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The Connotation, Operational Mechanism, and Optimization Path of Integrating Digital Governance into Funding-Based Education

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Abstract: Against the backdrop of digital transformation, this paper reveals the connotation of integrating digital governance into funding-based education from three aspects: educational equity, governance collaboration, and student development. It constructs a closed-loop operational mechanism of "Data Collection & Integration → Intelligent Analysis & Decision-Making → Collaborative Governance & Service → Dynamic Monitoring & Feedback". It innovatively proposes a "Three-Dimensional Empowerment Model": technological empowerment enabling precise identification, platform empowerment promoting resource integration, and data empowerment driving collaborative governance. Ultimately, it forms an optimized path for smart funding-based education: "Precise Need Identification - Dynamic Resource Allocation - Personalized Service Provision - Multi-party Collaborative Governance - Continuous Efficiency Enhancement".

Keywords: Digital Governance; Funding-Based Education; Precise Identification; Collaborative Governance; Smart Education.

1. Introduction

In the digital era, transformations in the education sector are deepening. Digital governance is gradually becoming a significant force driving educational development. Funding-based education, as a crucial component of educational work, shoulders the important responsibility of helping economically disadvantaged students successfully complete their studies and achieve comprehensive development. Integrating digital governance into funding-based education leverages the advantages of digital technology to enhance the precision, efficiency, and personalization of funding-based education work, thereby constructing a more robust funding-based education system.

2. The Connotation of Integrating Digital Governance into Funding-Based Education

Educational digital governance involves the integrated application of digital technologies and digital thinking throughout the entire domain and process of educational governance. By building an integrated educational management and service platform, it strengthens the mining, analysis, and empowering integration of educational data, achieves the reshaping of educational governance structures, promotes the reengineering of educational management and service processes, and enhances the digitalization and intelligence of educational decision-making, execution, monitoring, evaluation, service, and security. [1]

In the new era, the funding-based education model needs to transition profoundly from a security-oriented type to a development-oriented type, placing greater emphasis on students' spiritual and psychological needs, and effectively contributing to cultivating new generations capable of undertaking the mission of national rejuvenation. [2] Integrating digital governance into funding-based education enables precise identification of beneficiaries through technology, achieves fair distribution of resources, optimizes resource allocation, enhances educational governance efficacy, helps form a new digital and intelligent educational governance model, and realizes full lifecycle management of student funding data from enrollment to graduation.

2.1. Anchoring Educational Equity, Solidifying the Foundation of Funding-Based Education

Implementing Precise Funding Strategies: Utilizing big data technology, multi-dimensional collection and in-depth analysis of student-related data are conducted to construct a scientific model for identifying economically disadvantaged students. [3] This effectively avoids interference from subjective factors and information inaccuracies inherent in traditional funding models, ensuring accurate distribution of aid, safeguarding students' fundamental right to education, and putting the concept of educational equity into practice.

Establishing Unified Standards: Relying on objective data and following standardized processes, unified and transparent funding criteria and review mechanisms are established. [4] This measure aims to eliminate imbalances in funding caused by subjective factors and regional disparities, promote the equitable distribution of funding resources, and uphold every student's right to equal access to educational resources.

Ensuring Transparency in the Funding Process: Relying on digital platforms, the entire process of funding application, review, assessment, and fund disbursement is traceable and transparent. This not only facilitates supervision and management but also effectively prevents misconduct and corruption in funding work, maintains the fairness and credibility of funding-based education, and fosters an equitable educational environment.

2.2. Promoting Governance Collaboration, Pooling Multi-party Educational Synergy

Building a Multi-stakeholder Collaborative Framework: Breaking down information silos in traditional funding-based education, a digital educational ecosystem involving collaborative participation from multiple stakeholders such as schools, government, enterprises, and social organizations is established. [5] Leveraging data sharing and interaction platforms enables efficient communication and collaboration among stakeholders, pooling resources to provide comprehensive support for students' holistic development.

Promoting Integration of Educational Resources: Integrating various educational resources, including educational resources, financial resources, and human resources, optimizes their allocation and shared utilization. School-enterprise cooperation in building practical bases provides students with more hands-on opportunities; collaboration with social organizations on public welfare activities helps cultivate students' social responsibility, enhancing the efficiency and quality of education.

Strengthening Home-School-Community Linkage Mechanism: Using digital means to strengthen connections and interactions between schools, families, and communities, fostering a positive atmosphere for collaborative education. Online channels like parent schools and community education platforms enable timely sharing of student progress information, guiding all parties to participate in funding-based education, creating an all-encompassing growth environment for students, and broadening the space for education.

2.3. Focusing on Student Development, Empowering Student Growth and Future

Providing Personalized Growth Support: Comprehensively collecting information on students' interests, learning styles, and career plans enables teachers to create accurate student profiles. [6] Based on this, teachers can develop personalized teaching plans tailored to individual growth needs, stimulating students' learning potential and creativity, and promoting their personalized development.

