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Investigation on Student Evaluation of Higher Vocational Evaluation in the Context of Digital Transformation in Educational

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Abstract: *Digital transformation has reshaped the education ecology, injected new vitality and opportunities into vocational education, and brought a new development perspective. Student evaluation is a key link in education and teaching. Under the background of digital transformation, the law of vocational education and market demand should be followed to make digital technology help student evaluation reform. From the aspects of reshaping vocational education teaching system, building smart digital student evaluation system, improving teachers and students' digital literacy and system application ability, this paper probes into the path and strategy of student evaluation in vocational colleges under the background of education digital transformation. To realize the repositioning of the role of student evaluation and serve the training of high-level and high-quality professional talents.*

Keywords: *Education digital transformation; Student evaluation; Higher vocational education*

1. Introduction

Digitalization is an extension and deepening of the information technology revolution, resulting from the rapid advancement of information technology, digital technologies, and network infrastructure. Characterized by high efficiency, convenience, precision, and automated processing, digitalization has significantly enhanced information processing capabilities, spurring the emergence of technological revolutions and industrial transformations[1]. As the type of education most closely linked to the market, vocational education has seized the early opportunities presented by digital development. In October 2020, the Central Committee of the Communist Party of China and the State Council issued the "Overall Plan for Deepening the Reform of Educational Evaluation in the New Era", which emphasized that the goal of education evaluation in the new era is to fully implement the fundamental task of moral education, serve national development strategies and the needs of the people, and achieve educational equity and quality improvement. In October 2021, the Central Committee of the Communist Party of China and the State Council issued the "Opinions on Promoting the High-Quality Development of Modern Vocational Education," aiming to enhance the quality and level of modern vocational education. Given the current urgent national demand for high-quality technical and skilled personnel, vocational education faces the challenge of advancing digital transformation. To better cultivate talents that meet market demands, vocational colleges need to actively explore and adhere to the principles of vocational education while continuously advancing the reform of student evaluation to adapt to the changes and developments of the times.

2. Current Status of Student Evaluation in Higher Vocational Colleges

Student evaluation should be a comprehensive assessment of overall quality, encompassing multiple aspects such as physical, psychological, external appearance, and internal cultivation of students[2]. Through distributing questionnaires and conducting interviews at certain higher vocational colleges, and subsequently organizing and analyzing the survey results, the following issues in the current student evaluation system were identified.

2.1. Limited Evaluation Participants, Lack of Comprehensive Education

The student evaluation system in higher vocational colleges should reflect the connotation of "comprehensive education," requiring the participation of schools, enterprises, students themselves, and

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families. On the school side, this primarily involves full-time teachers, counselors, and student peer groups. On the enterprise side, industry mentors play a key role. From the student's perspective, the evaluation combines peer reviews and self-assessments. Family involvement mainly includes parents. However, currently, the majority of student evaluations in higher vocational colleges are dominated by full-time teachers, with insufficient involvement from other educational resources. This leads to issues such as low self-evaluation by students, lack of learning interest, weak self-discipline, and a disconnect from industry. These problems severely impact students' learning, life, and future planning and development.

2.2. Monolithic Evaluation Content, Partial Education

Research indicates that the “employment-oriented” and “competency-based” educational philosophies in higher vocational colleges result in an evaluation focus primarily on theoretical knowledge and practical skills, neglecting the cultivation of humanistic qualities such as moral values, integrity, and teamwork. This creates problems like self-centeredness, weak sense of responsibility, and lack of independence and confidence among students. Such an approach hinders the holistic development of students and makes it difficult to achieve the unique educational goals of higher vocational education.

2.3. Mechanical Evaluation Methods, Fragmented Education Process

Currently, the selection processes for awards, honors, and recommendations in higher vocational colleges are mainly based on two types of student evaluation results. One is the academic achievement obtained through teacher instruction, student learning, review, and examinations. The other is the moral education score derived from student participation in various intra- and extracurricular activities, such as competitions, practical activities, sports, and volunteer work. These scores are then integrated into the overall semester grade. This evaluation method, focusing on academic and moral assessments, overlooks the need for the educational process to permeate all educational stages. Such a student evaluation system does not facilitate individualized teaching and personalized development.

