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Evaluation of Teaching Strategies for Humanities Education in Higher Vocational Education in the Digital Age

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Abstract: Higher vocational institutions should focus on students' whole development and strengthen humanistic education in the current environment of higher education reform and development in order to meet the needs of social and economic development. In the context of the information age, there is also an urgent need to use digital technology to carry out more in-depth changes in teaching strategies. This paper starts from the development of humanistic education in higher vocational education, studies the content of humanistic education and the characteristics of teaching strategies, and analyzes the classroom environment and strategy design of digital smart teaching based on digital technology. Using the Analytic Hierarchy Process (AHP) to determine the weight of each factor, a multi-level fuzzy comprehensive evaluation model is constructed, which makes the comprehensive evaluation of teaching more objective. The research showed that teachers' demands for the improvement of digital intelligent classrooms accounted for the largest proportion of the improvement of the situation diagnosis and student data analysis systems in the middle school, as high as 83%. This appeal is conducive to improving digital teaching strategies. Second, after adopting the digital-based interactive teaching strategy, the proportion of teacher-led classrooms decreased from 34% to 27%, the proportion of student-led classrooms increased from 16% to 25%, and the proportion of classrooms in which students evaluated each other from 14% increased to 22%. This finding demonstrated that in digital teaching, teachers give students' initiative more and more consideration, increase interactive learning in the classroom, and permit more students to actively participate in class activities. Students' enthusiasm for learning and the number of classroom interactions have been improved.

1. Introduction

At the educational level, higher vocational colleges are also a type of higher education. Its higher

quality is reflected in the fact that it cultivates high-skilled application-oriented talents. Higher vocational education shoulders the important task of cultivating high-quality technical talents with modern vocational technology, good professional ethics and sustainable development. Humanistic quality education in higher vocational colleges is an important part of higher vocational education, and it is necessary to improve students' comprehensive quality through humanistic education. The fundamental goal of humanistic education in higher vocational colleges is to improve students' humanistic quality, establish the relationship between man and nature, man and society, and man and man, have humanistic emotions, and be able to correctly solve problems such as people's determination and emotion, and promote the healthy and sustainable development of students. Therefore, only by improving talent education in higher vocational colleges can they win the competitive advantage with high quality in the wave of educational reform and development.

Humanistic education in higher vocational colleges is a course set up by higher vocational colleges for the purpose of cultivating and improving students' humanistic quality. Xiaoling S pointed out that higher vocational education focuses on cultivating the production, construction, management and service skills of professional talents, and this level of education focuses on the actual needs of the society [1]. Geng pointed out that humanistic education is the process of transforming the excellent cultural connotation into the students' inner quality and improving their behavioral quality and temperament through a series of teaching methods [2]. Strause S S stated that humanities education is an education aimed at developing individuals' ability to change in the face of complex diversity [3]. Eroglu M A pointed out that humanistic education is a process of promoting people's autonomy and personalization. In this process, people can not only obtain literacy knowledge, but also get opportunities for their own development [4]. Voskoboinikova-Huzieva O's research claimed that the survey showed that humanistic education is different from professional and special education, it is a comprehensive education, and its purpose is to promote the all-round development of people [5]. There is controversy over the meaning and extension of humanistic education in academic circles, but it is certain that although humanistic education includes the two concepts of "humanities" and "education", these two concepts are not simply added together, but combination of the two.

Compared with traditional teaching methods, digital teaching methods focus on the processing and presentation of teaching information. Aini R M pointed out that teachers use digital media such as projectors and pictures in the teaching process, which can develop interactive and cooperative teaching strategies, and students' learning is happier and more meaningful [6]. Wang N said that the development of digital technology has brought convenience to the development of education and teaching, and also changed the traditional methods and means of education and teaching. Teaching strategies based on digital technology have brought new opportunities for educational development [7]. Jagadhesan B's research stated that humanities, as the basis for the development of cultural education, needs to be combined with digital information technology. After using a series of teaching strategies based on information technology, students are more willing to share ideas and problems with their classmates, and their learning enthusiasm is higher [8]. According to Muyassaroh M N, the manga teaching strategy using digital technology as a multimodal teaching medium is seen as a new trend in the classroom. Although many teachers have used this medium, to date, no research has explored the use of comic teaching in higher vocational education [9]. Walkert M showed that the purpose of a teaching sequence model using digital technologies is to advance a joint research-based approach among teachers to improve feedback on students' teaching strategies and instruction [10]. Digital teaching has abundant teaching resources, and the technology-based, information-based, and specialized teaching environment provides strong support for teaching reform.

Under the promotion of educational informatization, digital teaching has been implemented, but

due to the lack of integration with traditional teaching, the technical means in digital classrooms have not been effectively developed. Classroom interaction is an important link in humanities teaching, which is directly related to the effect and quality of teaching. Therefore, this paper would take the optimization of digital classroom strategies as the starting point, discuss the use of scientific and technological means to collect, process, and analyze students' learning status and behavior, and provide effective data support for teachers to accurately grasp the time and goals of classroom interactive activities, so as to carry out teaching intervention and strategy adjustment. In order to improve the effect of classroom interaction, a new technical approach is proposed, which further strengthens the in-depth integration of information technology and classroom teaching, and promotes the improvement of digital teaching strategies.

2. Design of Teaching Strategies Based on Digital Technology

2.1 Evaluation on Humanities Education in Higher Vocational Education

(1) The development of higher vocational education

With the reform and opening up and the development of the market economy, the emergence of higher vocational colleges has made the higher education system more perfect, improved the original vocational education level, and realized the transformation from "elite" to "popular" "change. Vocational and technical education is an important feature of higher vocational education. In terms of training goals, students can become practical, skilled and quality-oriented comprehensive talents [11]. Therefore, in the setting of curriculum structure, the focus is on resolving the conflict between goal and adaptability. The difference between higher vocational education and general higher education is shown in Figure 1.

