

Investigation of the Evaluation System of General Education in Higher Vocational Colleges under the Artificial Intelligence Environment

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Abstract: The concept of general education has been widely promoted and accepted since the 21st century and has been promoted in many colleges and universities. However, in the process of continuous practice and development of general education, its effect is far from reaching the original goal, and some problems have been exposed in curriculum design, classroom effect and teaching quality. Although there are many reasons for the above problems, the imperfect evaluation system of general education is also one of the factors that cannot be ignored. The establishment of a sound evaluation system for general education is the key to solving these problems. Only by solving the four major problems of “why to evaluate”, “who would evaluate”, “what to evaluate”, and “how to evaluate”, can these problems be fundamentally solved. Long-term growth for general education may only be attained in this manner. The importance of general education for higher vocational education to develop abilities has increased with the arrival of the Artificial Intelligence (AI) age. The general education in higher vocational education should focus on computer application skills, civic consciousness, and “whole person” education in order to satisfy the demands of contemporary growth. This study examined the need for and urgency of comprehensive literacy instruction in general education in colleges and universities based on the fuzzy theory of AI technology, so as to describe general education might include the benefits of AI technology. The resources and methods of general education were optimized, and the effectiveness of general education in comprehensive quality education was improved. The findings demonstrated that the evaluation system model for general education in colleges and universities based on AI could not only increase evaluation accuracy by 6.38%, but also support students’ individualized learning and cater to their needs in order to realize the goal of teaching and learning and more effective comprehensive quality education.

1. Introduction

General education is a crucial component of higher vocational education and is crucial to the growth and reform of vocational education. In order to build students' flexibility and creativity and to encourage the all-around development of abilities, the fundamental purpose of general education is to strengthen the sustainability of vocational education and improve students' knowledge structures. With the further advancement of AI, general education is becoming more and more important in advancing vocational education. Therefore, for the long-term advancement of general education as a whole, it is of utmost importance to design a general education curriculum evaluation system against the backdrop of AI.

Nowadays, there are relevant researches on general education by scholars: Solas Eddia believed that general education curriculum, as an important medium to realize general education, was a comprehensive talent training approach required by today's economy and society. As far as the existing research was concerned, there were few studies on the evaluation of the learning effect of general education courses, and there was a lack of clear criteria for judgment [1]. Brown Tiara Saufley's research believed that general education was called "common education" or "general education". Although experts and scholars had different descriptions of the concept of general education, they had basically reached a consensus on the goal of general education, that is, general education was "to educate the educated to transfer knowledge and values among different groups" [2]. Nilsen Sven divided education into general education and professional education. The former focused on cultivating students to be responsible people and citizens, while the latter focused on developing students' professional abilities [3]. Hampf Franziska proposed that general education belonged to the category of educational philosophy, which was to cultivate humanistic spirit and transcend utilitarianism and pragmatism. The key was to cultivate students' independent personality, independent thinking and other valuable qualities; it was an interdisciplinary comprehensive education, which expanded the breadth and depth of students' knowledge. This allowed students to have both humanistic and scientific literacy, and cultivated students into "all-round talents". It required students to conduct research in a wide range of humanities, social sciences and natural sciences. It was an education of knowledge and skills in various fields of human life in order to lay a solid foundation for future comprehensive development [4]. Floress Margaret T believed that teaching quality evaluation was to take teaching process and teaching results as the object of education evaluation. The evaluation of teaching quality of general education was to judge the value of teaching process and results based on the teaching objectives of general education and provide decision-making basis for general education. The evaluation subjects included teachers and students [5]. In general, general education has been widely recognized by universities around the world and has become an important part of the modern university system.

Now there are scholars' research on AI: Lee Youngho found that AI was a new field integrating AI and learning science through the analysis of key technologies and connotation of educational AI, which unlimited development space and important meaning [6]. Kim Kapsu emphatically pointed out that the AI education in the basic education stage should aim at the development of students' computing thinking and set appropriate teaching content according to the students' development level. The content was mainly technology application teaching [7]. Shin Seungki divided the design of AI thinking framework in AI education into four aspects, and pointed out that AI education changed specific learner models, teaching models, and learning fields [8]. Wollowski Michael described theoretically the significance and challenges faced by higher vocational colleges in carrying out AI education, and proposed countermeasures at different levels for these problems [9]. From the reality of AI education, Shin Seungki systematically discussed three levels of suggestions on the integration of AI education with the future society. In response to the policy, he vigorously

promoted the AI education in the basic education stage and helped the AI education in the basic education stage, which enabled AI education to steadily advance on this basis [10]. In a word, the development of AI education research in the era of AI has become a general trend. Experts and scholars have conducted in-depth discussions from the theoretical level in order to play a theoretical role in guiding practical research.

