

Mostly, students wrote their evaluations about the in-class activities in their diaries for online courses. The statements of the students about the in-class activities are that the in-class activities serve as a review of the subject, the in-class activities reinforce what they have learned, and the in-class activities make their knowledge more permanent. Such expressions are notable in terms of revealing that the online lessons conducted at the end of each week within the scope of the research were carried out with activities that reinforced the learning at home in accordance with the nature of the flipped learning model, made these lessons more memorable, and were carried out in the form of review of the subject.

S1, S2 and S5 wrote the following opinions on this subject in their diaries;

> *S1: In-class activities reinforce what I have learned. I learned all the parts of the piece that I had difficulty with, plus I completed the arpeggio studies with my teacher. We fixed the flaws in my piece together with my teacher. The lesson was very productive as I solved the rough edges and finished the piece completely.*
>
> *S2: In-class activities reinforce what I have learned very well and contribute to making my knowledge more permanent. The lessons are useful and memorable because they serve as a review of the subject.*
>
> *S5: In-class activities reinforce what I have learned. In the etudes and pieces, my teacher and I can solve the question marks in my head during the lesson without any problem and this changes my perspective towards the problems in the lesson.*

S3 and S4 wrote the following opinions on this subject in their diaries:

> *S3: The lessons are nice and enjoyable; I have consolidated what was shown in writing before the lesson. Everything is as it should be. The lessons are intriguing.*
>
> *S4: In-class activities reinforce what I have learned.*

The observation data, application messages and the researcher's diary support these views. Students' correspondence, student feedback during online courses and video recordings of the courses confirms these views.

The results of the analysis of student diaries indicated that students expressed opinions about the difficulties they encountered during the online course process. Students mostly used the statement "I do not experience any difficulties". However, even though the students intensely stated that they did not experience any difficulties, they wrote in their diaries some of the difficulties they experienced from time to time during the twelve-week training process. The most recurring of these difficulties was the statement "sometimes the internet connection is interrupted". This statement was also expressed by four other students except S1, although not frequently at different times.

The following opinions of S2, S3, S4, S5 written in their diaries on this subject can be given as examples:

> *S2: Sometimes the internet connection is interrupted and sometimes I have problems with the lesson hours, but other than that, I do not encounter any difficulties.*
>
> *S3: We had some connection problems during the lesson, but then it got better during the lesson.*
>
> *S4: Sometimes I have internet problems.*
>
> *S5: I do not have any problems during the lessons. If there are problems, they are internet-related problems. There has not been a negative situation in our lessons because our lessons are as attentive and efficient as they should be.*

In the following week, the researcher conducted interviews with the students in order to take precautions to eliminate this problem. As a result of the interviews, it was determined that all four students used mobile data as an internet network and that these students sometimes experienced network problems due to their location. In the following weeks, the students were advised to be in a place with a good network during class hours in order to take necessary precautions. In the following period, this problem was sometimes experienced, but rarely.

Another difficulty that students wrote in their diaries, albeit rarely, was that sometimes I have trouble with the class time. Although the students' requests were taken into consideration while making the course programs, some students occasionally informed the researcher that they had problems with the course hours. The researcher was flexible in changing the times of the lessons during the day in line with the students' demand.

S1 wrote the difficulties he experienced in his diary as follows;

> *S1: Since I connect via my phone, my guitar does not fit on the screen, so my teacher cannot see my right hand very well and even if I get it right because it is online, my teacher sometimes thinks that I am wrong.*

S1 wrote these views in his diary in the first week of the first unit. The researcher took a precaution to solve this problem in the following week and made the student sit in such a way that he could see both hands of the camera before starting the lesson. The student did not report any problems regarding this issue in the following weeks.

The observation data, application messages and the researcher's diary support these views. As a matter of fact, expressions parallel to these views can be observed both in the correspondence with the students during the at-home education processes and in the student feedback during the online lessons.