3. Constructing the Student Evaluation System in Higher Vocational Colleges under the Background of Educational Digital Transformation

Educational digitalization represents an educational transformation based on information and communication technologies. Through technological applications, resource digitalization, online learning, data management, and analysis, it fosters the intelligent, personalized, and innovative development of education[3]. Student evaluation is both the starting point and the ultimate goal of education and teaching[4]. Educational digitalization requires student evaluation to offer more diversified, real-time, personalized, and comprehensive opportunities. This aids in more accurately understanding students' learning and development, promoting personal growth and the development of comprehensive abilities. It also enhances teaching improvement, provides a basis for school decision-making, and maintains educational fairness and justice.

Under the background of educational digitalization, student evaluation indicators can be designed to incorporate technology and digital tools for multidimensional, more comprehensive, and precise assessments. Combining formative assessment and summative assessment methods, evaluation indicators and weight distributions are designed from three dimensions: evaluation participants, learning stages, and comprehensive qualities. From the perspective of evaluation participants, the evaluation should involve schools, enterprises, and students, assessing students' online learning, practical skills, achievement displays, personalized learning, and comprehensive qualities at different stages.

The evaluation system, as shown in Figure 1, integrates formative assessments throughout the semester, accounting for 70% of the total evaluation, and summative assessments at the end of the semester, accounting for 30%. Within the formative assessment, the weights are distributed as follows: school evaluation 50%, student evaluation 30%, and enterprise evaluation 20%. For summative assessment, the weights are: school evaluation 70% and enterprise evaluation 30%. Secondary indicators and specific evaluation criteria are provided following the primary indicators, quantifying the student evaluation system.

Tables 1-3 illustrate the evaluation indicators for the formative assessment, while Table 4 details the evaluation indicators for the summative assessment.

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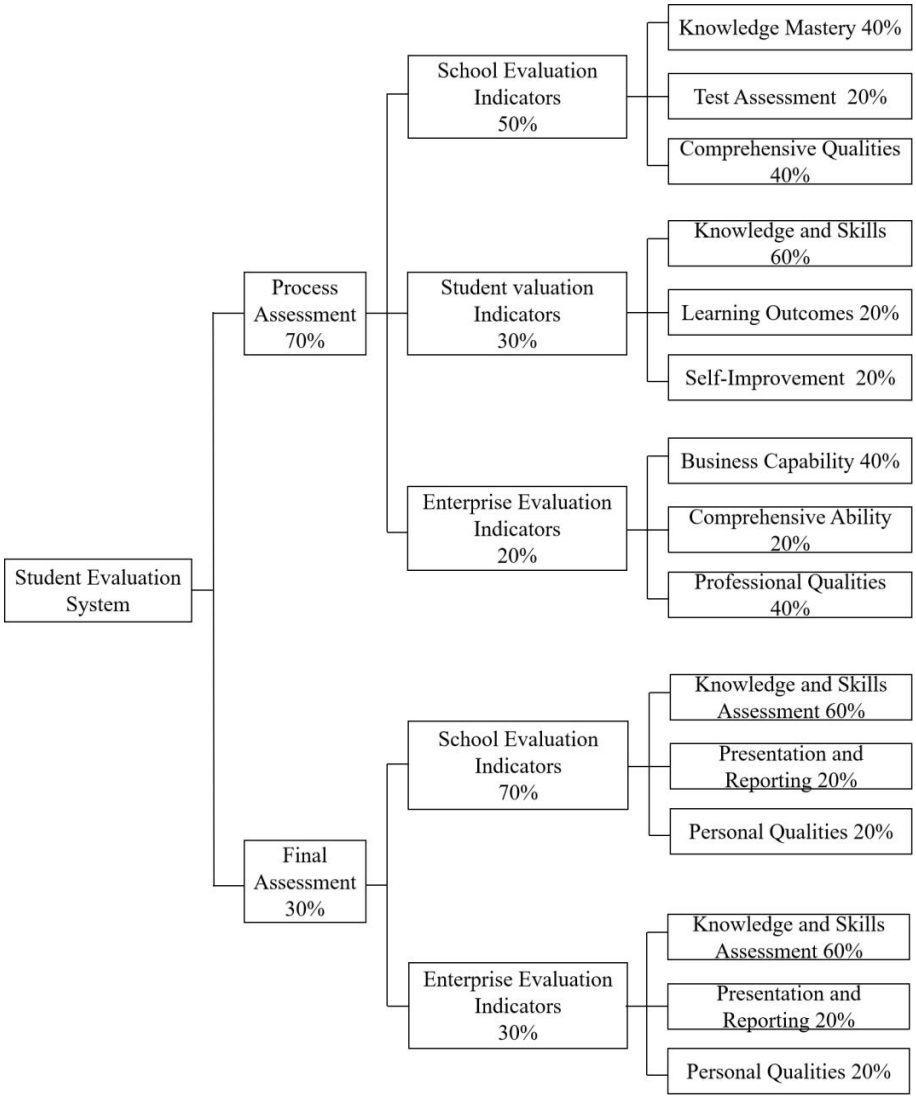

Figure 1: Diagram of Student evaluation system.