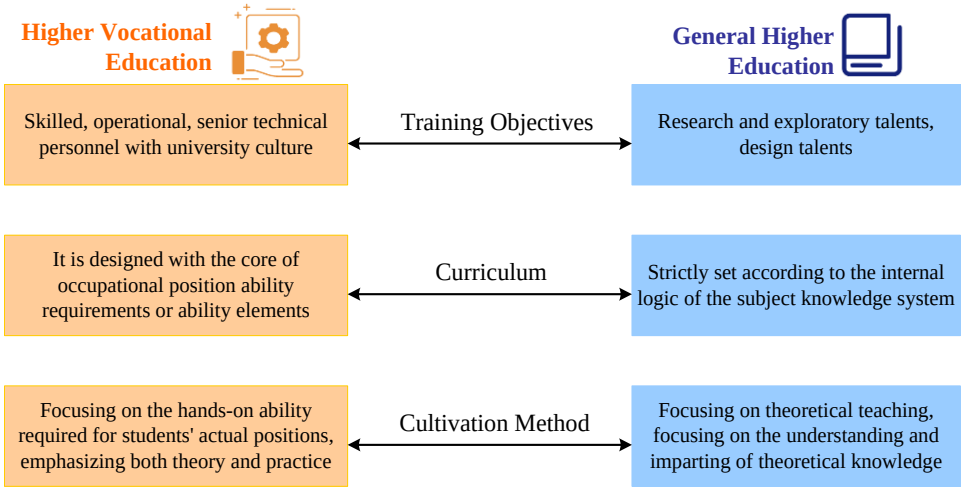


Figure 1: Differences between higher vocational education and general higher education

As shown in Figure 1, higher vocational education is fundamentally different from general higher education. It is neither a transition between application type and skill type, nor can it fully meet the needs of self-development. The training objects of higher vocational education are high-quality technical personnel with skill type, operation type, and university education level, while general higher education needs exploratory and design talents; secondly, there are also great differences in the content of professional courses. Higher vocational education focuses on cultivating students' practical work ability, combines education and training, and strengthens practice, so the mode is mainly skills training and practical teaching. General higher education focuses on the learning and mastery of theoretical knowledge, and the understanding and transfer of

theoretical knowledge [12].

At present, higher vocational colleges have formed a certain understanding of the cultivation of professional skills and humanistic quality, but there is a certain gap in the setting of some basic theories and professional skills courses. In terms of teachers, higher vocational education has special needs for teachers. It includes two types. One is a teacher who provides students with basic theoretical knowledge and professional theoretical knowledge, and the other is a practical teacher, who is mainly responsible for teaching students skill operations and giving practical guidance [13-14]. The most ideal situation is to combine the two, that is, to build a "double-qualified" higher vocational talent training team.

(2) Contents of humanities education in higher vocational colleges

The connotation of humanistic education is diverse, and it includes three media: knowledge, cultural accomplishment, and forms of existence [15]. All three media are indispensable, and only the true combination is a complete humanistic education. The contents of humanistic education are shown in Figure 2.

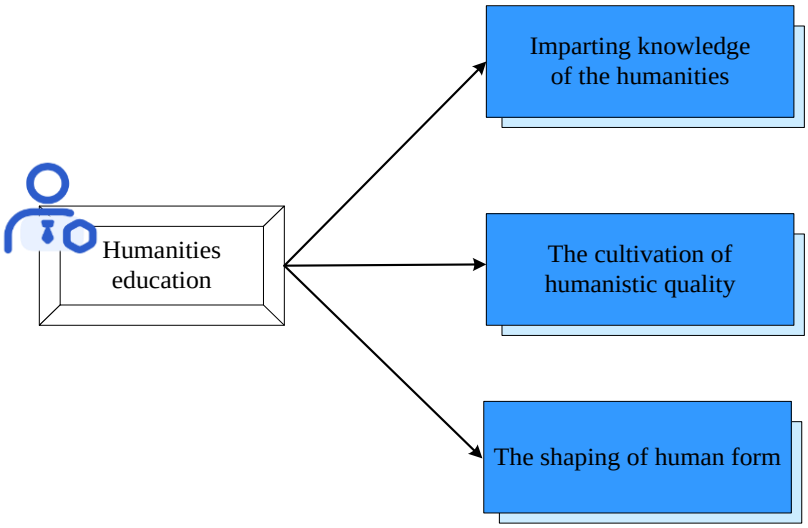


Figure 2: Contents of humanities education

As shown in Figure 2, strengthening students' humanistic knowledge is the basic premise for improving cultural accomplishment, and enhancing cultural accomplishment is to strengthen the internalization of students' humanistic knowledge; in the whole process of implementing humanistic quality education, students should establish correct concepts, good moral qualities and sound personality. Humanistic knowledge is a prerequisite for improving cultural accomplishment. To cultivate the humanistic quality of higher vocational students, people must combine knowledge and practice, guide students to study actively, combine students' study and practice, and internalize the basic elements of humanistic knowledge into students' inner identity [16-17]. The cultivation of humanistic literacy marks the further deepening of human quality education, and gradually enters the core process of humanization. The shaping of humanistic forms makes the education of humanistic literacy reach the peak, and plays a finishing touch to the whole educational process. It can be said that if it is not for the shaping of humanistic forms, then humanistic education cannot achieve real results. The formation of humanistic forms is a process of reconstructing humanistic information. It transforms humanistic knowledge and humanistic literacy into specific behavior and quality of students through the combination of educational system and institutional methods.

