Research on the New Forms of Foreign Language Teaching in Guangdong Higher Vocational Colleges under the Background of Education Digitization

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Abstract: This study focuses on the new forms of foreign language teaching in Guangdong's vocational colleges against the backdrop of education digitization. Through questionnaires and interviews, it identifies the different needs of employers, graduates, teachers, and current students regarding foreign language teaching in vocational colleges. Subsequently, a new digital model for foreign language teaching is designed and implemented in teaching practice. The results demonstrate that the new model has a significant effect on English teaching in vocational colleges, providing theoretical and practical support for foreign language teaching reform, enhancing teaching quality, promoting the growth of teachers and students, and driving the digital transformation of education.

Keywords: Education digitization; Guangdong's vocational colleges; Foreign Language teaching; New forms

1. Introduction

With the rapid development of information technology, the global education sector is undergoing profound changes. Digital technologies, such as cloud computing, big data, artificial intelligence, and mobile internet, have widely penetrated various aspects of education. Internationally, many developed countries have already actively explored digital education models and achieved remarkable results.

China has successively proposed strategies such as building a digital China and developing a digital economy and has made a series of policy deployments centered on building an education power, modernizing education, and improving the quality of education. In April 2018, the Ministry of Education released the "Education Informatization 2.0 Action Plan", emphasizing the promotion of deep integration and innovation between information technology and education and teaching, to facilitate educational equity and enhance educational quality. In February 2022, the "Key

Points of the Ministry of Education's Work in 2022" clearly put forward the strategic action of education digitization. The report to the 20th National Congress of the Communist Party of China also reiterated the importance of "advancing education digitization and building a learning society and a great learning country that promotes lifelong learning for all." This series of actions and reports signifies that China's education informatization has entered a new stage of digital transformation. Under this digital transformation, foreign language teaching in vocational education presents distinct characteristics of the current era.

Guangdong holds a significant position in international trade, export-oriented economy, cross-border e-commerce, and cultural exchanges, so there is a growing demand for composite foreign language talents who not only possess solid foreign language skills but are also proficient in digital tools and have digital literacy. Foreign language teaching in Guangdong vocational colleges must adapt to the new demand of regional economic development and innovate teaching forms with the help of digital means so that the trained students can better serve the development of the digital economy industry in Guangdong and even the whole country.

2. Literature review

2.1. Current research abroad

Foreign experts initiated research on digital education relatively early, and with advancements in technology, the level of attention has been increasing. Since 2016, research literature has grown rapidly, with main research hotspots focusing on teaching practices and their impact on teacher development. For example, Kmecová emphasized the digitization of the educational process and the importance of using digital technologies in teaching [1]. It first highlighted the necessity of guiding students to develop their digital competencies and digital and information literacy, as well as the significant role of teachers in the educational process, where they serve as management consultants influencing the effectiveness of education. Questionnaires were used to collect students' views on the importance of using digital technologies in the classroom, aiming to elucidate the details of the educational process. The research conclusions emphasized the importance of innovative learning plans and the introduction of new learning plans that focus on supporting the development of digital literacy and collaboration with digital technologies. Quaicoe and Pata proposed a model describing the status of digital teaching and learning (TD-TaL) in Ghanaian schools from the perspective of teachers. Using survey data collected from 256 teachers in 45 schools across 6 districts in the Western Region of Ghana, the model was tested in the Ghanaian context. The results indicated that, apart from the digital attitudes of most teachers, personal and digital cultural factors directly influence teachers' digital activities, while from an environmental perspective, only the school's digital agenda directly or indirectly affects teachers' digital actions (ZPA) through digital training. The model particularly emphasizes that in the observed Ghanaian schools, the ZFM factor (digital infrastructure and digital support for digital teaching) is not associated with the ZPA factor (digital teacher training) and teachers' digital knowledge, competencies, and action factors [2].

