A Study on Holistic Informatization Services and Management Practices for Student-Centered Continuing Higher Education

Sha Qiu*, Yuehui Wu[a]

School of Continuing Education, Kunming University, Kunming, 650031, China

*qiusha@kmu.edu.cn, [a]wyh6824@qq.com

Abstract. This paper takes the School of Continuing Education of Kunming University as the practical subject, focusing on the holistic informatization service and management of continuing higher education. Making full use of computer technologies, a research model consisting of three core elements is constructed, and the practice is advanced through four phases. By integrating multi-platform tools, optimizing teaching management processes,.etc, the study achieved outcomes such as significant efficiency improvements,.etc, providing practical references for the digital transformation of continuing higher education.

Keywords: Holistic Informatization, Framework, Digital Transformation, Integrated Information Tool, Continuing Higher Education

1 Introduction

With the regulation and guidance of continuing higher education continue to strengthen, the host universities are required to accelerate digital transformation and development to adapt to the characteristics of on-the-job learning, promote the standardized, orderly and healthy development of continuing higher education, and serve the needs of lifelong learning for all [1].

As a key department for continuing higher education, the School of Continuing Education of Kunming University has long been committed to student-centered principles, conducting sustained research and practice on the informatization of its work based on computer technologies. This has led to the initial construction of a holistic informatization management system for continuing higher education, yielding significant results.

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2 Research Background and Significance

2.1 Research Background

China's Education Modernization 2035 and other programmatic documents outline ten strategic tasks, including leveraging information technology to advance educational modernization, establish a nationwide lifelong learning ecosystem[2]. The informatization of continuing higher education is a critical revolution in the development of continuing higher education.

History demonstrates that education undergoes transformative changes in form, methods, and tools with advancements in educational technology—from books to online education, and now to AI-powered intelligent education. Each technological revolution has driven educational progress. Today, the informatization of continuing higher education is an inevitable choice.

Scholars at home and abroad have conducted extensive research on this topic. Li Liguo et al. have proposed a "technology empowerment-process reengineering-model innovation" transformation path, analyzing the strategic significance of digital transformation for continuing higher education[3]; Janse van Rensburg et al. systematically investigated core concepts of blended learning, critical implementation barriers, and design frameworks for learning resources[4]; Ma Tingqi et al. have constructed a digital transformation maturity model incorporating dimensions such as strategic planning, technological infrastructure, data application, and user experience, proposing quantitative evaluation indicators[5]. These existing studies have provided inspiration for the overall framework of this research while highlighting common, unresolved issues that have become key focuses of this study.

2.2 Existing Problems

Continuing Higher Education Faces "Marginalization and Hollowing Out.". The talent training programs and course settings for continuing higher education are failed to fully consider the learning, work, and life needs of part-time students. In teaching implementation, the work-study conflicts are not addressed. With insufficient application of information technology, it's leading to low attendance in face-to-face sessions.

Long-term Underinvestment has Hindered the Coordinated Use of High-quality Educational Resources. There is no effective coordination of existing digital resources to provide homogeneous services for part-time students. This has resulted in inadequate analysis of students' learning needs and behaviors, insufficient timely and comprehensive learning support, and a lack of data-driven precise decision-making.

2.3 Research Significance

The informatization of continuing higher education serves multiple purposes: (1) promoting changes in educational philosophy and management models, facilitating

the realization of continuing education concepts; (2) advancing reforms in teaching content and methods, improving teaching efficiency; (3) enhancing management service levels through information-based, networked, and efficient tools; (4) cultivating a new generation of teachers with high professional competence and information literacy through informatization; and (5) transforming traditional teaching interaction patterns and teacher-student relationships, driving changes in continuing education evaluation systems.

As a key component of the lifelong learning system, continuing higher education should firmly adhere to the "learner-centered" concept. Adopting holistic informatization education constitutes an inevitable pathway to achieving 5A(Assessment, Advice, Agreement, Assistance, Arrangement) education and effectively resolving core challenges in continuing higher education.

3 Research Approach

This study adopts a top-down approach for modeling. Based on the three components of the traditional data model (data structure, data manipulation, and integrity constraints), it constructs the three core elements of the holistic informatization construction model for continuing higher education: system constraints, static structure, and dynamic operations. The entire research is guided by this model, as shown in Fig.1.

