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Alternative ways of organizing distance practical classes for future music art teachers

Альтернативні Способи Організації Дистанційного Навчання для Проведення Практичних Занять Майбутніх Учителів Музичного Мистецтва

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Written by:

Pavlo Yalovskyi¹¹⁷<https://orcid.org/0000-0002-4116-1674>**Ruslana Lotsman**¹¹⁸<https://orcid.org/0000-0002-8500-1402>**Kateryna Yurieva**¹¹⁹<https://orcid.org/0000-0001-6403-9973>**Iryna Parfentieva**¹²⁰<https://orcid.org/0000-0001-6201-4916>**Alla Sokolova**¹²¹<https://orcid.org/0000-0003-0284-7320>

Abstract

The aim of this research was to find and study the effectiveness of alternative ways of organizing practical classes in Musical Art for Pedagogy students in the context of distance learning. The research involved semi-structured interviews with teachers and student surveys using a close-ended questionnaire. The content analysis of the answers revealed the main difficulties that the teachers had to deal with when organizing distance practical classes in Musical Art. It also enabled finding optimal ways to eliminate them. Their high efficiency was verified by conducting a pedagogical experiment. It was established that traditional methods of education are impossible during distance learning. They need to be replaced with new ones that are effective in technology-mediated learning. It was found that music teachers used special software, digital musical instruments as an alternative to traditional ones. Teachers also recorded video instructions and video lessons, and students recorded video reports on the work done.

Анотація

Метою даного дослідження було знайти та дослідити ефективність альтернативних способів організації практичних занять з музичного мистецтва при дистанційній формі навчання студентів-педагогів. У роботі проведено напівструктуровані інтерв'ю з викладачами та опитування студентів за допомогою закритої анкети. Контент аналіз відповідей виявив основні труднощі, з якими мали справу викладачі при організації практичних занять з музичного мистецтва дистанційно. Також дозволив знайти оптимальні шляхи їх вирішення. Їх висока ефективність перевірена шляхом проведення педагогічного експерименту. Встановлено, що під час дистанційного навчання традиційні способи організації навчання неможливі. Їх необхідно замінити на нові, ефективні при технологічно-опосередкованому навчанні. Виявлено, що викладачі музики використовували спеціальні програмні забезпечення, цифрові музичні інструменти як

¹¹⁷ Doctor of Philosophy, Senior Lecturer at the Department of Art Disciplines and Methods of Teaching, Faculty of Pre-school and Primary Education, History and Art, Kremenets Taras Shevchenko Regional Academy of Humanities and Pedagogy, Kremenets, Ukraine.

¹¹⁸ PhD of Pedagogical Science, Doctoral Student of Anatolij Avdievskiy Faculty of Arts, M. Dragomanov Ukrainian State University, Kyiv, Ukraine.

¹¹⁹ Doctor of Pedagogical Sciences, Professor of the Musical Art Department, Faculty of Arts, H.S. Skovoroda Kharkiv National Pedagogical University, Kharkiv, Ukraine.

¹²⁰ Doctor of Philosophy in Education, Associate Professor, Department of Musical Arts, Faculty of Pedagogy and Psychology, V.O. Sukhomlynskyi National University of Mykolaiv, Mykolaiv, Ukraine.

¹²¹ Doctor of Pedagogical Sciences, Professor of the Musical Art Department, Faculty of Arts, H.S. Skovoroda Kharkiv National Pedagogical University, Kharkiv, Ukraine.



Teachers began to use new teaching methods. Distance learning yielded higher learning outcomes than the traditional one, as technologies are interesting to students and contribute to their motivation and engagement. This article was reduced to the study of the peculiarities of the organization of distance learning of students — future teachers of Musical Art. Further research should be aimed at identifying ways of organizing Music Art education in general secondary educational institutions.

Keywords: learning technologies, digital competence, synchronous online learning, e-learning, music education.

Introduction

The pandemic of 2020 made people to revise the forms and methods of interaction with each other. Many workers in various industries have switched to teleworking. The education system has also undergone changes. Traditional offline learning had to be replaced by distance learning in a short period of time (Bork-Hüffer et al., 2021). This extreme shift to distance learning has caused a number of problems (Śliwa et al., 2021). Many curricula required direct contact of students with teachers, as well as the use of educational equipment that remained in the educational institutions. The problem that students didn't have musical instruments at home has become one of the obstacles to comprehensive practical training of future music teachers. The teachers of music education institutions were tasked to find ways of conducting practical classes in musical art different from the traditional ones because of the need to maintain distance. The analysis of the academic literature in the Literature Review section found that little attention was paid to the methods of organizing practical classes in musical art. Therefore, the aim of this research was to identify and study the effectiveness of alternative methods of conducting practical classes in the context of distance learning by using the example of future music teachers.