(3) Characteristics of humanistic education teaching strategies in higher vocational colleges

The students of higher vocational colleges are very different from those of ordinary colleges and universities. The education of higher vocational colleges has different educational characteristics

from other colleges and universities. Therefore, the humanistic education of higher vocational colleges should be based on the characteristics of vocational colleges, correctly understand the function of higher vocational humanistic education, grasp the characteristics of higher vocational students, and play the role of humanistic education in practice [18]. The characteristics of humanistic education teaching strategies in higher vocational colleges are shown in Figure 3.

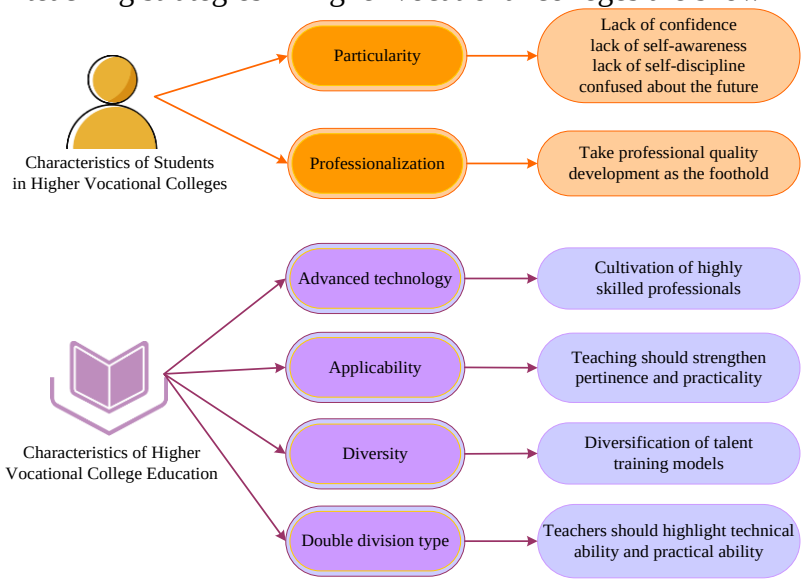


Figure 3: Characteristics of humanities education teaching strategies in higher vocational colleges

As shown in Figure 3, the humanities education teaching strategy of higher vocational colleges is to adjust the teaching content on the basis of satisfying the characteristics of higher vocational students. Students in higher vocational colleges generally have poor test scores. Coupled with social discrimination against vocational schools and unfair treatment in employment, they lack self-confidence; study habits are not very good, or initiative is poor, and they show weaker consciousness in the learning process; the rich and colorful extracurricular life in college makes it easier for these students to distract their study and lack self-discipline in behavior; in today's society, with the development of society, it is easy for students in higher vocational colleges to feel confused and anxious about their future.

Higher vocational education occupies a pivotal position in higher education, and its education is obviously different from general higher education and secondary vocational education [19]. In the training of high-tech professional and technical personnel in front-line work such as production, construction, management, and service, vocational colleges embody the characteristics of vocational education, with clear curriculum and teaching content; the talent training model emphasizes practicality, openness and professionalism; the teaching staff is also a characteristic "dual-training type".

2.2 Teaching Application in Digital Environment

Digital environment refers to the use of digital information technology to digitally process information resources to achieve effective management and exchange of information. It includes some intelligent hardware devices, related management systems and teaching platforms and other software systems. Digital teaching is the use of digital teaching methods in a digital teaching environment, guided by modern educational ideas such as constructivism. In digital teaching, teachers conduct teaching through a variety of teaching activities or means [20]. Compared with the traditional "teacher-centered" indoctrination teaching, the goal of digital teaching is

"student-centered", and its rich resources and creativity are not available in traditional teaching activities.

(1) Analysis of digital smart teaching environment

Digital intelligent classroom is a new information-based learning environment with interactivity as the core. Its purpose is to improve the teaching quality and enhance the teaching effect. The smart classroom is equipped with a variety of electronic equipment such as smart blackboards and e-school bags, which is convenient for teachers and students to carry out various teaching activities. The digital smart classroom is shown in Figure 4.

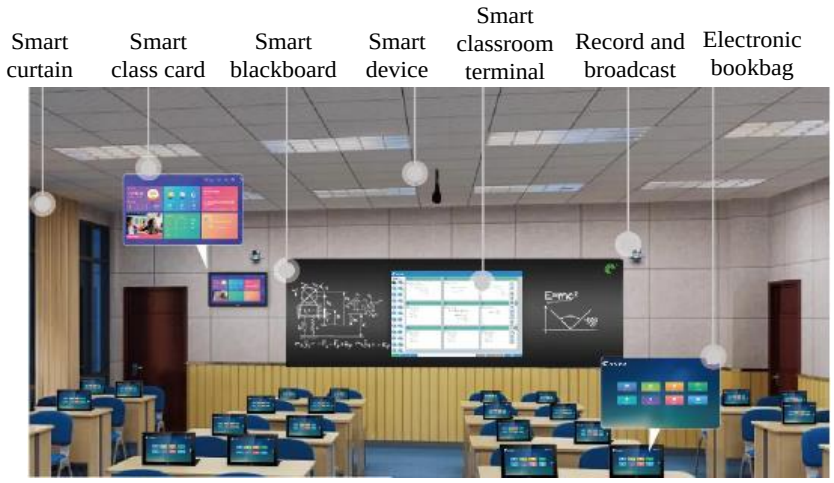


Figure 4: Digital smarter classroom diagram

As shown in Figure 4, the intelligent teaching interactive system composed of intelligent blackboard, electronic school bag, multimedia teaching terminal controller, etc. This facilitates the communication between people and technology. Teachers can flexibly switch in various interactive teaching such as teacher lectures, group discussions and exchanges, video learning, and class presentations, which is beneficial for teachers to carry out a variety of interactive teaching in the classroom, such as group cooperation and communication, independent inquiry learning, etc., thus creating a good classroom teaching environment and improving the quality of classroom interaction.