2.2. Current research in China

Chinese scholars started researching digital teaching relatively late but have developed rapidly. Zhu Zhiting et al. pointed out that understanding and recognizing the digital transformation of foreign language education is crucial for promoting innovation in foreign language education models and upgrading learning paradigms, which is of great value for adapting foreign language education to changes in the external competitive environment and future social adjustments [3]. Yang Zongkai et al. proposed that foreign language teaching under digital transformation should create an integrated and immersive teaching environment, adopt intelligent and convenient teaching tools, provide rich and

open resource supplies, and innovate flexible and diverse teaching modes [4]. Liu Guimei suggested that the construction of digital foreign language teaching resources should meet the urgent needs of higher vocational students to improve their job-related foreign language skills and comprehensive professional development, utilizing smart information technology to comprehensively reconstruct the foreign language curriculum system in higher vocational colleges, implementing "explicit + implicit" layered teaching strategies, optimizing assessment and quality evaluation diagnosis and improvement mechanisms, and enhancing foreign language teachers' digital teaching abilities, thereby promoting the in-depth progress of the entire teaching reform process [5]. Hong Huaqing proposed a series of action paths for the digital transformation of foreign language education, including optimizing resource analysis and evaluation models, increasing investment in intelligent applications in learning environments, enhancing teachers' digital literacy levels, strengthening data-supported teaching analysis capabilities, and improving data-driven teaching management and evaluation mechanisms [6].

Through the review of domestic and foreign literature, it is found that scholars' research on digital education mostly focuses on the introduction of theories or specific teaching aspects such as development trends, teacher roles, and teaching resources, with relatively little research on the new form of foreign language teaching as a whole. Therefore, this topic believes it is necessary to construct a new model of foreign language teaching in higher vocational colleges under the background of educational digitization and to conduct research and exploration on the teaching environment, teaching resources, teaching methods, and teaching evaluation required for foreign language courses, providing valuable practical and theoretical references for foreign language curriculum and teaching reforms in higher vocational colleges under the background of educational digitization.

3. Research design

3.1. Research questions

In the context of the digital era, this study aims to delve into several key issues:

Investigate the new demands of employers and vocational college graduates for foreign language knowledge, skills, literacy, and other aspects to adapt to the new requirements for foreign language talents in the digital era.

Focus on the current situation of foreign language teaching in Guangdong vocational colleges, specifically investigate the prevalence and application of digital technology in foreign language teaching; simultaneously, study the demand and usage of online teaching resources by teachers and students; furthermore, investigate the experiences and feedback of teachers and students in foreign language teaching and learning in a digital environment.

Design a new model for digital foreign language teaching and attempt to implement it in English teaching at vocational colleges, testing the application effect of the new model in practical teaching in the digital era.

3.2. Survey on the needs of vocational college graduates for foreign language knowledge, skills, and literacy in the digital era

3.2.1. Participants

To better understand the current needs of vocational college graduates for foreign language knowledge, skills, literacy, and other aspects in the digital era and clarify the direction of talent cultivation, a questionnaire was developed. The questionnaire mainly includes six dimensions: basic information, foreign language knowledge and skills, professional competence, professional literacy, feedback on school education and training, and deficiencies and suggestions. The questionnaire was distributed via WeChat, with a total of 50 questionnaires distributed, 45 collected, a response rate of 90%, and 45 valid questionnaires, yielding an effective rate of 100%. Among the respondents, there were 12 males

and 33 females; the majority worked in the service industry, accounting for 35.6%, followed by business and trade, and others.

3.2.2. Data analysis

The results of the independent sample *t*-test show that the significance level of the difference in professional competence between genders is 0.568, which is greater than 0.05, indicating no difference in professional competence among vocational college graduates of different genders. Similarly, there is no gender difference in professional literacy and feedback on school education and training. However, the significance level of the difference in foreign language knowledge and skills between genders is 0.001, which is less than 0.05, indicating a difference in foreign language knowledge and skills among vocational college graduates of different genders.

According to the results of multiple comparisons, in terms of foreign language knowledge and skills, the manufacturing industry scores higher than information technology, services, and others; education and training score higher than information technology and services; and business and trade score higher than information technology, services, and others.