This aim involved the fulfilment of the following research objectives:

- 1) Study the experience of organizing practical classes by Music Art teachers in the context of distance learning.

альтернативу традиційним. Також педагоги записували відеоінструкції та відеоуроки, а студенти відеозвіти з проробленої роботи. Викладачі почали застосовувати нові методи навчання. Таким чином, при дистанційній формі було досягнуто вищих результатів навчання, ніж при традиційній, оскільки технології цікаві студентам і сприяють їх мотивації та залученню. У даній роботі обмежилися дослідженням особливостей організації дистанційного навчання студентів, майбутніх учителів музичного мистецтва. Подальші дослідження варто спрямувати на виявлення способів організації навчання з музичного мистецтва в закладах загальної середньої освіти.

Keywords: технології навчання, цифрова компетентність, синхронне онлайн-навчання, електронне навчання, музична освіта.

- 2) Conduct a pedagogical experiment to study the impact of proposed alternative methods of organizing practical classes on the level of practical professional skills of future music teachers.
- 3) Study the degree of students' satisfaction with alternative ways of organizing distance learning when conducting practical classes in musical art.

The next section after the Literature Review contains a description of the methods used to achieve the aim. The obtained results are presented in the Results section: the list and frequency of problems that the music teachers faced during the organization of distance learning, the strategies and methods used to achieve the desired result. Provisions according to which distance learning was organized during the pedagogical experiment are also indicated. The results of a survey of students on their impression of the experiment are presented. The results of the final assessment of students' academic performance are also provided. The obtained results were discussed, and the conclusions were drawn.

Literature Review

In general, music education is important not only for cultural and educational development, but also for social, psychological (Gül, 2021) and intellectual one (Labunets et al., 2021). Therefore, it should be continuous regardless of extreme situations. Distance education can be an alternative to the traditional form of education. It

is not new. The first attempts at distance education were recorded as early as in 1728. Newspapers were the main means of education then, later — a radio, followed by a TV, a computer (Gül, 2021). However, only 2% of students studied remotely in 2016. The year of 2020 marked by a forced mass transition to this form of education (Bork-Hüffer et al., 2021). It was not immediately effective (Śliwa et al., 2021). Teachers acquired digital competences in a few weeks, learned new teaching methods and adapted their courses to online learning under extreme conditions (Schiavio et al., 2021). For example, more than 5,000 courses were prepared and posted on the online platform in two weeks in one of the Chinese universities (Cicha et al., 2021). The following online platforms were used: Zoom, Google Meet, Microsoft Teams, Cisco WebEx (Wannapiroon et al., 2022), Edmodo (Aslan et al., 2021), and Skype. Besides, TV channels, social networks (Facebook and YouTube) (Aslan et al., 2021) etc. were also used. Teachers acquired good experience that will be used after the pandemic (Cicha et al., 2021) by integrating online learning methods into the traditional form (Wannapiroon et al., 2022). They learned how to use conferencing, which made it possible to involve students and teachers from anywhere in the world in learning and teaching, regardless of the location of the university. However, the issue of organizing practical classes in the context of forced distancing remains poorly studied.

Researchers proved that the distance education had a number of advantages. In addition to solving the problem of distancing participants in the educational process, it provided flexibility of time (Vladova et al., 2021) and flexibility of learning (Zuo et al., 2021), opened the possibility of sharing and using materials via the Internet for many teachers, for example, Educational Information Network (Aslan et al., 2021). ICTs have provided teachers with resources that can be reused and quickly disseminated (Bolívar-Chávez et al., 2021). The organization of distance learning required solving many problems. For example, it is impossible to organize practical classes for students of some majors: doctors, artists, chemists, physicists, instrumental musicians (Cicha et al., 2021; Joseph & Trinick, 2021). The lack of instant feedback resulted in more time spent learning the same material online compared to traditional learning (Aslan et al., 2021). Teaching music has its own specifics. It involves both theoretical (Solfeggio, Music History) and practical (Instrumental Mastery, Ensemble) courses (Biasutti et al., 2021). The latter requires the

