

Comparative Perspectives on AI-Assisted Music Education in China, Ukraine, and Belarus

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Abstract: Artificial intelligence (AI) is changing how music is taught all over the world by making individualised teaching plans, giving specific performance feedback, and offering new ways for students to create music. However, due to the constraints of the national curriculum, institutional structure and traditional cultural values of musical artistry, these advanced technologies are also limited in terms of educational value and application. Systematically compare the introduction and development paths of AI-assisted music education in China, Ukraine and Belarus in this paper. According to the latest educational policy system, empirical studies of digital learning, and representative pedagogical projects, this paper examines the deep similarities and notable differences in governance, pedagogical application, technological facilities, and cultural attitudes towards the automation of music education. Based on the above analysis, although all three countries are fully aware of the vast opportunities provided by adaptive practice algorithms and inclusive participation through digital platforms, their structural deficiencies differ significantly. China has deployed a large number of state-supported facilities for the expansion of AI tools, while Ukraine's primary use of digital platforms has been to cope with the serious disruptions in life due to the COVID-19 pandemic and the ongoing war. Belarus is relatively reluctant to introduce digital technology in the main building of the conservatory at the moment. Based on the above comparison, a model for implementing AI-assisted music education with cultural sensitivity has been proposed. The three parts of this system will be: protecting teachers' initiative, boosting students' innate musicality, and aligning the introduction of new media with the local school curriculum and cultural inheritance.

Keywords: Music Education, Artificial Intelligence, Comparative Study, Culturally Responsive Pedagogy, China, Ukraine, Belarus.

1. Introduction

Artificial intelligence is being applied in more and more ways around the world to change how music is taught and learned at schools. High-end virtual tutors, AI-powered algorithmic composition tools and automatic performance analysis systems are all developing at an unprecedented speed to change the way primary and secondary schools, as well as top-tier universities teach and grade. The Degree of technology integration varies greatly from place to place due to differing regional policies and economic conditions. Rapidly expanding in China, digital music education and AI-assisted teaching tools are now being promoted by all-weather national strategies that aim to lead in artificial intelligence development and modernise cultural industries. The pace of digitalising in Ukraine has been significantly accelerated due to severe external crises; combined with the catastrophic effects of the global pandemic and the subsequent martial law, an urgent large-scale expansion of digital platforms and remote online music classes was required to ensure uninterrupted education. At the same time, the approach in Belarus remains relatively conservative and methodical; thus far, universities have gradually added courses on digital literacy and AI to the curriculum, but they are still rooted in the traditional eastern European conservatory model. These technologies have been applied widely in music education, and two sides have emerged. On the one hand, artificial intelligence can design customised training plans for students of different abilities according to their own strengths and weaknesses, and promptly provide them with objective feedback on pitch and expression. These tools are for the general public and provide some new ways for students without access to physical instruments or expensive private

lessons to be creative. At the same time, the strong momentum for automation poses deep-seated, fundamental questions about what music is. Educators and theorists have frequently raised concerns about whether algorithmic evaluation will reduce the subjective artistry of music teaching, if it might lead to a loss of the teacher's original charm, and whether standardized technological tools are too impersonal for local cultural expressions in music education. The first purpose of this paper is to explore the various forms of application for AI-assisted music education in China, Ukraine and Belarus. No longer limited to the idea that artificial intelligence is all-encompassing in education, this paper will investigate specific uses of such tools in various teaching situations, their place in the current institutional system, and what cultural conditions support or obstruct their deployment. Based on the above regional differences, this paper will build a strong theoretical foundation to help design music education projects that integrate artificial intelligence in a way that is both musically authentic and culturally rich. By organising a systematic study of the above three different environments, this research intends to offer all-encompassing reference materials for both the practical application and philosophical connotations of advanced digital technology in arts education.

2. Research Questions and Method

The research aims and limits of the study on technological integration in music education need to be clarified. The three main research problems of this paper are as follows. First, what kind of artificial intelligence is currently being applied to music education at both the secondary and tertiary levels in China, Ukraine and Belarus? Second, what are the characteristic patterns and cultural differences in the main objectives, selected instruments, pedagogical applications,

etc., of AI-assisted music education in the three countries? Third, what necessary contents should the culturally responsive implementation system contain to effectively lead policymakers and educators in designing new AI-assisted music projects? The research will use the following methods. Collect primary policy documents, recent academic research and institutional project reports on digital music education and artificial intelligence applications in the three target countries [5-7], and then synthesize them in the study. In addition to the analysis of this documentary, several concrete examples of illustrative projects will also be introduced, such as the application of AI-based algorithmic ear-training programs, grid-based digital notation systems in remote learning, and broad surveys on the adoption of digital music education [10]. The purpose of this qualitative study is not to find out why the system was not used or how many people did not use it. Therefore, the focus will be on introducing new teaching models and offering strong theoretical support for assisting music teachers in making informed choices about technology integration [3]. The way to do this is to focus on the qualitative analysis of the role of teachers, how to promote students' creativity, and in what way to connect AI tools with the existing cultural system, as well as understanding that technology should serve to extend human musical experience rather than replace it [1]. In light of the above, we must be aware that the results are in the specific socio-political environments of each country, and the success of technological integration is also influenced by broader changes in education policy and institutional resources [2]. Therefore, the constructed implementation framework will not be a purely theoretical product but will instead serve as a high-efficiency instrument for addressing actual teaching-learning difficulties.