In recent years, governments and enterprises at all levels have attached great importance to AI, and the number of intelligent upgrading industries is also increasing. The development of AI general education and the cultivation of AI compound talents have become new requirements for future work. The general education course of computational thinking and AI is guided by the cultivation of thinking ability, and explores the progressive cultivation teaching mode from professional cognition to computational thinking and then to AI thinking. At the same time, a project driven experimental content and network resource platform are built to organically integrate theory and practice, online and offline collaborative teaching. The reform practice shows that the general education curriculum has made a leap in importance, interest and other aspects, so that students' awareness of knowledge and practical ability have been further improved.

2. Current State of General Education Teaching Quality Evaluation Systems in Higher Vocational Colleges

(1) Evaluation of general education

Educational evaluation should support teachers in strengthening service functions and assist students in improving their learning outcomes. Teaching can only be properly promoted by building various teaching assessment systems in accordance with various teaching objectives. The evaluation of ordinary instruction and the evaluation of general education in colleges and universities have some overlap, but they are not entirely consistent. The “teaching” of teachers, the “learning” of students, and the interaction between teachers and students must all be considered in a comprehensive evaluation of general education [11]. As an important part of general education, the evaluation of college education and teaching is not only a feedback and analysis of general education in colleges and universities, but also a supervision and evaluation.

(2) Issues with general education teaching quality evaluation

The evaluation of general education teaching quality has recently been placed on colleges and universities' agendas due to the ongoing advancement of general education research. A scientific and organized method of evaluating the quality of general education has not yet been developed, but the majority of colleges and universities lack assessment criteria that are especially focused on the teaching quality of general education. Ineffective teacher evaluation practices include the following problems:

1) Unclear evaluation objectives and incomplete evaluation contents

Many colleges and universities have not formulated a clear goal of general education, so it is not clear what content to evaluate when evaluating the teaching quality of general education. They take the correctness of teachers' teaching attitude, fluency of language, clarity of thinking and students' classroom discipline as the main indicators to evaluate the teaching quality [12]. In actuality, the evaluation of teaching objectives, teaching topics, teaching forms and techniques, and teaching impacts should all be part of a thorough assessment of the quality of general education instruction. There should be a number of evaluation indicators for each element, and they should be operational, particular, scientific, and thorough.

2) The evaluation standards cannot emphasize the general education qualities

At present, the teaching quality evaluation of general education mostly follows the general teaching evaluation standards, and the teaching evaluation work often has this content. Teaching

evaluation is the assessment of various courses. The assessment criteria are usually wide and lack of pertinence, which cannot highlight the characteristics of general education [13]. General education itself has the following characteristics: The first is basic. General education requires college students to make basic study in the broad field of human knowledge. To create a solid basis for future professional learning and personal development, it is essential to comprehend and master the fundamental ideas and techniques used by different disciplines. The second is profundity. General education is not only to enable students to acquire knowledge in all aspects, but also to promote students' thinking and develop their rationality through knowledge learning. It touches the mind of students and promotes human nature, so as to develop personality and enhance the harmonious and comprehensive development of people. In view of the above characteristics of general education, the teaching quality evaluation of general education should have independent evaluation criteria and highlight its characteristics [14].

3. General Education in Higher Vocational Colleges and the AI Era

(1) Artificial Intelligence

Artificial Intelligence is referred to as AI. Its cross-like structure makes it sound like a course. However, it covers a wide range of topics. Even though it uses the word “intelligence”, it is an AI that was created primarily by simulating a number of complicated human intelligence-related tasks connected to perception, learning, reasoning, and communication. Its appearance is a result of machines realizing human intellect. The creation and deployment of intelligent robots that can mimic and expand the capabilities of human organs has drastically altered the demands placed on employees in society. These machines can now perform a variety of simple, repetitive, and even sophisticated activities that were previously difficult to complete, so AI is not a discipline in this study. It describes a range of intelligent hardware and software that combines several technologies. As indicated in Figure 1, AI is mostly employed in seven industries, including retail, healthcare, transportation, education, home furnishings, logistics, and security.

