ISSN 2522-6398 Vol. 8, Issue 8: 1-6, DOI: 10.25236/FER.2025.080801

Research on the Construction of Music Teaching Resources in Universities Based on Digital Platforms

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Abstract: *The rapid development of digital technology has created one-of-a-kind opportunities and difficulties for special construction music education resources in universities. At this present time, university teaching environments are undergoing profound changes. Traditional music education resources appear to fall short in three areas: accessibility, interactivity, and dynamic updating, leading them not to fully meet personalized and ubiquitous teaching needs. Because of their immeasurable strengths, integrated display, instant information interaction and sharing, digital platforms are presenting the central driving force reshaping the form of music education resources and teaching paradigms. By utilizing the strengths of digital platforms will allow for a systematic, normalized, shareable, adaptable, and applicable model of music resource construction, while developing an effective, expansive, and intelligent new resource ecosystem will bring significant concrete implications for improving teaching standards, modelling talent cultivation, and bringing new development insights within music disciplines.*

Keywords: *Higher Education Music Teaching; Digital Platforms; Teaching Resource Development*

1. Introduction

Music education in universities is undergoing a significant shift in the digital era. The existing range of music teaching resources vary, including sheet music, audio-visual recordings, demonstrations and so on. There has long been a bottleneck to their construction and management with limits to the presence of a multitude of resources, unsuitable or scant standards and poor sharing of practice. With poor means to scaffold meaningful acquisition of resources and facilitate deeper and more interactive applications to learners with traditional means, music and music education in universities are ripe for innovation. Digital platforms offer some real promise for system and aggregates, scalable and flexible, and interactively intelligent application to allow for a more systematic construction, standardisation, management and open-sharing of resource systems. The platform is a vehicle for resources, as well as a force for innovation and development in mode of teaching. From the perspective of music education in universities, it is important to consider its fundamental supporting role in helping to shape resource construction in theatre.

2. Characteristics of Music Teaching Resources in Higher Education Institutions and the Supporting Role of Digital Platforms

2.1 The Diverse Forms and Special Requirements of Music Teaching Resources in Higher Education Institutions

University music resources naturally present in various forms such as sheet music texts, performance demonstrations, and cultural historical materials. These materials not only contain rigorous symbol systems but also involve rich auditory experiences and profound historical contexts. Music educators, when facing these resources, need to balance the dual goals of artistic expression accuracy and cultural background integrity. Their teaching practice strongly relies on high-quality audio-visual materials to support skill transmission and cultural understanding. Digital platforms, with their powerful storage capabilities and flexible calling mechanisms, provide the basic conditions to meet the aforementioned complex needs. A vast library of sheet music from different regional styles, high-fidelity historical recordings, and multi-angle performance videos can be centrally archived and easily called upon. The technical characteristics of the platform naturally align with the special requirements of music resources for instant presentation, repeated observation, and multi-version

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comparison, effectively maintaining the quality standards and acquisition efficiency of these core teaching materials, and supporting teachers and students in obtaining the required content across time and space constraints [1].

2.2 The Core Enabling Value of Digital Platforms

The platform technology bears the responsibility of handling complex resource processing tasks, efficiently organizing vast amounts of scattered sheet music, audio and video, and background materials. The system's functions enable teachers and students to engage in dynamic score marking, segmented practice, and instant feedback. This interactive design significantly enhances the specificity of the music skill training process. The resource integration mechanism effectively connects theoretical literature, performance examples, and creative materials. The built-in collaboration tools on the platform allow teachers and students of different majors to conduct remote discussions and joint editing around specific music projects. Version control and permission management maintain a clear trail of resource updates and access security, while the metadata annotation system provides strong support for teachers and students to accurately locate teaching materials for specific styles or techniques. The platform environment essentially creates a virtual music workspace that transcends the boundaries of physical classrooms. Its core value lies in bringing together rich materials and interactive possibilities that are difficult to achieve in traditional classrooms under a unified interface.

2.3 Resource Development Objective System

The resource library must cover the complete teaching chain from basic music theory to advanced performance techniques, while accommodating representative works from different historical periods and regional styles. The construction team needs to carefully design a scientific and practical classification and cataloging system to ensure that each sheet music, recording, or document can be accurately placed and accompanied by detailed background descriptions. The materials themselves should have clear sound and visual quality and authoritative source information. The platform management system is responsible for continuously tracking resource usage feedback and regularly updating content. The setting of copyright agreements and access permissions must carefully consider the reasonable use boundaries of various resources, and metadata annotation work needs to deeply reveal the artistic characteristics and teaching points of the works. The final form of the resource system should be a dynamic knowledge collection with clear structure, fresh content, and easy expansion, which can closely meet the actual scenario needs of teaching and learning for music majors and teachers in universities, providing solid content support for courses at different levels.