3. AI-assisted Music Education in China

In the past ten years, the Chinese government has actively promoted the development of high-end information technology in education across the country. Within the scope of music education, this initiative has taken the form of widespread use of computer-aided ear training software, intelligent digital pianos and advanced networked ensemble platforms [5]. Recently, the all-weather national strategies for artificial intelligence in education have begun to explicitly include music and the arts in their broad objectives of building smart campuses and fostering universal AI literacy. Therefore, in recent years, academic research in China on AI in music education has expanded rapidly, with many advanced studies focusing on AI-assisted algorithmic composition, deep-learning performance analysis, and technologically enhanced teacher training methods [9]. At present, AI-assisted music education in China is generally composed of two parts: large-scale, state-sponsored infrastructure projects and agile, localised commercial innovations. Public schools and universities in big cities are also using AI tools to conduct research on instant-feedback, automated assessments of pitch accuracy and rhythmic precision, and automatically generate harmonic accompaniments for soloists [10]. The above devices are suitable for dealing with a large number of students. At the same time, the private educational sector has also taken advantage of this trend to develop many high-tech platforms and after-school classes that use AI to provide personalized music lessons, vocal training and basic music

theory instruction [5]. The first reason for connecting the above devices is practical: to improve the efficiency of teaching significantly, provide students with immediate, objective feedback on their own work, and reduce the large amount of time music teachers have to grade for all students [9]. Therefore, artificial intelligence is generally considered an outstanding, continuous assistant that can improve the mechanical and technical elements of music study, thereby allowing teachers to focus more on higher-level interpretation and expression guidance [1]. The above focus on technological optimisation also reflects the general mood of society towards automation, and as a result, progress that can be objectively observed has gained approval for the introduction of AI tools in traditional music teaching institutions [2].

4. Crisis Management and Digital Adaptation in Ukraine

The development paths of digital and AI-assisted music education in Ukraine are far from uniform; they have all been shaped by the circumstances of the crisis and institutional stability. The first development in Ukrainian educational technology was accelerated by the spread of COVID-19, and its development has continued under the conditions of martial law since [6]. With the wide-ranging damage to educational facilities and the mass evacuation of students and teachers, Ukrainian music institutions were compelled to transition to an all-distance learning mode promptly [8]. Therefore, the combination of digital tools and initial AI applications in Ukraine is no longer seen as an improvement to teaching, but as a necessity for the continuation of the education system. Educators in Ukrainian higher music education have been using various digital platforms to hold remote vocal and instrumental juries recently, and at the same time, algorithmic tools have been employed to address latency problems in synchronous online ensembles [8]. Although the use of high-end, custom-built AI music software may be less common in China due to severe resource constraints, accessible cloud-based digital audio workstations and AI-enhanced recording tools have begun to be used [6]. The above technologies can help the displaced students continue their creative work and compose asynchronously, while also receiving remote evaluations from their teachers. Therefore, the culture of these tools in Ukraine is rather utilitarian and life-oriented. Digital technology has provided support for the preservation of national musical heritage and maintained the continuity of education at the conservatory level during recent geopolitical tensions [6, 8]. In addition, the application of these tools has demonstrated that students and teachers are highly adaptable; thus, even in the face of poor infrastructure, digital innovation can be employed to close the distance and maintain the quality of artistic education. The Ukrainian case clearly shows that the worth of educational technology does not stem from high-end features alone but also from its ability to maintain education under extraordinary changes in the system [6].

5. Traditional Frameworks and Cautious Integration in Belarus

The republic of Belarus is the third different model for the integration of AI-assisted music education. The Belarusian model is to introduce new technologies and learning tools gradually within the framework of traditional teaching in a planned way. Higher education institutions in Belarus

continue to be dominated by the classical and rigorous methods of the eastern European conservatory tradition, and intense one-on-one instruction and the refinement of acoustic instrumental technique remain the primary focuses [4]. However, in light of the unavoidable change in the world of digitalisation, Belarusian universities are beginning to revise their courses to add music-computer technology and basic digital skills for future music teachers. Unlike the large-scale commercial applications of AI in China and Ukraine for crisis response, the application of AI in Belarus is currently limited to some special academic scenarios. At present, most of the courses that use digital tools are focused on music production, sound engineering, and contemporary composition, and are not widely applied to the assessment of classical performance [7]. Educators in Belarus are often quite hesitant about using automation for music assessment, and they have long felt that artificial intelligence is unable to grasp the subtle emotional expression and subjective artistry that are integral to their cultural literacy in music [3, 4]. Therefore, although AI tools are used for specific technical disciplines to some extent, the main task of performance education is still to be handled by teachers, and the traditional teacher-student model will not be disrupted by computers. Therefore, in order to protect the value of historical teaching methods, we need to make some adjustments; at the same time, new technological skills should be taught to prepare young people for the times. Therefore, Belarus can be viewed as an exemplary case of institutional support for the application of technology in teaching traditional Chinese music [7].