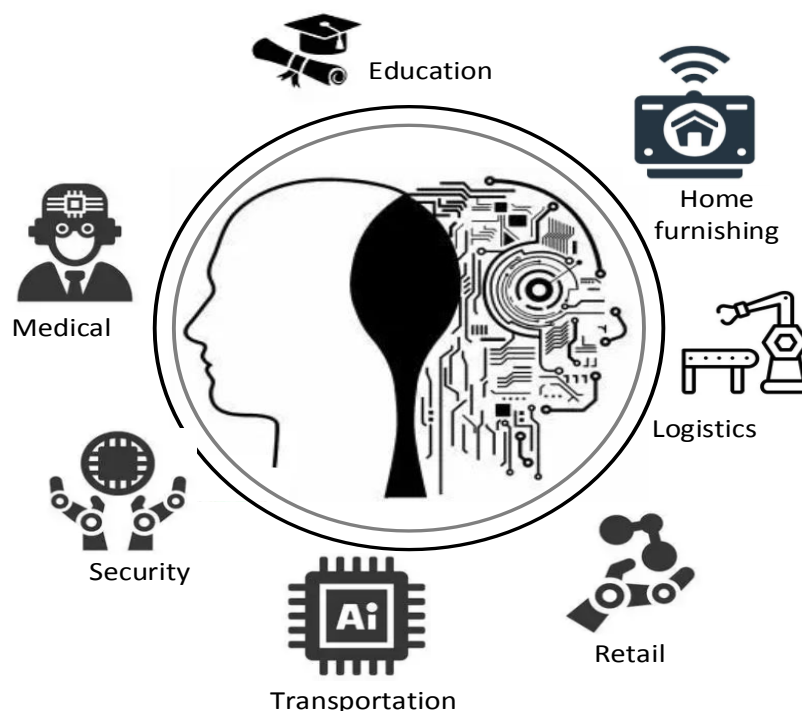


Figure 1. Application fields of Artificial Intelligence

(2) Artificial Intelligence+education

The end outcome of the thorough integration of AI with education is AI+. Intelligent technology has been used in education to encourage the development of teaching quality. The major goal is to hasten educational growth and provide a new learning environment in order to support schools' tailored instruction and finally realize educational objectives and the student-centered teaching philosophy. The "AI+education" primarily uses intelligent technology, which was created in the past on the foundation of the Internet and has numerous features. In order to administer the school's educational administration system, smart education may also aid instructors in lightening their load and facilitating autonomous study and review for pupils. Additionally, it makes schools and other educational institutions more convenient [15]. Students' self-development and growth should also be taken into consideration as part of the "AI+education" in addition to academic performance enhancement. The study defines "AI+education" as the comprehensive integration of intelligent technologies into the educational environment. Online and offline assessment techniques are varied, and intelligent evaluation may be tracked and provided with feedback in real time. With the support of intelligent technology and intelligent equipment, automatic evaluation of students' abilities has been realized, which has completed most of the tasks of teachers and finally realized the quantification and analysis of evaluation results.

(3) Necessity of combining general education with AI in higher vocational colleges

1) Computer application skill training would occupy an important position

United Nations Educational, Scientific and Cultural Organization defines those who do not know how to use computers to study, work and communicate as "functional illiterates" in the 21st century. Higher vocational schools develop technical skills for the front lines of manufacturing, building, management, and services. Front-line technical skills in manufacturing, building, management, service, etc. should be knowledgeable in the use of application software with the dawn of the era of AI. They should have a full understanding of the entire production system and an accurate control capability, and conduct in-depth research and innovation on specific products and technologies. The fundamental computer education curriculum framework is now unable to keep up with the pace of technological advancement. Each major should use the intelligent era's professional development trend to create a curriculum that fosters students' computer application skills while also meeting the demands of future job growth.

2) The "whole person" and "citizenship" components of general education should receive special focus

Higher education is becoming more and more professional and professional. General education is ignored or formalized, which causes knowledge to be separated from people's basic emotions, morality, ethics and other issues. When education becomes a tool for work and work becomes a tool for making a living, utilitarian society cannot avoid it. General education should first strengthen the "civic awareness" education of students, including the awareness of subject, responsibility, public morality, law, rights, participation and supervision, so as to cultivate modern civilized citizens with the ability to keep pace with the times; secondly, the strengthening "whole person" education is important since it teaches students how to develop a flawless personality and convey knowledge and abilities. When more simple, clear and repetitive undertakings are replaced by robots, labor productivity is greatly improved, products are increasingly abundant, people's living standards are greatly improved, and food and clothing are no longer difficult, education should pay more attention to the internal development of human beings. Education is no longer a "one-way person" with the same mass production model, single thinking and lack of creativity. It is to develop and tap the potential and creativity of different individuals to meet the needs of overall development and self realization [16].

3) General education should attach importance to humanities and aesthetics education

A great nation must be a nation that understands aesthetics. The age of intelligence is the age of individuality and aesthetics. The manufacturing of products is more realized through intelligent robots, and people would carry out creative product design to meet individual requirements for personality and aesthetics. Human thinking is mainly divided into rational and perceptual. Science represents rationality and conquers the world; art represents sensibility and beautifies the world. Apple’s core competitiveness is to beautify technology into art, which is a kind of perceptual intelligence. In order to achieve the happiness of life, human beings must have the technical ability to obtain the material conditions of happiness, but the tube is only subjective experience. In order to experience happiness, people must have the ability to experience happiness. In the future, there would be an era of “elegance is king”. The material level is high, but happiness may not be felt. Therefore, humanistic and aesthetic education is becoming increasingly important in the intelligent era. Humanistic and aesthetic education not only serves the requirements of the era of intelligence, personalization, diversification and humanization, but also can improve aesthetic ability and happiness and cultivate perfect personality, so as to promote the all-round development of people and social civilization.

