
Original Research Article

Exploration on the Construction of Teaching Ability Model for English Teachers in Vocational Undergraduate Colleges in the Era of Smart Education

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Abstract: The teaching level of English teachers significantly impacts students' learning outcomes and overall development. The ongoing reform of university English courses has amplified the challenges faced by English teachers in vocational colleges. These challenges include insufficient professional team building, an incomplete theoretical framework for vocational English teaching, and a lack of in-depth understanding and innovation among teachers. Experimental evidence suggests that English teachers in vocational colleges lack adequate post-service education, hindering their ability to adapt to the evolving demands of teaching. Therefore, strengthening research on the teaching abilities of vocational English teachers is crucial for promoting the development of higher education.

Keywords: Smart education; English teacher; Teaching ability model; Informatization capability

1. Introduction

In the era of smart education, educators must adapt to the challenges posed by information technology-driven instruction. Embracing a timely transformation of educational concepts and roles is essential, along with optimizing teaching methods to enhance teaching literacy.

Researchers have explored teacher teaching ability model construction. Paliwal M employed a structured questionnaire to gather data from 296 Indian university teachers. The first step involved confirmatory factor analysis using IBM AMOS-26 software to establish preliminary models for five concepts and assess their applicability. Subsequent path analysis on the established model using the structural equation model revealed shortcomings in curriculum design, communication, and time management among Indian university teachers, while their technical abilities aligned with online education needs^[1].

Archibald D E developed an ability system to evaluate teachers' preparedness and teaching effectiveness in mixed contexts. Data was collected from different semesters, beginning and ending, within a blended learning program. The results indicated significant statistical significance for both influencing factors and common factors^[2].

Roll M J J employed a structural equation model to study 205 pre-service tutors aged 18-35. Their research revealed a correlation between dimensions measured by external and self-evaluation, further validating the proposed multivariate digital ability framework. The survey findings highlighted the importance of attitudes towards digitization and digital security standards application, while indicating a weak connection with general multidisciplinary digital abilities among pre-service vocational teachers^[3].

The present study focused on constructing a teacher's teaching ability model for English teachers in vocational undergraduate colleges. The analysis of vocational undergraduate English teachers' teaching abilities from various perspectives provides valuable insights for improving their teaching effectiveness.

2. Era of Smart Education and the Construction of Teachers' Teaching Ability Models

2.1. Smart Education

(1) Concept of smart education

As educational informatization deepens, our understanding of education also broadens. Educational informatization encompasses the process and state of integrating information technology with education (including school education, family education, social education, etc.) to comprehensively promote educational development. Education informatization is an ongoing process with distinct characteristics in different periods. Currently, the country is transitioning from digital education to smart education, which has emerged and made significant progress ^[4-5].

(2) Literacy of smart education teachers and its elements

Examining the concepts of smart education and teacher literacy provides a foundation for understanding smart education teacher literacy. Smart education teachers operate within the framework of smart education environments and possess the fundamental qualities and conditions necessary to effectively carry out their work ^[6].

Smart learning teachers exhibit several defining characteristics: embracing smart learning concepts, organizing smart learning environments, implementing effective smart learning teaching and evaluation methods ^[7-8]. These factors comprise a complex and interconnected system ^[9]. Research should not only focus on teachers' intelligent learning abilities but also delve into other components of their intelligent abilities to establish and refine a comprehensive system of teacher intelligent abilities ^[10].

2.2. Teacher's Teaching Ability Model

(1) Construction of information capability model

Teachers must possess a strong foundation in information technology to effectively utilize it in online courses and adapt to the demands of smart education ^[11-12]. Continuous learning and exploration of new educational technologies are essential ^[13].

(2) Construction of cooperative teaching ability model

Establishing teacher education and development centers is crucial for fostering collaborative teaching abilities ^[14-15]. These centers provide teachers with access to relevant resources, broaden their educational horizons, and promote the adoption of innovative teaching models.

(3) Construction of a personalized teaching ability model

Active engagement in practical applications is key to constructing personalized teaching models ^[16-17]. Smart education offers opportunities for teachers to observe, learn, and reflect on their teaching practices, facilitating personalized learning for students.