According to the results of the analysis of the student diaries, students' opinions about the course instructor are important in terms of evaluating the instructor. From the first week of the study, these opinions guided the researcher's communication with the students. The students did not express a negative opinion about the course instructor; the opinions they wrote in their diaries on this subject were positive. The students wrote in their diaries the statement *"Our instructor provides the necessary feedback"* the most. This was followed by the statement *"Our instructor is very helpful"*.

The following comments written by S3, S4 and S5 in their diaries can be given as examples on this issue:

S3: Our teacher provides the necessary feedback; he is constantly active. Our teacher helps us in every subject.

S4: Our teacher provides all the necessary feedback on time.

S5: Our teacher provides the necessary feedback.

From the student diaries, it is obvious that the course instructor provided the necessary feedback to the students. These views are also supported by the researcher's notes and observation data.

The most striking statement of the students in terms of confirming the teacher-student communication in the at-home education process during the twelve-week education process is that the instructor responds to my letters at any time of the day and helps me instantly.

The following opinions written by S1 and S2 in their diaries on this subject can be given as an example.:

S1: Even if I write to my teacher at night, he replies in a very short time.

S2: Even if I write to our teacher at any time of the day, he responds and helps me instantly.

It can be concluded from the student diaries that the students did not have any problems in communicating with the instructor during the at-home processes of the study. The observation data, application messages and the researcher's diary support this view. Hence, in the researcher's notes, there are findings that students asked questions about the course content from time to time via Edmodo and WhatsApp applications and that the necessary feedback was provided to them.

The other opinions expressed by the students about the instructor are as follows: *Our teacher is a friendly and understanding teacher, I feel lucky to have a lesson with a very caring teacher, I feel energized after having a lesson with our teacher, my belief that I can overcome everything increases after having a lesson with our teacher, I think we have a good synergy with my teacher.*

The following opinions written by S1 and S2 in their diaries on this subject can be given as an example:

S1: Our teacher is a friendly and understanding teacher, I think and feel that we have a good synergy.

S2: I feel lucky to have a lesson with a very caring teacher. I feel energized after having a lesson with our teacher and my belief that I can overcome problems increases.

S5: Our teacher makes a positive contribution. If there is a negative situation, we overcome the problems together.

From the student diaries, it is understood that the students established a good communication with the instructor and formed a strong bond with the instructor. The observation data, practice messages, researcher's diary and video recordings of the online lessons confirm these findings. In online lessons, students were able to express themselves easily and exhibit their performances.

Views on the Aftermath of Online Courses

The analysis of student diaries revealed that students expressed their opinions about their learning of the unit content. These statements of the students are important in terms of evaluating their own learning experiences. Since the first weeks of the research, these opinions have been a source of data for the researcher to evaluate the learning progress of the students.

Regarding this issue, the students wrote positive opinions in their diaries. All of the students frequently wrote in their journals that they had learned the course content sufficiently, albeit with different words.

The following statements written by the students in their diaries can be given as an example on this matter:

S1: I think I have gained enough understanding, there is very little left that I have not learned.

S2: I think I have learned the lesson sufficiently.

S3: I think I have learned the information I need to learn.

S4: I think I have learned enough of the information I need to learn.

S5: I think I have learned enough of the information I want to learn and gain.

S1, S2 and S3, who wrote their opinions on this subject in their diaries in more detail in some weeks, made the following remarks:

> *S1: I have almost finished the deciphering of the piece. Next are the nuances. I think I am at a level where I can record what I play. I have completed the piece, but there are small problems, I will complete them in the lesson and send my video.*
>
> *S2: I practiced the piece thoroughly and I think I will be able to record it after making the final checks with my teacher. I can apply the musical expressions of the piece and I feel that I am now at a level where I can record the piece.*
>
> *S3: I learned my little overlooked sight-reading mistakes. I can now play my scales, arpeggios and my piece.*

The observation data, researcher's diary and video recordings of the lessons provided support for these views. In the online lessons conducted at the end of each week, students' knowledge was tested by using the question-and-answer method to evaluate their learning. In addition, psychomotor behaviors requiring performance were also observed. In the video recordings of the lessons, it is observed that the students fulfilled the tasks expected of them at the end of each week.