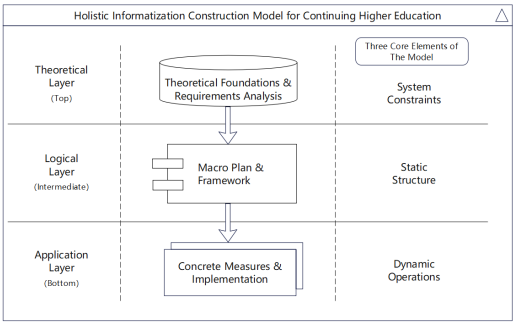

Fig. 1. Holistic Informatization Construction Model for Continuing Higher Education.

3.1 System Constraints

System constraints represent the comprehensive constraints of the informatization construction. Through predefined constraints and rules, they monitor the construction process to ensure accuracy and effectiveness, enabling the process to align with expected goals. They serve as the guiding standard for forming the static structure and dynamic operations, constituting the theoretical layer at the top of the model.

The abstraction of constraints and rules primarily includes two aspects:(1) Adhering to requirements from documents such as *the Ministry of Education's Implementation Opinions on Promoting the Reform of Academic Continuing Education in Ordinary Higher Education Institutions in the New Era*, emphasizing the student's primary role

and reinforcing the student-centered educational philosophy.(2) Analyzing the goals, needs, and demands of students in continuing higher education, fully considering and determining professional talent training objectives, and strengthening control over key links such as the formulation of talent training programs, curriculum design, course resource support, quality monitoring, and graduation thesis management.

3.2 Static Structure

The static structure, under the guidance of system constraints, constructs the macro plan and framework for informatization, defining the logical structure of the construction. It serves as the intermediate logical layer of the model. Its core content involves unifying and optimizing management processes, methods, and standards, applying information-based teaching management and service platforms, improving the quality of continuing higher education services and management, and building a support system for holistic informatization service and management.

3.3 Dynamic Operations

Dynamic operations refer to the specific measures taken under system constraints to achieve construction goals, following the predefined plan and framework. They are the practical methods and tools used during construction, adjusted dynamically under the monitoring of constraints and rules. As the application layer at the bottom of the model, their key strategies involve evaluating existing information resources and tools, and integrating, optimizing, and simplifying them.

4 Measures and Achievements

Guided by the informatization construction model, this research progressed through four phased implementations over three years. It evolved from the decentralized application of multiple software tools aimed at addressing immediate teaching and management issues, to the integration of systems for achieving full-process informatization in management, and ultimately to the development of customized optimizations and integration of artificial intelligence technologies to align with the evolving trends of informatized management.

4.1 Phase 1: Free Construction

With the development of continuing higher education, demands for data acquisition, management, and business process promotion increased, necessitating information-based support. Off-campus teaching centers introduced information tools or platforms (e.g., WeChat, WeChat mini-programs, "Xuexitong" APPs, self-purchased management platforms) to assist with key tasks such as student information collection, grade management, and teaching management, improving operational effectiveness. However, due to a lack of unified planning, tools and methods varied across centers, lead-

ing to inconsistent data formats and processes. This resulted in low data utilization and management challenges for the school.

4.2 Phase 2: holistic informatization

To address issues from Phase 1, the School of Continuing Education led a collaborative effort with off-campus teaching centers to optimize management processes and adopt a "five-unification" framework: unified school brand design, management systems, management models, teaching resource distribution, and teaching support service systems. This standardized interactions between universities and teaching centers, as well as between teaching centers and students, and clarified the host university's main responsibilities and the norms for off-campus teaching center services. Concurrently, talent training programs were revised to align with part-time students' work, life, and professional development needs.

Based on this, existing information management tools and platforms were evaluated and optimized. Informatization was strengthened across all links (off-campus teaching centers, program setup, enrollment, student status, graduation, and teaching management), and data compatibility and migration between platforms were achieved. A multi-platform management toolkit covering all aspects of continuing higher education was developed and standardized across all off-campus teaching centers, enabling paperless operations, improving efficiency and quality, and providing effective data support for management decisions. The application of this toolkit is illustrated in Fig.2.

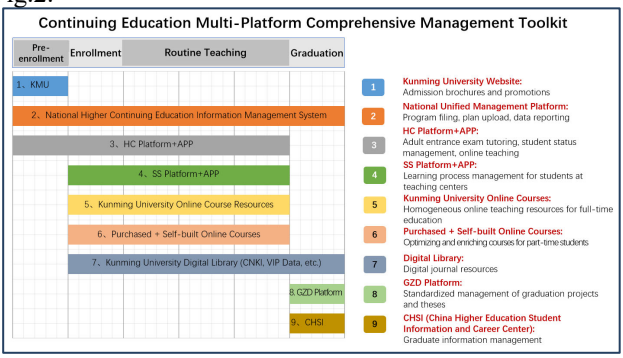

Fig. 2. Basic Application of the Multi-Platform Management Toolkit.