Table 1: School Evaluation Indicators for Formative Assessment

No.	Primary Indicator	Secondary Indicator	Specific Evaluation Standards
1	Knowledge Mastery (40%)	Theoretical Knowledge Practical Application Knowledge System Framework	Evaluated through tests, class discussions, group presentations, and project summaries. Assessed by the ability to apply theoretical knowledge to real-life situations, practical skills, and transferability. Judged through comprehensive papers, practical reports, and defenses to determine the construction of the knowledge system.
2	Test Assessment (20%)	Information-based and Offline Evaluation	Use of modern information technology and offline test results.
3	Comprehensive Qualities (40%)	Self-directed Learning Expression and Communication Team Cooperation Sense of Responsibility	Ability to independently lead and control their own learning process. Effectively conveying thoughts, iewpoints, or information. Collaboration and mutual support among team members to complete tasks. Taking responsibility for one's actions, decisions, and obligations.

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Table 2: Student Evaluation Indicators for Formative Assessment

No.	Primary Indicator	Secondary Indicator	Specific Evaluation Standards
1	Knowledge and Skills (60%)	Basic Knowledge Advanced Knowledge Theory-Practice Integration	Understanding of basic knowledge, ability to explain concepts, and describe processes in their own words. Engagement with deeper and more complex knowledge, including critical thinking and independent learning abilities. Continuous reflection during practical internships, linking learned knowledge to actual situations.
2	Learning Outcomes (20%)	Classroom Performance Academic Performance Self-Evaluation Student Evaluation	Participation, class discussions, and completion of assignments reflecting learning attitude and enthusiasm. Test and exam scores as direct indicators of learning outcomes. Students' subjective evaluation of their own learning outcomes, reflecting awareness and reflective abilities. Evaluation by peers through questioning to assess academic performance.
3	Self-Improvement (20%)	Active Learning Reflective Ability Problem-Solving Ability	Demonstrating a proactive pursuit of knowledge and interest in exploratory learning. Ability to deeply reflect on their own learning and behavior, understanding strengths and weaknesses for improvement. Skills in analyzing problems, developing solutions, and implementing plans.

Table 3: Enterprise Evaluation Indicators for Formative Assessment

No.	Primary Indicator	Secondary Indicator	Specific Evaluation Standards
1	Business Capability (40%)	Internship Experience Work Attitude Work Ability	Relevant field internships and work experience, including the complexity and practical application of tasks. Evaluation through observation, feedback, and assessment of responsibility, enthusiasm, and teamwork. Comprehensive assessment of technical skills, communication abilities, and problem-solving skills, ensuring standards and innovation.
2	Comprehensive Ability (20%)	Professional Ethics Comprehensive Qualities	Possession of knowledge and skills related to the studied profession and ability to apply them in real work. Cultural literacy, moral qualities, and sense of social responsibility.
3	Professional Qualities (40%)	Professional Ethics Adaptability Communication Ability Cooperation Ability	Adherence to professional ethics, honesty, responsibility, and compliance with rules. Ability to adapt to new work environments and changes. Clear expression of ideas and effective communication with colleagues, clients, and superiors. Effective team collaboration and task completion, managing internal team relations.

According to the student evaluation system illustrated in Figure 1 and the evaluation indicators in Tables 1-4, the evaluation results for students in a given semester can be obtained. The participation of schools, students, and enterprises throughout the process ensures fairness and justice, showcases the personalized education of the school, motivates students, and strengthens cooperation with enterprises.

