

# **Value, Dilemmas, and Strategies for the Digital Transformation of Teaching Resources in Special Vocational Education**

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**Abstract:** Educational digitalization is key to promoting high-quality development in special vocational education. As its core support, the digital transformation of teaching resources has become a critical development topic. This study employs literature review, field research, and case analysis methods to sort out relevant research and practical experiences, analyze real-world problems, and summarize effective implementation paths. The study finds that while the digital transformation of teaching resources in special vocational education holds significant value in meeting the specific needs of disabled students, reshaping the teaching ecology, and promoting educational equity, it faces multiple dilemmas in practice, including insufficient funding and resource guarantees, poor adaptability between technology and needs, low matching degree between resources and student personalization, and an urgent need to improve teachers' digital literacy. Breaking through these transformation bottlenecks requires collaborative efforts from multiple stakeholders. Strategies such as guaranteeing support, technological innovation, resource reconstruction, and teacher training must be implemented to promote the digital upgrade of teaching resources, providing high-quality resource support for the high-quality development of special vocational education.

**Keywords:** Special Vocational Education; Teaching Resources; Digital Transformation

## **1. Introduction**

With the rapid advancement of the global wave of educational digitalization, utilizing digital technology to aid in the construction of a learning society and a lifelong education system has become a universal consensus of the times [1]. Recent policy documents issued by the state explicitly propose deepening educational reform and driving the process of educational

modernization through digitalization. Against this macro background, special vocational education, as a key field shouldering the important mission of skills training and social integration for disabled students, faces not only an urgent need for digital transformation but also issues concerning the baseline of educational equity. As the core carrier of special vocational education, the quality of digital construction of teaching resources directly affects teaching effectiveness and is a foundational project for meeting the personalized learning needs of disabled students and breaking through physical and mental barriers.

However, the digital transformation of teaching resources in higher special vocational education is currently in a preliminary exploration stage. It faces multiple structural challenges, including funding shortages, poor technical adaptability, imbalance between resource supply and demand, and lagging digital literacy among teachers. These issues severely restrict the depth and breadth of the transformation. In view of this, this study aims to systematically sort out the theoretical logic and practical value of the digital transformation of teaching resources in special vocational education and deeply analyze the aforementioned key bottlenecks. By combining literature research with field investigations, this study will propose targeted implementation strategies, aiming to construct a high-quality and inclusive digital teaching ecology.

The conduct of this research possesses both significant theoretical and practical value. Theoretically, it helps enrich the theoretical system of digital transformation in special vocational education and clarifies the core mechanism of digital resources in reshaping the teaching ecology. Practically, the dilemmas revealed and the strategies proposed can provide scientific decision-making references for education administrative departments in planning, vocational colleges in optimizing

resource allocation, and teachers in improving digital literacy, thereby effectively promoting the high-quality development of special vocational education and fostering social inclusion and equity.

## **2. Value Implications of Digital Transformation**

The digital transformation of teaching resources in special vocational education is not merely an iteration of technical tools but a reshaping of educational concepts and a recreation of the ecology. Its core value lies in using digital empowerment to precisely respond to the specific needs of disabled students, reconstruct the teaching ecosystem, and promote the substantial realization of educational equity through multi-dimensional paths.

### **2.1 Meeting Specific Needs: A Paradigm Shift from "Standardized Supply" to "Personalized Compensation"**

Traditional special education is often constrained by unified teaching resources, making it difficult to fully account for the obvious individual differences among disabled students.[2] The core value of digital transformation lies in leveraging technical means to achieve "one case, one plan" precise compensation.

First, overcoming technical barriers to achieve accessibility. For students with hearing, visual, and physical disabilities, digital resources incorporate assistive technologies such as sign language recognition, screen reading translation, voice navigation, and AR motion compensation. These effectively remove physical barriers to perception and action, constructing channels for equal access to information.