According to the results of the analysis of the student diaries, the students expressed their opinions about the elimination of their pre-course deficiencies in the lesson. These statements of the students evaluated how much they eliminated their deficiencies before the lesson. From the first week of the research, the researcher carefully examined the students' views on this issue and did not ignore them while planning her lessons.

On this issue, students wrote positive opinions in their diaries. All of the students wrote in their diaries that they eliminated their deficiencies in the lessons.

The following statements written by the students in their diaries can be given as an example in this regard.:

> *S1: I overcome all my deficiencies before the lesson in the lesson.*
>
> *S2: I studied all my deficiencies thanks to the applications and resources shared, and then I eliminated them by reinforcing them with the support of our teacher.*
>
> *S3: I eliminated all my deficiencies before the lesson. I found answers to the issues I had in my mind.*
>
> *S4: I reinforced what I learned by eliminating my deficiencies in the lesson.*
>
> *S5: I found answers to all the questions in my mind before the lesson.*

S2 and S5, who wrote their opinions on this subject in their diaries in more detail during some weeks, used the following statements;

> *S2: I can use apoyanda and tirando techniques better and apply the musical expressions in the piece.*
>
> *S5: I eliminated my deficiencies related to scale position and finger numbers. Apart from that, while deciphering the piece, I learned how to decipher the piece comfortably and eliminated problems such as tonality.*

The observation data, researcher's diary and video recordings of the lessons support these views. As a matter of fact, every week, the tasks performed by the students during the week were followed and necessary feedback was given to them. From time to time, some students' mistakes in tasks requiring performance were detected and necessary feedback was given to them through the show-and-tell method.

Views from Mobile Learning Environment Evaluation Form

Table 20. Distribution of Mobile Devices Used

Students	S1	S2	S3	S4	S5
Mobile Devices	Mobile phone, Computer	Mobile phone, Computer	Mobile phone, Computer	Mobile phone, Computer	Mobile phone, Computer

As Table 20 demonstrates, it is clear that all five students in the research group used cell phones and computers as mobile devices in their learning processes at home. There was no difference in the answers given by the students at the end of each unit during the four units of the education process.

Table 21. Distribution of the Efficiency of the Mobile Devices Used

Student Views	**Frequency (f)**	**Percentage (%)**
Efficient	5	100
Not Efficient	0	0
Partially Efficient	0	0
Total	**5**	**100**

When Table 21 is considered, all five students answered the question about the efficiency of the mobile devices used in the learning processes at home with the answer "efficient". On this subject, the students gave the same answer at the end of each unit during the four units of the education process.

While the students were evaluating the mobile learning environment, they were asked to write down which mobile applications they used in the study. The mobile applications used by the students are presented in Table 22.

Table 22. Distribution of Mobile Applications Used

Students	S1	S2	S3	S4	S5
Mobile Applications Used	Datuner Music Dictionary Metronome Beats. Edmodo Spotify WhatsApp	Datuner Basic Music Knowledge Music Dictionary Rhytm Engineer Lite Spotify Metronome Beats. Edmodo WhatsApp	Datuner Music Dictionary Metronome Beats. Edmodo Basic Music Knowledge WhatsApp	Datuner Musicscore Basic Music Knowledge Music Dictionary Spotify Metronome Beats. Rhytm Engineer Lite Edmodo WhatsApp	Datuner Basic Music Knowledge Music Dictionary Metronome Beats. Edmodo WhatsApp Spotify
Frequency (*f*)	**7**	**8**	**6**	**9**	**7**

According to Table 22, it is obvious that the students used most of the applications within the scope of the study. During the research process, S4 used the most mobile applications with nine applications, followed by S2 with eight applications. S1 and S5 used seven mobile applications, and the student who used the minimum number of applications was S3 with six applications.

In the mobile learning environment evaluation form, students were asked a question about which needs the mobile applications they used met. When the answers given by the students to this question are analyzed, it is seen that the most repeated statements by the students are as follows: *I tuned my guitar, I learned the words I did not know the meaning of in the piece I studied, it enabled me to practice my piece using metronome, I*

listened to the pieces I studied from different performers. All students in the study group used these expressions, albeit with different words. The other expressions used by the students in this regard are "*I benefited from the theoretical knowledge"* used by four students and *"I solved the weighing groups that I had difficulty with in the piece"* used by two students, respectively.

