

Research on the Application of Public Aesthetic Education Smart Teaching System from the Perspective of Resource Sharing

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Abstract: In response to the fragmentation of public aesthetic education resources, insufficient platform coordination, and limited depth of smart teaching applications, this paper examines the construction logic, operating mechanism, and application path of a smart teaching system for public aesthetic education from the perspective of resource sharing. Based on policy orientations of public aesthetic education, educational digital transformation, and smart education theory, the study adopts literature review, needs analysis, system architecture analysis, and application scenario analysis. It constructs a system framework consisting of resource integration, smart teaching, shared distribution, interactive feedback, and operation management. The study argues that the value of such a system lies not in simply accumulating digital resources, but in improving resource allocation efficiency and service accessibility through standardized resource governance, multi-subject collaborative supply, tiered service delivery, and continuous evaluation feedback. The study provides references for resource sharing in university public aesthetic education, the expansion of social aesthetic education services, and the construction of smart teaching platforms.

Keywords: Resource Sharing; Public Aesthetic Education; Smart Teaching System; Teaching Application; Educational Digitalization

1. Introduction

1.1 Research Background and Significance

Public aesthetic education is an important means of improving aesthetic literacy, cultural understanding, and the quality of spiritual life. It is also a key component of the coordinated development of school aesthetic education and social aesthetic education. Relevant policies

emphasize strengthening aesthetic education in the new era, improving the supply system of aesthetic education resources for all students and social members, and promoting collaboration between school curricula and social cultural resources. In this context, public aesthetic education is shifting from isolated courses or occasional art activities to a comprehensive educational process involving curriculum resources, cultural venues, artistic practice, digital platforms, and social services.

In practice, the supply of public aesthetic education resources remains uneven. Universities, art troupes, museums, art galleries, cultural centers, and local cultural institutions have accumulated abundant high-quality resources. However, these resources are often scattered across institutions and platforms, with inconsistent standards, limited sharing channels, and restricted service coverage. As a result, they are difficult to transform into public aesthetic education services that are accessible, usable, and evaluable. Grassroots communities, underdeveloped regions, and groups with weaker aesthetic education foundations still lack stable channels for obtaining courses, art appreciation resources, and practical guidance.

Educational digitalization and smart education offer new possibilities for addressing these problems. Educational informatization and new educational infrastructure both emphasize the role of digital resources, online platforms, intelligent services, and data governance in improving educational equity and quality. For public aesthetic education, a smart teaching system can overcome temporal, spatial, and organizational barriers, transforming scattered resources into open sharing, precise delivery, and dynamic feedback. Therefore, studying such a system from the perspective of resource sharing can improve resource allocation efficiency and support the mechanisms through which universities serve society, cultural resources participate in education, and digital platforms promote the popularization of

aesthetic education.

1.2 Literature Review at Home and Abroad

International studies on arts education, digital learning, and smart teaching have long focused on the reconstruction of technology-supported learning environments. Major topics include open digital resources, learning platform construction, personalized learning support, and learner participation. These studies generally suggest that digital technologies can expand access to arts and aesthetic education resources and enhance participation through open resources, online platforms, and interactive tools. From the perspective of public aesthetic education, however, existing studies focus more on general digital education or arts resource development, with limited attention to public welfare, inclusiveness, and cross-subject collaboration.

In China, recent research has discussed school aesthetic education reform, public art curriculum construction, smart education platform application, and educational digital transformation. Existing studies indicate that smart education is not a simple upgrade of teaching tools, but a systematic transformation involving learning environments, resource allocation, teaching relations, and evaluation methods. In the field of aesthetic education, scholars have also begun to examine how intelligent technologies reshape aesthetic education goals, expand arts education resources, and innovate teaching models. These studies provide a theoretical basis for the present research.

Nevertheless, several gaps remain. First, studies on resource sharing in public aesthetic education often remain at the level of conceptual advocacy, with insufficient discussion of resource standards, operating mechanisms, and platform governance. Second, research on smart teaching systems mainly focuses on school courses or subject teaching, while public aesthetic education involves cross-school, cross-institutional, and cross-group scenarios. Third, studies of application effects often make strong claims with weak data support, and have not yet formed a clear indicator system or evaluation path. This paper therefore further discusses system structure, resource sharing mechanisms, and application evaluation.