Second, achieving adaptive matching of learning content. Relying on artificial intelligence and big data analysis, teaching resources can dynamically capture students' cognitive characteristics and learning trajectories, transforming static textbooks into customizable dynamic content. For instance, providing visual compensation for hearing-impaired students through media materials (such as animations and short videos), and supporting visually impaired students with audiobooks and tactile feedback, achieves interactive learning through multi-sensory channels. This shift from "teacher-centered" to "student-centered" ensures that teaching

resources can precisely align with the Zone of Proximal Development for each student.

### **2.2 Reshaping Teaching Ecology: Ecological Reconstruction from "Experience-Driven" to "Data-Intelligence"**

Digital transformation drives the teaching model of special vocational education from traditional indoctrination to a proactive learning ecology deeply integrated with situational awareness, social interaction, and emotional resonance.

In terms of teaching models, relying on big data and learning analytics, teachers can accurately capture student potential and customize personalized strategies; a diversified evaluation mechanism integrates formative and summative evaluations to achieve dynamic optimization of teaching strategies. In terms of teaching methods, multi-sensory technologies such as real-time subtitles break down communication barriers, VR/AR immersive scenes deepen project-based and inquiry-based learning, and intelligent systems push teaching management from experience-dominated to data-driven, significantly improving the level of refined guidance.

Regarding teacher awareness, digital technology stimulates teacher reflection and innovation, spawning new teaching designs that integrate online and offline elements [3]; tools like virtual simulation broaden horizons, promoting the integration of technology into curriculum development, while experience sharing within communities further consolidates collective innovative momentum, comprehensively revolutionizing the teaching ecology.

### **2.3 Promoting Educational Equity: A Deep Leap from "Equality of Opportunity" to "Substantive Inclusion"**

Digital technology breaks through spatial and temporal limitations, opening up new paths for disabled students, especially those in remote areas, to access high-quality educational resources, providing support for the realization of educational equity from multiple dimensions [4].

First, breaking spatial and temporal shackles. Online platforms make high-quality courses and digital library resources easily accessible. Immersive scenarios created by VR/AR allow students to break free from the constraints of their real environments, achieving intuitive experiences, while simultaneously promoting

the sharing of global educational resources and the expansion of international perspectives.

Second, bridging regional disparities. Through digital means, educational resources can be widely popularized among disabled student groups, ensuring that disabled students in different geographical locations can equivalently access educational resources; government and social collaboration increases investment in remote areas, promoting educational equity from the root.

Third, expanding educational participation. A tripartite linkage mechanism involving families, schools, and communities has been constructed. Teaching platforms serve as digital bridges for instant communication between homes and schools, ensuring that learning progress and support measures can be shared in real-time; digital technology integrates community internship opportunities and public welfare assistance, creating an inclusive and interactive learning atmosphere that promotes overall social integration.

### **3. Analysis of Dilemmas**

The digital transformation of teaching resources in special vocational education requires the integration of numerous elements. It is a multi-dimensional interactive process involving policy introduction, technology research and development, resource adaptation, and teacher participation. This transformation possesses strong scientific, professional, and complex characteristics. The dilemmas reflected in practice are mainly manifested as: the dual dilemma of funding and policy, the adaptability gap between technology and humans, challenges in the personalized adaptation of resources, and the lack of teachers' digital literacy capabilities.

#### **3.1 The Dual Dilemma of Funding and Policy**

The digital transformation of teaching resources in special vocational education faces a dual bottleneck of funding shortages and insufficient policy support. Regarding funding, digitalization covers the entire chain of infrastructure, platforms, content, and training, requiring huge investments. Special education institutions have high operating costs, and existing appropriations and social donations are difficult to cover additional expenses. This leaves institutions struggling when introducing advanced technologies, severely restricting the speed and quality of transformation.

Regarding policy, although there is macro-level emphasis, specific guidelines and supporting measures lag behind. Institutions lack clear guidance in project declaration and effectiveness evaluation. Current policies mostly focus on general education, neglecting the specific needs of special education. Support is weak in key areas such as assistive technology R&D, legal protection of resources, and dedicated software design, limiting the effectiveness and applicability of resources. Furthermore, there are legal gaps in information security assurance. Although general regulations like the "Personal Information Protection Law" exist, specific laws and regulations targeting the niche field of online education for persons with disabilities are lacking. This poses severe challenges to the information security of participants and hinders the in-depth expansion of the transformation.