4. Fuzzy Comprehensive Evaluation System under Artificial Intelligence

(1) Fuzzy theory

As one of the most widely used and effective fields of fuzzy theory, fuzzy control based on AI is helpful to solve many problems that traditional control theory cannot solve or is difficult to break through. Fuzzy control is to identify phenomena with fuzzy characteristics and judge the results by simulating the human brain thinking process through the basic principles of fuzzy mathematics, so as to give accurate results and effectively control the controlled object. Its characteristics are relatively different from manual and empirical control, as shown in Table 1:

Table 1. Differences between fuzzy control, manual control and empirical control

Control mode	Input mode	State	Output mode
Fuzzy control	Summarize a complete set of control rules in advance and input them into the computer	Current value measured by the sensor	Fuzzy reasoning decision calculation
Manual control	Summarize the control experience in advance and put it into the computer	Current value measured by the sensor	Automatically given by computer
Experience control	Control experience	Current state	Manually given by the operator

(2) Description of fuzzy comprehensive evaluation algorithm

The fuzzy comprehensive evaluation theory in AI refers to the capacity to carry out a fair comprehensive evaluation on a wide range of variables that influence the qualities of things. The non-linear foundation of the evaluation process serves as the foundation for the fuzzy comprehensive evaluation. A typical non-linear assessment is the evaluation that occurs during the general education teaching process at colleges and universities. There are many assessment objects, including leaders, peers and students. The student base is relatively large, and each has its own ideas and nature. Therefore, their evaluation descriptions are different. Fuzzy comprehensive evaluation

refers to the evaluation of things that cannot be represented by a certain number through a fuzzy means that combines a variety of fuzzy indicators. The evaluated item, evaluation index, weight coefficient, comprehensive evaluation model, and evaluator are the five components that make up the fuzzy comprehensive evaluation method. The precise procedure often goes as follows: The evaluation indicators are chosen, prepared, and weighted. The suitable evaluation model is once again chosen to assess the comprehensive indicators, and the indicators are eventually separated and arranged. The remarkable feature of this algorithm is that it uses mutual comparison to judge the functional relationship by evaluation factors and evaluation values. When evaluating the quality of scientific research and teaching, many factors must be comprehensively considered. Therefore, this paper mainly uses the fuzzy comprehensive evaluation method to design the teaching quality evaluation system.

(3) Main research fields of fuzzy theory

The research scope of fuzzy theory under AI is very wide, and its applications in some uncertain or fuzzy fields mainly include the following five directions, as shown in Figure 2.

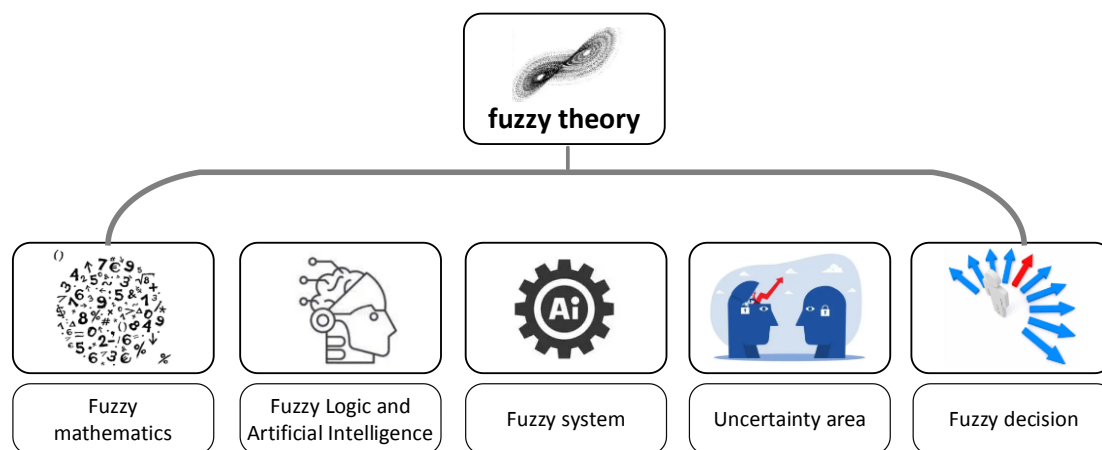


Figure 2. Main research fields of fuzzy theory

According to the aforementioned information, there are several domains where fuzzy signals and uncertainties are applicable. As far as the current situation is concerned, there would be more real-world applications if the fuzzy field continued to develop and became more flawless. One of them is the general education quality assessment method used in colleges and universities. One of the fundamental tenets of contemporary education evaluation is to evaluate the evaluated items thoroughly, completely, and actively, which goes beyond simply looking at the outcomes. Numerous features and characteristics, many of which are ambiguous, contribute to the general education quality evaluation's considerable subjectivity and fuzziness. This issue can be effectively resolved using the fuzzy comprehensive evaluation approach. Therefore, it is imperative that colleges and universities incorporate the fuzzy comprehensive assessment algorithm into their systems for evaluating the quality of their instruction. On the basis of this concept, it is possible to evaluate the teaching quality thoroughly using the fuzzy comprehensive evaluation algorithm.