synchronous interaction of participants in the educational process, the availability of musical instruments, and a place for learning (Aslan et al., 2021). Synchronous distance learning often depends on the quality of the Internet connection, as well as on the availability of ICTs. Besides, not all students have the necessary musical instruments at home. Therefore, the transition to the distance learning necessitated a search for alternative to traditional ways of teaching and learning. For example, the following were used: brainstorming, dramatization, exhibitions and demonstrations (Aslan et al., 2021), project method (Francom et al., 2021; Rolinska, 2021), flipped classroom (Ng et al., 2022), coaching (De Bruin, 2021), portfolio (Okay, 2021) and others. Various computer software for teaching music (Bresler, 2021), for example, Sibelius (Bolívar-Chávez et al., 2021), or Simply Piano — an application for learning to play the piano (Mei & Yang, 2021) - began to be used. They made it possible to focus on the elements of musical temperaments, intervals, chords, being more effective than in-class work and providing a student-centred approach (Rolinska, 2021; Ishhenko et al., 2022). ICTs help in audition, reading scores, listening to musical instruments (Ng et al., 2022).

The success of online learning depends on the digital literacy of the participants in the educational process (Willermark & Gellerstedt, 2022). A teacher must have high-level digital competence (Polhun et al., 2021) and be self-efficacious (Ogodo et al., 2021). The development of these competencies also depends on the community (urban, rural) in which the educational institution where the teacher works is located (Johnson & Stanley, 2021).

The transition to online education was facilitated by the creation of teacher communities and providing assistance to teachers through briefings and special courses. Their main objectives were the following (Wannapiroon et al., 2022): teach how to analyse course content, use videoconferencing, conduct classes online, create and manage online resources, develop tests, create videos, evaluate learning outcomes remotely, etc.

The effectiveness of distance education also depends on the acceptance of technologies by the participants of the educational process (Vladova et al., 2021). The technology acceptance model (TAM) is most often used to determine it (Zuo et al., 2021). Although students and pupils were born in the era of technological development and are familiar with virtual reality, this does not

mean that they have sufficient digital literacy for online learning (Joseph & Trinick, 2021).

Anderson (2022) discusses the CLASP model of music education, which includes the following components: composition (C), literature studies (L), audition (A), skill acquisition (S), and performance (P). Degé (2021) offers reading musical notations, distinguishing by ear, memorizing musical and auditory excerpts, training fine motor skills and gaining knowledge about the structure of music. Abeles et al., (2021) proposed to include the study of popular music in the programme. They advised to use international opportunities for professional development of popular music education — Musical Futures — in order to improve the teacher qualifications. Music teachers are taught to play, improvise, compose, model, and perform on modern musical instruments (guitar, electric bass, drums, and keyboard instruments). The access to digital resources containing lesson plans, popular music arrangements, and playback tracks is also provided. Those include the Berklee PULSE Music Method website or the LKR Jam Zone (Abeles et al., 2021) and CanDoMusic (Calderón-Garrido et al., 2021).

In musical practice, it is not so much the quantity, but the quality that matters (How et al., 2022), as well as the direct teacher-student interaction (Degé, 2021). The teacher must see all the details (finger movement, posture, pose) (Biasutti et al., 2021). Therefore, finding ways to make this practice qualitative is an important task for the researchers.

Methodology

Design

This study was conducted in three stages.

The first stage involved semi-structured interviews conducted in order to find out the difficulties music teachers encountered in the organization of practical classes in music during the transition to distance education and the ways they found to overcome them.

The second stage provided for a pedagogical experiment, which involved the introduction of the most effective methods and strategies for organizing practical music classes in the experimental group.

The third stage involved the evaluation and comparison of the level of students' achievements in the control and experimental groups, as well as a questionnaire survey of

students of the experimental group to determine the effectiveness of the proposed methods of organizing practical music classes in the context of distance learning.

Participants

The sample included 48 Music Art teachers who work with students majoring in Secondary Education (Music Art). Of them, 28 participated in semi-structured interviews and shared their impressions and experiences of organizing practical music classes during distance learning. There were 20 teachers who participated in the pedagogical experiment. The sample also included 390 students, of which 193 were included in the control group and 197 in the experimental group. All survey participants gave their written consent. Interviews and questionnaire survey were conducted online.

Instruments

The study involved semi-structured interviews that included open-ended questions and a questionnaire containing closed-ended questions.

Data collection

The degree of influence of the methods of organizing practical music classes proposed during the experiment was assessed remotely using videos recorded by students with their own performance (singing, playing a musical instrument). A total of 390 videos were recorded, analysed and rated.