#### **3.2 The Adaptability Gap between Technology and Needs**

The diversity in perception, cognition, and action among disabled students requires resource design to possess high adaptability, yet the current status reveals significant deficiencies [5]. First, technological R&D lags behind. Resource libraries at all levels, despite heavy investment, suffer from low utilization rates. There are few breakthroughs in key assistive technologies (such as intelligent recognition and speech-to-text), leading to resources that "lack pertinence and practicality, with poor openness and interactivity" [6]. The exclusion of visual interfaces for visually impaired students and the unfriendliness of voice command systems for hearing-impaired students are direct manifestations of this mismatch between technology supply and demand.

Second, inhumane design neglects emotional experiences. Technical defects not only cause operational barriers but also trigger psychological rejection and a lack of learning motivation among students, exacerbating participation difficulties. Finally, the application of new technologies is hindered. Frontier technologies such as AI, VR, and AR mostly remain at the concept validation stage, lacking large-scale successful cases. Coupled with rapid technology iteration and a lack of standards, the cost of resource updates is high, and the risk of trial and error is significant. This makes it difficult for special education institutions, which already lack resources, to bear the burden,

further deepening the gap between technology and actual needs.

### **3.3 Challenges in Resource-Student Adaptability**

The personalized needs of disabled students are the core yardstick for testing resource quality, yet existing resources largely follow conventional education models, seriously lacking pertinence [7]. Especially in practice-oriented courses such as pastry craftsmanship, e-commerce, etc., resources tailored specifically for disabled students are nearly blank. Mainstream platforms may possess massive standardized content, but they struggle to support the development of professional skills for these students. This "supply-demand mismatch" not only limits knowledge transmission but also weakens the ability of disabled students to participate in socio-economic activities, affecting the effectiveness of school-enterprise cooperation and market integration.

At a deeper level, this reflects a huge gap in the transition from "universal education" to "specialized education." The core difficulty lies in "intermediate technology conversion": this is not merely a physical process of converting general content into accessible versions, but also a conceptual challenge requiring educators to deeply understand the cognitive characteristics of disabled students and innovatively use technology to precisely match their learning habits. The weakness of current general resources in facing special needs highlights the urgency of a dual transformation of technology and concepts. Only by crossing this "intermediate zone" and achieving refined reconstruction of resources can we truly promote educational equity and stimulate the potential of disabled students.

### **3.4 Digital Reshaping of Teachers and Literacy**

In the realm of special vocational education, teachers are the core element of the digital transformation of teaching resources, and their level of digital literacy directly concerns the effectiveness of the transformation. Currently, the primary challenge is that the teacher group's cognition of digital teaching is generally superficial. They view it merely as a simple expansion of electronic textbooks, ignoring the unique value of digitalization in enhancing

classroom interactivity, opening up personalized learning pathways, and promoting the diversification of teaching content [8]. This cognitive limitation becomes the primary obstacle to improving teachers' digital literacy. Secondly, the lack of information technology skills among teachers is another significant problem. Although digital teaching tools are constantly emerging, teachers lack necessary training and practical opportunities in the actual operation and application of information technology. They find it difficult to effectively integrate digital tools into daily teaching activities, resulting in the inability to fully demonstrate the digital advantages of teaching resources. Furthermore, the disconnect between theoretical learning and practical application further exacerbates the dilemma. Even if some teachers receive preliminary digital training, they still face difficulties in transforming theoretical knowledge into teaching innovation during specific implementation. This contradiction is particularly prominent in the field of special education, which requires a high degree of personalization and flexibility.

## **4. Implementation Strategies**

In response to the aforementioned dilemmas, the study proposes the following strategies:

### **4.1 Policy Support and Optimization: Constructing Multi-dimensional Strategies to Guarantee Educational Equity**

Resolving the funding and policy difficulties encountered in the digital transformation of teaching resources in special vocational education requires collaborative cooperation among the government, the market, and society to build a multi-level and comprehensive support system. This not only lays a solid foundation for the long-term development of special education but is also a key measure to promote educational equity and inclusive social growth.