2. Core Concept Definition and Theoretical

Basis

2.1 Definition of the Core Connotations of Resource Sharing and Public Aesthetic Education

Resource sharing in public aesthetic education refers to the process of integrating, classifying, opening, circulating, and reusing aesthetic education courses, artworks, practice cases, teaching staff, venue resources, and digital tools while respecting resource ownership, educational principles, and public welfare. It is not a simple aggregation of resources. Its core lies in standardized organization, digital transformation, and scenario-based services, through which scattered resources can form a continuous supply for different groups.

Public aesthetic education is a universal form of aesthetic education for all social members. Its goal is to improve the public's aesthetic perception, artistic understanding, cultural identity, and humanistic literacy. Compared with professional arts education, public aesthetic education emphasizes inclusiveness, openness, and everyday relevance. It covers university public art courses, community aesthetic education, public welfare aesthetic education, cultural venue education, online art popularization, and the transformation of local cultural resources.

Resource sharing and public aesthetic education are internally consistent. Public aesthetic education needs resource sharing to expand the coverage of high-quality resources and narrow resource gaps among regions, schools, and groups. Resource sharing also depends on public aesthetic education scenarios to realize value transformation, enabling cultural and artistic resources to move from static preservation to dynamic communication, teaching application, and public participation. Thus, resource sharing is both an important path for inclusive development and a basic condition for smart teaching systems.

2.2 Theoretical Support for Smart Teaching Systems

The construction of a smart teaching system for public aesthetic education requires multiple theoretical supports. Constructivist learning theory emphasizes learners' active role in knowledge construction and regards learning as understanding formed in specific contexts and interactions. Since public aesthetic education is

experiential and contextual, the system can provide diverse aesthetic experiences and knowledge construction spaces through images, audio and video, virtual exhibitions, online discussion, and practice tasks.

Smart education theory emphasizes coordination among digital technology, learning environments, and educational services. The core of smart education is not merely the use of technological tools, but the enhancement of educational accuracy and adaptability through intelligent perception, resource aggregation, process support, and data feedback. In public aesthetic education, the system should provide tiered, personalized, and sustainable services according to learners' foundations, interests, learning stages, and usage contexts.

The theory of educational resource allocation optimization focuses on fairness and efficiency. Because public aesthetic education resources differ across regions and institutions, system construction should balance resource aggregation and distribution. Unified standards and platform interfaces can improve integration efficiency, while recommendation mechanisms, sharing rules, and service preferences can extend high-quality resources to weaker regions and groups.

The theory of teachers' digital literacy also supports system application. Teachers and aesthetic education service personnel are key actors in the continuous operation of smart teaching systems. Their abilities in digital resource development, platform use, data interpretation, and ethical awareness directly affect application quality. Therefore, system construction should not focus only on platform technology, but should also improve teacher training, resource review, and application evaluation. Only when teachers and platform managers have these capacities can the technical system be transformed into stable teaching support rather than remaining a set of unused digital functions.

3. Construction of a Smart Teaching System for Public Aesthetic Education from the Perspective of Resource Sharing

3.1 System Demand Analysis and Functional Module Design

The demand for a public aesthetic education smart teaching system mainly comes from three levels: users, resources, and technical operation.

The user level includes ordinary learners, public aesthetic education teachers, staff members of arts institutions, platform managers, and social service organizations. Ordinary learners need convenient access to tiered, interesting, and sustainable resources. Teachers and resource providers need a stable platform for publishing courses, organizing interaction, and tracking learning outcomes. Managers need standardized management of resource quality, user data, platform operation, and service performance.

Resource-level demands are reflected in diversified types, scattered sources, and inconsistent standards. Public aesthetic education resources include course texts, art appreciation materials, teaching cases, exhibition resources, local cultural resources, video courses, practical activity plans, and interactive tasks. Without unified classification, metadata tagging, and quality review, these resources can hardly circulate across platforms, institutions, and scenarios. Therefore, the system should support resource collection, standardization, intelligent retrieval, tag management, and copyright identification.