Analysis of data

All responses were recorded and then coded. Content analysis was used to process the obtained data. All responses were divided into the following categories:

- 1) problems that arose during practical music classes in the context of distance learning;
- 2) strategies and methods used to organize practical music lessons in the context of distance learning;
- 3) technologies used in music lessons during online learning.

A survey of students of the experimental group was also conducted using a questionnaire with 10 questions. Each of them was evaluated on a five-point Likert scale, where 1 is a very low level, ..., 5 is a high level. Reliability was tested by Cronbach's alpha. It ranged from 0.74 to 0.86, which indicates its acceptability. Mathematical

methods of statistical data processing were used to analyse the obtained results: Cohen's kappa coefficient, Pearson's chi-squared test. Statistica application software was also used.

Ethical criteria

Participation in the pedagogical experiment was voluntary and free of charge. The questionnaire survey was conducted in compliance with all ethical standards. There was enough time allocated for responses.

Results

The results of the interviews showed that music teachers encountered a number of obstacles during the transition to distance learning (Table 1). Not all students had a musical instrument at home. Synchronous accompaniment was not possible because of the online platforms and the quality of the Internet connection. It was impossible to play with four hands, conduct rehearsals of the ensemble, choir, etc. for the same reason.

Table 1.
Problems that arose during practical music classes in the context of distance learning

Item No.	Questions	Number of positive answers, %
1	Was your competence enough to conduct practical music classes online?	64 %
2	Were the online music classes effective?	52 %
3	Was it necessary to change the content of the educational programme in connection with the transition to distance education?	8 %
4	Was it possible to involve students in online learning?	72 %
5	Was it possible to provide quality feedback?	54 %
6	Did students quickly adapt to distance learning?	86 %
7	Was it possible to achieve the necessary synchronization during the music class?	6 %
8	Was there a lack of direct interaction with the student when correcting posture, pose, hand position, finger movements, etc.?	92 %
9	Was it possible to achieve synchronicity in the joint performance of musical works and songs?	4 %

An analysis of the responses received during a semi-structured interview regarding the strategies and methods used by teachers to organize practical music classes during distance learning showed that the transition to online learning made music teachers to analyse the content of the course and change the forms and methods of teaching (Table 2). Face-to-face teaching and learning was replaced by online

video conferences. Teachers had to quickly learn how to use online educational resources and how to manage students' distance learning. They developed PowerPoint presentations, educational videos, online tests for knowledge control, etc. for this purpose. Teachers developed some educational materials themselves, and also used publicly available ones, for example, on YouTube.

Table 2.
Strategies and methods used to organize practical music classes during distance learning

Item No.	Questions	Number of positive answers, %
1	What educational resources did you use? created by myself	56 %
	online resources publicly available on YouTube	68 %
2	Have you developed new teaching methods that you can use when you return to offline education?	74 %
3	Has the number of hours allocated for independent work of students changed in connection with the transition to distance education?	48 %

Students had to compensate for the lack of musical instruments at home, for example, by performing rhythmic exercises with improvised materials available in every home. Students created rhythmic patterns by clapping, stomping, clicking, hitting

buckets or tables with spoons, using cereal in containers and the sounds of a mobile phone, hair dryer, mixer, newspaper, package, etc. Solfeggio skills were formed during distance learning through online music reading exercises.

The inability to achieve synchronicity during online performance was compensated by working in small groups. Working in small groups was also effective because students could support each other using the Learning by Teaching method. They also replaced the synchronous performance of works with a video recording of the performance of one's part while reproducing the records of all others.

Teachers often made video recordings of their own performance of certain works, while intentionally making mistakes that students had to identify and analyse. That was followed by showing a video with the correct performance of the work. Professional musicians were invited to the meeting whenever possible, who conducted an online workshop.

The teachers had to review the content of the courses and make them shorter, because online learning required more time to achieve the educational goal than offline learning. It was also necessary to take into account the individual capabilities of students and the educational needs of each student.

Besides, students were engaged in self-education most of the study time. For this purpose, conditions were created that encouraged to engage in independent work.

The teachers evaluated the level of students' musical and performance abilities (singing, playing musical instruments) based on videos recorded by students with their own performance. This enabled obtaining the most accurate (in the context of distance learning) reproduction of the sound of the student's voice or the sound of the instrument. It was also possible to assess the student's posture, pose, finger placement and movement, etc. Students had to make video recordings using additional cameras and tripods. Having received and analysed the video, the teacher could demonstrate it during an online meeting and stop at those fragments where the student made mistakes, review it together again and find the right ways to solve problems.