(4) Construction of teaching design ability model

This model encompasses five core components: teaching goal design, learner analysis, teaching strategy design, process design, and teaching evaluation design ^[18-19]. Each component plays a vital role in ensuring

effective teaching and learning outcomes.

2.3. Teaching Ability in the Context of Smart Education

As educational informatization advances, the definition of teaching ability has expanded to include concepts such as educational technology proficiency, information teaching, information literacy, and digital-age teaching [20]. Scholars now emphasize integrating technology, course content, and teaching methods in subject-specific instruction, driven by ongoing advancements in information technology.

With the evolution of teaching and learning methodologies, scholars highlight information literacy as a crucial component of teaching ability. It involves using information technology tools to address real-world teaching challenges, enhancing teaching effectiveness, and promoting students' moral awareness and responsibility through diverse teaching information.

Teaching ability, in the context of educational informatization, involves utilizing information technology to advance curriculum teaching. The development of smart education has elevated expectations for teachers, requiring them to integrate information technology deeply, employ various smart teaching methods (personalized teaching, heuristic teaching, etc.), and utilize multifaceted teaching evaluation practices to provide engaging learning experiences and personalized learning services for students.

3. Survey Questionnaire Design and Data

The survey questionnaire on the teaching ability of young English teachers in vocational colleges mainly consists of two parts. The first part is the basic information of 87 teachers, mainly including age, educational background, etc; the second part is teaching ability, mainly including teaching design, teaching implementation, teaching control, teaching reflection, scientific research and innovation. A total of 100 questionnaires were distributed and 100 were collected in this survey.

(1) Background information

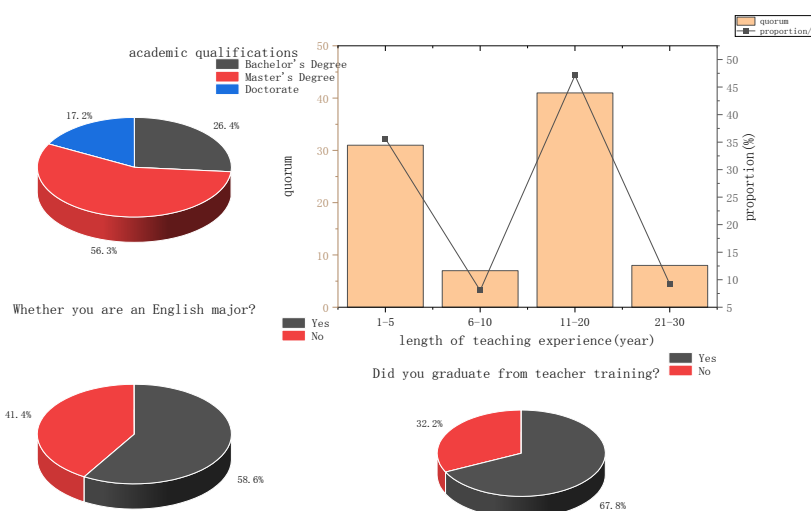


Figure 1. Basic schedule of survey subjects.

In Figure 1, 17.2% of English teachers in the surveyed vocational undergraduate colleges had a doctoral degree, while 56.3% of English teachers had a master's degree. Nearly half of English teachers had been in the teaching industry for 11 to 20 years. 35.63% of people had only been employed for 1 to 5 years.

(2) Current situation of teachers' teaching ability

Based on the survey results in Figure 2, judging from the sum of the percentage of teachers who choose "fully compliant" and "basically compliant", it can be concluded that the teaching ability of English teachers is as follows:

