Research on Digital Empowerment of Comprehensive Quality Evaluation Reform for Students
----Taking the Comprehensive Data Platform for the Five-Education of Guangdong University of Science and Technology as an Example

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Abstract. With the development of information technology, the combination of digital technology and comprehensive quality evaluation of college students has become the inevitable way of talent cultivation. We will continue to promote the implementation and deepening of the "five-education" education model by means of digital reform. Through the comprehensive data platform of the five-education, we collect all positive and negative lists, five-education activities, class mutual evaluation, group evaluation and other data of students in Guangdong University of Science and Technology during their school life. After assigning weights, we calculate the scores of each education of students, generate comprehensive annual reports of the five-education and comprehensive performance cards, so as to realize the comprehensive quality evaluation of students that can be quantified, interpreted and applied, and help cultivate talents.

Keywords: Comprehensive Quality Evaluation; Five-Education Comprehensive Data Platform; Digitalization.

1 Introduction

Comprehensive quality evaluation is the key point of training top-notch innovative talents, an important direction of the current basic education reform, and an important task of educational evaluation reform[1]. With the all-round advancement of quality education and the deepening of curriculum reform, the comprehensive quality evaluation becomes more and more important[2]. Only by scientifically and accurately evaluating the development of students' comprehensive quality can we truly reflect the substantive progress of China's quality-oriented education reform, provide empirical evidence for the selection of talents at all levels and types, guide teachers to update educational concepts and change teaching models, and guide teachers, parents and students to establish a correct talent view[3]. Comprehensive quality evaluation is an important baton to promote the reform of quality education and the all-round development of students.

Comprehensive quality evaluation has been carried out in China for nearly 20 years, and governments at all levels attach great importance to it, promulgation a series of documents, emphasizing the importance of comprehensive quality evaluation, deployment of

comprehensive quality evaluation work plan, "Deepening the overall plan for the reform of educational evaluation in the New era" clearly requires "reform of student evaluation, innovation of evaluation tools, improvement of comprehensive quality evaluation system, and improvement of comprehensive evaluation". In order to reverse the unscientific evaluation orientation and improve the ability and level of education governance, under this background, the reform of comprehensive quality evaluation has become the primary task to promote the high-quality development of education.

To improve the level of cross-level, cross-regional, cross-system, cross-department, cross-business collaborative management and service, for us to deeply promote the digital reform of students' comprehensive quality evaluation provides the fundamental follow and points out the direction[4].

Although the academic circles about the comprehensive quality evaluation of the connotation of understanding, but there is no consensus. On the whole, our project team understands the comprehensive quality evaluation as a comprehensive evaluation of students' interdisciplinary ability, essential character and implicit values, emphasizing the comprehensive development of students (that is, the "five education simultaneously" covers all aspects of "morality, intelligence, physical fitness, the United States and labor"), taking into account the comprehensive development of academic and non-academic literacy. The students' ability, character and values are comprehensively examined[5].

From the actual effect, the existing evaluation methods of colleges and universities generally have shortcomings: The existing comprehensive quality evaluation system is greatly influenced by general education, and there are some problems in the evaluation method, such as single evaluation subject, simple evaluation content, extensive evaluation method, insufficient evaluation differentiation, and emphasis on result over process, etc. In the evaluation data, there are also problems such as lack of reliability, sub-quantification and comprehensiveness, which affect the reliability and validity of comprehensive quality evaluation. The evaluation data cannot be collected in real time and cannot dynamically reflect the development status of students[6]. In addition, the evaluation process is time-consuming and labor-intensive, and the comprehensive quality evaluation of college students is very heavy and lagging, resulting in the lagging analysis of students' self-cognition and the difficulty of forming a timely evaluation feedback loop. At the same time, the lack of effective monitoring and management tools in the process of students' growth makes students lack of self-active early warning ability.

Starting from the digital reform of the comprehensive quality evaluation system, this study collects all the positive and negative lists, activities, class mutual evaluation, group evaluation and other data of students during school through the comprehensive data platform of "Five Education" created by the school. After the weight is assigned, the scores of students' morality, intelligence, physical fitness, beauty and labor are calculated respectively, and the comprehensive annual report and comprehensive performance card of "Five Education" are generated. To realize the quantifiable, explicable and applicable comprehensive quality evaluation of students, and promote the digital reform of the comprehensive quality evaluation system with systematic standardization[7].

