

Online Training in Music Education Based on a Signature Pedagogy

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Abstract—This paper presents the investigation of the effectiveness of the online training for future music teachers based on the signature pedagogy at the university. The literature review stated the gap in research which covers online learning strategies for training music teachers in the professional preparation process. Due to the shift of the educational process to online during the COVID-19 pandemic, the relevance of pedagogical tools for preparing future specialists in online education increased. The comparative analysis of music education standards in different countries let us determine the set of teachers' professional activities in general school music class. The main contribution is the design of a small private online course based on the signature pedagogy which delivered the set of specific pedagogical tools for training music teacher professional skills online. This course was implemented at Kazan Federal University. The experimental work was based on the teacher's assessment of online tasks, in which students demonstrated the music teacher's professional skills. The results are shown with the statistical methods of median, standard deviation and Pearson's correlation. The obtained results proved the effectiveness of the online training based on the signature pedagogy which provided learning activities according to the specific features of music teacher professional practice.

Keywords—music, education, teacher, online training, signature pedagogy, university, learning strategy

1 Introduction

The rapid development of technical progress offers new perspectives in education, including Humanities and Arts. The implementation of technological tools provides the upgrade of teacher strategies. Currently, educators need new approaches for delivering professional knowledge and training students' skills for preparing future specialists. In this regard, the design of online courses based on a fundamental system of professional training suggests bridging the gap between global professional perspectives and teaching methods in educational practice.

The COVID-19 pandemic noticeably stimulated the teachers' attention to the online tools. In order to reach educational purposes, teachers were encouraged to select the

best decision among the variety of different types of online courses. Above the most popular MOOC (Massive Open Online Course) [1], researchers characterized wide range of online courses, such as BOOC (Big Open Online Course), DOCC (Distributed Open Collaborative Course), LOOC (Little Open Online Course), MOOR (Massive Open Online Research) and SPOC (Small Private Online Course) [2]. The SPOC also was divided into several varieties, including COOC (Corporative open on-line courses)—courses designed for companies—and SOOC (Small open online courses)—low-audience courses due to the extreme specialization of the subject and NOOC (Nano open online courses), characterized by requiring less than 20 hours of dedication [3].

Researchers pointed the preparing effective online course is a very expensive process [4]. It requires specific skills and spending a long time creating the content and video records. Furthermore, in many cases, they need to be not only subject experts and educators, but instructional designers and web developers as well [4]. To reduce the cost of educational process and save human efforts for loading content in distance learning environments, Rumble [5] suggests shifting the point of view from teachers' activity in preparing study material, to students' active interaction by the means of online resources.

Signature pedagogy was invented by Shulman as an approach to foster students' activity in the professional training. This approach is characterized as a teaching style based on the fundamental dimensions of any profession such as thinking, performance, and acting with integrity [6]. Shulman's key idea based on the statement that professional knowledge is more than academic discipline and needed in special methods in order to teach how to think like a real professional, including values and hopes of the profession. Structuring the educational process based on the signature approach allows systematizing forms of professional activity and implementing them into the learning process by the means of online tools.

2 Background

2.1 Signature pedagogy within subject fields

The term of signature pedagogy was coined by Shulman for the explanation of educational methods for professional preparation in the fields of medicine, law, and clergy. The scholar was defined by this term the "types of teaching that organize the fundamental ways in which future practitioners are educated for their new professions" [6, p. 52]. According to his works, this approach provides the forms of instructions which correspond to the preparation process of particular professions. Based on the Carnegie Foundation's studies, Shulman emphasizes the leading trends of preparation for the professions among three main practical dimensions such as the intellectual, the technical, and the moral. This theory allows to conceptualize the choice of teaching methods for preparing future specialists by training their skills precisely.

Follow him, other researchers implied this approach in different subject fields including teacher education, psychology, history, journalism, and arts. According to professional activity, researchers suggest specific methods for each subject field study. For initial education they promote the method of activization of multidimensional

thinking skills [7]. The improvement of school leadership through watching the specific movies in the middle school based on the signature pedagogy for the development of the critical thinking skills [8]. For the postgraduate students the signature pedagogy was implemented through the research method [9].