Business Supervision Platform. Leveraging the Ministry of Education's China Higher Education Student Information and Career Center (CHSI), the National Higher Continuing Education Information Management System, and Kunming University's official website, core tasks such as graduate information certification, basic information review (e.g., program filing, plan upload, data reporting), and public disclosure of educational information (e.g., enrollment, payment, promotion) are handled. This ensures the reliability and effectiveness of core data and integrates information with national platforms.

Teaching Management Platform. For teaching processes and data management, platforms such as HC, SS, and associated APPs are used to standardize support service processes and collect student learning behavior data, enabling timely reminders and corrections. Specifically:

HC Platform + APP. Provides pre-enrollment preparation courses to track learning needs; post-enrollment, it manages teaching centers, programs, student status, courses, online teaching processes, resources, and data (e.g., online courses, exams), facilitating flexible online learning for part-time students.

SS Platform + APP. Manages learning processes by periodically collecting data and communicating with students, enabling timely guidance and issue resolution to enhance feedback and application value.

Online Course Platform. Courses are critical to teaching outcomes. This study primarily adopts blended teaching (online + offline) for reform, building on theoretical frameworks of blended learning and its adaptability to part-time students[6]. Offline teaching focuses on ideological and political courses and practice-oriented core courses, with live online streaming to accommodate students unable to attend in person.

Given part-time students' specific needs and work-study conflicts, the school increased online course proportions as required by the Ministry of Education. To address resource shortages, a "purchase + self-built" model was adopted, with nearly 80% of courses now online.

Purchased online courses. These include HC platform courses (60%-70% of total), Kunming University's full-time online public courses and purchased resources (10%), and high-quality courses from other platforms (e.g., National Academy of Educational Administration's continuing education courses) to enrich electives.

Self-built online courses. Supported by university funding, a course resource center was established using traditional video production and emerging AI course-building technologies. Seventeen self-built online courses have been developed, addressing specialized needs and approaching the Ministry of Education's requirement of "self-built online courses accounting for at least 30%."

Auxiliary Resource Platform. The school coordinates digital resources (e.g., CNKI, VIP Data) from Kunming University's digital library, providing off-campus teaching centers with access to support students' online learning and thesis writing.

Graduation Project Management Platform. To ensure graduation project quality and comply with national and provincial thesis sampling requirements, the school

adopted the GZD thesis management system (used in full-time education) to standardize thesis management for undergraduate students in continuing higher education.

4.3 Phase 3: Normalized Management

While Phase 2 achieved holistic informatization, challenges remained: the multi-platform toolkit required extensive training, caused operational complexity due to platform switching, and faced data compatibility and migration issues. Drawing on experiences of unified platform construction in other teaching centers, which emphasize process standardization and data compatibility, the school initiated normalized management by integrating tools into a single platform.

With project funding, the school is developing a comprehensive continuing education service platform to manage all continuing education work (academic and non-academic). This platform will provide user-friendly interfaces, ensuring logical independence (i.e., internal module changes remain transparent to users).

The academic education module will integrate Phase 2 tools, with strong scalability to incorporate new functions, enabling one-stop services without requiring users to learn multiple platforms. This platform, currently in the implementation phase after demand analysis and framework design, is illustrated in Figure 3.

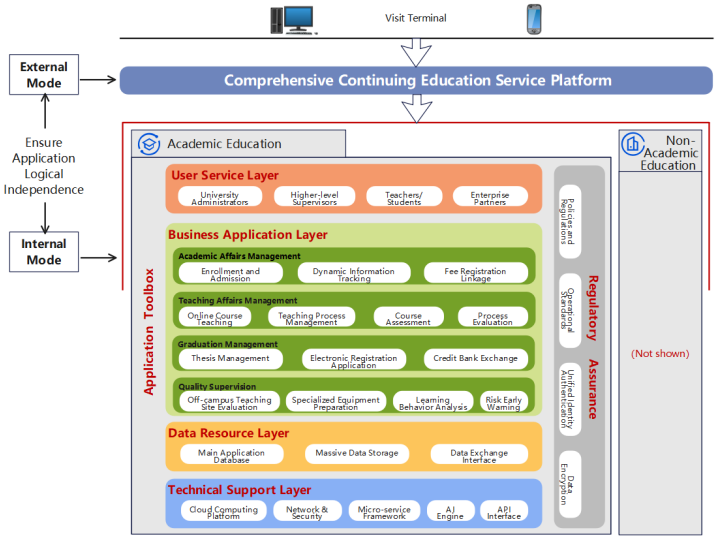

Fig. 3. Basic Framework of the Comprehensive Continuing Education Service Platform.