3. Key Issues in Music Teaching Resource Development Based on Digital Platforms

3.1 Insufficient Systematic Development of High-Quality and Distinctive Resources

Construction teams often face the dilemma of scattered and lacking depth in the collection of unique resources. Valuable folk music materials from local colleges or unique research achievements of their own teachers fail to form a coherent curriculum resource chain. The content of the resource library tends to be biased towards common classic compositions and general theories, with a low proportion of specialized materials reflecting the discipline strengths of the school or the essence of regional music culture, and slow updates. The process of material integration lacks sufficient verification of version authority and academic background, resulting in the coexistence of sheet music or recordings of the same work from different sources, without clear thread organization and quality screening standards. Audio and video materials with unclear copyright ownership limit their open sharing scope on the platform. Precious historical archives or master class recordings are difficult to digitize and incorporate into regular teaching cycles due to licensing issues. Resource construction activities themselves lack long-term planning and sustained investment mechanisms, making the construction of unique thematic libraries often remain at the initial collection stage. This makes it difficult to support the teaching needs of unique courses that require deep exploration and systematic presentation, ultimately affecting the depth and breadth of the resource system in teaching practice.

3.2 Lack of Resource Standards, Norms, and Metadata Systems

When integrating music materials from different sources, technical departments often encounter

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disagreements over resource naming formats and encoding rules, which directly leads to inefficient retrieval processes and ambiguous results for both teachers and students. There is a lack of unified and detailed definition standards for metadata fields, such as the creation year of works, performance genres, or core technical points, which fail to achieve standardized identification and association. Platform administrators are forced to spend a lot of effort on manual identification and classification in the face of a massive upload of sheet music and audio files. The same work resources uploaded by different teachers may be scattered under different classification directories due to differences in description habits. The correlation information between works by the same composer in different periods or the comparison clues of multiple classic interpretations of the same track within the resource library have not been established through an effective metadata system. Teachers find it difficult to accurately locate the required materials when preparing for specific teaching topics, and their retrieval behavior often requires additional time for secondary screening among irrelevant results. The resource organization advantages that the platform should possess have not been fully translated into teaching support efficiency [2].

3.3 Challenges in Resource Sharing Mechanisms and Copyright Protection

Copyright issues themselves constitute a substantial obstacle to the open sharing of resources. Many live performance recordings or master class videos with educational value are difficult to circulate freely on platforms due to complex copyright ownership issues. Resource sharing mechanisms often lack clear definitions of resource access permissions and responsibility boundaries between different departments within a school and in cross-school collaboration scenarios, resulting in valuable materials being restricted to a narrow range of uses. Teachers sometimes hesitate to upload their personalized teaching materials to platforms due to concerns about insufficient intellectual property protection, and platform administrators also face practical difficulties in identifying whether user-uploaded content infringes on third-party rights. Copyright regulations provide relatively vague definitions of fair use in the field of education, making platforms cautious or even avoid collecting contemporary work recordings or sheet music, limiting the timeliness and richness of the resource library. Resource sharing activities lack supporting incentive mechanisms and standardized processes, making it difficult to mobilize teachers' enthusiasm for contributing their personal resources. At the same time, cross-institutional resource exchanges often progress slowly due to copyright concerns and poor platform interoperability, restricting the integration and utilization efficiency of high-quality teaching resources.

3.4 Room for Improvement in Platform Functionality Adaptability and User Experience

The operational speed and stability of the platform system sometimes fail to meet the core needs of music teaching for instant audio-visual response. Phenomena such as stuttering loading of large sheet music files or interruptions in high-quality audio streams directly affect the classroom demonstration effect and student practice experience. The interface design logic does not fully align with the unique working habits of the music discipline. Teachers and students often need cumbersome navigation operations when searching for specific teaching tools or switching between different resource types. The fragmented state of functional modules prevents teachers from smoothly integrating sheet music analysis tools, performance demonstration videos, and classroom discussion areas into a unified teaching process. Students also need to repeatedly navigate between different interfaces to complete segmented exercises or submit assignments. Insufficient mobile adaptation limits the possibility for teachers and students to utilize fragmented time to access resources or engage in lightweight interactions. The system's support for auxiliary functions such as sheet music zooming, playback speed adjustment, or pitch marking is not convenient or in-depth enough. The design team's understanding of frontline teachers' actual teaching scenarios and students' learning pain points is biased, leading to the development of some functions deviating from core teaching demands. The potential of the platform has not been effectively transformed into a smooth experience and efficiency improvement in teaching activities.