However, under the guidance of demand-side thinking, a series of problems such as quality structure and innovation have appeared in the teaching staff. Some problems were found through interviews with teachers. For example, teachers often complain that the digital system does not have the functions required by teachers, or the functions provided by the system are inconvenient to use; the lack of digital resources and the lack of matching make it difficult to prepare lessons. Because the companies and manufacturers chosen by each school are different, the hardware and software used are not exactly the same, and the functions provided by each company and manufacturer have their own advantages and disadvantages. Therefore, there is a contradiction between teachers and technology providers, that is, teachers' demand for functions that the school's digital intelligent system does not have is increasing, but there is also a phenomenon that some teachers ignore or do not make good use of the excellent functions of the existing digital systems, as shown in Figure 5.

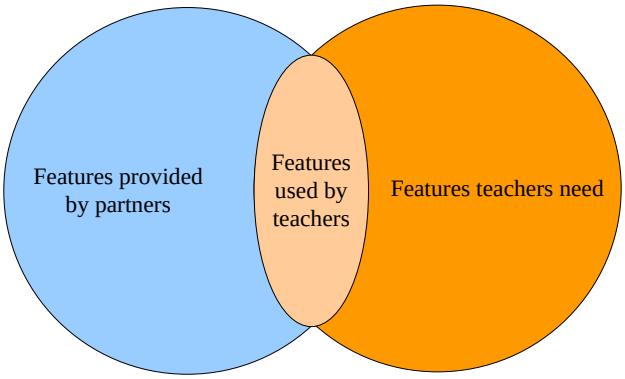


Figure 5: Conflict between teachers and providers of digital technology capabilities

As shown in Figure 5, in the past, teachers did not fully play the role of digital teaching. Secondly, in a class, teachers could not fully use the full role of a digital platform. This paper intends to start from the past teaching video materials, analyze the teaching activities carried out by teachers, and find out the functions used in the relevant teaching activities; at the same time, it is also necessary to analyze the technical characteristics and digital functions of the digital teaching environment, compare it with the teaching activities commonly used by teachers, find out some functions that are neglected by teachers, and guide them from the perspective of supply to make them play the biggest role.

(2) Smarter teaching strategy design

According to the actual characteristics of the digital intelligent classroom, six major teaching links of the intelligent classroom are proposed. The difference between the digital intelligent classroom and the traditional classroom is that the digital intelligent classroom provides a high interactive learning environment based on technology. In the digital intelligent classroom, with interactive teaching as the center, classroom teaching activities are carried out through the creation of learning situations, group cooperation and exploration methods, etc. The main teaching links of intelligent classroom interaction are shown in Figure 6.

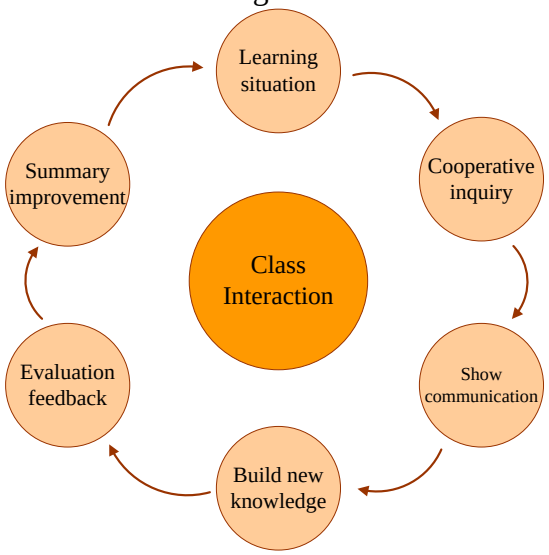


Figure 6: Main teaching links of smart classroom interaction

As shown in Figure 6, the classroom teaching of intelligent classroom includes situation introduction, cooperative exploration, display and communication, construction of new knowledge, evaluation and feedback, and summary improvement. In each teaching link, modern and advanced

information technology is used to carry out teaching activities in digital intelligent classrooms, promote classroom interaction, and deeply integrate technology and teaching. Scenario introduction is at the beginning of classroom teaching. Teachers need to create scenarios, use various activity methods, and introduce them into the classroom to enhance students' interest in learning; cooperative inquiry is the core content of classroom teaching. It is the teacher divides students into several groups according to the teaching purpose, assigns learning tasks in group collaboration, and guides them to explore in groups; demonstration and communication is the process of presenting and communicating the learning results after group study, so as to improve their self-assessment and reflection ability; the construction of new knowledge refers to sorting out the knowledge that students need to master on the basis of students' cooperative exploration, display and communication, so that students can construct new knowledge in an orderly and complete manner; the evaluation and feedback link is that the teacher sets the test questions in the classroom to test the students' learning effectiveness in stages, and finds and corrects the problems in time through the feedback of the test. Summarizing and improving is the last step in teaching. Teachers should systematically summarize the key and difficult points in teaching, arrange homework after class, consolidate what they have learned, and enhance students' ability to apply knowledge. These links all reflect the characteristics of interactive teaching methods in digital intelligent classrooms.

