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Research on the Construction of a Precision Academic Guidance Model for Student Communities under the Perspective of Digital Empowerment

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Abstract: *Against the backdrop of the full implementation of the educational digitalization strategy and the continuous deepening of the "Three All-Round Education" reform in colleges and universities, student communities have gradually transformed from traditional living and accommodation spaces into important education fields for study style construction, academic assistance, and talent cultivation. Currently, the traditional academic guidance model in colleges and universities restricts the improvement of study style construction quality and efficiency and the implementation of precise education work. To address the shortcomings of the traditional academic guidance model and promote the transformation of student community education work from "flood irrigation" to "precision drip irrigation", this paper, from the research perspective of digital empowerment, elaborates on the principles and measures that should be followed in the construction of a precise academic guidance model for student communities. Reshaping the academic education logic of student communities through digital means and improving the community education work system in the new era can provide important theoretical references and practical paths for colleges and universities to promote the digital transformation of education, deepen the reform of precise education, and improve the quality of talent cultivation.*

Keywords: *digital empowerment; student community; academic guidance model*

1. Introduction

With the comprehensive advancement of educational digitalization strategies, digital technologies such as big data, artificial intelligence, and smart platforms are deeply integrated into university education systems, driving the transformation of traditional educational management models. As a vital platform for moral education, academic culture development, and academic support, student communities serve as a bridge connecting classroom instruction with out-of-class self-study. academic guidance models primarily rely on centralized tutoring approaches, which often lack clarity target identification and suffer from delayed problem assessment, making it difficult to identify individual students' academic weaknesses and differences in learning habits. In the context of digital empowerment in education reform, reconstructing the academic guidance system in student using digital tools has become a key pathway to improving academic culture and realizing holistic, all-around, and lifelong education. Digital technologies offer advantages such as comprehensive data collection and precise academic analysis, breaking the spatiotemporal limitations of traditional guidance. Therefore, it is essential to consider the actual conditions of student community education in universities and explore the development of a precision academic guidance model suited to the characteristics of contemporary student circumstances, thereby supporting universities in achieving individualized teaching and precise education.

2. Principles for Constructing a Precision Academic Guidance Model for Student Communities under Digital Empowerment

2.1 Principle of Moral Education and People-Oriented Development

Moral education and nurturing individuals are fundamental missions of higher education in the new era and should be the core principle guiding the construction of a precision academic guidance model student communities under digital empowerment. This principle must be fully integrated throughout entire process—from system design and technological infrastructure to implementation and outcome

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evaluation.

Specifically, this principle requires placing students at the center during the development of the precision academic guidance model. The ultimate goal should be students' academic growth, ability enhancement, and overall competence development. All aspects—including the construction of digital platforms, academic condition analysis, tiered guidance design, resource allocation, and management and evaluation mechanisms—must focus on students' real academic challenges and meet their diverse developmental needs. For struggling students, in addition to leveraging data to address academic deficiencies, regular companion-style guidance should be provided to correct negative learning attitudes and cultivate self-discipline and resilience. For average and high-achieving students, while supporting academic advancement and skill breakthroughs, attention should also be given to cultivating research literacy, innovative thinking, scholarly integrity, and teamwork abilities in a holistic manner. At the same time, adhering to the core logic of nurturing through technical services and empowering through data, we transform digital information into a warm and supportive educational foundation, integrating digital tools with the fundamental mission of cultivating virtue and talent, ensuring a firm commitment to the core objectives of ideological and political education and talent development in higher education institutions.

2.2 Data-Driven and Precise Adaptation Principle

The strength of digital education models lies in leveraging multi-source student performance data to enable objective assessment, proactive prediction, and targeted interventions. Therefore, under digital empowerment, constructing a precise academic guidance model for student communities should follow the principles of data-driven decision-making and precise adaptation.

Specifically, this principle requires establishing a comprehensive, standardized system for data collection and analysis during model development, integrating multidimensional data such as classroom learning, after-class study, assessment results, and community-based learning. This transforms student performance evaluation from "single-point static data" to "multidimensional dynamic data." By relying on intelligent algorithms for data cleaning, filtering, analysis, and modeling, we can clearly distinguish students' academic foundations, ability gaps, root causes of difficulties, and developmental needs, accurately categorizing academic risk levels and student growth types. Based on precise student profiles, differentiated guidance is provided according to layers, categories, and specific needs, enabling accurate problem identification, demand matching, resource allocation, and implementation of targeted measures. This ensures that every academic support initiative aligns closely with students'actual learning conditions, thereby enhancing the effectiveness of academic guidance.