For example, S2 stated the following views on this subject;

> *Da Tuner helped me tune my guitar. I benefited from the Basic Music Knowledge application in some subjects that I was deficient theoretically. Thanks to the Music Dictionary application: I learned the words I did not know the meaning of in the piece I was studying. The Rhythm Engineer Lite application helped me solve the scale groups I had difficulty with.*

S5 expressed his views as follows:

> *The applications have fulfilled many of my needs such as tuning my guitar, learning terms I didn't know the meaning of, learning new information, metronome my work, listening to music, etc.*

In line with these data, it can be asserted that students use the mobile applications within the scope of the study in order to meet their different needs. Observation data, application messages and the researcher's diary confirm the students' views on this issue. This is because the researcher questioned whether the students used mobile applications during the education process both in correspondence and face-to-face communication in online courses. The researcher received feedback from the students that they used these applications for various needs. The researcher reflected his experiences in this process in his notes. In addition, the dialogues between the researcher and the students can be observed in the video recordings of the lessons.

Table 23. Distribution of the Answers to the Question "*Were the mobile application(s) you used efficient?*"

Student Views	Frequency (f)	Percentage (%)
Efficient	5	100
Not Efficient	0	0
Partially Efficient	0	0
Total	**5**	**100**

When Table 23 is examined, all five students answered the question about the efficiency of the mobile applications they used in the learning processes at home as efficient. There was no difference in the answers given by the students at the end of the four units.

Table 24. Distribution Regarding the Question "*Do You Consider Yourself Competent to Use the Mobile Learning Environment within the Scope of the Study?*

Student Views	Frequency (f)	Percentage (%)
Yes	5	100
No	0	0
Partially	0	0
Total	**5**	**100**

When Table 24 is examined, all five students answered yes to the question about whether they found themselves competent to use the mobile learning environment. In this regard, students gave the same answer at the end of each unit.

Table 25. Distribution of the Answers to the Question "Do You Think You Have Enough Experience to Use the Mobile Learning Environment within the Scope of the Study?"

Student Views	Frequency (f)	Percentage (%)
Yes	5	100
No	0	0
Partially	0	0
Total	**5**	**100**

When Table 25 is examined, it is seen that all five students answered yes to the question 'Do you think you have enough knowledge to use the mobile learning environment'. The students gave the same answers at the end of each unit.

Table 26. Distribution of Answers to the Question "*Does the Mobile Learning Environment within the Scope of the Study Facilitate Your Learning?*"

Student Views	Frequency (f)	Percentage (%)
Yes	5	100
No	0	0
Partially	0	0
Total	**5**	**100**

Examining Table 26, it is observed that all students answered yes to the question "Does the mobile learning environment within the scope of the study facilitate your learning?". It was observed that students gave the same answers in four different evaluations.

Table 27. Distribution of Answers to the Question "*Is the Mobile Learning Environment within the Scope of the Study Adequate for Your Access to the Resources You Need?*"

Student Views	Frequency (f)	Percentage (%)
Yes	5	100
No	0	0
Partially	0	0
Total	**5**	**100**

When Table 27 is examined, it is seen that all of the students answered yes to the question 'Is the mobile learning environment within the scope of the study adequate for your access to the resources you need? There was no difference in the answers given by the students at the end of the four units.

Table 28. Distribution of Answers to the Question "*Is the Mobile Learning Environment within the Scope of the Study Sufficient to Overcome Your Deficiencies?*"

Student Views	Frequency (f)	Percentage (%)
Yes	5	100
No	0	0
Partially	0	0
Total	**5**	**100**

When Table 28 is examined, it is seen that all students answered yes to the question "Is the mobile learning environment within the scope of the study sufficient for you to overcome your deficiencies?". The students gave the same answer at the end of each unit during the 4 units of the education process.