Technical operation demands include platform stability, data security, cross-terminal access, and intelligent services. Because public aesthetic education serves diverse users with different devices and levels of digital literacy, the system should support mobile phones, computers, and smart screens, and reduce the difficulty of use through a simple interface, low-threshold operation, and clear navigation. It should also follow data security and privacy protection requirements and manage learning data, feedback information, and user profiles in a standardized way.

Based on these demands, this paper divides the system into five core functional modules. The first is the aesthetic education resource integration module, responsible for resource collection, classification, standardization, storage, and copyright identification. The second is the smart teaching service module, which supports course delivery, learning path design, online teaching, task release, and learning support. The third is the resource sharing and distribution module, responsible for cross-institutional resource calls, tiered service delivery, and balanced regional allocation. The fourth is the user interaction and feedback module, supporting communication, Q&A, work display, satisfaction feedback, and demand

collection. The fifth is the platform operation and management module, responsible for resource review, data statistics, system maintenance, quality monitoring, and security management. These modules are not isolated components. They follow a continuous process of resource entry, resource processing, resource use, result feedback, and operational maintenance. In this way, the system links resource governance, teaching support, and public cultural service provision, and helps avoid the common problem of building a platform without forming a stable service mechanism.

3.2 Aesthetic Education Resource Sharing Mechanism and Integration Path

The stable operation of the system depends on standardized, continuous, and collaborative resource sharing mechanisms. First, a resource co-construction and sharing mechanism should be established to clarify the rights and responsibilities of universities, cultural centers, art galleries, museums, art troupes, community organizations, and social institutions. These actors can provide courses, exhibition resources, teachers, local cultural materials, and practice spaces according to their strengths, forming a diversified supply structure.

Second, a resource quality control and review mechanism should be established. Public aesthetic education resources have both educational and public attributes, and their content should comply with aesthetic education principles, value orientation, and knowledge standards. The platform should review resource sources, content quality, target users, usage permissions, and update cycles to avoid resource accumulation, repetition, uneven quality, and value deviation. For AI-generated or AI-assisted resources, human review should be added to ensure accuracy and educational appropriateness. Third, an equitable distribution mechanism should be established. The goal of resource sharing is not only to improve utilization efficiency, but also to promote balanced public cultural and educational services. The system can set resource recommendation and service preference mechanisms according to regional resource foundations, user needs, school curriculum conditions, and community service capacity, giving priority to grassroots communities, remote areas, and groups with weaker aesthetic education foundations.

Finally, a dynamic update and feedback

mechanism should be established. Since public aesthetic education resources are time-sensitive and scenario-dependent, the system should update content, adjust recommendation rules, and optimize service procedures according to usage frequency, learning completion, feedback, and teaching evaluation. The integration path includes cross-institutional resource connection, standardized classification and coding, cloud-based storage and scheduling, and application feedback, thus shifting resources from one-time uploading to continuous optimization.

4. Practical Application and Effect Verification of the Smart Teaching System for Public Aesthetic Education

4.1 Practical Application Scenarios and Implementation Process

The system can be applied to community aesthetic education, campus public aesthetic education, online universal aesthetic education, and offline interactive aesthetic education. In community settings, it can deliver short courses, art appreciation videos, local cultural introductions, and practical activity information to residents, meeting fragmented learning and daily cultural needs. In campus settings, it can connect with school teaching platforms, support public art courses, second-classroom activities, and campus culture construction, and promote the integration of classroom teaching and extracurricular practice.

For remote regions or groups with limited offline resources, the system can lower participation thresholds through lightweight terminals and online services, enabling learners to access art courses, exhibition guides, work appreciation, and interactive tasks remotely. In offline interactive scenarios, the system can support activity reservation, resource delivery, learning records, and achievement display, forming a complementary relation between online learning and offline experience.