5. Development of a Fuzzy Comprehensive Evaluation System for General Education Using Artificial Intelligence

(1) System of fuzzy comprehensive assessment being built for general education

In order to meet the performance requirements of the general education evaluation system, it is necessary to design both the hardware and software levels, and the system hardware is to use the

device on the original system hardware, so this paper mainly starts from the software level. The system software architecture of this paper is an open evaluation system for curriculum design with AI technology as the core, which has strong universality, practicability and scalability. The detailed system software architecture is shown in Figure 3.

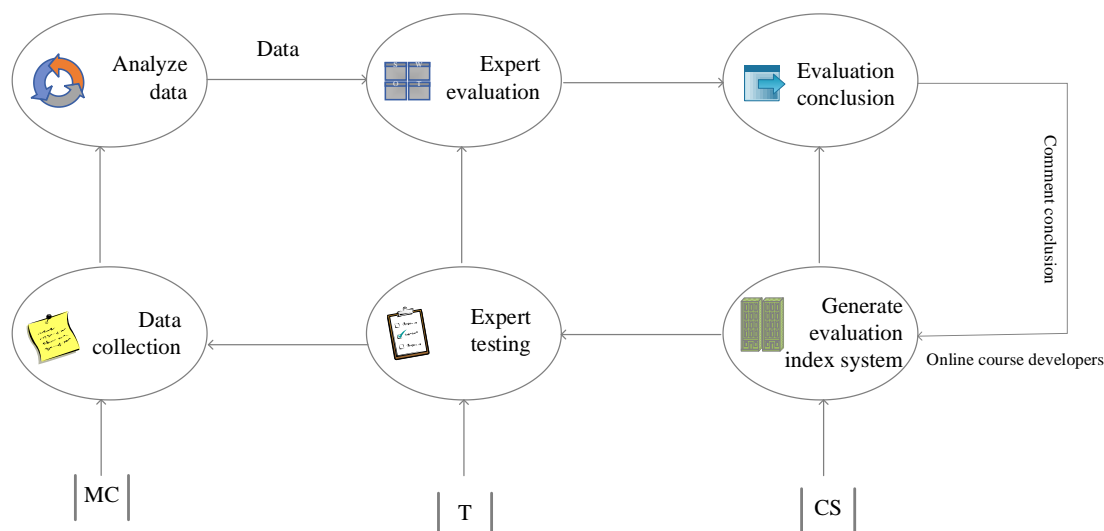


Figure 3. Software architecture diagram of fuzzy comprehensive evaluation system

(2) Design of a general education teaching quality evaluation index for higher vocational institutions

The evaluation index can objectively and scientifically reflect the nature and characteristics of educational design. It is an important element of the evaluation system of educational design. As a result, the assessment index has to be tightly and meticulously inspected. The general education teaching evaluation index system in colleges and universities should be created based on the traits and goals of general education, the rationale behind and key components of educational evaluation activities, and the general education evaluation theory. The general education teaching idea, curriculum design, conventional teaching, teacher strength, and comprehensive assessment are the major five components of the evaluation index system for general education teaching quality in higher vocational institutions. The evaluation indicator system of general education teaching quality in higher vocational colleges is created in accordance with the classification method of educational objectives, which takes the evaluation indicators, evaluation contents, and basic characteristics and educational goals of general education into consideration:

1) Evaluation objective

According to whether the teaching objectives are stated clearly, specifically, and completely, whether they are outstanding in their scientificity and hierarchy, whether they fully consider the viability of educational activities to achieve their goals, and whether they can reflect the individual differences of students, the general education teaching objectives can be roughly divided into three goals.

2) Evaluation object

The achievement of the teaching objectives of teachers' general education curriculum is mainly assessed by teachers of general education curriculum or curriculum group, and whether students can achieve the teaching objectives of general education curriculum.

3) Evaluation method

As far as the evaluation method is concerned, it is not enough to evaluate the effectiveness of general education only by investigating students' mastery of humanistic knowledge and the

advantages and disadvantages of courses. It is also necessary to find a more scientific and efficient evaluation paradigm for the effectiveness of general education from a new perspective.

4) Evaluation content

Teaching goals: Whether the teaching objectives are clear, specific, comprehensive, scientific and hierarchical; whether they can support the general objectives of general education; whether they take into account the feasibility of educational activities to achieve the objectives; whether they reflect the individual differences of students.