In the mobile learning environment evaluation form, a question was asked as 'What kind of conveniences does the mobile learning environment within the scope of the study provide you? While answering this question, it is seen that the students mostly used the following expressions: *It enables me to progress on my own without a teacher physically present, it provides convenience in accessing the information and resources I need quickly, I benefited from various applications while applying what I learned.* All five students in the study group used these expressions, albeit with different words. These expressions were followed by the expressions *"It allows me to carry out my guitar education without being tied to a place and time"* used by four students and *"Everything I need is at hand"* used by three students. The other expressions used by two students are as follows: *It allows me to solve the scale groups more easily while deciphering, and I can easily solve the parts I get stuck in my piece from the videos.*

For instance, S2 expressed his views on this issue as follows:

> *The mobile learning environment helped me to complete my guitar education without being tied to a location. This environment helped me to progress on my own without having a teacher with me physically. Under normal conditions, I had difficulty deciphering the piece and solving the scale groups. Thanks to this study, these steps became easier for me.*

S4 also expressed a similar opinion on this issue:

> *Thanks to the mobile learning environment, the course content is always at hand, so I can work on the course wherever and whenever I want. In addition, I can progress on my own as if my teacher is with me. I can solve some of the problems I have difficulty with, such as weighing, etc. more easily.*

S5 expressed his views as follows:

> *Thanks to the mobile learning environment, I can study anywhere using the resources and videos available at my fingertips. For example, I can read about a course topic even when I am on the bus. I can progress on my own and sometimes I use the apps even if I feel incomplete on a topic.*

When the obtained data are analyzed, it is noteworthy that students frequently used concepts such as time and space flexibility, access to resources, and individual learning while expressing their views. From this point of view, it is meaningful that these concepts, which are considered among the advantages of mobile learning, are emphasized by the students. In the process, the researcher brought this issue to the agenda, albeit briefly, in the lessons with the students because of the curiosity of the students' views on this issue. It was reflected in the researcher's notes that the students used expressions parallel to these thoughts in their verbal communication with the researcher. In addition, these expressions can be observed in the lesson videos.

In the mobile learning environment evaluation form, the question "What kind of difficulties do you encounter while using the mobile learning environment within the scope of the study?" was asked. When the answers of the students are analyzed, it is seen that they mostly used the expression "I do not encounter any difficulties". This expression was used by 4 students, albeit with different words.

The answers of the students on this issue are as follows:

> *S1: I do not encounter any problems.*
>
> *S2: I do not encounter any difficulties.*
>
> *S4: I do not experience any difficulty.*
>
> *S5: I do not experience any problems.*

S3, on the other hand, stated that he could not allocate enough time for this issue and sometimes had problems in finding a physical environment where he could apply what he had learned. In the following weeks of the process, the researcher discussed this issue with S3 in order to take measures to eliminate these difficulties. In the interview, S3 stated that he was working at a job for economic reasons, so sometimes he had trouble finding time to study.

In the mobile learning environment evaluation form, the question "What are the deficiencies, if any, of the mobile learning environment within the scope of the study?" was asked. When the answers of the students are examined, it is seen that all of the students expressed the opinion that they do not think there are any deficiencies, albeit with different words.

For example, some students expressed their views on this issue as follows:

S1: I think there is no deficiency.

S3: I think there is no deficiency.

S4: I don't think there is any deficiency.

In line with these data, it can be asserted that students use the mobile applications within the scope of the study in order to meet their different needs. Observation data, application messages and the researcher's diary confirm the students' views on this issue. In the interviews with the students on this subject, the students stated that they found the mobile learning environment complete.

In the mobile learning environment evaluation form, students were asked to write their recommendations and suggestions for the mobile learning environment within the scope of the study. It is seen that the students' recommendations and suggestions on this subject are that such learning environments should not be limited to instrument lessons, mobile learning environments should be made widespread and such learning environments should be used in all fields.

For instance, some students expressed their views on this issue as follows:

S1: Mobile environments are very useful for us. I think they should be used in all lessons and become widespread.

S2: I think that such studies should not be limited to instrument lessons. Mobile learning environments should be used frequently in our other lessons as well.