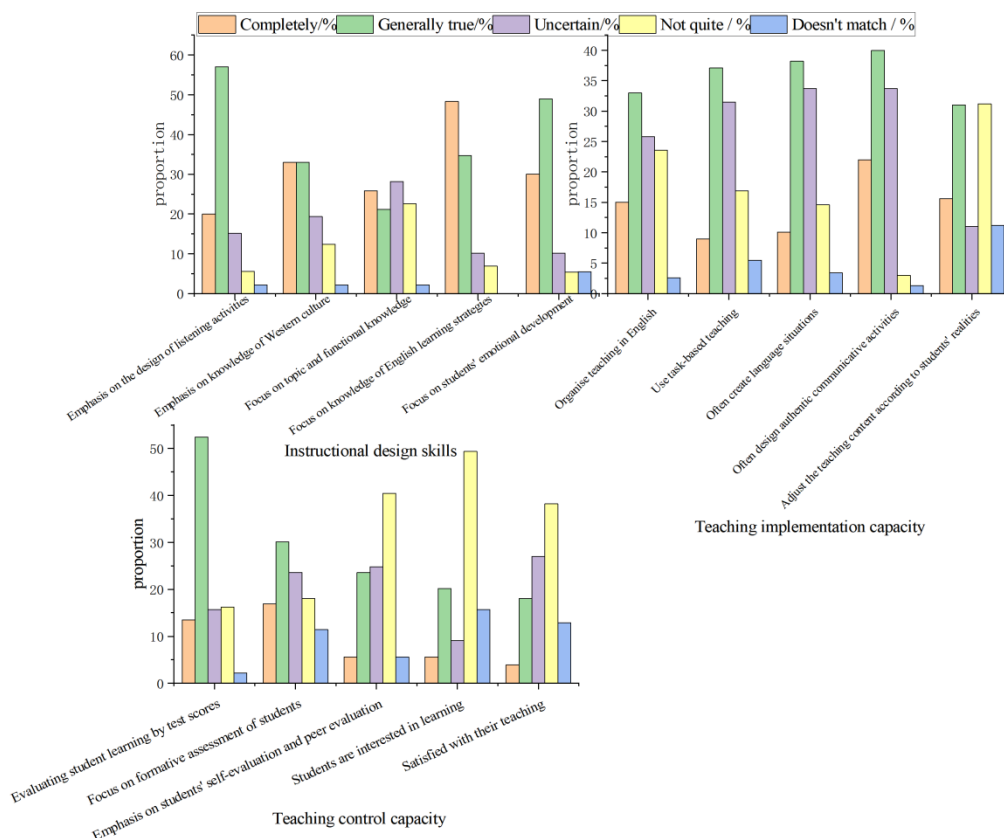


Figure 2. Teaching ability survey.

Based on the data analysis of the English teacher competency survey in Figure 2, the following conclusions can be drawn:

A. Analysis from Teaching Design Ability

A significant portion of teachers emphasize English listening and speaking activity design and Western cultural knowledge explanation (77% prioritize listening and speaking activities, 66% prioritize Western cultural knowledge). Vocational undergraduate teachers prioritize English learning strategy knowledge and students' emotional development over topic and functional knowledge (83% focus on English learning strategy knowledge, 79% focus on students' emotional development).

B. Analysis of Teaching Implementation Ability

46% to 62% of students meet the requirements for "organizing teaching in English," "adopting task-based teaching," "frequently creating language scenarios," "frequently designing authentic communication activities," and "adjusting teaching content based on students' actual needs." This suggests a clear need for improvement in vocational undergraduate English teachers' teaching implementation abilities.

C. Analysis of Teaching Control Ability

65.92% of vocational undergraduate English teachers evaluate students' learning based on exam results. The adherence to other indicators, including "emphasis on formative evaluation," "emphasis on self-evaluation and peer evaluation," "strong interest in learning," and "satisfaction with one's own teaching," ranges from 47% to 21.9%. These findings indicate significant shortcomings in vocational undergraduate English teachers' teaching control abilities.

(3) Overall situation of maintaining the ability of teachers in vocational undergraduate colleges and universities

Utilizing a 5-level scoring system, the theoretical median of 3 serves as the reference value. Figure 3 illustrates that English teachers in local undergraduate universities maintain a moderate to high teaching ability. The questionnaire's average value exceeds 3 (M=3.45). "Ability foundation" denotes proficiency in English listening, speaking, reading, and writing. "Current state of ability" encompasses overall competence, while "ability improvement" measures the extent to which surveyed teachers enhance their English proficiency outside professional duties.

