

Original Research Article

Research on innovation and practice of digital empowerment in piano teaching reform in higher vocational colleges

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Abstract: The national digital education strategy has advanced the in-depth transformation of aesthetic education in vocational education, while traditional piano teaching faces prominent problems such as inadequate model adaptability, insufficient resources, and simplistic evaluation. Based on the talent training orientation of higher vocational colleges, this paper analyzes the core dilemmas of current piano teaching and explores innovative digital empowerment paths from teaching philosophy, mode, resources and evaluation. It proposes targeted practical strategies to support the high-quality development and digital transformation of piano teaching in vocational colleges.

Keywords: digital empowerment; higher vocational colleges; piano teaching; teaching reform; aesthetic education

1. Research background and significance

With the continuous advancement of the national digital education strategy, aesthetic education in vocational education has entered a stage of comprehensive and systematic reform. The in-depth integration of digital technology and professional courses has become a core direction of teaching reform in higher vocational education. The clearly states that digital technology should be relied on to reshape talent training models and build an intelligent and personalized new ecosystem of vocational education, providing policy guidance for the reform of art courses in higher vocational colleges. As a core practical course for majors such as preschool education and music performance in vocational colleges, piano teaching focuses on skill practice and applied competence cultivation and serves as a crucial carrier for implementing vocational aesthetic education.

For a long time, piano teaching in higher vocational colleges has adopted a traditional teaching system, featuring rigid teaching modes, outdated teaching resources, insufficient teacher-student interaction, and one-sided evaluation systems. Such problems fail to adapt to the learning characteristics of vocational students with uneven learning foundations and practical-oriented learning demands, and cannot meet the high-quality development requirements of modern vocational aesthetic education. Empowered by big data, artificial intelligence, virtual simulation and other digital technologies, the barriers of time, space and resources in traditional piano teaching can be broken, realizing precise teaching implementation, diversified teaching resources and comprehensive teaching evaluation, and effectively making up for the deficiencies of current vocational piano teaching. Therefore, exploring the reform paths and practical innovations of digitally empowered piano teaching has important practical value for optimizing the vocational aesthetic education system and cultivating compound artistic talents^[1].

2. Core problems of current piano teaching in higher vocational colleges

Based on practical teaching experience and existing research, the dilemmas of piano teaching in higher vocational colleges are mainly reflected in teaching implementation, resource construction, teachers' competence and evaluation system, which hinder digital transformation. Traditional vocational piano teaching mostly adopts a one-way teaching mode of "teacher demonstration and student imitation" with rigid teaching methods and insufficient classroom interaction. Teaching is largely based on teachers' personal experience and fixed textbooks, lacking updated modern music elements and industry frontier

content. It fails to meet personalized learning needs, resulting in low student initiative and insufficient cultivation of innovative ability.

In terms of teaching resources, most vocational colleges have not constructed systematic digital piano teaching resource libraries. High-quality scores, demonstration videos and practical tutorials are fragmented and lack unified integration and dynamic updating, with inadequate inter-college resource sharing mechanisms and low resource utilization efficiency. In addition, the allocation of digital teaching hardware is insufficient, and the coverage of intelligent piano and virtual simulation teaching equipment is limited, restricting the normalized implementation of digital teaching modes. In terms of teachers' development, many piano teachers lack systematic digital teaching literacy. They can only carry out basic multimedia teaching but are incompetent in digital teaching design, data-based learning situation analysis and intelligent tool application, making it difficult to realize in-depth integration of digital technology and piano teaching.

The lagging teaching evaluation system is a key bottleneck restricting teaching quality improvement. Current vocational piano teaching evaluation mainly focuses on final performance results and technical proficiency assessment, ignoring the comprehensive assessment of students' learning process, practice status, aesthetic literacy and innovative ability. The evaluation method is single and highly subjective, unable to fully reflect students' growth and teaching effectiveness, and fails to form a closed-loop mechanism for teaching optimization.

3. Innovative reform paths of digitally empowered piano teaching in higher vocational colleges

3.1. Updating teaching philosophy to anchor digital education orientation

The primary step of digitally empowered piano teaching reform is the iteration of teaching philosophy, breaking the traditional teaching logic of "emphasizing skills over literacy and results over processes". Based on the orientation of vocational education, higher vocational colleges should establish a digital teaching philosophy of "technology empowerment, literacy orientation and student-centered teaching", integrating digital literacy improvement, personalized competence cultivation and professional aesthetic shaping into the whole process of piano teaching. Teachers need to transform from pure skill instructors to teaching designers, learning guides and literacy cultivators. Relying on digital technology to identify individual student differences, they should focus on cultivating students' post adaptability, balancing technical training, musical aesthetic perception and innovative ability cultivation, so as to conform to the aesthetic education goals of modern vocational education^[2].