Serving Students' Diverse Growth Needs: Integrating multi-dimensional data encompassing teaching activities, teaching management, and teacher development enhances the depth and breadth of learning analytics, driving high-quality educational development, thereby better meeting students' growth needs at different stages and in different fields.

Promoting Students' Holistic Development: Utilizing digital technology, attention extends beyond students' economic status and academic performance to comprehensively grasp their development in ideological and moral character, physical and mental health, and social practice. Integrating educational work throughout the entire student growth process promotes students' all-round development in morality, intellect, physique, aesthetics, and labor. For instance, mental health monitoring platforms enable timely intervention; social practice record systems cultivate social responsibility.

Supporting Students' Future Development: Building diversified learning opportunities and development platforms for students helps them enhance their comprehensive qualities and innovation capabilities, strengthening their competitiveness in future society. Online course platforms and project databases broaden students' knowledge horizons; intelligent technology assists in planning personalized learning paths, laying a solid foundation for students' future development.

3. The Operational Mechanism of Integrating Digital Governance into Funding-Based Education

To effectively realize the goals of digital governance empowering funding-based education, a scientific, efficient, and closed-loop operational mechanism must be constructed. This mechanism, driven by data as the core, encompasses the entire process from data aggregation to effect feedback. Through technological empowerment and process reengineering, it ensures the precision, synergy, and sustainable development of funding-based education work.

3.1. Data Collection and Integration

Multi-channel Data Collection: Build a comprehensive information collection network covering all aspects of students, breaking down information silos. On one hand, conduct in-depth cooperation with government departments, utilizing data-sharing platforms with civil affairs, public security, etc., to obtain students' family economic status, household registration, and other basic information. For example, leveraging civil affairs system data can precisely identify students from low-income families. On the other hand, tap into internal campus data resources. Using campus card systems, collect students' consumption records in canteens and stores to indirectly assess their economic status. Additionally, library borrowing systems reflect students' learning preferences and habits, providing data support for subsequent personalized funding and education.

Standardized Data Integration: Establish unified data standards and formats for cleaning, transforming, and integrating collected multi-source data. Build a data warehouse for centralized storage and management of funding-related data, ensuring data consistency and integrity. For example, standardize student identity information from different departments using unified coding rules to eliminate duplication and errors, laying a solid foundation for subsequent data analysis and application.

3.2. Intelligent Analysis and Decision-Making

Building Data Analysis Models: Utilize big data analytics, machine learning, and other technologies to construct data analysis models for funding-based education. [7] In the beneficiary identification stage, models can automatically generate students' funding need indices based on multiple dimensions like family economic data, campus consumption data, and academic performance, with assigned weights, achieving precise identification. For instance, students from economically disadvantaged families showing significant academic improvement could receive higher funding levels. For resource allocation, personalized funding plans are formulated by combining data on student interests and career plans, optimizing resource allocation.

Decision Support System: Develop a decision support system based on data analysis results, providing visualized data analysis reports and decision recommendations to funding management departments. The system can predict trends in funding work through data mining (e.g., changes in different types of funding needs), helping managers formulate strategies proactively, enhancing the scientific and forward-

looking nature of decisions.

3.3. Collaborative Governance and Service

Intra-school Department Collaboration: Break down data barriers between internal school departments and establish cross-departmental collaborative work mechanisms. The funding management department shares student academic data with teaching departments to develop targeted academic support plans for funded students; collaborates with student affairs departments on mental health education and counseling, focusing on the well-being of funded students. Simultaneously, linkage with career guidance departments enables precise job recommendation services based on students' career plans and internship data, forming an all-round educational synergy.

Home-School-Community Linkage: Build a digital service platform for tripartite collaboration among school, family, and society. [8] Through the platform, schools promptly provide feedback to parents on students' funding and learning situations; parents can also upload updates on family economic status changes, achieving home-school information exchange. Furthermore, actively introduce social resources by collaborating with enterprises and social organizations to provide students with internship opportunities, scholarship programs, etc., fostering joint participation in funding-based education and creating a supportive educational environment.

3.4. Dynamic Monitoring and Feedback

Establishing a Dynamic Monitoring System: Implement real-time dynamic monitoring of the entire funding-based education process. By setting key indicators and thresholds, problems and risks can be identified promptly. [9] For example, monitor the progress and flow of funding disbursements to ensure safe and compliant usage; track students' academic progress and behavioral changes, intervening promptly for students showing anomalies.

Multi-channel Feedback Mechanism: Establish a feedback platform involving students, parents, and society to collect opinions and suggestions on funding-based education work. Students can provide feedback on the convenience of the application process or the fairness of resource allocation via the online platform; parents can report changes in family circumstances and expectations for school funding work; society can evaluate the effectiveness of funding-based education. Based on feedback, strategies and methods are adjusted and optimized timely to continuously improve work quality.