First, strengthen financial support and special assistance. The government should significantly increase direct investment in special education digitalization in the annual budget, demonstrating national determination to guarantee educational equity for persons with disabilities. Specifically, special funds can be established to clearly include special vocational education in the key support scope of national educational informatization, providing stable

and sufficient financial guarantees. Special funds should cover multiple links such as infrastructure construction, hardware and software upgrades, digital resource development, and teacher training to ensure the comprehensiveness and effectiveness of fund usage. Simultaneously, encourage social capital participation through various channels such as Public-Private Partnership (PPP) models, issuing education bonds, and accepting charitable donations to broaden funding sources. Establish transparent and efficient project declaration and audit processes to attract enterprises and public welfare organizations to invest in special vocational education digitalization projects, while ensuring the transparency of fund usage and the implementation of accountability mechanisms. Second, optimize policy supporting measures and incentive mechanisms. National and local governments should issue specific and operable policy documents that clarify the goals, paths, and timelines for the digital transformation of special vocational education, providing clear guidance for various institutions. This includes, but is not limited to, clarifying standards for digital teaching resources, copyright protection rules, and teacher digital skill certification systems. At the same time, construct a sound policy incentive system to reward higher special education institutions that actively participate in digital transformation and achieve significant results, such as tax reductions and project subsidies. Efforts should also be made to increase policy inclination towards special needs. Given the particularity of special education, more support should be provided in terms of policy. For example, increase direct subsidies for the R&D of special assistive technologies, encourage the development of educational resource software and content adapted to the needs of disabled students, and provide a legal framework for copyright protection of special education resources to ensure the originality and legality of these resources. Third, strengthen the construction of the legal system. To guarantee the healthy development of special vocational education in the process of digitalizing teaching resources, the state needs to formulate specialized laws. These laws should clarify the legal responsibilities of participants in the production, dissemination, and use of digital educational resources, strengthen the protection of personal privacy in

special vocational education, establish the legal rights enjoyed by persons with disabilities, and guarantee their equal and comprehensive educational opportunities in the digital age.

#### **4.2 Technology R&D and Integration: Meeting Special Needs to Achieve Seamless Fusion**

Constructing a seamlessly fused ecological system of special education teaching resources requires a high focus on strategic construction and precise adaptation to bridge the existing fault line between technology and individual needs.

First, accelerate the adaptation of technological innovation to personalized needs. Facing the challenges of technological lag and the gap in personalized needs, a multi-party collaborative R&D platform should be built. This involves integrating the strengths of the government, universities, research institutions, and enterprises to form special research groups in key technical fields such as assistive technology, intelligent recognition, and speech translation. This requires implementing a dynamic demand-oriented strategy. Through continuous market research and feedback loop mechanisms, the core demands of the front line of teaching (teachers, students, and their families) must be accurately grasped. It also means adhering to a user-centered design philosophy, inviting disabled students to participate in the full-cycle design and verification of products to ensure that solutions fit practical needs.

Second, strengthen the humanization of technology and user stickiness. Addressing the issues of technological coldness and insufficient motivation for disabled students to participate, principles of emotional intelligence design must be integrated. Introduce affective computing and user psychology into technical design to develop interactive teaching resources capable of perceiving and adapting to the emotional responses of disabled students, enhancing the emotional connection and participation in the learning process. Further promote the seamless integration of hardware and software technologies. Relying on technology integration platforms, accelerate the conversion of frontier technological innovation achievements into the classroom. Specifically, ensure the seamless docking of cutting-edge assistive technologies with teaching application software. For example, voice navigation and screen reading functions

configured for visually impaired students must maintain consistency and stability across hardware platforms. Simultaneously, build an inclusive learning community, encourage disabled students to share usage experiences, promote peer learning and mutual assistance, and collect feedback to continuously optimize the user experience of teaching resources.