The signature pedagogy was widely used in Arts and Humanities. For the development of students' writing skills, the method of critique was applied [10]. In the high school history class, the method of case study showed its efficiency [11], as well as in an orchestral composer workshop [12]. For the future journalists, preparing the integrated learning as a signature pedagogy was implemented [13]. The method of critique was the most popular in art classes, including teaching theater performing [14], graphic design [15], and modern choreography [16]. An attempt to describe the signature pedagogy in music theory and performance also was noted [17]. Despite that, we did not find an example where the music teacher signature pedagogy was covered by the detail structure of signature pedagogy approach.

Moreover, Shulman in his works did not explain the music teacher signature pedagogy directly. Considering the referring of music to the art education in general, we can establish the analogy with another subject area, described by him. The scholar mentioned the art preparation in one row with clergy education, which he characterizes as the development of habits of heart. That is why it is possible to assume that the main dimension of the music teacher signature pedagogy will be the moral aspect. In the frames of the future music teacher educational process where the students are engaged by the teacher for the experiments and collaborative work, while the critique and comments are provided by their instructor, this suggestion seems to be reasonable.

2.2 Design of an online course by using SPOC

Among wide range of online course types, the educational trend to design a resource for small number of participants to satisfy their specific learning needs was appeared. This trend was supported by the creation of SPOC (Small Private Online Course), invented by Fox [18] at the University of Berkeley. A new course presented the adaptation of MOOCs tending to personalize learning [19]. This was the next stage in education technologies in comparison with MOOCs, which spread out the general knowledge for large groups. Close interaction of tutor with students in SPOC facilitates intensive students' engagement through intimate relationship between all the participants. In addition, SPOC has kept on providing access to information resources, including electronic libraries; it provides knowledge through lectures, evaluates learning outcomes and creates an educational community for the exchange of learning experiences.

Among the variety of MOOCs providing music education including history and theory of music, playing instruments or vocal singing, creating compositions or improvisations through the platform of Coursera, none of them provides personalization in this field. At the same, time the research work of Pike in teaching by Skype for playing the instruments demonstrated positive results and advantages of the online interaction in comparison with traditional face-to-face practice [20]. Based on literature review, the gap between the high development of modern computer tools and online courses for future music teachers covering the complexity of their professional activity is large.

2.3 Standardization of music teacher professional activity

General school education includes music as a mandatory class in the curriculum in all civilized countries. Despite some elements of the content of this class differs depended on national traditions, the core of music activities follows the constant standard of music education.

The fundamental set of children' activities in general school music class demonstrates the USA National Standard for Music Education [21], which includes:

- Singing, alone and with others, a varied repertoire of music.
- Performing on instruments, alone and with others, a varied repertoire of music.
- Improvising melodies, variations, and accompaniments.
- Composing and arranging music within specified guidelines.
- Reading and notating music.
- Listening to, analyzing, and describing music.
- Evaluating music and music performances.
- Understanding relationships between music, the other arts, and disciplines outside the arts.
- Understanding music in relation to history and culture.

The implementation of this set tends the main goal of music education the improvement of musical intelligence which defined by Gardner as ability to perform, compose, and appreciate music and musical patterns [22].

The standard set of music lesson activities in Russian schools very close to the USA list. It includes vocal singing and playing musical instruments alone and with others. Developing of music listening skills, the study of history and theory of music and composer activity in order to foster the creative skills present the pivotal part of the educational process. The study of relationships between music and other arts delivered by music-mediated and musical poly-artistic activities are required, too [23].

Based on the Shulmans' definition and the comparison of general school music education standards, three dimensions of music teacher signature pedagogy were characterized. The surface structure of music teacher signature pedagogy is featured as the complex of schoolchildren activities, which include, according to the standard vocal and instrumental performing, composing and improvising, reading, notating, listening, analyzing, describing and evaluating music, and performing music, as well as understanding music in relation to other arts, disciplines outside the arts, and to history and culture. During the training process future music teachers improves their own skills, as well as how to teach all these forms of activities.

The deep structure of music teacher signature pedagogy tends to intensify students in professional activity through their engagement study process developing and implementation new methods. Students are trying to identify the relevant problems and gaps in music education due to the task of improvement in children' skills and increasing the effectiveness of the process. Moreover, they are engaged in the developing new teaching strategies and using learning tools for future implementing of them at school.