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Table 4: School and Enterprise Evaluation Indicators for Summative Assessment

No.	Primary Indicator	Secondary Indicator	Specific Evaluation Standards
1	Knowledge and Skills Assessment (60%)	Theoretical Knowledge Evaluation Practical Skills Evaluation	Evaluation of theoretical knowledge through offline tests. Conducting practical skills tests for 2-3 projects, with arithmetic mean scores calculated.
2	Presentation and Reporting (20%)	Clear Purpose Logical Structure Feedback and Improvement	Clear and well-defined presentation purpose. Content is logically structured and easy to understand. Acceptance of feedback, evaluation of effectiveness, and necessary improvements.
3	Personal Qualities (20%)	Confidence and Determination Positive Attitude Learning and Growth	Confidence in abilities and goals without losing humility. Demonstrating an optimistic and positive attitude towards the future. Pursuit of continuous learning and personal growth.

4. Pathways and Strategies for Student Evaluation in Higher Vocational Colleges under the Background of Digital Transformation in Education

Vocational education helps students enhance their competitiveness, shape their professional identity, and achieve career goals, thereby better meeting market demands. At the same time, vocational education also bears social responsibilities, promoting economic development, increasing productivity, and fostering innovation. With the advent of the digital transformation era across society, teachers and students in vocational colleges face new opportunities and challenges, necessitating the exploration of pathways and decisions for student evaluation.

4.1. Reshaping the Vocational Education Teaching System

Digital transformation is closely related to education and teaching, leading a comprehensive reform centered on technology, profoundly changing the face of traditional education. Chen Ziji, Director of the Department of Vocational and Adult Education of the Ministry of Education, pointed out in his keynote speech“Practice and Reflection on the Digital Strategy Action of China's Vocational Education”that“the essence of digitalization is to reconstruct the educational ecosystem”[5]. Therefore, the combination of digital technology and student evaluation enriches the evaluation content and innovates evaluation methods, providing more personalized learning paths and support for each student. Traditional student evaluations, which focused on regular performance and final scores, have expanded to cover the entire teaching process, collecting comprehensive student data and forming a feedback loop for improvement. Before class, digital platforms can be used to distribute questionnaires, pre-study quizzes, and interactive discussions, offering diverse and real-time resources and services. Educators can gain a more comprehensive understanding of students' learning status and adjust course design and teaching strategies accordingly to improve teaching effectiveness. During class, real-time attendance, voting, and interaction methods can increase engagement and promote active participation; the use of virtual reality (VR) or simulation software can better meet students' learning needs. After class, collecting data on quiz scores, questions, and answers provides a thorough understanding of students' post-class performance, pushes personalized resources, and optimizes teaching design.

4.2. Building a Smart Digital Student Evaluation System

“China Education Modernization 2035” proposes to “accelerate educational reform in the information age,” “build smart campuses, and integrate intelligent teaching, management, and service platforms to use modern technology to accelerate the reform of talent training models, achieving a seamless integration of large-scale education and personalized cultivation”[6]. Relying on smart campuses, building a digital student evaluation system is an educational management model based on modern technology and information methods. It aims to integrate digital technology and big data analysis tools to provide more intelligent, efficient, and personalized student evaluation services. The system integrates diverse evaluation methods to comprehensively assess student performance. Through intelligent data management, real-time collection, analysis, and processing of student data, it can provide accurate comprehensive evaluations. Additionally, the system analyzes evaluation data to offer personalized

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learning suggestions and support for each student, fostering individual growth. The system can design a user-friendly interface on the smart campus platform, facilitating use by students, teachers, and administrators; implement necessary security measures to protect student data privacy and security; and integrate with other educational information systems, such as student management and course management systems, to achieve information flow and sharing. By building a smart digital student evaluation system, modern technology can more accurately and efficiently drive innovation in talent training models. This not only means achieving efficient management of large-scale education but also provides strong support for personalized cultivation.

4.3. Enhancing Digital Literacy and System Application Ability for Teachers and Students

From an application perspective, it is essential to establish deeper digital literacy among teachers and students. Firstly, a comprehensive training system should be established, organizing professional digital education training courses and seminars to help teachers and students deeply understand digital education concepts and operations. Then, teachers and students should be encouraged to actively use digital teaching resources, including teaching videos, interactive courseware, and virtual experiments. Finally, promoting the innovation of digital teaching methods, such as flipped classrooms and online group discussions, is crucial. These efforts not only help address the challenges of digital education but also lay a solid foundation for improving school education levels. When teachers and students possess digital literacy and application capabilities, they can effectively utilize the student evaluation system, leading to a healthy, intelligent, and personalized development direction for student evaluation.

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