According to the correlation analysis results, there are significant correlations between foreign language knowledge and skills and professional competence, foreign language knowledge and skills and professional literacy, professional competence and professional literacy, and school education and training feedback and professional literacy. However, there is no significant correlation between foreign language knowledge and skills and school education and training feedback, or between professional competence and school education and training feedback.

3.3. Survey on the current situation of digital teaching by foreign language teachers in higher vocational colleges

3.3.1. Participants

To better understand the current application status of digital tools and resources in foreign language teaching in vocational colleges and to improve teaching quality and efficiency, a questionnaire was developed. It mainly includes eight dimensions: basic information, usage of online teaching resources, demand for online teaching resources, the prevalence of digital technology in foreign language teaching, application of digital technology by teachers in foreign language teaching, satisfaction with digital teaching resources, satisfaction with digital teaching tools, and digital teaching environment and teaching experience. The questionnaire was distributed in higher vocational colleges nationwide through WeChat groups, with 100 questionnaires distributed, 96 collected, a response rate of 96%, 2 invalid questionnaires excluded (some questions unanswered), and 94 valid questionnaires, yielding an effective rate of 98%.

3.3.2. Data analysis

The survey shows that 72 responses are from Guangdong Province, accounting for 76.6%, and 22 from other provinces, accounting for 23.4%. It can be seen that the survey results are heavily weighted towards the situation in Guangdong Province. There are 48 public and 46 private schools, accounting for 51.1% and 48.9% respectively, with no significant difference. There are 16 male teachers (17%) and 78 female teachers (83%), indicating that the results are biased towards the perspectives of female teachers. In terms of professional titles, there are no assistants, 50 lecturers (53.2%), 36 associate professors (38.3%), 4 professors (4.1%), and 4 others (4.1%), biased towards the views of lecturers and associate professors. The number of years engaged in foreign language teaching is as follows: less than 1 year, 10 (10.6%); 1–5 years, 8 (8.5%); 6–10 years, 8 (8.5%); 11–20 years, 52 (55.3%); and 21 years and above, 16 (17%).

The results of the independent sample *t*-test show that the significance level of the difference in the usage of

online teaching resources between provinces is 0.854, which is greater than 0.05, indicating no difference in the usage of online teaching resources among higher vocational colleges in different provinces. Similarly, there is no difference in the prevalence of digital technology in foreign language teaching, the application of digital technology in foreign language teaching, satisfaction with digital teaching resources, satisfaction with digital teaching tools, or the digital teaching environment and teaching experience between provinces. However, the significance level of the difference in the demand for online teaching resources between provinces is 0.017, which is less than 0.05, indicating a difference in the demand for online teaching resources among higher vocational colleges in different provinces.

Differences in various dimensions based on the nature of the school: The significance level of the difference in the usage of online teaching resources between school types is 0.968, which is greater than 0.05, indicating no difference in the usage of online teaching resources among higher vocational colleges of different natures. Similarly, there is no difference in the demand for online teaching resources, the prevalence of digital technology in foreign language teaching, the application of digital technology in foreign language teaching, satisfaction with digital teaching resources, or the digital teaching environment and teaching experience based on the nature of the school. However, the significance level of the difference in satisfaction with digital teaching tools based on the nature of the school is 0.022, which is less than 0.05, indicating a difference in satisfaction with digital teaching tools among higher vocational colleges of different natures.

Differences in various dimensions based on gender: The significance level of the difference in the usage of online teaching resources between genders is 0.935, which is greater than 0.05, indicating no difference in the usage of online teaching resources among teachers of different genders. Similarly, there is no difference in the demand for online teaching resources, the prevalence of digital technology in foreign language teaching, the application of digital technology in foreign language teaching, satisfaction with digital teaching resources, or satisfaction with digital teaching tools based on gender. However, the significance level of the difference in the digital teaching environment and teaching experience based on gender is 0.017, which is less than 0.05, indicating a difference in the digital teaching environment and teaching experience among teachers of different genders.