The implicit structure of music teacher signature pedagogy ensures the students awareness in values and dispositions of real professionals, who implement the standard point in school practice. Posing the challenges from the social reality which needs

to solve the problems and to bridge the gaps in wide context including economical, political and other areas that tend to redirect the traditions of the music education or significantly upgrade them, students elaborate how to think as a real specialist.

Based on studies of the relevant issues in the fields of professional training, online learning and standardization in music education, the objectives were stated of the investigation:

- i. What types of activities includes the signature pedagogy of music teacher preparation process?
- ii. Which online tools can replace face-to-face learning in time of emergency in music teacher professional preparation?

2.4 Design of SPOC based on signature pedagogy

To bridge the gap between academic knowledge and professional practice, the small private online course in the LMS MOODLE for future music teachers based on signature pedagogy was designed. This resource allows for the coverage of the hours which, according to the curriculum, was intended for the specific practicum where students are training traditional music teacher' professional skills. The course consists of four modules which match the main trends of learning goals from the beginning to the graduating of the bachelor program: Perception, Performance, Creation, and Research. Each of these modules includes learning tasks for different levels. That is why students can repeat them several times during the study.

The course is implemented by using MOODLE resources. It consists of theoretical lectures, webpages, quizzes, tests, fora, chats, attached external tools for webinars, and more. The content of these resources satisfies the requirements of the curriculum for the bachelor program of music education.

The crucial component of Shulman' theory is the engagement of students in performing their future professional roles—in particular, in the art class they are doing that through artistic creativity, musical performance, active critics, challenges, and commenting artistic works of each other. All these activities were delivered by designed SPOC based on signature pedagogy approach. The learning activities were designed and structured by three fundamental dimensions of the signature pedagogy: surface structure (all forms of interaction between educational process participants), deep structure (a set of assumptions about how to impart a subject knowledge), and implicit structure (values and dispositions of real professional activity) [24].

Following Shulman's model, the surface structure was implemented by the full set of school children music lesson activities according to the standard of music education. For training vocal and instrumental performing skills students recorded themselves and sent their records to a teacher for feedback. In the frameworks of performance practice students prepared ensemble records by using of the telematics technology. Students had been training their creative skills in the preparation of art compositions by combining poetry with music. The skills of listening to music, understanding, and evaluating were trained through the method of essay written by students. By chat, teachers delivered individual and group consulting, provided personal advice for improvement skills, and managed of the process. During the workshop, teachers organized the online discussion for challenging and commenting music experience among all the students.

The implementation of the deep structure provided specific methods for stimulation of music teacher pedagogical skills. For this purpose, the project work was organized. Students designed some didactic improvements for general school educational process. They put themselves in the position of a music teacher; they had been creating new methods and means to foster school children music skills. By the online meeting, students received the personal university teacher's consultation for chosen the research trend for the projecting work. The instructions about the formal details how to prepare the project were delivered by teacher online and by the means of the resource "lecture" in the online course. The web and digital sources including subject internet sites, books, and articles provided by SPOC were useful for this work. Furthermore, the artistic projects were prepared. Students recorded solo and ensemble instrumental and vocal compositions by using online tools. In this work, students trained their pedagogical skills of organizers, who decides collectively how to improve their music records. All this work had taken place in online way only.

According to Shulman's definition of implicit structure, the specific forms of learning activity were included into the course. These forms provided the professional development through awareness in music teacher values, attitudes and dispositions. For this purpose, interaction with schoolteachers who have real practice was organized. This interaction included watching a video of school music lessons, visiting specify sites, interviewing school teachers, reading information about them, and organizing events for school children. The discussions of critical issues, which are strongly relevant in modern general school music education, had taken a pivotal role. The arguing of actual problems and discussion of contrary arguments to promote effective solutions were organized in online workshops and off-line forums. Through all these forms of activity, students' engagement in the core of music teacher professional experience was increased through fostering of their awareness in moral aspects of the real school practice.

The SPOC based on signature pedagogy allowed to gather in one course systematically the music teacher professional competence. The fundamental set of general school children's activities in music class and three levels of Shulmans' signature pedagogy for promoting the professional knowledge, skills, and ability to work with integrity was implemented by the means of MOODLE tools in online environment.