S-T (Student-Teacher) analysis method is a method to quantitatively analyze the teaching process. It divides classroom behavior into teacher-student relationship, namely S behavior and T behavior. T behavior means that teachers rely on sight and hearing to transmit information, and all other behaviors are S behaviors. After sampling, an S-T curve diagram is drawn from the sampling data, and the S-T curve diagram is shown in Figure 7.

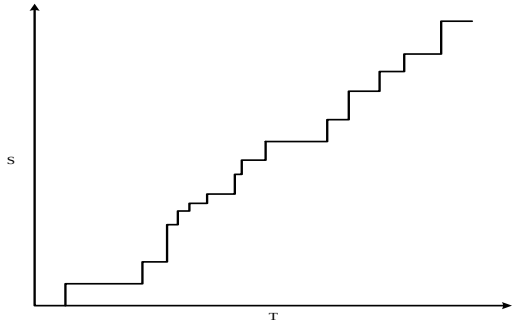


Figure 7: S-T curve diagram

As shown in Figure 7, the S-T curve starts from the time when the teaching starts, the vertical axis and the horizontal axis are the behavior time of S and T, respectively, and the behavior description is recorded. From the S-T diagram, one can clearly see the behavior of teachers and students in the classroom.

The S-T analysis method is mainly to calculate the time occupation Et and the behavior conversion rate Cr of the two behaviors. The formula is:

$$Et = QT / Q \tag{1}$$

Among them, the number of teacher behavior T is represented by QT, and Q refers to all behaviors that occurred in the entire teaching process. The higher the Et result, the greater the proportion of teachers in the classroom.

The behavioral conversion rate Cr is expressed as:

$$Cr = (g - 1) / Q \tag{2}$$

The behavior conversion rate refers to the consecutive times of the same behavior. The higher the

Cr , the higher the number of interactive teaching in the classroom.

2.3 Teaching Evaluation Based on Fuzzy AHP Theory

Fuzzy Theory is used to analyze and test the fuzzy phenomenon, and the general teaching evaluation uses a lot of fuzzy comprehensive evaluation. The key to teaching evaluation is the construction of evaluation model, which is simple in calculation and convenient in modeling. By combining the principles of fuzzy mathematics and AHP theory, the frequency and time of students' participation in learning and interaction in teaching are counted, the overall learning ability index of students is calculated, and a comprehensive, objective and timely evaluation of their learning process and knowledge mastery is carried out.

It is determined that the set of evaluation factors is Y , and then the result is:

$$Y = \{y_1, y_2, \cdots\cdots, y_m\} \tag{3}$$

In the traditional teaching evaluation, after the teachers have determined the evaluation indicators, they would determine the size of the weights according to their subjective judgments. The AHP method uses a multi-factor stratification method to perform weighted calculations on each factor. This method has a strong scientific nature, so the AHP method is introduced into the teaching evaluation, and by calculating the weight of each index, the problems existing in the traditional evaluation are solved, and the determination of the weight is more objective. Therefore, a concept based on relative importance measurement is proposed, and the index scaling method is used to give the corresponding measurement criteria. The standard of the index scaling method is shown in Table 1.

Table 1: Definition criteria for indicator scale

Scaling (x_{pq})	standard
2	The factor p is as important as the factor q
4	factor p is slightly more important than factor q
6	Factor p is significantly more important than factor q
8	The factor p is more important than the factor q, and the advantage is obvious
1,3,5,7,9	The scale value corresponding to the intermediate state

As shown in Table 1, the factors p and q represent two indicators for the comparison of the two factors. Constituting a pairwise comparison matrix, the importance of any indicator is the same.

If there is $x_{pq} = 6$, there must be $x_{qp} = \frac{1}{6}$, that is, there is:

$$x_{pq} = \frac{1}{x_{qp}} \tag{4}$$

If the following relationship exists:

$$x_{pq} = x_{pl} \bullet x_{lq} \tag{5}$$

The matrix is completely compatible, and the relative priority of each index can be given by the eigenvector corresponding to its largest eigenroot, and the required weight vector can be obtained after forwarding it.

The weight coefficient vector in the evaluation factor group is set to:

$$\tilde{X} = \{x_1, x_2, \cdots\cdots, x_m\} \tag{6}$$

Among them,

$$\overline{X_p} = \sqrt[m]{\prod_{q=1}^{m} x_{pq}} \tag{7}$$

$$X_p = \frac{\overline{X_p}}{\sum_{p=1}^{m} \sqrt[m]{\prod_{q=1}^{m} x_{pq}}} \tag{8}$$

Using the AHP method, each evaluation factor is selected to evaluate the importance of the relationship, and a corresponding comparison matrix is established to obtain the relevant weights as the basis for evaluation. After determining the weights, the largest eigenvalue λ_{max} is calculated:

$$\lambda_{\max} = \frac{1}{m} \sum_{p=1}^{m} \frac{x_{pq} X_P}{X_P} \tag{9}$$

Secondly, by calculating the one-time index CI and the ratio CR, the consistency of the above comparison matrix is checked.

$$CI = \frac{\lambda_{\max} - m}{m-1} \tag{10}$$

$$CR = \frac{CI}{RI} \tag{11}$$

The values of the maximum eigenvalue λ_{max} of each layer, the one-time index CI and the ratio CR are obtained by Formula 10 and Formula 11, and the definition standards are shown in Table 2.