3.2. Innovating teaching modes to build an online-offline integrated ecosystem

Relying on digital platforms and intelligent teaching tools, the piano teaching process can be reconstructed to form a blended teaching mode of "online independent learning + offline targeted practical training", solving the problems of time-space constraints and delayed feedback in traditional teaching. For online learning, teachers can upload hierarchical courseware, performance demonstration videos and music analysis resources through intelligent education platforms, set personalized learning tasks, and support students to arrange learning progress independently. With the help of intelligent piano practice systems, students can complete daily training, and the platform can collect learning data including practice duration, rhythm accuracy and fingering errors to form dynamic learning archives^[3].

Offline classroom teaching focuses on breaking through key and difficult points, technical correction, emotional expression and stage performance guidance. Virtual simulation technology is applied to build immersive performance scenarios, simulate real stage environments, relieve students' performance tension and improve practical training effectiveness. Guided by AI data analysis, teachers can conduct centralized explanation for common problems and targeted tutoring for individual problems, realizing the transformation from unified teaching to precise teaching and effectively improving classroom teaching efficiency and students' learning quality^[4].

3.3. Integrating digital resources to construct a systematic teaching resource system

To solve the problems of fragmentation, lagged updating and poor sharing of piano teaching resources, higher vocational colleges should build standardized, dynamic and shareable digital resource libraries.

In accordance with vocational talent training objectives and curriculum standards, diversified resources including basic skill tutorials, classic music analysis, modern music works, stage performance cases and teaching micro-lessons are systematically sorted by difficulty and teaching modules to adapt to students at different learning levels. Inter-college resource sharing mechanisms should be established to update teaching content with industry frontier cases and make up for the lag of traditional textbooks.

In addition, combined with the vocational characteristics of higher vocational education, expanded resources such as digital music creation, intelligent arrangement and modern piano performance are added to enrich the teaching system. It realizes the organic integration of traditional technical training and digital literacy cultivation, helping students adapt to the competency requirements of modern artistic posts.

3.4. Optimizing evaluation system to establish a data-based multi-dimensional evaluation mechanism

Based on big data technology, a three-dimensional evaluation system combining formative evaluation, summative evaluation and literacy evaluation is constructed to break the limitations of single result-oriented evaluation. Formative evaluation collects whole-process learning data such as online learning, after-class practice, classroom interaction and task completion through digital platforms to objectively record students' growth trajectory. Summative evaluation comprehensively assesses students' academic performance based on final performances, music interpretation and technical application. Literacy evaluation focuses on students' musical aesthetic ability, innovative thinking, stage performance and teamwork competence to realize all-round assessment of skills and literacy.

Furthermore, multi-dimensional evaluation methods including teacher evaluation, student self-evaluation and peer evaluation are adopted. The intelligent evaluation system generates visualized learning situation reports to accurately identify teaching deficiencies and students' weaknesses, providing data support for teaching strategy optimization and personalized tutoring, and forming a complete closed loop of "teaching implementation, data monitoring, evaluation feedback and teaching optimization".

4. Guarantee measures for digital teaching reform

To ensure the effective implementation of digitally empowered teaching reform, higher vocational colleges should improve the guarantee system from three dimensions: teachers' development, hardware construction and institutional management. In terms of teacher training, regular digital teaching competency training should be carried out, focusing on intelligent tool application, digital teaching design and learning data analysis. Teaching research platforms should be built to improve teachers' digital teaching ability and cultivate compound teaching teams. In terms of hardware construction, the configuration of intelligent piano classrooms, virtual simulation teaching equipment and digital teaching platforms should be optimized to support the normalized operation of digital teaching modes. In terms of system construction, incentive mechanisms for digital teaching innovation should be established to encourage teachers to carry out teaching reform research and promote the high-quality digital development of piano teaching^[5].

5. Conclusion

Digital empowerment provides a new reform path for piano teaching in higher vocational colleges, effectively solving the core problems of rigid teaching modes, insufficient resources, one-sided evaluation and inaccurate education in traditional teaching. Under the background of vocational education digital transformation, piano teaching in higher vocational colleges should adhere to the orientation of vocational aesthetic education, take digital technology as the core support, and comprehensively reconstruct the teaching system through updating teaching philosophy, innovating teaching modes, integrating digital resources and optimizing evaluation mechanisms. It promotes the transformation of piano teaching from simple skill training to comprehensive literacy cultivation and precise talent training, improves the overall quality of vocational aesthetic education, and cultivates high-quality compound artistic talents adapting to the development needs of the modern cultural and art industry.

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