Third, promote the synergistic optimization of emerging technologies and educational resources. The primary measure is the systematic integration of national-level educational resource platforms. Given the current fragmentation of resources, a hierarchical management system under top-level planning needs to be constructed [9]. Scattered resource libraries should be integrated through scientific classification into a logically rigorous and smoothly navigated knowledge network to significantly improve the system integration and accessibility of resources. This will not only greatly increase resource utilization rates but also lay a solid foundation for technology penetration and personalized teaching practices. Secondly, carry out empirical research on forward-looking technology applications. Select representative special vocational education institutions or specific teaching scenarios as pilots to deeply explore the teaching application potential of frontier technologies such as Artificial Intelligence, Virtual Reality (VR), and Augmented Reality (AR), accumulating experience for subsequent promotion. Furthermore, establish and improve industry standards and guidelines. It is recommended that the government cooperate with professional institutions to formulate application standards and operational guidelines for emerging technologies in the field of educational resources for special vocational education, ensuring the standardization and sustainability of technology deployment. In addition, establish a flexible teaching resource update mechanism. Construct a dynamic update and evaluation system for technology and educational resources to ensure that educational content synchronizes with the latest technologies, while simplifying the resource update process to reduce the burden on teachers, jointly creating an innovation-driven and fully inclusive special education environment that fully stimulates the potential of every student.

#### **4.3 Resource Reconstruction and Innovation:**

#### **Overcoming Individual Differences to Improve Adaptation Effectiveness**

Resolving the problem of personalized adaptation of teaching resources for disabled students requires collaborative efforts from educational decision-makers, technical personnel, teachers, and all sectors of society. We must cross the barrier of "intermediate technology conversion" to provide disabled students with higher quality and more personalized teaching resources, laying a solid foundation for their future development.

The primary task is to strengthen needs analysis and user persona construction. Deepen the understanding of individual differences among disabled students, breaking through the superficial label limitations of "special education." Utilize methods such as questionnaire surveys, interviews, learning behavior data analysis, and machine learning techniques to conduct detailed tracking and analysis of the learning process of each disabled student. Gain an in-depth grasp of the cognitive abilities, learning characteristics, interest preferences, and difficulties faced by disabled students of different categories, constructing precise student personas to support resource customization.

Secondly, promote the barrier-free transformation and innovation of teaching resources. Facilitating "intermediate technology conversion" is not simply converting general content into accessible versions. Instead, based on the specific disability types of students, develop barrier-free teaching resources with better compatibility and higher accessibility. For example, use Augmented Reality (AR)/Virtual Reality (VR) technologies to simulate practical scenarios, providing tactile feedback for visually impaired students and equipping hearing-impaired students with accurate subtitles and sign language videos. Through these deeply customized resources, ensure that every disabled student can access learning content without barriers and enjoy an equal learning experience. Simultaneously, accelerate the construction of diversified resource libraries covering various professional fields. Each field should include personalized special education resource modules ranging from basic to advanced to professional levels to meet the needs of different learning stages.

Furthermore, expand the depth and breadth of market integration and school-enterprise

cooperation. Enterprises should actively engage in special vocational education, developing customized internship positions and training projects according to the needs of disabled students. Schools and enterprises should jointly establish practice bases to provide students with real vocational environments and practical opportunities. Through school-enterprise cooperation, introduce advanced technologies and practical experiences from enterprises into teaching resources to enhance the practicality and pertinence of resources [10]. At the same time, utilize market mechanisms to promote the optimization and updating of special education resources to meet the changing learning needs of disabled students.

#### **4.4 Teacher Training and Development: Solving Literacy Issues to Improve Education Quality**

In the process of high-quality development of special vocational education, improving the digital literacy capabilities of university teachers directly affects the effectiveness of educational innovation.

First, deepen teachers' cognition of digital teaching concepts. Establish a comprehensive concept of digital literacy among the teaching staff, enabling teachers to recognize that digital teaching is not merely the electronization of textbooks but a brand-new teaching concept and method. It can greatly promote learning effects, enhance teaching interactivity, and create personalized learning experiences. Organize a series of seminars and workshops, inviting experts in educational technology and outstanding frontline special education teachers to share advanced concepts and successful cases of digital teaching, allowing teachers to deeply understand the core value and potential of digital teaching.