Table 2: Definition criteria of λmax, CI and CR at each layer

	λ_{max}	CI	CR
First floor	2.2	0<0.2	0<0.2
Second floor	3.9538	-0.02905<0.2	-0.2116<0.2
Third floor	3.2	0<0.2	0<0.2

As shown in Table 2, the consistency index CI and consistency ratio CR of the established pairwise comparison matrix are both less than 0.2, indicating that the comparison matrix meets the satisfactory level.

For the evaluation, the weighted average method is directly used for calculation, such as Formula 12:

$$y_2 = \sum_{p}^{m} y_{lp} \bullet X_p, l = 1,2,3 \tag{12}$$

Among them, through quantitative evaluation of quantitative teaching activities, the final teaching evaluation score Y is obtained. The teaching evaluation score is based on the principle of maximum subordination, and the graded evaluation value of learning participation can also be obtained.

$$Y = y_1 \bullet X_1 + y_2 \bullet X_2 \tag{13}$$

3. Experiment of Interactive Teaching Strategies

3.1 Validity and Feasibility Based on Fuzzy AHP Theory

To test the reliability of fuzzy AHP theory, after the teaching, the students' digital learning and humanistic literacy levels were tested. After four rounds of teaching practice, questionnaires were distributed to 90 students and 30 teachers in a higher vocational college. There were 120 valid questionnaires. The Cronbach's alpha of this questionnaire was 0.876, which was highly reliable; the validity of the questionnaire was 0.737, which was greater than 0.7, indicating that this questionnaire had high reliability and good validity.

The pre- and post-test analysis of the students' digital learning and humanistic literacy after practice is carried out, and the application effect of interactive teaching strategies in the teaching of humanities education courses is grasped as a whole. The normal distribution of digital learning and humanistic literacy is shown in Figure 8.

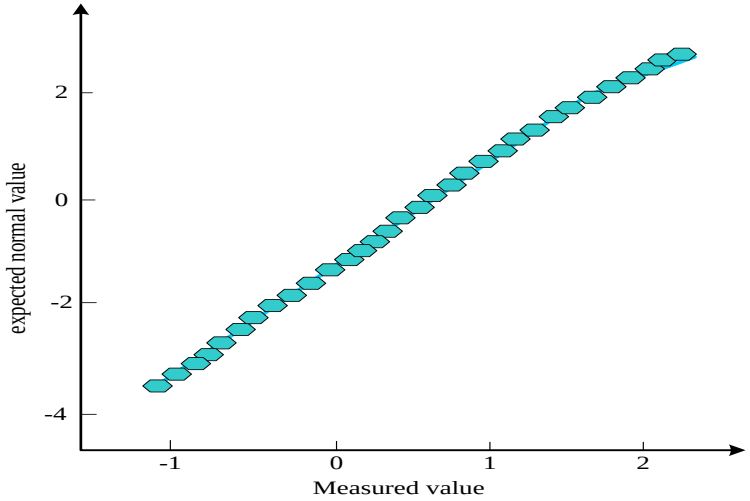


Figure 8: Normal distribution of digital learning and humanistic literacy pairings

As shown in Figure 8, the results show that in the distribution of digital learning and humanistic literacy, the difference between the two groups of data is normally distributed to a certain extent. Secondly, this experiment analyzes the teaching effect of interactive teaching strategies on digital humanities education from three aspects, and the results are shown in Table 3.

Table 3: Pre- and post-test analysis of each dimension of digital learning and innovation

	Pre-Test And Post-Test	Average Value	Standard Deviation
Creation of Learning Environment	Pre-test	3.4744	0.3977
	Post-test	3.9578	0.36401
Collection and Management	Pre-test	3.5244	0.43556
	Post-test	3. 8511	0.30077
Application and Innovation	Pre-test	3.4344	0.47992
	Post-test	3.8078	0.44445

As shown in Table 3, before the teaching practice, the average value of the students' digital learning situation was 3.4744, and after the teaching practice, it was 3.9578; before teaching practice, the average value of collection and management of digital learning resources was 3.5244, and after teaching practice, it was 3.8511; before teaching practice, the average value of digital

learning resource utilization and innovation ability was 3.4344, and after teaching practice, it was 3.8078. These results show that after the implementation of the interactive teaching strategy, the digital learning situation, the collection and management of digital learning resources, and the application and innovation ability of digital learning resources have been significantly improved.

Along with the development of the digital smart classroom, based on the design of teaching strategies and teaching activities, teachers' expectations for the improvement of the digital smart classroom are shown in Table 4.

Table 4: Teachers' expectations for improvement in the digital smart classroom

Type	Proportion
Provide relevant training for teachers	59%
Provides different teaching templates to lighten the burden of lesson preparation	74%
Optimized the interface and expanded the practical functions	60%
Improve technology and increase equipment flexibility	73%
Strengthen the diagnosis of academic conditions and improve the student data system	83%
Provide more teaching resources based on textbooks	75%

As shown in Table 4, strengthening the improvement of the learning situation diagnosis and student data analysis system accounts for the largest proportion of teachers' expectations for digital intelligent classrooms, as high as 83%. Secondly, it is expected to enrich teaching resources, improve teaching equipment, and upgrade teaching templates, which can play a certain role in the optimization of teaching strategies.

3.2 Evaluation of the Current Situation of Teaching Strategies Supported by Digitalization

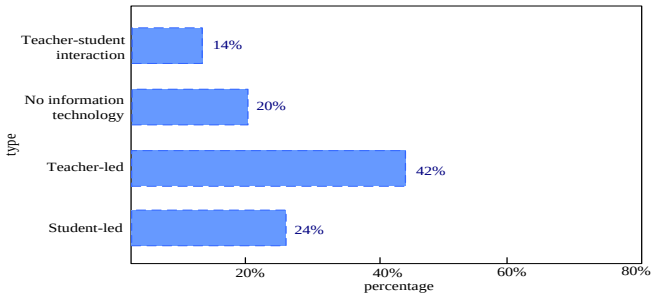
Through the statistics of the humanities education curriculum and the distribution of class hours in each semester, it can be seen that the proportion of class hours of humanities education courses in higher vocational colleges in two academic years is shown in Table 5.