Teaching content: What the teaching material contains might represent the general education teaching objectives. Curriculum objectives for general education may be broken down into three basic categories: cognition, ability, and emotion. Whether the teaching content contains the knowledge of these three aspects is the most important sign of whether the cognitive goal can be achieved.

Teaching methods: Whether teaching methods can pay attention to teaching methods and inspire thinking; whether it can actively integrate and cross all aspects of knowledge, provide a diversified perspective of understanding, and think in multiple directions; whether it can adopt different forms of teaching according to the characteristics of the curriculum.

Teaching effect: Whether the teaching effect has achieved the teaching goal and whether it has really achieved it. The teaching effect is measured by the students' learning achievements, so the evaluation should focus on "students in the learning process". The evaluation can be divided into fully realized, basically realized and unrealized according to the realization degree of the goal in terms of knowledge, ability and emotion. The fourth level indicators can be designed according to the realization degree of the goal in terms of knowledge, ability and emotion. The education quality evaluation system and indicators of the above higher vocational colleges are shown in Table 2.

Table 2. General education teaching quality evaluation system and evaluation indicators

Evaluation objective	Evaluation object	Evaluation method	Evaluation content
Teaching objectives	Teachers/students	Portfolio evaluation method, psychological scale test method, standardized examination, questionnaire survey method, curriculum embedded evaluation method, etc.	Clear, specific and comprehensive
Content of courses			Whether it can reflect the teaching objectives of general education
Teaching methods			Whether to pay attention to the teaching and enlightenment of methods
teaching effectiveness			The actual situation of achieving teaching objectives

(3) Calculation of index weight

This study builds a multi-level and multi-structure model for each component of the problem and applies an analytical hierarchy approach to determine the weight of the evaluation index of general education in colleges and universities. The aspects of the current structure are also contrasted with those of the prior structure. The results show that the model has good applicability, and the construction of discrimination matrix can judge the importance of general education evaluation indicators and calculate the relative weight of comparative elements. When comparing the

importance of n general education evaluation indicators B_1, B_2, \dots, B_n to the upper level, it is necessary to determine their proportion in the upper level. For any two general education evaluation indicators B_i and B_j , the proportion of their impact degree is b_{ij} , so the following formula can be obtained:

$$b_{ij} = \frac{B_i}{B_j} \quad (1)$$

Similarly, the formula is as follows:

$$\frac{B_j}{B_i} = \frac{1}{b_{ij}} \quad (2)$$

To sum up, the judgment matrix $B = (b_{ij})_{n \times n}$ of general education evaluation indicators is obtained from the above analysis, and then the relative weight of each element is calculated. After assigning the weight of the general education evaluation index of the previous level to the current index, the weight of each general education evaluation index is recorded as w_1, w_2, \dots, w_n , and the relative weight of B_i and B_j is as follows:

$$b_{ij} = \frac{w_i}{w_j}, i = 1, 2, \dots, n \quad (3)$$

The judgment matrix obtained by using the attribution degree to complete the evaluation of general education design can be expressed as follows:

$$B = \begin{bmatrix} \frac{w_1}{w_1} & \frac{w_1}{w_2} & \dots & \frac{w_1}{w_n} \\ \frac{w_2}{w_1} & \frac{w_2}{w_2} & \dots & \frac{w_2}{w_n} \\ \dots & \dots & \dots & \dots \\ \frac{w_n}{w_1} & \frac{w_n}{w_2} & \dots & \frac{w_n}{w_n} \end{bmatrix} \quad (4)$$

The weight vector of general education evaluation index in higher vocational colleges can be expressed as follows:

$$W = (w_1, w_2, \dots, w_n)^T \quad (5)$$

The judgment matrix can be expressed as follows:

$$B = W \bullet \left(\frac{1}{w_1}, \frac{1}{w_2}, \dots, \frac{1}{w_n} \right) \quad (6)$$

In this system, the scoring standard set for general education in colleges and universities would also be expressed by V , and the algorithm for evaluating the value of general education in colleges and universities can be expressed by multiple indicator factor set U . The two sets can therefore be specifically expressed as follows:

$$U = \{u_1, u_2, \Lambda, u_n\} \quad (7)$$

$$V = \{v_1, v_2, \Lambda, v_n\} \quad (8)$$

The fuzzy relationship between the product of the evaluation index set U and the scoring standard set V of higher education institutions can be expressed as R, and the multiplication of A and R matrices can be expressed as a comprehensive evaluation matrix T^* :

$$T^* = (t_1^*, t_2^*, \Lambda, t_n^*) \quad (9)$$

P' is considered to be a transpose matrix. The following can be used to indicate the overall assessment score Q of general education in higher vocational colleges:

$$Q = T^* \times P' \quad (10)$$

(4) Simulation experiment and analysis

The obtained general education evaluation index data of higher vocational colleges are divided into 6 pieces, and the fuzzy evaluation model under AI generated by training is tested. Figure 4 displays the test outcomes and illustrates how closely aligned the test value and evaluation outcome of the fuzzy evaluation model under AI trained with the original sample data are. As a result, it is possible to assess the teaching quality using a fuzzy assessment model based on AI.