2 Constructing the "five-education concurrent" educational model

This article explores the concepts of "five educations simultaneously" and the deep integration of information technology and education, as well as the education system and its path, from the perspectives of educational ideas, development trends, and the main characteristics of "five educations simultaneously" in universities at home and abroad[8]. It proposes a three loop linkage quality closed-loop management model, which combines problem orientation and goal orientation, "five educations simultaneously" and "comprehensive education", process evaluation and result evaluation, theoretical research and practical innovation, and multiple measures to jointly promote. Based on the comprehensive development concept and educational philosophy of "five educations simultaneously", the school has improved the comprehensive quality evaluation system for students, and innovated the process evaluation method of "five educations"[9]. It has designed moral education evaluation indicators based on "ideological and moral, law-abiding and disciplinary, behavioral habits, and the practice of socialist core values"; and intellectual education evaluation indicators based on "learning ability, thinking ability, expression ability, relevant professional ability, career planning ability, and problem-solving ability"[10].Set up a sports evaluation index that integrates daily participation, physical fitness monitoring, and specialized sports skill testing to foster good exercise habits and healthy lifestyles for students; Set up aesthetic education evaluation indicators to encourage students to cultivate artistic hobbies, improve artistic literacy, and enhance their ability to experience, appreciate, display, and create beauty; Set up a labor education evaluation index based on the concept of labor, combining individual, collective, volunteer, and professional labor, to help students develop labor habits, acquire labor skills, and learn diligence, thrift, and frugality,See Figure 1.

Moral education comes first	Ability is the most important	combination of knowledge and practice	Be bold in innovation	comprehensive development
Morals	personality and three outlooks、Law-abiding、patriotic、dedicated、honest、friendly			
Wisdom	academic performance、certification competition、fraud prevention、career planning、problem solving、innovation and entrepreneurship			
Physical	physical fitness、exercise habits、interests and strengths、sports competitions、psychological mentality、perseverance and willpower			
Aesthetics	aesthetic concept、image and appearance、language expression、civilized behavior、appreciation and creation of beauty、interests and specialties			
Labour	labor concept、labor habit、voluntary labor、social practice、professional labor			

Figure 1 Comprehensive Evaluation System Diagram.

In order to more effectively promote the digital reform of students' comprehensive quality evaluation system, the school proposed the term "comprehensive literacy" (that is, the school's "five education" education model), established the "Five education" working committee and the thematic promotion working group, and created the "Five education" comprehensive data system to objectively, comprehensively and scientifically evaluate the development of students' "Five education"[11]. Provide technical support for comprehensive quality evaluation, provide data support for follow-up personalized training, truly implement the fundamental task of cultivating talents, provide the same industry with reference experience for vocational personnel training and evaluation of operable, calculable, verifiable, transferable digital management system of student comprehensive quality evaluation, and improve the quality of

talent training[12]. The "Five-Education" Office has enhanced its coordination and guidance functions, and has nine special promotion working groups, including moral education, intellectual education, physical education, aesthetic education, labor education, and "Five-Education Tutors", to carry out various tasks, solve problems, and ensure the project's smooth operation and development. The school has also issued the "Implementation Plan for the 'Five-Education' Education Model", "Moral Education Casts Soul", "Intellectual Education Consolidates Foundation", "Physical Education Strengthens Body", "Aesthetic Education Infiltrates", and other work plans and special activity plans, and revised the "Management Measures for 'Five-Education Tutors"[13]. Based on the school and students' reality, the school has built a "Comprehensive Evaluation System for Five-Education" by defining the evaluation content, subject, and method[14]. The school has developed a "Comprehensive Data Platform for Five-Education" by using the information construction resources. The platform synchronizes students' five-education data collection, and creates an innovative "Comprehensive Performance Card for Five-Education" and positive and negative lists to record students' performance in different stages[15]. It works with the existing Student Course Score Table that shows students' knowledge effectiveness, forming a quantifiable, evaluable and traceable comprehensive evaluation system for students' overall quality. The school has also set up a rectification mechanism to urge students with negative lists to improve within a deadline and encourage their growth and progress,See Figure 2.
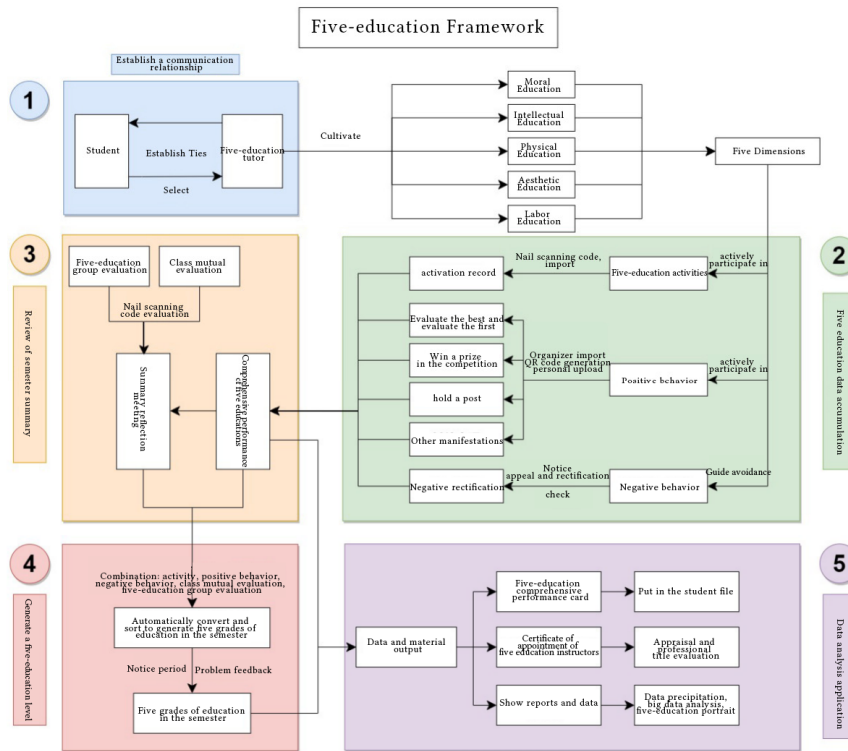