The operational mechanism of "Data Collection & Integration→Intelligent Analysis & Decision-Making→ Collaborative Governance & Service→Dynamic Monitoring & Feedback" for integrating digital governance into funding-based education forms a closed-loop work system. Driven by data, intelligent decision-making, collaborative service, and continuous optimization, it constantly enhances the precision, scientificity, and effectiveness of funding-based education work.

4. Optimization Paths for Integrating Digital Governance into Funding-Based Education

To deepen the application effectiveness of digital governance in the field of funding-based education, ensure the effective implementation of its connotation and the efficient operation of its mechanism, and achieve sustainable development, it is imperative to explore systematic optimization paths. These paths aim to precisely identify needs, optimize resource allocation, innovate educational models, strengthen collaborative governance, and enhance team capabilities, collectively building a smarter, more efficient, and equitable new ecosystem for funding-based education.

4.1. Precise Identification: Building a Data-Driven Beneficiary Identification System

Multi-source Data Collection: Establish a shared platform integrating data from civil affairs, education, public security, and other departments to obtain students' family economic status and demographic information. Simultaneously, leverage campus systems like card consumption and library borrowing to collect students' daily behavioral data. Multi-dimensional data collection comprehensively and authentically reflects students' actual needs. For instance, analyzing card consumption records helps understand dining frequency and expenditure levels, indirectly assessing economic status and avoiding bias from single data sources.

Intelligent Analysis Model: Utilize big data analytics to construct beneficiary identification models. Models can set multiple evaluation dimensions and weights to perform quantitative analysis on collected data, automatically generating students' funding need indices. For example, prioritize funding for students from economically disadvantaged families showing significant academic progress but frugal lifestyles. Continuously monitor dynamic changes in student data through the model to adjust funding levels promptly, ensuring the accuracy and timeliness of identification.

4.2. Resource Optimization: Enhancing Funding Resource Allocation Efficiency Using Digital Technology

Optimizing Allocation Mechanisms: Develop an intelligent funding resource allocation system. Based on a comprehensive assessment of factors like students' need index, academic performance, and social service participation, resources are allocated precisely. Move away from the "one-size-fits-all" approach, providing differentiated funding schemes for different student types. For example, offer research project funding to economically disadvantaged students with research potential; provide start-up capital support to students with entrepreneurial aspirations, maximizing resource effectiveness.

Real-time Supervision and Feedback: Establish a real-time fund flow supervision system, using blockchain technology to record every transaction, ensuring funding security and transparency. Simultaneously, collect student feedback on funding policies and fund usage through a student terminal system, enabling timely adjustments to resource allocation strategies and improving satisfaction with funding work.

4.3. Empowering Education: Creating a New Digital Education Ecosystem

Personalized Development Planning: Leverage AI technology to tailor personalized growth and development plans for students. Based on data such as interests, academic performance, and career inclinations, push matched learning resources, practical opportunities, and career guidance

courses. For example, push programming competition information, online courses, and enterprise internships to students interested in computer science, aiding their self-growth and career goals.

Online-Offline Integrated Education: Build an online learning community for funding-based education, aggregating diverse educational resources, and facilitating thematic discussions and experience sharing. Simultaneously, combine with offline practical activities like volunteer service and innovation/entrepreneurship practice to help students enhance their comprehensive qualities through experience. The integration of online and offline broadens educational channels, enriches forms, and enhances effectiveness.

4.4. Collaborative Governance: Establishing a Multi-party Digital Governance Community

Inter-departmental Collaboration: Within the school, strengthen collaboration between the funding management department and teaching, student affairs, career guidance, and other departments. Break down data silos, achieve data sharing, and enable business synergy. For example, funding management collaborates with teaching to provide academic support; links with career guidance to offer job placement services, forming an educational synergy.

Home-School-Community Linkage: Construct a digital governance network linking school, family, and society. Through home-school interaction platforms, provide timely feedback to parents on students' funding and learning, and solicit parental input; collaborate with enterprises and social organizations to introduce social resources, offering students more practical opportunities and funding programs, jointly creating a favorable educational environment.

4.5. Capacity Building: Enhancing the Digital Literacy of the Funding Work Team

Training System: Develop a systematic digital literacy training plan. Organize regular training for funding staff on digital technology applications, covering big data analysis, AI tool usage, information security, etc. Through training, enhance staff capabilities in data mining, analysis, and application, enabling them to proficiently use digital technology in funding-based education.

Incentive Mechanism: Establish incentives for improving digital literacy. Recognize and reward individuals and teams who excel in applying digital governance to funding work. Encourage funding staff to actively explore innovative applications of digital technology in funding-based education, fostering a positive innovation atmosphere.

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