3. Measures for Building a Precision Academic Guidance Model for Student Communities under Digital Empowerment

3.1 Establishing a Comprehensive Digital Student Performance Assessment System to Strengthen the Data Foundation for Precise Guidance

Accurate student performance assessment is a crucial prerequisite for personalized academic guidance. We must leverage digital technologies to build a comprehensive, real-time, dynamic, and multidimensional big data assessment system for student performance, integrating various educational data resources and creating scientific student profiles to provide solid data support for precise academic guidance.

First, establish a multi-source integrated data collection mechanism to achieve full coverage of student performance data. Break down the siloed structure where data is stored independently across departments and not shared, and create a unified, standardized student academic data pool, and build a cross-departmental digital collaboration platform with unified technical standards to ensure automatic conversion and real-time synchronization of data from various departments within the platform. The data collection dimensions should be comprehensive and granular, covering six key areas: basic student information, course learning data, academic assessment data, daily behavior data, community learning data, and growth and development data. Course learning data includes real-time metrics such as class attendance, online study duration, lecture material browsing history, quality of homework completion, and quiz scores; academic assessment data covers mid-term and final grades, credit progress, records of failed courses requiring retakes, and GPA trends; daily behavior data includes self-directed learning indicators such as library borrowing frequency, self-study duration, lab usage records, online course

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learning trajectories, and participation in academic lectures; community learning data focuses specifically on field-specific metrics such as usage time in community study rooms, evening study patterns, and participation in community academic activities [1]. Using a dual-mode approach combining automatic data scraping and manual input, the digital platform automatically aggregates structured data in real time. For unstructured data related to students' learning attitudes, academic challenges, and exam preparation difficulties, regular online reporting channels are established, enabling complementary integration of quantitative and qualitative data to reconstruct students' authentic learning status.

Second, develop standardized models for data cleaning and analysis to ensure the accuracy and reliability of student performance data. We establish unified standards for data screening, cleaning, classification, and archiving. We utilize artificial intelligence algorithms to intelligently process the massive volume of collected student data, automatically removing invalid or duplicate entries. We construct differentiated student performance analysis models based on the distinct academic training characteristics of different majors and grade levels. For first-year students, we focus on adaptation-phase assessments, addressing issues such as insufficient major understanding and ineffective study methods; we focus on the academic performance analysis of sophomore and junior students, particularly in core professional courses, paying attention to credit progress, weak course areas, and gaps in professional competencies. By leveraging algorithmic models, student academic data is dynamically compared and trend-analyzed to identify critical turning points and learning weaknesses.

3.2 Building a Digitalized Tiered and Categorized Guidance System for Personalized, Precise Educational Support

Based on digital academic profiles and risk early-warning results, a precise academic guidance system is established that features "tiered classification, individualized strategies, and dynamic adaptation." Customized, differentiated, personalized, and context-specific community-based academic support plans are developed for students at different academic levels, with varying issues and developmental needs.

First, a digitalized safety-net support mechanism is designed for students facing significant academic difficulties. Through the community's digital education platform, each struggling student is assigned a dedicated academic mentor. A specialized support team composed of community counselors, subject instructors, and outstanding student party members is formed to conduct in-depth analysis of the root causes of academic challenges—such as foundational weakness, lack of motivation, environmental influences, or psychological anxiety—based on the student's academic profile. Tailored intervention plans are then developed accordingly. For students with weak foundations, customized remedial programs focusing on key knowledge points are provided through online micro-courses, question banks, and targeted practice resources. For those lacking effective study methods, specialized training is offered covering pre-class preparation, classroom engagement, post-class review, error analysis, and time management. For students whose academic decline stems from psychological anxiety, collaboration with the psychological counseling center ensures timely online and offline mental health support [2]. The entire support process is recorded in real-time via the digital platform, with continuous updates on academic data and ongoing monitoring of intervention effectiveness. Academic profiles are periodically refreshed, enabling dynamic adjustments to support strategies.

Second, a digitalized excellence enhancement mechanism is implemented for average-performing students. Targeting students with stable academic performance, solid foundations but limited breakthroughs, and room for improvement in overall capabilities, this program aims to "improve quality and efficiency, break through bottlenecks, and strengthen core competitiveness." Using the digital platform, students' strengths and weaknesses across disciplines are analyzed, and phased learning resources, advanced professional courses, and competition training materials are recommended [3]. Within student communities, digital excellence development camps are established, offering regular training in disciplinary thinking, research initiation, and competition preparation to broaden students' knowledge horizons.