S4: Mobile learning environments are very useful, so I think they can be used in all our lessons as they are in our current guitar lesson.

The students were highly motivated throughout the education process. In the conversations between the researcher and the students about the guitar lesson conducted in this way from time to time, it was reflected in the researcher's notes that the students expressed positive opinions about the mobile learning environment. In this sense, student opinions reflected in the researcher's notes overlap with these recommendations and suggestions.

In the mobile learning environment evaluation form, students were asked to write the name(s) of the mobile application(s) they wanted to add to the mobile learning environment within the scope of the study. When the students' opinions were analyzed, it was seen that they did not write any application names. Some students, for example, expressed their views on this issue as follows;

S2: There is no application that I would like to add because the shared applications fulfilled my needs.

S3: There is no application I want to add.

S4: The applications meet my needs, there is no application I want to add.

DISCUSSION AND CONCLUSION

According to the results of the sub-objective of this study, 'How do students' performances improve in guitar education conducted with the flipped virtual classroom model supported by mobile learning environments?', it was seen that the students' performance achievement status for the units was generally good, and although only one student's achievement status for the first and fourth units was average, the students' achievement status for the unit performances was successful and very successful. According to these results, it can be said that the education carried out in this way improved the performance achievement of the students. In this context, in relation to the results of this study, there are no studies that address the performance dimension by integrating flipped classroom and mobile learning models. However, Yildiz (2017) aimed to test the

effectiveness of individual instrument flute education lessons conducted with the flipped learning model compared to traditional teaching. According to the results of this study, it was seen that there was a higher and significant increase in the academic achievement, performance achievement scores and motivation towards the instrument lesson of the experimental group students in all level groups compared to the control group students. From this point of view, the results of the study are consistent with the results of this study.

According to the results for the sub-objective of the study, 'How are the students' realization of the unit outcomes in guitar education conducted with the flipped virtual classroom model supported by mobile learning environments?', it is concluded that the students realized the unit outcomes to a great extent. From this point of view, it can be said that the guitar education carried out with the flipped classroom model supported by mobile learning environments was effective in the achievement of the unit outcomes by the students in the study group. In particular, the fact that all students realized all of the affective domain outcomes in all four units shows that the students' desire and motivation for the course conducted in this way is high. When the related literature was examined, there were no academic studies conducted to evaluate the students' achievement of the unit outcomes of the music and instrument education curriculum. However, in academic studies in which mobile learning and flipped learning models were studied separately, the effectiveness of these models was tested in terms of various variables such as achievement status, attitude, self-awareness, self-efficacy. As a matter of fact, when the literature is examined, there are academic studies on the usability of mobile learning model and mobile learning environments in music education (Kalkanoglu & Serin Ozparlak, 2012; Ayhan, 2012; Onder & Yildiz, 2015; Andac, 2016; Oztosun Caydere, 2016; Kurun, 2017; Serafin et al. 2017; Baloglu, 2018; Hardal, 2018; Kibici, 2019; Satir, 2019; Guzel et al.2020 ; Conway, 2020; Uygun, 2020; Macias, 2021; Cayari, 2021; Gan et al. 2021; Uecker, 2021; Unal, S. & Piji Kucuk, D. 2022) and academic studies on the usability of the flipped classroom model in music education (Sever & Sever, 2017; Montgomery et al. 2017; Yildiz, 2017; Hao, 2018; Urgiles et al. 2019; Ma, 2020; Nergiz, E. 2022), it has been revealed that both of these models have a positive effect on the quality of music and instrument education.