According to the results of the one-way ANOVA, among the seven dimensions, only the application of digital technology in foreign language teaching and satisfaction with digital teaching resources differ by professional title, with significance test results of 0.001 and 0.031, respectively, both significantly less than 0.05. According to the results of multiple comparisons, in terms of the application of digital technology in foreign language teaching by professional title, lecturers score higher than associate professors. However, in terms of satisfaction with digital teaching resources, teachers with other professional titles score higher than lecturers, associate professors, and professors.

There are no significant differences in the seven dimensions of the questionnaire based on teaching experience, as the significance levels are all greater than 0.05.

According to the correlation analysis results, there are significant correlations between all variables, and the correlation coefficients are all greater than 0, indicating positive correlations.

3.4. Survey on digital foreign language learning among higher vocational college students
3.4.1. Participants

To better understand the satisfaction of digital foreign language learning in higher vocational colleges and improve teaching efficiency and effect, a questionnaire was developed. The questionnaire covered eight dimensions: basic information, usage of digital teaching resources, demand for digital teaching resources, usage of digital teaching tools, application of digital technology in foreign language learning, satisfaction with digital teaching resources, satisfaction

with digital learning tools, and digital teaching environment and learning experience. The questionnaires were distributed via WeChat, with a total of 100 questionnaires sent out and 97 returned, yielding a response rate of 97%. After excluding 4 invalid questionnaires, 93 valid questionnaires remained, with an effective rate of 95.9%.

An analysis of the survey results reveals the numerical characteristics of demographic variables, reflecting the distribution of the respondents. Based on the frequency analysis of each variable, the distribution generally meets the requirements of the sample survey. Among the respondents, there are 19 males and 74 females. In terms of majors, 57% are liberal arts, 15.1% are science, 4.3% are engineering, and 23.7% are other majors.

3.4.2. Data analysis

According to the results of the independent sample t-test, the significance level of the difference in digital teaching resource usage between genders is 0.145, which is greater than 0.05, indicating that there is no significant difference in digital teaching resource usage between male and female vocational college students. Similarly, there are no significant differences in demand for digital teaching resources, usage of digital teaching tools, application of digital technology in foreign language learning, satisfaction with digital teaching resources, satisfaction with digital learning tools, and digital teaching environment and learning experience between genders.

According to the results of the one-way ANOVA, among the seven dimensions, only the usage of digital teaching resources shows significant differences across majors, with a significance level of 0.046, which is less than 0.05. Based on the results of multiple comparisons, it can be seen that liberal arts students use digital teaching resources more than science and engineering students.

Based on the above correlation analysis results, there are significant correlations between all variables, and the correlation coefficients are all greater than 0, indicating positive correlations.

3.5. Interviews with employers on the demands of higher vocational college graduates in the digital era
3.5.1. Interview design

For this interview, five principals from different industries were selected. The interview outline was sent via WeChat, and the respondents replied with voice or text messages, which were then compiled.

3.5.2. Interview analysis

In the digital era, employers have diversified and specific demands for the foreign language-related professional knowledge of vocational college graduates. The summary is as follows:

International trade and cross-border e-commerce: Proficient in international trade terminology and understanding the operating rules of cross-border e-commerce platforms. Able to use foreign languages for product descriptions, customer service, and marketing promotion. Possess foreign language understanding of international trade regulations, payment and settlement methods, and cross-border logistics.

Business communication and office skills: Solid business English skills, including listening, speaking, reading, and writing, especially business correspondence writing and business negotiation skills. Cross-cultural communication strategies to adapt to business exchanges in different cultural backgrounds. Familiarity with various office software and online collaboration platforms to meet the demands of digital office work.

Foreign language education and training: Strong language foundation, mastery of modern foreign language teaching methods, and course design principles. Understanding of educational psychology to better adapt to student needs. Familiarity with the use of online teaching platforms and possession of skills in the production and integration of

multimedia teaching resources to cope with the trend of digital education.

In summary, employers' demands for the foreign language-related professional knowledge of higher vocational college graduates in the digital era extend beyond language skills themselves, encompassing various aspects such as international trade, cross-border e-commerce, business communication, digital office work, and foreign language education, emphasizing the importance of comprehensive application abilities and digital skills.