Figure 2 Framework of the Five-Pronged Education Model.

3 Development and application of comprehensive data platform for five-education

The school has developed the "Five-Element Comprehensive Data Platform" with its own intellectual property rights. The platform collects, compares, and analyzes the data of students' "Five-Element Education", and combines the longitudinal and horizontal evaluation of each element, objectively recording the students' performance and learning effectiveness, and tracking the changes in their ability development. The platform can automatically generate a "Five-Element Portrait" for each student, and conduct a comprehensive evaluation of "Five-Element Education" based on big data, which enhances the evaluation's comprehensiveness, accuracy, and scientificity. It also has functions such as data collection, evaluation analysis, behavior portrait, negative warning, teacher-student interaction, etc., providing strong support for the students' comprehensive quality evaluation,See Figure 3.
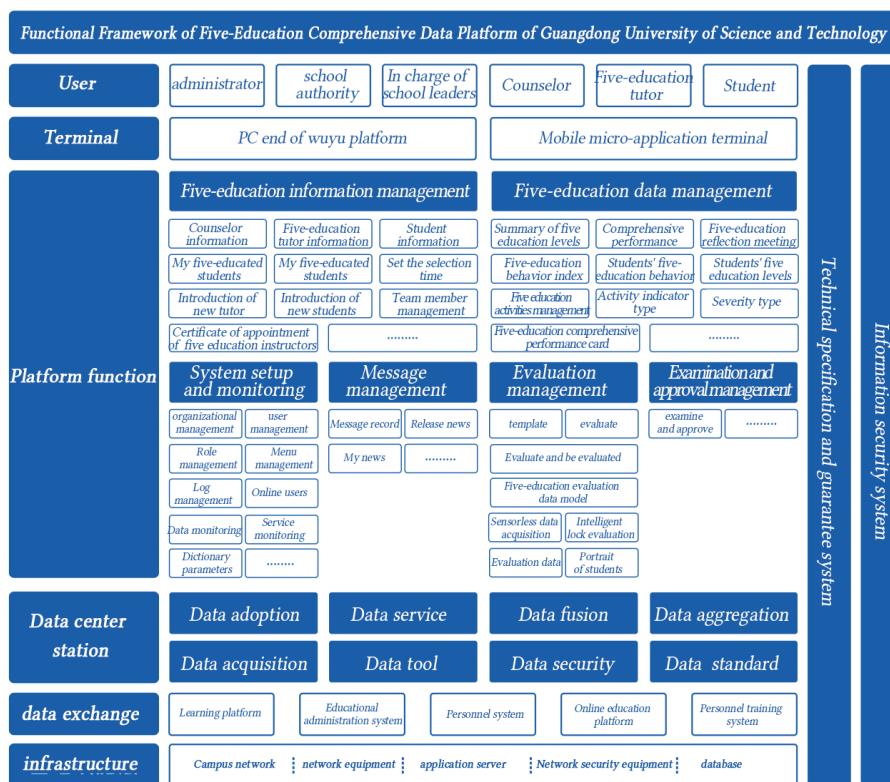

Figure 3 Functional architecture of the five Education integrated data platforms Figure 3.3 Specific implementation and application of the five education integrated data platform built by schools.

3.1 Digitalization demand under the "Five-Pronged" education model

The school needs a comprehensive data platform for five-education to implement the five-module education system and the "five-education-simultaneous" evaluation index system,

and to record all information about students and teachers related to student cultivation and growth. The platform should be able to combine massive student information with the evaluation index system to produce a portrait of students' five-education (moral, intellectual, physical, aesthetic and labor education). This can enhance the evaluation subject, change the evaluation methods, and improve the evaluation results. The platform should also have high productivity to save staff time and energy for creative work[16].