In the results of the study for the sub-objective 'What are the views of the researcher and students regarding the guitar education conducted with the flipped virtual classroom model supported by mobile learning environments', it was revealed that the students expressed positive opinions both in the diaries they wrote and in the evaluation forms of the mobile learning environment during the implementation process. In addition, it was reflected in the researcher's notes that the students expressed views parallel to these views in the private interviews conducted by the researcher with the students and in the video recordings of the lessons. Throughout the training process, students stated that their motivation and self-confidence were high both in individual learning processes and in online face-to-face lessons, that they did not feel alone, and that they had an efficient learning process. From this point of view, it can be said that guitar lessons conducted in this way are effective and beneficial. Similar to this study, it is seen that there are very few academic studies in the literature on the studies in which two models are used together. It is seen that the few studies that support each other by integrating these two models in the related field are studies from foreign literature, and there are no domestic studies conducted in this way. The results of these studies (Lin et al. 2019; Lin & Wu, 2021; Ng, et al. 2021) and the results of this study are in parallel with each other. Therefore, in these studies, it is revealed that the flipped classroom model supported by mobile learning environments has a positive effect on the quality of music education. In these studies, it was emphasized that the flipped classroom model supported by mobile learning environments improved the success of students, students expressed positive opinions about the education process carried out in this way and their motivation was high.

In general, when all these results are considered, the use of mobile learning and flipped classroom models in music and instrument education by integrating and structuring them can provide quality learning processes. As in other disciplines, the use of mobile learning and flipped learning models in music and instrument education can contribute to the learning of music students. Considering the importance of audio-visual technologies in music and instrument education, especially using technology-based mobile learning and flipped learning models can accelerate music students' acquisition of musical behaviors. In addition, supporting these two models by integrating them with each other can minimize the difficulties of both models. Thus, more qualified learning processes can be carried out.

Due to the nature of music, digital media are needed in many sub-dimensions of music education such as musical hearing (ear) education, voice education, instrument education, musical movement and rhythm (weighing) education. For example, voice recorders, note writing, music listening, tuners and many other applications and software can meet the various needs of music students. Taking advantage of the convenience and functionality offered by technology can enrich music education in terms of the materials used and bring quality learning processes. In addition, since resources and course materials can be easily shared and used with the support of technology, in-class lesson time can be used more effectively, and virtual learning environments such as simulations, games, etc. can both increase students' motivation and provide permanent learning. Therefore, in today's world where the use of technology has become a necessity, the use of learning models based on the systematic use of technology in music and instrument education and the creation and implementation of music curricula based on these models can have a positive effect on individuals' acquisition of musical behavior.

Implications and Suggestions

According to the results obtained in this study, the following are suggested for educators and administrators:

- Today, technology shows a rapid development and can facilitate our lives in many aspects with its functionality. Developments in technology are also reflected in education. Benefiting from the convenience and functionality provided by technology in terms of education can enrich the educational processes in terms of the materials used, as well as bring qualified learning processes. The widespread use of technology in education in recent years has brought new technology-based learning models to the agenda. As a result of this study, which was conducted using a flipped virtual classroom model supported by mobile learning environments for the instrument (guitar) dimension of music education, it was seen that the guitar education carried out in this way improved the performance skills of the students and enabled them to realize the unit achievements. In addition, students expressed positive opinions about the education process and learning environments throughout the implementation process of this study. Technological devices, applications and software, simulations, various educational games, virtual classrooms, etc. virtual learning environments can have a positive impact on learning processes. In this context, it can be considered important to use technology-based learning models and technology-supported learning models in education. In this regard, it may be useful to design, prepare and implement music curricula based on mobile learning and flipped classroom models in music education and its sub-dimensions.
- When the literature on the flipped classroom model is examined, it is seen that academic studies have mentioned limitations such as the difficulty of controlling the learners in the out-of-class learning process in the education carried out with the flipped classroom model, the difficulty of controlling the learners in the out-of-class learning process, the fact that it is often not possible to follow whether the learners have done their extracurricular tasks or to what extent they have done them, and that some learners who are inadequate in individual learning may be left alone in the process of learning information. In this study, the out-of-school education processes of the flipped virtual classroom model were supported with mobile learning environments. As a result of the study, it was revealed that these problems experienced in the out-of-school education processes of the flipped virtual classroom model were eliminated with mobile learning environments based on both the observations and notes of the researcher and the opinions of the students. In this regard, the organization of out-of-school education processes in music education carried out with the flipped classroom model by instructors by supporting them with mobile learning environments can eliminate the limitations of the flipped classroom model.
- Mobile learning and flipped classroom models are mostly used separately in the literature. In this study, a guitar education process was carried out by integrating the related learning models. As a result of the study, it was seen that the guitar education carried out in this way was functional in the dimensions specified in the sub-objectives of the study. In this regard, it can be ensured to enrich the data contents including the use of these models together by integrating them in music education.