4. Results

These research findings reflect the diversified and differentiated needs and experiences in the education field, as well as the impact of different background factors on students, teachers, and the usage of teaching resources.

4.1. Differences in the demand for online teaching resources among higher vocational colleges in different provinces

This phenomenon may stem from the uneven development of the regional economy, culture, and education. As an economically developed region, the higher vocational colleges of Guangdong Province may pay more attention to international integration and the integration of industry-leading technologies, so the demand for online teaching resources may be more diversified and cutting-edge. In contrast, other provinces may focus more on basic teaching and practical skill training due to limitations in resources, funding, and concepts [7].

4.2. Differences in satisfaction with digital teaching tools among higher vocational colleges of different natures

Public and private higher vocational colleges differ in funding sources, management modes, and teaching resources, which may directly affect the investment and usage of digital teaching tools [8]. Public colleges may introduce more high-quality digital teaching tools due to sufficient funding, thereby improving teacher and student satisfaction. However, private colleges may have limited investment in digital teaching tools due to funding constraints, leading to lower satisfaction.

4.3. Differences in digital teaching environment and learning experience among teachers of different genders

Gender differences may lead to different attitudes, habits, and adaptability among teachers when adopting and using new technologies. Some studies have shown that female teachers may be more meticulous and detail-oriented when using new technologies, while male teachers may be more inclined to explore the potential functions and applications of new technologies [9]. These differences may result in different perceptions and evaluations of the digital teaching environment and learning experience.

4.4. Differences in foreign language knowledge and abilities among higher vocational college graduates of different genders

Gender differences in foreign language learning performance have been a long-standing phenomenon. This may be related to differences in language abilities, learning styles, and interest preferences between males and females [10]. Some studies have found that females may have advantages in language memory and application, while males may excel in logical reasoning and spatial imagination. These differences may be reflected in foreign language learning, thereby affecting the foreign language knowledge and abilities of vocational college graduates.

4.5. Differences in foreign language knowledge and abilities, and professional competencies across industries

Different industries have varying requirements for foreign language knowledge, abilities, and professional competencies due to differences in business nature, market demand, and internationalization levels. For example, industries such as foreign trade and tourism have higher requirements for foreign language communication skills, while technology and manufacturing industries may focus more on professional competencies and technical abilities. These industry differences require graduates to possess knowledge and abilities that match the industry they are employed in.

Meanwhile, employers' demands for the foreign language-related professional knowledge of vocational college graduates in the digital era extend beyond language skills themselves, encompassing various aspects such as international trade, cross-border e-commerce, business communication, digital office work, and foreign language education, emphasizing the importance of comprehensive application abilities and digital skills.

4.6. Differences in the usage of digital teaching resources among students of different majors

Students of different majors have differences in learning content, learning methods, and learning needs, which directly lead to differences in their usage of digital teaching resources [11]. Science and engineering students may focus more on learning professional terminology and practical communication skills, tending to use digital resources such as vocabulary banks and simulated dialogues. In contrast, liberal arts students may pay more attention to an in-depth understanding of language culture and literary works and prefer to use digital resources such as e-books and online courses for extensive reading and in-depth analysis. These differences result in diversified and personalized applications of digital teaching resources across various majors.

5. Design and practice of new teaching modes

5.1. New digital foreign language teaching mode

The new digital foreign language teaching mode is supported by modern information technology, integrating online learning platforms, multimedia teaching resources, intelligent auxiliary teaching tools, and other digital means to achieve clear teaching objectives, intelligent teaching environments, digitized teaching resources, integrated teaching content, diversified teaching methods, pluralistic teaching evaluations, and intelligent teaching management. This mode not only provides students with richer, more vivid, and intuitive learning experiences but also offers personalized learning paths and resource recommendations based on students' learning situations and interests, thereby stimulating their learning enthusiasm and enhancing learning outcomes. The teaching elements and their connotations are as follows.