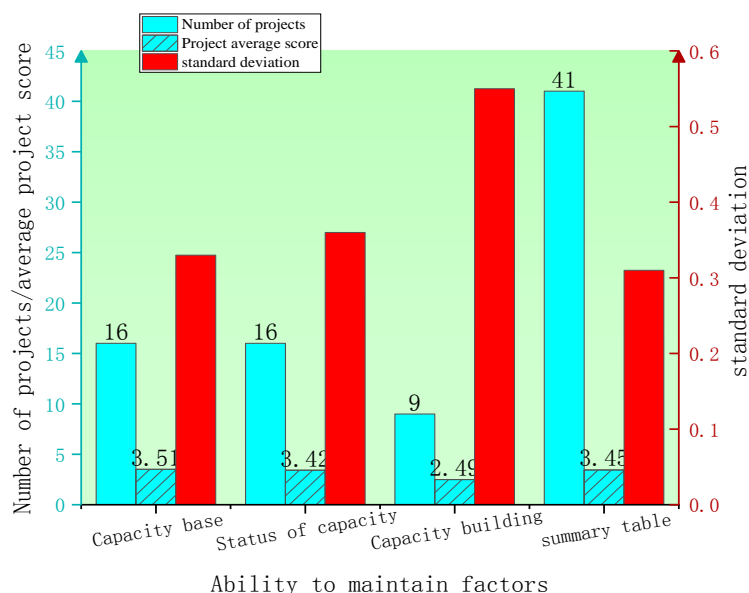


Figure 3. Overall Situation of Maintaining the Ability of University Teachers.

Figure 3 illustrates the examination of indicators, namely "capability foundation," "capability status," and "capability improvement," with 16, 16, and 9 questions tested, respectively. Notably, "ability foundation" and "ability status" scored higher at 3.51 and 3.42, indicating robust basic English skills (listening, speaking, reading, and writing) and acceptable teaching abilities among vocational undergraduate English teachers. However, the 'ability improvement' indicator scored only 2.49, below the theoretical median of 3, indicating inadequate post-service education for teachers.

(4) T-test analysis of maintaining teaching ability of English teachers of different genders in vocational undergraduate universities

This article surveys and analyzes the teaching ability of English teachers across genders in vocational undergraduate universities, employing a T-test to highlight differences among various samples. The T-value reflects the significance of differences between the mean values of the two sample groups. A higher T-value indicates a more substantial difference, and a larger absolute T-value signifies a greater disparity. The calculation

formula for the T-value is as follows:

A. When $\sigma_1 = \sigma_2$ (the two sets of samples have the same variance):

$$T = \frac{(\bar{x}_1 - \bar{x}_2) - D_0}{S_P \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}} \tag{1}$$

B. When $\sigma_1 \neq \sigma_2$ (the difference between the two sets of samples is different):

$$T = \frac{(\bar{x}_1 - \bar{x}_2) - D_0}{S_P \sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}} \tag{2}$$

Table 1. Analysis of teaching abilities of English teachers of different genders.

Male				
	Capacity base	Capability Status	Competence Enhancement	Overall Scale
Number of persons	30	30	30	90
Mean score	3.39	3.21	2.89	3.45
standard deviation	0.32	0.45	0.51	0.46
Female				
Number of persons	70	70	70	210
Mean score	3.7	3.56	2.12	3.78
standard deviation	0.45	0.42	0.51	0.49
T-value	-0.908	-0.796	0.823	-0.547

Table 1 reveals that male English teachers scored lower on basic ability indicators compared to their female counterparts. The absolute value of T, approximating 1, signifies a significant difference in basic abilities between male and female teachers. While the average score for male teachers' ability status was lower than females, their score on the ability improvement indicator exceeded that of females. This suggests a higher level of post-service education among male teachers.

4. Conclusions

Higher education institutions' academic affairs departments should establish a conducive English teaching environment, bolster infrastructure, and intensify in-service education and training for English teachers. Providing more opportunities for further education is crucial to enhance their knowledge and theoretical understanding. The questionnaire survey highlights a deficiency in post-employment education among current teachers. Integrating practical teaching training into pre-employment training can better equip young teachers to meet professional demands and expedite their development into exemplary university educators. Regardless of educational background or seniority, teachers must consistently update their knowledge and enhance their abilities.

Fund

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