3.5 Insufficient Integration of Resource Application Depth and Teaching Models

The utilization of online resource libraries by teachers and students mostly remains at the superficial level of searching for sheet music or playing demonstration recordings, with less exploration of the built-in analysis tools or collaborative functions of the platform to deepen music understanding and skill training. In the process of teaching practice, online resource activities and offline classroom

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lectures are often in a fragmented state, and digital materials are not organically embedded into the core links of the curriculum to drive exploratory or interactive learning. The content of the resource library itself is rarely systematically designed into a structured task sequence that supports specific teaching modes such as flipped classrooms or project-based learning, and its potential is not fully activated. Teachers sometimes find it difficult to find high-quality combined materials that fit their specific teaching goals, and students also lack effective platform guidance and process support when using resources to complete assignments or engage in creative activities. The connection between the resource library and the curriculum progress and evaluation system is not sufficiently close, failing to form a virtuous loop where resource application drives the improvement of learning outcomes. The learning behavior of student groups on the platform is mostly characterized by passive information reception rather than active participation in knowledge construction and artistic expression. The deep interaction and collaborative creation mechanism between teachers and students, as well as among students, around resources has not been effectively established in the platform environment, limiting the supportive role of resources in teaching mode innovation [3].

4. Core Strategies for Music Teaching Resource Construction Based on Digital Platforms

4.1 Establishing a Layered and Categorized Resource System and Construction Plan

The planning team needs to coordinate the design of a hierarchical resource framework covering the entire chain of music disciplines, clearly defining the core content boundaries and construction priorities of different levels of libraries, such as basic theory, performance skills, creative analysis, music history and theory, and specialized topics. Subject experts should thoroughly demonstrate the specific composition logic of resources within each level, ensuring that core classic literature, representative works interpretations, and key teaching cases form an organic combination within the corresponding level. The construction of specialized resource libraries needs to closely focus on the disciplinary strengths of the school or regional cultural genes to develop special plans, systematically sorting out the digital paths of unique resources such as folk music materials, teachers' original works, or local music historical materials. The construction of the basic resource layer must closely align with the undergraduate teaching syllabus and core course knowledge points, prioritizing the supply of high-quality sheet music texts and performance recordings that support daily teaching. The structure of the resource library itself needs to be preset with clear expansion interfaces and update mechanisms. The planning document should specify in detail the entry standards, update cycles, and exit rules for various types of resources, ensuring that the resource system always has the vitality and resilience to respond to dynamic changes in teaching needs, laying a solid foundation for the continuous construction and precise deployment of subsequent resources.

4.2 Establishing Unified Resource Standards and Metadata Norms

The Technical Committee should take the lead in developing unified technical specifications and descriptive standards for music resources across the entire school, clearly defining the format of sheet music files, audio and video encoding parameters, and document naming conventions to ensure resource compatibility and long-term usability. The metadata model design must be deeply integrated into the teaching logic of the music discipline, with core fields covering work style and genre, historical background, core techniques, teaching application levels, and correlation information between different versions. The specification document should define in detail the value rules and semantic relationships of each metadata field to ensure that teachers can accurately and consistently label their teaching value points and core characteristics when uploading resources. For special materials such as historical recordings or non-standard sheet music, the specification system needs to reserve flexible space for extended descriptions and establish supporting cataloging guidelines. The platform backend needs to deploy intelligent metadata verification and conversion tools to assist administrators in efficiently processing raw materials with various formats and incorporating them into a unified management framework. A regular review mechanism and feedback channel should be established during the implementation of the specifications to promptly identify and correct deviations in the implementation of standards, gradually forming a benign operating foundation with accurate and clear resource descriptions, efficient and orderly platform management, and precise and convenient retrieval for teachers and students, clearing technical obstacles for the deep integration and effective utilization of resources [4].