6. Culturally Responsive Implementation Framework

Based on the comparison of China, Ukraine and Belarus, it can be seen that a uniform, all-encompassing method for integrating artificial intelligence in music education is fundamentally unfeasible. Given the various conditions on the ground, educators and policymakers need to create a culture-sensitive implementation model. The first core of the system is Pedagogical Alignment. Select and set up AI tools that are suitable for the specific educational goals of this area. If the institution emphasises strict classical techniques, AI can be used to help students learn correct intonation and rhythm more precisely; if it focuses on modern composition, generative AI algorithms can be employed to stimulate students' creative ideas [2, 7]. Technology should support teaching and learning, not lead it. The second is the Protection of Teachers' Autonomy. Across all three countries, people are anxious about automation. A culturally sensitive system for supporting teachers will be introduced, not one to replace them [1]. Teachers should still be responsible for the final evaluation and aesthetic judgement, and only use the objective data provided by AI as a reference [9]. Thirdly, Language and accessibility need to be enhanced. To help AI tools actively support and accurately reflect the particularly musical cultures and various backgrounds of the students, their software interface localisation, digital notation systems and algorithmic repertoires need to be adapted to the local context. Given the differences in dialects across the country, special attention will be paid to local speech and culture in the construction of the intelligent system. Resilient infrastructure and teacher training have also been left out. Substantial investment is needed in hardware and software accessibility, comprehensive professional training, and other ways to make

music teachers feel capable and confident about using artificial intelligence in teaching, ensemble coordination and assessment [10]. Provide continued support and regular training for the new system to prevent faculty members from being left out of the digital age. Based on the four basic principles, schools will be able to use the excellent efficiency and power of artificial intelligence to enhance the work of music education in a way that is still close to the people and the culture.

7. Conclusion

The integration of AI-assisted music education has advanced across China, Ukraine and Belarus under different national policies, various socio-political circumstances at present, and long-established teaching traditions. China uses these technologies to achieve large-scale optimisation of education and scale, but Ukraine needs them for the basic survival of its institutions in the face of serious conflict; Belarus, on the other hand, integrates them cautiously into a very defensive traditional conservatory model. Despite the different situations, a common story is emerging: artificial intelligence is expected to provide personalised learning paths, support the creation of new works, and expand the scope of music education. However, the basic problem for music educators and national policymakers is not whether to use AI, but rather how to make a sound plan for implementing powerful AI tools to promote the modernisation of local music culture and at the same time protect the professional autonomy of educators and the artistic integrity of students. A culturally responsive implementation framework needs to align with teaching, provide choices for teachers, be easy to learn, and build a strong infrastructure to support the current period of global change. Given the above factors, the world's music education community hopes that artificial intelligence can help foster the development of creativity in people. This well-organized way will help spread advanced technology and bring about large-scale, long-lasting changes for students all over the country, improving their education while also preserving the original culture and emotions of music education.

References

- [1] Brown, A. R. (2007). *Music technology and education: Amplifying musicality*. Routledge.
- [2] Holland, S. (2000). Artificial intelligence in music education: A critical review. In E. R. Miranda (Ed.), *Readings in music and artificial intelligence* (pp. 239–274). Routledge.
- [3] Hodges, D. A., & Sebald, D. C. (2011). *Music in the human experience: An introduction to music psychology*. Routledge.
- [4] Gorbunova, I. B., & Pankova, A. A. (2014). Computer music in the teacher-musician training. *Mediamusic*, (3).
- [5] Ho, W. C. (2023). *Culture, creativity, and music education in China: Developments and challenges*. Routledge.
- [6] Yatsukh, O. (2025). Educational innovations and digital technologies as an opportunity to improve the educational environment in Ukraine during martial law. *European Humanities Studies: State and Society*, 1(1), 68–81.
- [7] Alieva, I. G., Gorbunova, I. B., & Mezentseva, S. V. (2019). Music computer technologies as a worth-while means of folklore studying, preserving and transmission. *Utopia y Praxis Latinoamericana*, 24(Extra 6), 118–131.

- [8] Vyshynskiy, V., & Yahodzynska, I. (2017). Distance learning for music disciplines in higher education: Challenges and prospects. In *Society. Integration. Education. Proceedings of the International Scientific Conference* (Vol. 3, pp. 585–598).
- [9] Ho, W. C. (2004). Attitudes towards information technology in music learning among Hong Kong Chinese boys and girls. *British Journal of Music Education*, 21(2), 143–161.
- [10] Qing, Z. (2023). Value-oriented music education in Belarus and China: Comparative analysis of the regulatory framework. *Business. Education. Law*, 2(63), 346–353.