4.4 Phase 4: Digital-Intelligent Empowerment

With the deepening application of AI, the school will enhance the platform's digital and intelligent capabilities, leveraging AI to mine data and provide better management assistance and decision support for continuing higher education.

4.5 Achievements

The adoption of paperless operations, standardized processes, and timely data acquisition has reduced labor, material, time, and transportation costs, improving efficiency and reducing expenses in teaching and management. A U.S. Department of Education report also verified through meta-analysis that online learning enhances efficiency for adult learners[7].

Taking course exams as an example: Traditional offline exams involved manual paper preparation, grading, and logistical arrangements, incurring costs for teachers, teaching centers, and students (e.g., transportation, meals, work absence). Online exams now handle these tasks digitally, and allowing students to take exams flexibly according to their schedules—reflecting the student-centered philosophy. The costs of exams and management have been reduced by 40%, while students' costs have been cut by 50%. Thanks to the adoption of automatic test paper generation by the system, with 60% of the marking also done automatically, the process of a single exam has been shortened from one week to 3 days, representing a 43% increase in efficiency.

Since the start of informatization, continuous improvements have yielded significant results:

- Serviced over 13,000 students, with 886,000+ platform usages.
- Offered 850+ online courses across 25 programs, with 522,000+ online learning enrollments.
- Organized 1,821 online exams, with 320,000+ registrations and participations.
- Dropped the average deferred exam rate from 22.4% to 0.01%, decreased the absent-exam rate from 5.1% to 0.42%, the first-time pass rate has risen from 88.7% to 93.2%, and the average proportion of students scoring above 80 points has reached 59.4%.
- The average annual graduation rate has increased from 75.4% to 87.8%, with undergraduate theses passing provincial sampling.
- Resolved issues within 3-5 working days, with complaints minimized to single digits.

In recognition of these achievements, the study was selected as a "2024 High-Quality Development Brand Case for Digital Transformation of Continuing Education in New-Era Colleges and Universities" and presented at an exchange conference hosted by the Vocational and Continuing Education Digital Construction Professional Committee of the China Association for Adult Education, gaining peer recognition.

The framework of this study is based on traditional modeling theories, and its business processes align with the routine work of most continuing education departments. As a brand case, the research results have been referenced and studied by other institutions and received positive evaluations from experts. The platform developed in the study features strong compatibility, with multiple external interfaces pre-set. It has obtained support from the Kunming University and the Department of Education of Yunnan Province, and plans are in place to provide services for relevant businesses across the province.

5 Conclusion

This study leverages holistic informatization to collect data across teaching, management, and service, providing efficient data support for decision-making. It effectively addresses the two main issues identified, fulfilling the host university's primary responsibilities:(1)By integrating the university's digital resources and teaching environments into talent training for continuing higher education, it promotes homogeneity and standardization, mitigating "marginalization and hollowing out"; (2)By strengthening the collection of part-time students' learning behavior data, it enhances the standardization and efficiency of teaching support services, alleviating long-term underinvestment and resource coordination challenges.

Through the effective use of the university's digital resources and platforms, students engage in learning activities more aligned with full-time education, improving teaching quality and fostering a sense of belonging and identity among part-time students, thus better achieving talent training goals.

As information technology deepens its integration into continuing higher education, integrating digital teaching resources via a main platform and strengthening holistic planning to manage all links through informatization will enhance teaching support and quality assurance. The construction of this platform encompasses two parts: academic education and non-academic education. The later-stage development will achieve resource sharing between these two parts, resolve the work-study conflict, enable credit transfer, track growth paths, and provide precise lifelong learning support.

This study will continue to innovate management concepts, improve regulations, and apply advanced technologies to promote the connotative and high-quality development of continuing higher education in the new era, contributing to equitable and lifelong learning for all.

Acknowledgment

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