Table 5: The proportion of class hours of humanities education courses in two academic years

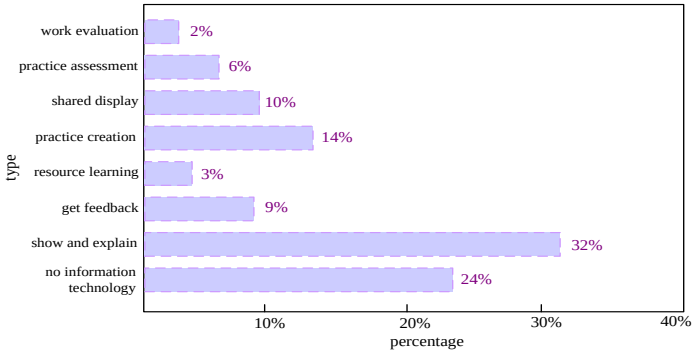
	Humanities Education Program	Other Courses
First Semester	13.89%	86.11%
Second Semester	12.25%	87.75%
Third Semester	28.6%	71.4%
Fourth Semester	35.27%	64.73%

As shown in Table 5, the proportion of humanities education courses in each semester is more than 12%. Moreover, the proportion of humanities education courses in the higher vocational colleges increases semester by semester, indicating that humanities education courses are being paid more and more attention.

The experiment uses the code table of teaching activities and functional analysis in the digital environment. Through coding and video analysis of 50 cases of humanities education courses using digital technology, the data information was integrated and the corresponding conclusions were drawn. Through the analysis of these experimental data, people can see the teaching situation supported by the digital environment, as shown in Figure 9.



(a). The distribution of functional users supported by the digital environment

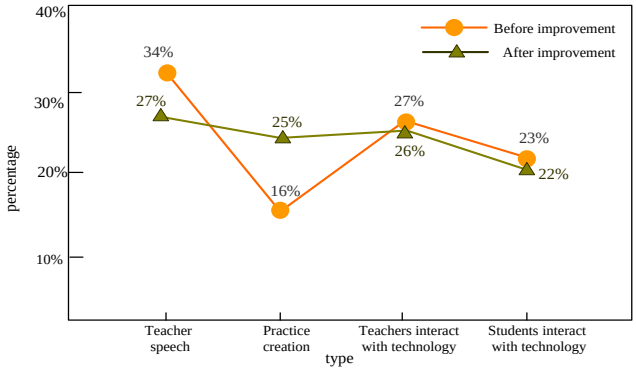


(b). Distribution of teaching activities supported by digital environment

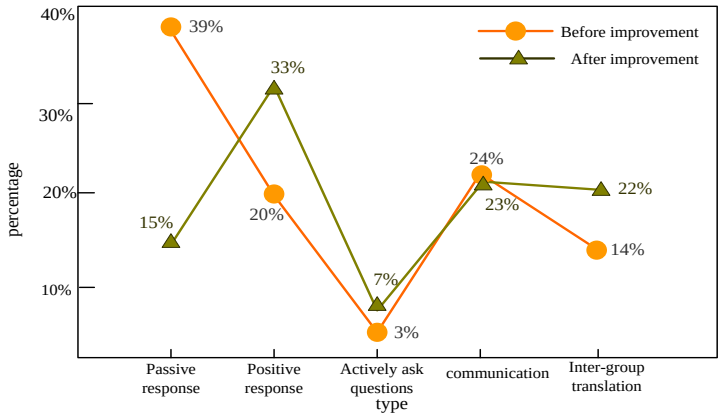
Figure 9: Teaching supported by a digital environment

As shown in Figure 9(a), with the support of digital technology, teachers are the main users of digital functions, 42% of teaching activities were led by teachers, followed by 24% of teaching activities led by students. As shown in Figure 9(b), in terms of specific teaching activity classification, teaching activities based on demonstration and explanation accounted for 32%, the teaching activities of practical creation accounted for 14%, and the teaching activities of evaluation and resource learning accounted for the least, 2% and 3% respectively.

Finally, the interaction situation of classroom teaching is understood, and statistical analysis is carried out on the interaction method of classroom teaching and students' language situation. The main purpose is to understand whether the improved teaching strategies based on the digital environment can improve classroom interaction, and improve teaching level, and students' learning experience and suggestions in smarter classrooms. The overall interaction of classroom teaching is shown in Figure 10.



(a). Interactive methods of classroom teaching



(b). Students' language situation

Figure 10: Overall interaction in classroom teaching

As shown in Figure 10 (a), after adopting the digital-based teaching strategy, the proportion of teacher-centered classrooms has dropped from 34% to 27%, and the proportion of student-centered classrooms has increased from 16% to 25%. This demonstrates that teachers pay more attention to the subjectivity of students' learning in the digital smart classroom, that student participation in class has improved, and that interaction between teachers and students in the classroom as well as interaction between students themselves has increased. The percentage of interactions between professors and students and digital technology has remained consistently high, demonstrating that technology has steadily filtered into the teaching of smarter classrooms and has provided substantial support for in-class interactive teaching activities. As shown in Figure 10 (b), after adopting the digital-based teaching strategy, the rate of negative responses to questions in the classroom decreased from 39% to 15%, while the rate of positive responses to questions increased from 20% to 33%, and the rate of students actively participating in the questioning session increased from 3% to 7%. The findings demonstrated that students are willing to actively engage in classroom interaction when using an interactive teaching technique based on digital technology, more actively answer the questions raised by teachers, and put forward their own opinions and questions. The ratio of mutual evaluation between students increased from 14% to 22%, indicating that more students actively participated in the activities of sharing and exchange and mutual evaluation between groups. Students' enthusiasm for learning and classroom learning atmosphere have been significantly improved.