- Use of technological tools in education requires costs in some cases. Especially the high cost of licensed educational software developed by software companies makes it difficult for educators and students to obtain them. It may be useful for music education institutions to ensure the provision of mobile technologies by following current developments, and to encourage the use and dissemination of these technologies.
- Mobile technologies (application/software/device) are developing rapidly every day. In addition to new applications and software developed by software companies, applications and software developed by software companies are developing with updates by adding new features. In order to train prospective music teachers on this subject and to benefit from the educational opportunities that mobile technologies can create, it may be useful to teach a course that reveals the current status of mobile technologies for music education in Music Teaching Undergraduate Programs, for which purposes these technologies can be used and how they can be integrated into music education processes, or to develop existing courses in this context.
- It is important for music educators working in various educational institutions to follow the developing mobile technologies and to keep their knowledge and experience up to date in order to use mobile technologies in the music education processes they carry out. In this regard, it may be useful to organize seminars and training programs at regular intervals that reveal the current status of mobile technologies (application/software/device) for music education, for what purposes these technologies can be used and how they can be integrated into music education processes.
- Today, technological tools and the digital environments created by them have taken their place in every aspect of our lives. In particular, digital environments are used intensively by individuals of all ages thanks to the various opportunities they offer. Storage, diversity, portability and low cost of information can be provided in various digital environments. It may be useful for music educators to transfer the curriculum contents of the courses they conduct to digital media and share them with students, and in this context, it may be useful to share the relevant curriculum contents with software companies that develop various applications and software for music education.
- The involvement of music education institutions and educators in the process of developing applications and software for music education can contribute to the development of applications that meet the needs of music students and enrich the content of the applications. In this regard, it may be useful for music education institutions and music educators to act in cooperation with software companies and contribute to the development of various applications and software for music education in line with the needs of music students.
- When various application stores where applications can be downloaded are examined, it is seen that there are many applications for music education and its sub-dimensions. In this study, before the implementation process started, the applications for the contents of the curriculum of the study were scanned, the selected applications were introduced to the students and the students were enabled to use these applications in the implementation process. As a result of the study, the students stated that these applications reinforced their learning, facilitated the solution of problems experienced from time to time in learning processes, were effective and functional in accessing and using information, and expressed many positive opinions on this issue. In this regard, it may be useful for music educators to introduce mobile applications related to the contents of the courses they conduct to students and enable them to benefit from these applications in their learning processes.
- It may be useful for relevant institutions to encourage projects based on the use of digital media in music education and to finance academic studies on the development and applicability of these digital media.

Depending on the results obtained in this study, the following can be suggested for the researchers:

- This study was conducted for undergraduate music teaching students. As a result of the study, it was seen that the guitar education carried out with the flipped virtual classroom model supported by mobile learning environments improved students' performances and was effective in achieving unit outcomes. It is difficult to make general judgments about the functionality of the flipped virtual classroom model supported by mobile learning environments because the study was limited to examining the functionality of the study only for the performance and unit outcomes dimensions of guitar education, the action research design, which is the research model within the scope of

the study, was limited to a study group consisting of music teaching undergraduate students. For this reason, it may be useful for researchers to conduct academic studies based on the functionality of the flipped classroom model supported by mobile learning environments with different study groups consisting of music teaching undergraduate students and different research designs. Similarly, conducting academic studies on different instruments, different dimensions such as achievement, perception, attitude, awareness, etc. of guitar and other instruments, and students at different levels of music education can also contribute to the field.

Finally, this research emphasizes that the flipped virtual classroom model supported by mobile learning environments can play a functional role in classical guitar education therefore in instrument and music education. In addition, the research reveals that fusing mobile learning and flipped learning models is an efficient tool in instrument education.

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