Second, strengthen teachers' information technology skills training. Schools should actively organize various information technology training courses, including content on software operation, multimedia production, and the use of online teaching platforms. Establish information technology exchange communities for teachers, allowing them to share experiences, learn from each other, and jointly solve technical problems encountered in digital teaching. Simultaneously, establish a comprehensive teacher digital literacy certification system, linking it closely with

teachers' career development and incorporating it into the considerations for title evaluation and promotion. This will prompt teachers to spontaneously pursue excellence, forming an endogenous cycle of self-improvement.

Third, promote the integration of theoretical learning and practical application. In teacher training, emphasize the combination of theory and practice. Do not only impart theoretical knowledge of digital teaching but also enable teachers to master methods of transforming theory into teaching innovation through case analysis, simulated teaching, and other means. In view of the characteristics of special education, organize teachers to carry out research on personalized teaching cases, jointly discussing how to use digital teaching methods in special vocational education to meet the special needs of students. Provide practical opportunities for teachers, such as arranging for teachers to participate in the design and implementation of digital teaching projects, or carrying out internship and training activities in cooperation with enterprises, allowing teachers to improve their information technology skills through actual operations. Encourage teachers to carry out teaching reflection, timely summarize lessons learned in digital teaching practice, and continuously adjust and optimize teaching strategies.

#### **5. Conclusion**

The digital transformation of teaching resources in special vocational education is an inevitable choice to comply with the development of the times and promote educational equity. This study indicates that although the transformation holds tremendous value in meeting the specific needs of disabled students and reshaping the teaching ecology, it is still constrained by multiple factors such as funding systems, technical adaptability, resource supply, and teacher literacy. Digital transformation is not merely the introduction of technology but the reconstruction of educational concepts and ecology. In the future, it is necessary to adhere to the principle of "people-oriented." Through multi-stakeholder collaboration involving the government, schools, enterprises, and society, a comprehensive support ecosystem must be constructed. Only by deeply integrating the "sensory compensation" function of digital technology with the "human growth" goal of special education can we truly cross the chasm

of "intermediate technology conversion" and achieve high-quality, inclusive development of special vocational education.

### References

- [1] Jiang Bo. Grasping the Development Trend of Digitalization and Embracing the Future Learning Society. *China Adult Education*, 2025, (17): 03-04.
- [2] Zhai Nannan. Design and Practice of Personalized Learning Paths for Students with Special Needs in a Digital Environment. *China New Communication*, 2025(18): 45-47.
- [3] Deng Bilian, Xu Fei, Yan Na. Practical Exploration of Digital Empowerment for the Growth of Special Education Teachers. *Modern Special Education*, 2026, (01): 79-80.
- [4] Liu Haoyu, Zhang Ying. Research on Physical Education for Disabled Students from the Perspective of Educational Equity. *Sports Style*, 2025(11): 44-46.
- [5] Li Jiawei. Research on the Optimal Allocation of Rehabilitation Resources for Disabled Children in China. Xi'an: Northwest University, 2020[2020-12-01].
- [6] Cheng Dongmei. Research on the Construction, Sharing Status, and Construction Model of Digital Educational Resources in Higher Vocational Colleges. *China Vocational and Technical Education*, 2016, (2): 88-92.
- [7] Cao Yixiao. Opportunities, Challenges, and Coping Strategies for the Digital Transformation of Special Education. *Modern Special Education*, 2025, (14): 33-38.
- [8] Shen Qianqian. Realistic Challenges and Countermeasures for Improving the Digital Literacy of Special Education Teachers in the New Era. *Modern Special Education*, 2025, (20): 29-34.
- [9] Qi Yudan, Yang Mengyue. Optimization Paths for Digital Technology Empowering High-Quality Development of Online Teaching in Higher Education. *Online Learning*, 2026, (01): 52-54.
- [10] Wang Xiaohui. Collaborative Efforts of Schools, Enterprises, and Communities to Expand New Paths for Disability Assistance, Employment, and Income Increase. *Huaxia Times*, 2025-01-03(003).