The most difficult thing was to organize the practical classes of the ensemble. However, none of the interviewed teachers cancelled these classes. The vast majority used alternate superimposition of sounds by students on the already existing recording of other parts (Table 3). Then they got a unified sounding. They also each played their part separately, while the others listened, evaluated and commented. Teachers and students learned to listen without interrupting and then give clear, concise and accurate comments.

Table 3.
Technologies used in music classes during online learning

Item No.	Questions	Number of positive answers, %
1	Did you use technological devices during online music classes?	96 %
2	Did students actively use music technology in class?	82 %
3	Did the quality of the sound affect the effectiveness of the music class?	94 %
4	What websites and computer programmes did you use during distance learning?	
	Viber	74 %
	Google Classroom	26 %
	Zoom	62 %
	E-mail	86 %
	GoogleMeet	44 %
	Remind	12 %
	School Status	10 %
	YouTube	96 %
	Schoology	8 %
	Skype	22 %
5	What support did you receive during distance learning?	
	free consultations	64 %
	webinars	72 %
	advice from colleagues	86 %
	online forums or Facebook groups	36 %
6	Do you have enough skills to work with virtual musical instruments so that you can provide support for students when working with them?	56 %

Zoom, GoogleMeet, Skype, Viber were used for video conferences. Social networks were used to exchange information. Special software was also used, for example, hearing training programmes (GNU SOLFEGE, Functional Ear Trainer, etc.).

The teachers also used various software. For example, Sibelius - a programme for editing, recording and listening to musical works. Augmented reality technologies and their connection with musical instruments were also used. The Simply Piano application was widely used, which enables to simulate playing the piano, with the possibility of providing instant feedback on the correctness of the user's performance. It can be applied by users with different skill levels.

Digital music technologies were widely used in music classes, for example, electronic musical instruments. They provided students with an opportunity to learn how to edit music and create new sounds. Students showed interest in creating electronic music of various styles and genres. Computers enabled students to notate, write and edit music. Besides, Internet resources made it possible to listen and read music. The teachers also used Lola (n.d.), Swing (n.d.), AEC (n.d.) and Music Paint Machine (n.d.) projects.

Therefore, a pedagogical experiment was introduced taking into account the previous experience of music teachers. Teaching and learning was organized online during the experiment training according to the following provisions:

- 1) organization of video conferences using one of the online platforms in groups of up to 8 people;
- 2) use of additional cameras, tripods, microphones during video conferences;
- 3) making video recordings of instructions and samples of the performance of musical works by the teacher and their subsequent study by students;
- 4) video recording by students of their performance of musical works and further analysis of the work by the teacher during an online meeting with students;
- 5) use of digital musical instruments;
- 6) use of mobile applications and application software designed for the development of practical abilities and skills in performing musical works.

The conducted pedagogical experiment had a positive effect on the results of student learning (Table 4). It contributed to the performance growth by 6% compared to the control group.

Table 4.
Results of the final control of the students' performance levels

The average score of students on a 100-point scale			
Control group		Experimental group	
Before the experiment	After the experiment	Before the experiment	After the experiment
71	76	71	82

The student questionnaire survey showed that the use of online digital music technologies, mobile applications and special software during practical classes contributes to enhancing students' motivation to study, their involvement, encourages independent learning. As a result, their performance increases. During distance learning, students gained experience working with ICT tools and learned to work with educational platforms. They quickly adapted to online learning. Almost 88% consider distance education effective. And 56% believe that it promotes the development of creative thinking. At the same time, 70% of respondents believe that distance learning is as effective as traditional learning for the development of practical skills and abilities.

The use of mathematical methods revealed that the weighted sum of squared deviations of the group means from the total mean, that is, the intergroup variance d , ranged from 283 to 1465 because of the heterogeneity of the sample. The latter is connected with conducting a pedagogical experiment in different groups, which included students from different higher educational institutions.

In turn, the root mean squared deviation from the mean value for the same questions of the questionnaire in different educational institutions of the sample was different. The intergroup variance, which describes the fluctuations of these groups, and the intragroup variance, which describes the fluctuations caused by random factors not taken into account, are unequal, which indicates that the null hypothesis is not valid.

Using the Pearson's chi-squared test for the results of the questionnaire, it was found that the values of χ^2_1 obtained for the experimental group are greater than χ^2_{12} calculated for the control group. So, it can be stated that there is a certain connection between the methods used in classes in the experimental group during the development of practical skills in music in the context of distance learning and the acquired abilities and skills.