5.1.1. Teaching objectives

Knowledge objective: Through digital platforms, students are equipped with solid language basics, integrated with knowledge of international trade terminology, cross-border e-commerce platform operation rules, international trade regulations, payment and settlement methods, and cross-border logistics [12].

Skill objective: Enhance students' comprehensive application abilities in listening, speaking, reading, writing, and translating in a digital environment, especially their abilities to conduct autonomous and collaborative learning using digital technologies [13].

Literacy objective: Cultivate students' information literacy, cross-cultural communication skills, and innovative

thinking, enabling them to adapt to the career development needs of the digital era.

5.1.2. Teaching environment

Constructing a digital environment: Leveraging big data, virtual reality, and other technologies to build an integrated, open, shared, and collaborative smart teaching environment that supports blended learning, remote live interactive teaching, and routine recording [14].

Introducing new teaching modes: Introducing AI assistants to aid teaching, promoting a transition from a "teacher-student" binary structure to a "teacher-machine-student" ternary structure [15].

Encouraging collaborative participation: Encouraging teachers to integrate AI technologies and tools into teaching, creating teaching scenarios; encouraging students to use AI tools to assist in self-study and conduct extension training [16].

5.1.3. Teaching resources

Integrating digital resources: Through digital technology, integrate suitable foreign language platforms, online courses, and other resources, introduce cutting-edge content, and gather excellent teaching cases, courseware, videos, and other teaching resources [17].

Dynamically adjusting content: Dynamically adjust teaching content based on learning progress and level to ensure that students learn the most timely and relevant foreign language knowledge [18].

Introducing enterprise cases: Timely integrate real enterprise cases and cutting-edge knowledge and technologies into teaching content to enhance the alignment between talent cultivation and enterprise needs.

5.1.4. Teaching methods

Creating simulation scenarios: Establish virtual laboratories, rely on simulation software to mimic real work scenarios, and conduct teaching activities in realistic teaching environments, making the learning process more intuitive and interactive, which helps students deeply understand and grasp knowledge.

Personalized learning: Provide learning paths based on situations and interests, supporting students' autonomous learning and in-depth exploration.

Building learning communities: Support cooperative learning methods such as group projects, online discussions, and collaborative documents, building an open and interactive learning community that cultivates interaction, collaboration, teamwork, and communication skills among students [19].

5.1.5. Teaching evaluation

Constructing big data for teaching evaluation: Utilize big data for learning analysis, diagnosis, process monitoring, and comprehensive evaluation, providing a comprehensive, multi-dimensional, and multi-subject evaluation of students' learning effectiveness.

Innovating evaluation content and forms: Use project outcomes, internship reports, skill competition results, etc., as evaluation bases and incorporate certificate exam scores into the evaluation system.

Creating electronic learning archives: Record students' mastery and growth in knowledge points, providing support for personalized evaluation.

5.1.6. Teaching management

Data analysis: Utilize big data and AI technologies to conduct in-depth analysis of data on students' learning behaviors and effectiveness, providing a scientific basis for teaching decision-making.

Teaching feedback: Regularly collect feedback from teachers and students, and promptly adjust and optimize teaching strategies.

Teacher training: Organize teachers to participate in activities such as digital teaching ability enhancement training and digital collaborative teaching and research, use big data technology to monitor teachers' teaching data, and provide stratified and classified "precision training" programs [20].

5.2. Teaching practice of the new foreign language teaching mode in higher vocational colleges under the background of education digitization

5.2.1. Participants

This study selected research subjects from first-year non-English major students at Guangzhou Huanan Business College, ultimately determining four large classes (eight small classes, with every two small classes forming one large class for combined instruction), totaling 256 students. Among them, there were 135 students in the experimental class (109 males and 26 females) and 121 students in the control class (98 males and 23 females). Additionally, the course was taught by an experienced English teacher.