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4.3 Building an Open and Collaborative Resource Co-construction and Sharing Platform

The platform architecture design needs to focus on breaking down technical barriers and permission gaps between different departmental resource repositories within the university, and building a unified access environment that supports the smooth circulation of teaching materials within and across music disciplines. The construction team should clearly define the specific permission boundaries for different user roles in resource uploading, review, use, and collaboration, and design a simple and transparent sharing application process. The copyright advisory group needs to develop differentiated copyright solutions for different types of music resources, with a focus on clarifying the protection rules and authorization scope for original teaching materials, while exploring feasible authorization templates for legally included new tracks or contemporary recordings. The platform needs to integrate convenient version control and collaborative editing tools to support teacher teams in jointly building structured resource packages or jointly developing digital lesson plans around specific teaching topics. The incentive mechanism design should fully recognize the value of teachers' contributions to original resources or their deep involvement in resource optimization, and incorporate them into the teaching achievement evaluation system. Platform managers need to proactively connect with regional university alliances or professional institution resource repositories, explore the establishment of safe and controllable cross-institutional resource sharing and exchange protocols and technical interfaces, gradually converge to form a high-quality music teaching resource pool with a wider service scope and more diverse content, so that the platform can truly become an open hub that stimulates collective wisdom and promotes resource value-added.

4.4 Enhancing Platform Function Adaptability and User Experience Optimization

The development team must face the stringent requirements of music teaching for platform response speed and operational convenience, and prioritize addressing technical bottlenecks such as large sheet music loading delays or high-fidelity audio stream interruptions that directly affect the smoothness of teaching. Interface designers need to deeply understand the core workflows of teachers and students when analyzing sheet music, comparing performance versions, or practicing in segments, and reconstruct navigation logic and tool layouts that conform to the cognitive habits of the music discipline. The integration of functional modules should focus on eliminating the sense of separation between resource browsing, teaching tools, and interactive spaces, supporting teachers to complete material calling, real-time annotation, demonstration playback, and classroom discussion organization within a coherent interface. The system's capabilities need to be deeply adapted to mobile learning scenarios, ensuring that teachers and students can conveniently view sheet music, adjust playback parameters, or participate in lightweight interactions on tablets or mobile phones. The development of auxiliary functions needs to focus on specific details unique to music study, such as dynamic zooming of sheet music, independent control of multi-track audio, and playback with variable speed but constant pitch. User experience optimization must establish a regular mechanism for collecting and quickly responding to teacher and student feedback, accurately translating the real pain points of frontline teaching into iteration priorities, so that the evolution of platform functions closely aligns with the actual pace of teaching and learning, ultimately allowing technology to truly serve the smooth and efficient process of music teaching [5].

4.5 Promoting the Deep Integration of Resources into Teaching Model Innovation

Instructional designers need to closely collaborate with teacher teams, carefully weaving platform resources into a structured task sequence that supports inquiry-based learning or collaborative creation around core teaching objectives. The platform environment should provide convenient tools to support teachers and students in real-time annotation on sheet music, comparing different performance versions, or conducting in-depth online discussions around specific music issues. The content of the resource library itself can actively link to preset teaching activity templates, guiding teachers to easily design flipped classroom pre-class preview packages or project-based learning resource combination packages. The platform's functional design needs to focus on connecting resource application with learning evaluation, supporting teachers in conducting process-based assessments based on students' digital traces in resource analysis, collaborative creation, or performance practice. The platform operator can regularly organize teaching case workshops based on distinctive resources, demonstrating how to effectively integrate audio and video materials, interactive tools, and collaborative spaces to activate the classroom. The behavior of teachers guiding students on the platform to actively utilize resources for knowledge construction and artistic expression needs to be fully encouraged and technically

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supported. The platform needs to create a digital learning ecosystem conducive to teacher-student co-creation and peer evaluation. The vitality of the resource library is ultimately reflected in its role as a core carrier driving the transformation of teaching mode from one-way impartation to multi-dimensional interaction and deep participation, effectively serving the goal of cultivating music literacy and innovation ability.

5. Conclusion

Digital platforms have delineated fundamental pathways for the future construction and development of music teaching resources in universities, and effectiveness of these impacts is based on innovation within music education. Building resource systems, unifying standards and norms, improving sharing mechanisms, bettering platform performance, and integrating teaching modes display an inseparable ecological cycle. Planning should begin on layers and classifications, and the concept of open collaboration should drive the process forward for long-term sustainable development. Music education will not just a pursue a binding of high quality digital resources, it will seek sustainability in integrative technology and humanities, and a teaching format and cultural inheritance, between virtual and real practices on a digital platform. Institutions in higher education must consider the long-term picture, continually investing into systematic research and practical resource construction, allowing digital technology to integrate with music teaching, and building a powerful capacity to develop music talent for the new era.

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