The comprehensive data platform for the five-education aims to address the practical issues of "focusing on intelligence, neglecting morality, physical fitness, beauty, and labor" in talent cultivation; the practical challenges of "incomplete evaluation indicators, insufficient process evaluation, and inadequate value-added evaluation" in education evaluation reform; and the pain points of "lack of integration, collaboration, and information technology empowerment" in education and teaching reform.

3.2 Development of comprehensive data platform for five-education empowering students' comprehensive quality evaluation

The school has established a set of mechanisms that integrate and coordinate the five modules, and built a "comprehensive data platform for five education" with a qualitative and quantitative process evaluation digital platform. It benchmarks against the "positive list" and "negative list", and records the students' basic situation and outstanding performance in the five aspects of "morality, intelligence, physical fitness, beauty, and labor" through information technology. After the platform data is reviewed, it is summarized and archived in the student's personal file. The school has also developed functional modules such as system management, system monitoring, five education data management, five education information management, approval management, and message management, from the perspectives of different role.

The first functional module is system management, a basic function, mainly platform administrators and developers classify all users. The organizational management is to divide students according to administrative classes and teachers according to belonging departments. User management under the system management is to manage the user's organization, role, personal information, and status. The second major functional module is five education data management, which belongs to the core function. This module integrates the sub-functions of students 'five education data, five education behavior indicators, students' five education level, five education activity management, and five education comprehensive performance card. This module is to record the positive and negative list and five education activities of students during the school period and calculate and generate the five education grade and comprehensive performance card. The third functional module is Wufu information management, which presents all user information, and also has the function of inputting new user information and opening the time selection of Wufu tutors. The fourth functional module is approval management. Students upload positive list and negative list rectification materials here, and relevant users and administrators can approve here. The fifth functional module is the information exchange module, the administrator can release messages to users, and can also realize the information exchange between counselors, tutors and students.

3.3 Application of the comprehensive data platform for the five education

3.3.1 Application at the student level

The performance of "five education" can be divided into five aspects: "moral, intellectual, physical, aesthetic and labor", and the grade is divided into unqualified, qualified and excellent. The evaluation team is based on the evaluation index and negative list, combined with the summary and reflection of the "five education" of the class. Evaluation should be conducted once every semester. If there are any unqualified items, rectification should be made. The evaluation results of students' "five education" are linked to the graduation and award evaluation. The platform comprehensively records the growth process of students, and students can check the gaps and play their best role through the five education portraits and the annual comprehensive report. The comprehensive performance card generated by the platform mainly records the students 'working status, awards, grades, positive and negative behavior list, etc., and files them into the student files as important as the students' course scores.

3.3.2 Application at the level of mentors and counselors

The five-education instructors and counselors can view the development of their students' education within the system, compare it with the average of students in the same class and grade, and guide students' development in a targeted manner. Realize one-life one-strategy, fully realize the individualized development of students and differential guidance. At the same time, the platform also has a student evaluation function. Through student evaluation and scoring, including the effect of five-education instructors guiding students' academic studies, comprehensive quality improvement, and cultivating students' growth and success, combined with the pass rate of five-education instructors' students, the assessment of five-education instructors guiding students can be realized, which can be used as an important reference for the promotion of five-education instructors' professional titles.

3.3.3 Application at school level

The comprehensive data platform for the five-dimensional education is the most favorable support for the implementation of the "five-dimensional education"mode, making it feasible to evaluate the comprehensive quality of students based on the all-round development of"morality, intelligence, physical fitness, aesthetics, and labor". At the same time, schools can use the positive and negative list data of students to comprehensively summarize the achievements and shortcomings of education, adjust the school talent cultivation plan dialectically, and guide the departments of the school to carry out work in talent cultivation. For example, the academic affairs office can adjust the curriculum settings, teacher ratio, and examination methods of each education course.

3.4 Development plan for the comprehensive data platform of the five education

The comprehensive data platform for the five-dimensional education has been put into use for nearly three years, and the relevant functions have been gradually improved in the exploration. In the future, will continue to optimize the platform function module, achieve more intuitive students education portrait, realize visual tracking, better realize value-added evaluation, and applied to the talent training mode reform, improve the khalid ents system mechanism, reverse not scientific education evaluation orientation, eventually condensed into can copy, can

promote education mode, using digital can assign, improve education efficiency, promote education evaluation reform go deep.

4 Summary

Overall, the talent training of digital integration universities will be the future development trend. The reform of comprehensive quality evaluation of Guangdong University of Science and Technology has begun to show results. Education mode transformation a long way, on the one hand, to "five fusion" concept has a thorough understanding, on the other hand also want to do a good job of "connected" cohesion, from the national and school level thinking how to five integrated data platform into teaching activities, actively explore in the process of education mode reform, realize the more scientific education, but also promote the intelligent platform, concise design.

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