3 Materials and methods

3.1 Study design and settings

Due to the COVID-19 pandemic, the education process was shifted into the online methodology. The exploratory study design was used to uncover the effectiveness of the SPOC based on signature pedagogy in the replacing the music teacher professional training in a remote way. This study was conducted at the Kazan Federal University. The study population comprised 42 undergraduate students who studied music teacher curricula during the academic year 2021–2022. Data were collected from one academic semester during September 1, 2021, to January 31, 2022. All these students were enrolled to the SPOC for training special music teacher professional skills. The effectiveness of the course was studied by questionnaires through an online tool.

Ethical clearance to carry out the study was attained from Kazan Federal University policy the processing of personal data. Students were informed about the purpose of the study. Those who did agree to participate signed a consent electronic form. The survey was anonymized to protect the identities of the students [25].

3.2 Instruments

The data were collected by the quantitative study using the method of teacher' assessment. For this purpose, the seven learning tasks were selected, which demonstrate the effectiveness of students' online activities. The tasks included Solo performance (SP), Ensemble performance (EP), Composing (Cm), Music lesson design (MLD), Essay (Es), Music-poetry composition (MPC), and Project work (PW). In total, these tasks covered the set of learning activities and were established based on the signature pedagogy approach. The teacher evaluated each task during the learning process by using a five-point Likert scale.

The score of solo performance included the average sum of the evaluation of students' instrumental performance and vocal singing. The ensemble performance was evaluated during the group presentation in the vocal and instrumental ensemble, while each student received the score reflecting his/her personal performance. The task of composing demonstrated the creation of musical compositions or improvising according to the teacher's instruction. Each student presented the design of a music lesson, including the subject explanation and choosing illustrations in order to implement it in in school. The skills of listening, analyzing, describing, and evaluating music were demonstrated in the task of essay, in which students showed the critical analysis of music. The creative skills students also demonstrated in the task of music-poetry compositions, which they prepared based on their understanding of music in relation to the history of art and culture. The realization of project work needed the students' knowledge in music education theory and methods, as well as the relationship of music with other arts and disciplines outside the arts.

3.3 Statistical analysis

All the receiving data were proved be statistical methods of median, standard deviation, and Pearson's correlation.

The method of median provided the value, which was featured as a "typical" separating the higher half from the lower half among the score results of students. In comparison with the method of the mean, the median eliminates the skewing by a small proportion of extremely large or small values and ensures a better representation of the results.

The statistical method of standard deviation provides the measuring of the amount of variation or dispersion of a set of values. This method indicates the differences between the results of each respondent. The low standard deviation proves the similarity of all the results, while the high index shows that data are spread out over a wider range.

The coefficient of the Pearson's correlation is a measure of linear correlation between two sets of data. The method reflects a linear correlation, while it ignores some other types of relationships. This coefficient will be useful in cases when a researcher studies how the sets of data correlates among each one.

4 Results

Out of 42 participants, all of them completed all the tasks, demonstrating a response rate of 100%. Among the respondents, males accounted for 16.6% (n = 7), and females accounted for 83.3% (n = 35).

4.1 Evaluation of online music training

The obtained results of the median of the students’ music teacher activities assessment were not less than 4.4, close to max 5. That means the most part of the student cohort demonstrated high results in doing the online tasks. The results of standard deviation for each scale did not exceed 0.88, and all of them were very close to 1. This means there were no statistically significant differences among all the assessments, received by students in the process of online training.

The data (median and standard deviations) and Pearson’s correlations for the items of assessment are displayed in Table 1. The correlation among all data were positive, significant, and in the expected direction. The positive correlation among the results of each learning task let us state their sufficiency as a set of activities, featured as music teacher signature pedagogy.

Table 1. The scores and statistical results of the teacher’s assessment

Learning Tasks	Median	Standard Deviation	SP	EP	Cm	MLD	Es	MPC
Solo performance (SP)	4.8	0.98						
Ensemble performance (EP)	4.6	1.03	.56					
Composing (Cm)	4.5	1.11	.36	.41				
Music lesson design (MLD)	4.7	0.88	.45	.56	.38			
Essay (Es)	4.4	1.34	.46	.35	.56	.56		
Music-poetry composition (MPC)	4.9	0.99	.48	.28	.76	.47	.37	
Project work (PW)	4.6	1.15	.39	.64	.58	.57	.67	.78

Note: All coefficients are significant ($p < 0.01$).