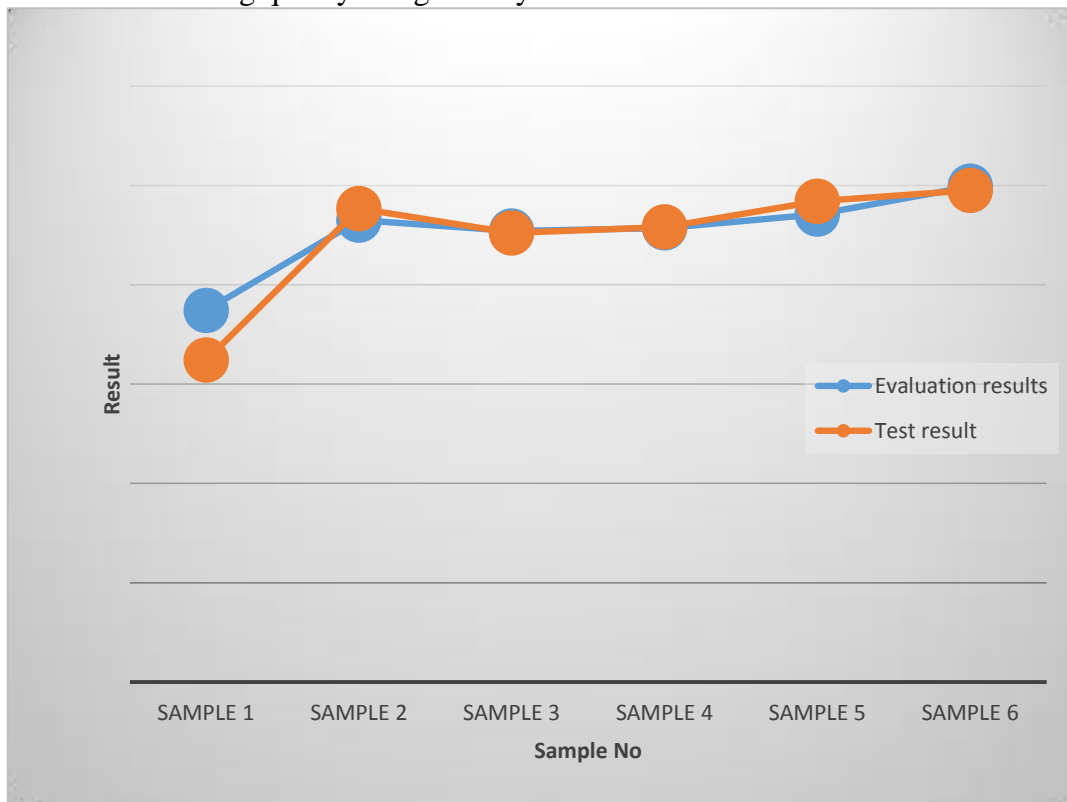


Figure 4. Comparison between test value and evaluation result of fuzzy evaluation model under AI trained by original sample data

The correlation coefficient between the actual value of the traditional evaluation model and the fuzzy evaluation model and the model output is compared in Figure 5 for both models. Figure 5 illustrates how the fuzzy comprehensive evaluation model outperforms the conventional evaluation approach. This is mostly due to the fact that the standard assessment model is based on linear

modeling, which is unable to capture the nonlinear relationship between the evaluation grades and the markers of teaching quality. The fuzzy comprehensive evaluation model based on AI can simulate all nonlinear evaluation relationships. According to the experimental results, the evaluation method proposed in this paper has the highest accuracy.