Third, a digitalized elite empowerment mechanism is introduced for high-achieving students. Designed for top performers with strong academic records, exceptional learning abilities, and aspirations for further studies, scientific research, innovation, or competition achievements, this initiative builds a high-end academic empowerment platform to foster outstanding growth and individual development. Through the digital platform, premium educational resources are integrated to

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precisely match students with research mentors and competition coaches, while providing access to cutting-edge academic lectures, research project opportunities, and entrepreneurship training. Leveraging big data, students' progress toward their goals is tracked, enabling personalized guidance in graduate school planning, research development, and competition preparation. This approach helps uncover students' potential and cultivate high-quality, innovative talents, ensuring comprehensive and individualized development across all academic levels.

3.3 Establishing a Digitalized, Diversified Resource Supply System to Expand Community-Based Academic Education Channels

By utilizing digital technologies, high-quality educational resources from both within and outside the university are integrated into a dynamic, continuously updated digital academic resource supply system. This enriches the content and formats of community-based academic guidance, broadens educational channels, and enhances the effectiveness of academic support.

First, we integrate high-quality digital learning resources such as core professional micro-courses, in-depth knowledge videos, specialized question banks, error analysis, and preparation materials. We classify and archive these resources by major, grade level, course, knowledge points, and competency modules to establish a dedicated digital resource library for the academic community. We leverage big data analytics of students' learning conditions to identify both common needs and individual requirements, enabling intelligent and precise resource recommendations. We offer on-demand access, online replay, and offline download functions, allowing students to study anytime and anywhere during their free time, ensuring comprehensive and barrier-free access to premium educational resources. We regularly update the resource library with new content aligned with talent development plans and curriculum reforms, supplementing it with innovative learning materials to maintain relevance and timeliness.

Second, we upgrade existing student community spaces through digital transformation to build multifunctional academic support environments, including smart study rooms, digital tutoring workshops, live online classrooms, academic discussion rooms, and research training corners. In smart study rooms, we implement intelligent attendance and learning behavior monitoring systems that automatically track study duration, dynamically record learning status, and enable smart seat reservation, providing students with an autonomous learning environment. We organize digital offline academic activities using a hybrid model combining "in-person instruction + live streaming + recorded playback," offering specialized programs such as in-depth subject reviews, targeted Q&A sessions, and study skills training. Students unable to attend in person can actively participate via live streams and later review recordings to reinforce learning outcomes. We utilize the digital platform to collect student activity preferences, customize community academic event themes, and ensure events precisely meet students' academic needs.

3.4 Establish a Digital Closed-Loop Management and Evaluation System to Ensure Effective Implementation of Guidance

We leverage digital technologies to build a full-cycle closed-loop management system encompassing "data early warning—targeted intervention—process control—outcome evaluation—review and optimization," enabling digital oversight throughout the entire academic guidance process, full traceability, and comprehensive assessment to enhance the quality of precision academic support.

First, we use the community-based digital education platform to maintain detailed, documented records for all academic guidance, support, and enhancement activities. We record information such as target students, guidance timing, content, methods, problem resolution, student feedback, and follow-up improvement suggestions, ensuring every support session, activity, and guidance effort is documented, tracked, and archived. For students facing significant academic challenges, we implement a digital management model involving daily tracking, weekly review, and monthly summaries. Academic mentors regularly update students' learning progress and task completion status, conduct weekly reviews based on learning data to assess effectiveness, analyze improvements, and generate specialized support reports. The platform automatically aggregates all management data into a complete growth trajectory file, documenting both students' academic progress

Second, we develop a comprehensive digital evaluation system integrating formative and summative assessments, along with quantitative and qualitative metrics. Evaluation dimensions should

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cover multiple aspects, including academic performance improvement, credit acquisition progress, improved study habits, independent study duration, participation in activities, changes in academic mindset, and overall competency development. We automatically aggregate evaluation indicators using big data and apply algorithmic models to generate intelligent composite scores, producing automated reports on individual academic growth, class academic atmosphere, and community guidance effectiveness. We incorporate subjective student feedback through digital tools such as online surveys, anonymous responses, and one-on-one interviews to collect opinions on guidance content, format, instructors, and outcomes, thereby evaluating the actual effectiveness of precision academic support.

4. Conclusion

Leveraging digital technologies for precise academic guidance is an inevitable trend for higher education institutions in the new era to advance holistic education and enhance talent development. By utilizing digital tools such as big data collection, intelligent learning analytics, and dynamic risk early warning, institutions can capture students' daily study patterns, community learning behaviors, and phased academic changes. This enables accurate identification, assessment, and intervention of academic issues, facilitating personalized teaching, categorized guidance, and dynamic management.

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