The Cohen's kappa coefficient calculated in the experimental group was 1.03. This indicates high effect of using the methods and approaches proposed during the pedagogical experiment. In the control group, which was taught using the traditional method, the Cohen's coefficient was 0.5, indicating a medium effect.

Discussion

The findings of Cicha et al. (2021) showed that students felt comfortable with online learning. Their self-efficacy was high. They could use computer programmes for learning. The experiment carried out in this work confirmed the high interest of future music teachers in using the latest technologies during online practical classes.

In the spring of 2020, more than 93% of teachers completed advanced training in the organization and management of online learning and acquired additional skills necessary to increase their digital competence (Wannapiroon et al., 2022). Teachers started using digital documents (presentations, e-books, quizzes) and mobile applications (Aslan et al., 2021). This study showed that, most often, teachers used the advice of colleagues and webinars when organizing practical music classes online.

Online learning requires more time spent on the organization of training by teachers and on the completion of assignments by students (Zuo et al., 2021). More than 81% of students think so. Mobile devices (tablets, smartphones) were the most popular ICT tools used by 67% of students. Despite the transition to a new form of education, 68% of teaching methods have been preserved, having been slightly modified. Lectures and seminars have moved from classrooms to online platforms. And only 20% of students indicated the new learning methods such as online quizzes and real-time comments (Zuo et al., 2021). This study found that 74% of teachers used new methods during distance learning.

The disadvantages of online learning include: the negative impact of this form on the physical condition of teachers and their students (more than 67% of students complained of vision problems), more than 45% complained of feeling alienated, and about 44% — of poor Internet connection (Zuo et al., 2021). The teachers also noted that distance education enables achieving only part of the educational goals (Gül, 2021) and does not provide an opportunity to carry out an effective evaluation of the obtained learning outcomes. It was proved that educational information presented in the form of a video contributes to the achievement of learning outcomes. However, it was impossible to fully implement practical activities during distance learning. Ensembles experienced the greatest negative impact of the pandemic among all instrumental learning (Calderón-Garrido et al., 2021). Music Theory was the least impacted. It was impossible to implement singing, rhythm exercises and any group work in music classes because of the impossibility of synchronization. In this study, this problem was solved by recording individual parts.

It was established (Mei & Yang, 2021) that the use of augmented reality, ICT-based music learning tools (smart musical instruments) in classes contributed to the growth of students' interest in learning, the improvement of learning outcomes, and the development of mental and research skills. As this study showed, 56% of teachers are ready to work with virtual musical instruments. Teachers of all countries without exception, even the most digitized, such as Sweden, experienced problems in the organization of online learning (Willermark & Gellerstedt, 2022). The 2020 pandemic forced 54% of surveyed teachers and 45% of their students to develop their digital competence.

The experience gained during the pandemic made enabled drawing conclusions regarding the organization of effective teaching and learning in emergency situations (Francom et al., 2021). For this purpose, it is necessary to create a plan for using the online education in extreme situations. It is mandatory to have communication channels. A survey (Francom et al., 2021) showed that 62% of respondents were provided with computers or tablets, and 66% had Internet access. It was also proved that regardless of the subject being taught, teachers tried to find new methods, which can be effective during distance learning. Despite all the difficulties of distance learning, the teachers are going to use the acquired knowledge during traditional learning as well.

This study has practical value, as it complements the existing teaching methods, which have already been used during practical classes in Musical Art, with new ones that can be used in distance learning.

The research was reduced to the issues of organization of practical work only for future Music Art teachers. The peculiarities of schoolchildren's music education were not considered. Therefore, further research should focus on finding alternative ways of organizing distance learning in Musical Art for students of general secondary educational institutions.

Conclusions

In extreme conditions, such as natural disasters, pandemics or wars, ensuring the continuity of the educational process is crucial. For this purpose, the search for effective forms and methods of teaching and learning is carried out. Distance education is the most acceptable under such conditions. As this research showed, it can provide high results with a successful selection of organizational methods and training methods. So, it is worth using digital technologies when organizing practical classes in Musical Art. For example, digital musical instruments, special application software. It is also effective to use video instructions developed by teachers or selected and used from the list publicly available on social networks. Asynchrony, which cannot be avoided when using Internet communication and technical means, was the main problem in the organization of group work online. Therefore, an alternative to conducting synchronous work in groups was to make video recordings of individual parts of each performer separately, and then carry out their subsequent group analysis by students and the teacher. The results of this study are useful for teachers of higher educational institutions when organizing practical classes in Musical Art in the context of distance learning.

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