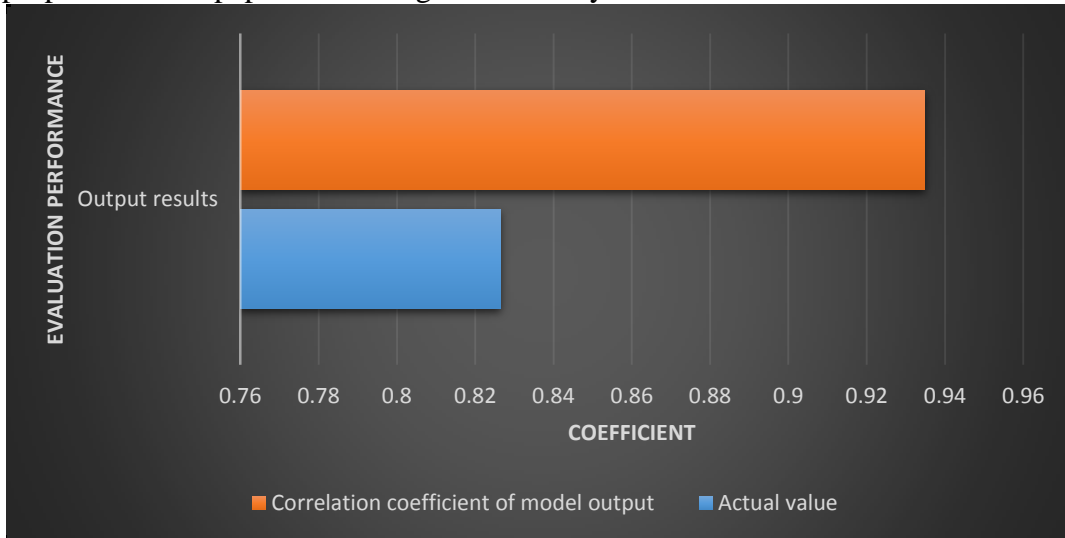


Figure 5. Comparison of correlation coefficient between actual value and model output of traditional evaluation model and fuzzy evaluation model

Figure 6 shows that when findings from the fuzzy comprehensive evaluation model are compared to those from the traditional evaluation model, the fuzzy comprehensive evaluation model based on AI not only increases accuracy by 6.38%, but also sparks students' interest in general education.

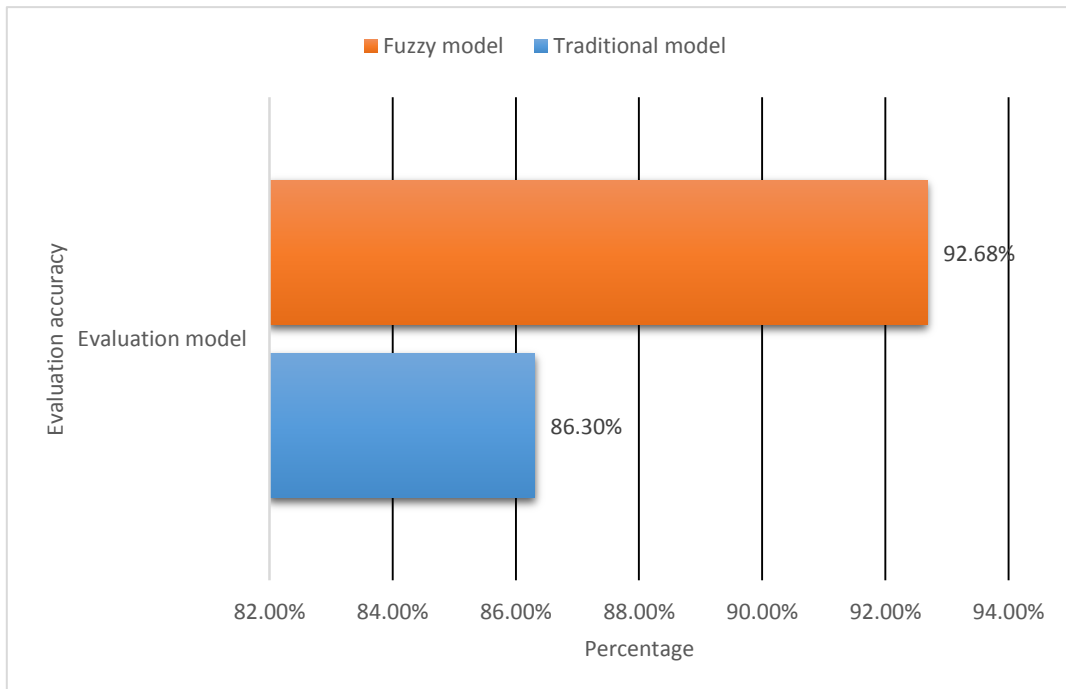


Figure 6. Comparison of accuracy results between fuzzy comprehensive evaluation model and traditional evaluation model

6. Conclusions

The development of compound skills has become a significant and long-term talent training goal of colleges and universities due to the new era's quick development and the rising demand for high-quality talents. The assessment indicators of general education serve a basic and vital role in accomplishing the school objectives and enhancing the quality of talent training as the primary tool for higher vocational colleges to meet the training objectives. The identification of the training aim for compound skills should be the underpinning for the reform and creation of general education curricula in the AI environment. This determination should be based on the curriculum system, teaching design, and teaching methodologies. In order to increase the quality of curriculum teaching and achieve the full training of compound abilities, traditional culture and developing technology are organically merged to design and optimize the classroom teaching material.

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If any, should be placed before the references section without numbering.

Data Availability

Data sharing is not applicable to this article as no new data were created or analysed in this study.

Conflict of Interest

The author states that this article has no conflict of interest.

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