5.2.2. Methods

In this study, a pre-test, mid-test, and post-test design was adopted to comprehensively assess the performance of the experimental and control classes. Through horizontal comparisons, the aim was to reveal performance differences between the experimental and control classes at the same testing stages, thereby evaluating the teaching effectiveness of virtual assistant intervention in in-depth English reading in higher vocational education. Simultaneously, through longitudinal comparisons, the performance changes of the experimental and control classes at different testing stages were tracked to observe the trends and magnitudes of their learning progress. This dual comparative analysis method not only helps to deeply understand the effectiveness of teaching measures in the experimental class but also provides a scientific basis and improvement direction for future teaching practices.

5.2.3. Results

This study conducted pre-test, mid-test, and post-test performance assessments for both the experimental and control classes. Through comparisons, it was found that the experimental class showed significant performance improvement. Starting from a wide distribution in the first test, with the lowest score being 10 and the highest 100, it gradually transitioned to the third test where the score distribution was most concentrated, with the lowest score being 10 and most students scoring between 80 and 100. Although the control class also showed some performance improvement, the magnitude was relatively small. Scores improved significantly from many low scores in the first test to most students scoring between 50 and 90 in the third test, but the overall improvement was not as significant as that of the experimental class. Overall, the performance improvement in the experimental class was more notable, which may reflect the effectiveness of the digital teaching mode.

When comparing the English scores between the experimental and control classes, the study found some significant differences. The scores of the experimental class showed a significant increase, with the mean of Score 1 being 62.35, while the mean of Score 2 rose to 68.24, an increase of 5.89 points. By Score 3, the mean jumped to 81.57, which was not only 13.33 points higher than Score 2 but also 19.22 points higher than Score 1. This significant progress was also verified statistically, with paired sample t-tests showing significant differences between the three scores of the experimental class (all P-values less than 0.05), and there was a significant correlation among them.

Although the control class also showed some performance improvement, the magnitude was relatively small. The

mean of Score 1 for the control class was 63.95, the mean of Score 2 rose to 69.82 (an increase of 5.87 points), and the mean of Score 3 was 75.61 (5.79 points higher than Score 2 and 11.66 points higher than Score 1). Similarly, the three scores of the control class also passed the paired sample *t*-test, indicating significant differences among them (although the *P*-values for Scores 2 and 3 were close to the significance level of 0.05). However, compared to the experimental class, the magnitude of performance improvement in the control class was smaller, which may indicate that the application of virtual assistants in higher vocational English reading teaching has a more significant effect on improving students' performance (**Table 1**)

Table 1. Performance assessments of the experimental and control classes

	Pair	Test	Mean	Standard deviations	Standard error mean
Experimental class	Pair 1	Score 1	62.35	30.23515	2.44437
		Score 2	68.24	30.73909	2.48511
	Pair 2	Score 2	68.24	30.73909	2.48511
		Score 3	81.57	24.49806	1.98055
	Pair 3	Score 3	81.57	24.49806	1.98055
		Score 1	62.35	30.23515	2.44437
Control class	Pair 1	Score 1	63.9 5	28.55265	2.67420
		Score 2	69.82	27.00319	2.52908
	Pair 2	Score 2	69.82	27.00319	2.52908
		Score 3	75.61	24.92591	2.33453
	Pair 3	Score 3	63.9 5	28.55265	2.67420
		Score 1	75.61	24.92591	2.33453

In summary, the experimental results show that the scores in the experimental class became more concentrated, with an increase in high-scoring students and significant improvement in overall performance. Although the control class also saw some improvement, the magnitude was smaller, and there remained a large variance in student scores. This indicates that the new digital foreign language teaching mode has a positive effect on English language teaching in higher vocational colleges, significantly enhancing student performance.

6. Conclusion

The new digital foreign language teaching mode can effectively improve the quality and efficiency of foreign language teaching in higher vocational colleges, meeting the new demands for foreign language talents in the digital era. By integrating various digital means, this mode not only enriches teaching resources but also diversifies teaching methods and assessment approaches, providing a valuable reference for foreign language teaching reform in higher vocational colleges. In the future, the digital teaching mode should be further promoted and applied to facilitate the mutual growth of teachers and students, contributing to the cultivation of foreign language talents who can adapt to the needs of the global digital era.

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