5 Discussion

5.1 Online music training

Since the last decades, online learning has gradually become a critical issue in the modern education system and an important trend for future development of education. However, this trend has only partially affected music training. In the recent past, the experience in training music performing skills online was extremely unique, covering several courses on the platform Coursera and individual researchers’ experimental work due to delivering music lessons bridging social or location limitations [20].

The noticeable changes in the music education appeared after the world lockdown due to the COVID-19 pandemic in 2020 when universities all over the world were forced to shift the educational process from face-to-face to online. New conditions required rapid fostering academic approaches in order to satisfy educational purposes. In this respect, several subject fields like music needed in specific tools for providing personal student-teacher interaction. In contrary to the massive open online courses and others assuring the fast spreading of the knowledge, the using of small private online course offered personalization in teaching process. This type of online training allows the teacher being attentive with each student following the traditions and covering professional specific of music education.

5.2 Implementation of signature pedagogy in future music teacher' online training

Before the pandemic period the online training of musical performing skills was very rarely used topic in global researches. Among several papers studied, the possibility to teach music online the research work of Pike [20] could be highlighted. She investigated social benefits and difficulties of the teaching piano by Skype. These lessons allowed to eliminated location and social gaps in learning piano performing skills remotely [20]. The crucial element of these lessons was the lack of personal interaction, while in traditional piano class, a teacher feels free to correct a student's hand or sitting position. In the Pike' experiment, this lack was not a critical problem, and students without direct teacher interaction were able to choose their own comfortable way of playing piano. What is more, teachers began to explain their advice in more concise way, as direct instructions, which were very clear in delivering the objectives of the lesson and providing the improvements of the students' skills.

During the online learning by using SPOC, students used to practice different performing activities. Each student was enrolled in solo performing activity, such as piano, vocal, and choir conducting class. They participated regularly group practice in the class of music ensemble. These activities were organized by using tools of music recording and individual chat with a teacher. Each week, a student had to prepare the record of music performance and send it to the teacher, who gave him feedback with comments and instructions for the improvement. From the first days of this practice, each student used to take a lot of attempts in order to record the best performance, without any mistakes. So before students received a teacher's feedback, they had a fruitful self-improvement practice, because they had to listen critically to their own records and try to do it better.

In addition to the performing classes, students received tasks in composition and improvising online. According to the topic giving by teacher, they composed songs and musical pieces by themselves and then loaded these records in the SPOC and in the connected page in network YouTube for global sharing. Among the creative tasks was the preparing music-poetry compositions. Students were free in selecting topics and artistic ideas in this work. During the process, the majority of students demonstrated their artistic capacity and creativity. They recorded very attractive music-poetry compositions, which were acknowledged by an audience through the

sharing in YouTube. This work was productive in practice by using the computer technology of telematic that allowed to create group compositions online and combine several videos step-by-step. This work needs more advance skills when playing in an ensemble, because each participant must follow the previous records directly.

The significant benefits of online interaction with future music teachers by using SPOC were the individual chats of a teacher with students. The features of this work were the texting of all the teacher's instructions and structuring them. Students followed them precisely, while they were able to read these instructions as many times, as they needed. The valuable achievements of learning process in performing classes and project works were noted through this way of student-teacher interaction.

6 Conclusions

The research work results let us conclude that the online tools can replace face-to-face learning in a case of emergency, like the COVID-19 pandemic. The design of a small private online course (SPOC) based on the signature pedagogy implemented by features of music teacher activity allowed students to improve their professional skills. What is more, the process promoted the student-teacher interaction and opportunity to offer for every student task in the field of his/her personal environment significantly increased. The perspective of design being flexible, adaptive, and a meaningful educational resource to accommodate students learning, work, and life goals was noticed [26].

The experimental results showed a high level of students' music teacher activities in the process of doing by them learning tasks. The positive correlation among all the students' activities after online training based on the signature pedagogy proved the effectiveness of the process and verified the sufficiency of using this set of activities as a music teacher signature pedagogy. Based on the obtained results, the possibility of implementation SPOC based on signature pedagogy for future music teacher' online training was confirmed.

This research has some limitations, such as the number of students were engaged in the experiment, while the same curricula studying by more students at the University in total. Therefore, only senior students participated, and their effectiveness in doing online tasks were assessed.

Despite the limitations, some benefits of implementation of SPOC based on signature pedagogy were noted, such as unlimited access to learning content, close personal interaction between a teacher and students, and self-improvement students' practice.

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