4. Conclusions

Vocational colleges are places for cultivating high-tech talents, not institutions specializing in skill training. Therefore, it is very important to cultivate the humanistic quality of college students. Enhancing humanistic education is a trend that would inevitably emerge as society develops and advances. To accomplish the unity of the two, people should focus on cultivating both scientific and technology literacy as well as humanistic literacy; in terms of curriculum setting, a curriculum system with humanistic literacy as the core should be established. Humanistic education is a comprehensive educational work. The teaching strategies of the humanities education courses for the students of higher vocational colleges should be based on the humanities, rely on professional teaching, and combine the characteristics of students and education in higher vocational colleges to carry out people-oriented humanistic quality education. Only in this way can people create comprehensive talents with high technology. This research explored the learning state of students and the teaching behavior of teachers after beginning with an analysis of the digital smart teaching

environment and its tactics. A number of statistics demonstrated how the close coupling of classroom instruction with digital information technology has aided in the development of teaching methods. The research and application of humanistic education in higher vocational institutions would surely advance and yield more outcomes with the ongoing growth of teaching practice.

References

[1] Xiao S. Innovation management of English teaching in higher vocational colleges in China. Agro Food Industry Hi Tech, 2017, 28(1):628-631.

[2] Geng Z. Practicing Inclusive Teaching Strategies in a Storytelling Class. Headwaters, 2017, 30(1):20-20.

[3] Strause S S, Wilson N. New Strategies for New Literacies - Digital Strategy Backpack Samplers. Journal of Teaching and Learning with Technology, 2018, 7(1):1-24.

[4] Eroglu M A. Integrating Digital Tools for Teaching of Writing Expression in Turkish Language. International Journal of Learning and Teaching, 2019, 11(1):34-41.

[5] Voskoboinikova-Huzieva O. Digital Humanities In Higher Education System Of Canada. Continuing Professional Education Theory and Practice, 2019, 2(2):58-62.

[6] Aini R M, Muslem A, Usman B. Lecturers' Strategies Used In Teaching English Reading Comprehension: A Case At A Private College In Aceh. Humanities & Social Sciences Reviews, 2020, 8(3):20-30.

[7] Wang N, Zhang Y. Application Status and Promotion Strategy of Integrated Network Teaching Platform——Taking Northwest A&F University as an Example. Asian Agricultural Research, 2019, 11(04):94-96.

[8] Jagadhesan B, Saravanan M P, Saravanan M J. An Impact of Blockchain Technology on Digital Education In Machine Learning. High Technology Letters, 2021, 27(3):350-361.

[9] Muyassaroh M N, Asib A, Marmanto S. The Teacher's Beliefs and Practices on the Use of Digital Comics in Teaching Writing: A qualitative case study. International Journal of Language Teaching and Education, 2019, 3(1): 45-60.

[10] Walkert M. Kvalitetsutveckling av digitala trepartssamtal i svensk yrkeslrarutbildning [Quality development of digital trialogues in Swedish vocational teacher education]. Nordic Journal of Vocational Education and Training, 2019, 8(3):160-174.

[11] Sahoo S, Behera M P, Sahu S. Metacognitive Awareness on Teaching and Teaching Competence of Secondary Prospective Teachers. Shanlax International Journal of Arts Science and Humanities, 2021, 8(3):77-85.

[12] Andhini R, Halimi S S. Using Portfolio as A Source Of Information About Learning Process. International Review of Humanities Studies, 2021, 6(1):488-500.

[13] Mendez M, Anguita J M, Mendez D. The effect of digital platforms in the motivation of future primary education teachers towards mathematics. New Trends and Issues Proceedings on Humanities and Social Sciences, 2020, 7(3): 112-123.

[14] Vicky D, Rob S. Breaking the Triple Lock: Further education and transformative teaching and learning. Education + Training, 2018, 60(6):529-543.

[15] Rahmat A, Syakhrani A W, Satria E. Promising online learning and teaching in digital age: systematic review analysis. International Research Journal of Engineering IT & Scientific Research, 2021, 7(4):126-135.

[16] Suleimanova O A. Towards synergetic combination of traditional and innovative digital teaching and research practices. Training Language and Culture, 2020, 4(4):39-50.

[17] Ruyue L. Study on the optimization and combination of tourism management teaching and multimedia technology in higher vocational education. Agro Food Industry Hi Tech, 2017, 28(1):1375-1379.

[18] Tugwell O O. Effect of Problem-Based Learning on Students' Academic Achievement in Digital Electronics in Ken Saro-Wiwa Polytechnic, Bori, Rivers State, South-South, Nigeria. Innovation of Vocational Technology Education, 2020, 16(1):62-75.

[19] Galchuk L M. The E-Course Multimodal Content, Its Specific Structure and Teaching Affordances. RUDN Journal of Psychology and Pedagogics, 2019, 16(4):634-650.

[20] Ciambrone R. Pedagogy and ICT: The Principles of Differentiated Teaching and New Technologies. International Journal of Digital Literacy and Digital Competence, 2017, 8(2):39-55.