System implementation should proceed step by step. The first stage is resource preparation and platform deployment, including resource sorting, standard formulation, system debugging, and initial resource uploading. The second stage is personnel training and user introduction, focusing on platform use, resource review, and data management for teachers, managers, and service personnel. The third stage is pilot operation and process monitoring, in which

universities, communities, or cultural institutions are selected as pilots and data on resource access, user participation, and learning feedback are collected. The fourth stage is optimization and promotion, in which functional modules, resource structures, and service processes are improved according to pilot results. During wider promotion, the implementation rhythm should also be adjusted according to the organizational capacity and resource base of different scenarios. This can prevent excessive management pressure caused by large-scale expansion at one time and help transform pilot experience into replicable institutional procedures.

4.2 Investigation and Data Analysis of Application Effects

As an academic study, the application effect of a smart teaching system cannot be summarized only by “more users” or “more resources.” A clear evaluation indicator system is needed. Based on the goals of public aesthetic education and the features of smart teaching systems, application effects can be analyzed from five dimensions: resource sharing efficiency, user participation, teaching service quality, resource allocation balance, and system operation stability. Resource sharing efficiency may be observed through resource visits, call frequency, reuse rate, and cross-institutional use. User participation may be measured through registration, completion rate, interaction frequency, and continued use. Teaching service quality may be judged through learning satisfaction, course evaluation, achievement display, and teacher feedback.

Resource allocation balance is a key dimension that distinguishes this system from general teaching platforms. The system should not only serve users with strong aesthetic education foundations, but also address differences in resource access among regions, age groups, and levels of digital literacy. Indicators such as the proportion of grassroots community users, remote-area resource visits, and completion among groups with weaker foundations can be used to assess inclusiveness. System operation stability mainly concerns response speed, data security, resource update frequency, fault handling, and management standardization.

In terms of data analysis, platform statistics, questionnaires, interviews, and case tracking can be combined. Platform data reflect resource use

and learning participation. Questionnaires reveal satisfaction and changing needs. Interviews help identify deeper problems in resource adaptation and teaching services. Case tracking observes changes in specific schools, communities, or learner groups before and after system application. If authentic sample size, investigation period, and statistical results are unavailable, the paper should avoid definitive expressions such as “significantly improved” and adopt more cautious academic wording. The combination of multiple data sources can reduce the one-sidedness caused by relying only on platform records, while also providing more concrete evidence for subsequent system iteration. It enables researchers to examine not only whether resources are used, but also whether users understand, continue to participate in, and benefit from the services provided.

From the perspective of application logic, the system has three main values. First, resource integration and standardized governance improve the discoverability and usability of scattered aesthetic education resources. Second, intelligent delivery and multi-terminal services enhance the convenience and continuity of public participation. Third, data feedback and dynamic updating promote the shift of public aesthetic education services from experience-based management to process monitoring and continuous improvement.

5. Conclusion

Taking resource sharing as its core perspective, this paper examines the construction and application of a smart teaching system for public aesthetic education. On the basis of defining resource sharing and public aesthetic education, it constructs a framework composed of resource integration, smart teaching, shared distribution, interactive feedback, and operation management, and proposes application paths for community aesthetic education, campus public aesthetic education, online universal aesthetic education, and offline interactive aesthetic education. The study argues that the focus of system construction is not merely building a platform or accumulating resources, but promoting high-quality aesthetic education resources from scattered storage to open sharing and effective use through resource standardization, multi-subject co-construction, tiered services, and continuous evaluation.

The main contribution of this paper is to

introduce the logic of resource sharing into the study of smart teaching systems for public aesthetic education, clarifying the functional structure, operating mechanism, and evaluation dimensions of the system. For university public aesthetic education, the system can promote the linkage of curriculum resources, social cultural resources, and digital teaching resources. For social aesthetic education services, it can expand the coverage of high-quality resources and increase opportunities for grassroots and weak-foundation groups. For smart education construction, it provides a concrete scenario for the digital transformation of aesthetic education. This study also has limitations. Due to the lack of large-scale real platform operation data, its discussion of application effects is mainly based on evaluation indicators and application logic, and cannot replace strict empirical testing. Future studies may conduct long-term tracking in specific universities, communities, or cultural institutions, collect user behavior, learning outcomes, and service feedback data, and quantitatively analyze system performance.

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