

# Current Situation and Improvement Strategies of Digital Literacy of Business English Teachers in Local Universities

## -- A Case of Guangzhou Institute of Science and Technology

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### Abstract

In the era of rapid information technology and enhanced network infrastructure, the higher education landscape witnesses a revolutionary shift, emphasizing the cultivation of students' digital literacy. This exigency not only reflects the impetus of educational reform but also poses a challenge to educators' digital capabilities. Concurrently, the new era mandates elevated standards for teachers' digital literacy. This study, taking the business English teachers in Guangzhou Institute of Science Technology as a case, probes into their digital literacy. Digital literacy is herein categorized into five pivotal dimensions. Via questionnaire surveys, it dissects the extant situation and issues of teachers' digital literacy and, grounded on the survey outcomes, undertakes a meticulous analysis from the aspects of digital awareness, digital technology knowledge and skills, digital application, digital social responsibility, and professional development. Eventually, a suite of proposals and strategies is proffered to enhance teachers' digital literacy. The study aims to offer profound insights and fundamental comprehension for elevating teachers' digital proficiency and furnish practical referential and inspirational cues for colleges and universities in advancing digital education reform.

### Keywords

Digital literacy; business English teacher; local undergraduate university.

## 1. Introduction

Over the past few years, the remarkable progress of information technology and the continuous enhancement of network infrastructure have precipitated profound and far-reaching transformations in people's modes of living, learning, and working. The advent of digitization, networking, and informatization has emerged as the hallmark of the new era. This technological surge has spurred a global shift in education towards digitalization, with the digitization of education assuming a pivotal position as a strategic objective in the national development agenda of many countries, including our own.

Within the realm of higher education, the elevation of students' digital literacy has emerged as a central tenet of contemporary education reform initiatives. This pursuit is intrinsically intertwined with the digital acumen of educators. Concurrently, the new era imposes more exacting demands on the digital literacy of teachers. For business English teachers, digital literacy constitutes an integral facet of their professional growth and evolution. Through in-depth exploration and the active promotion of digital literacy, teachers can perpetually rejuvenate their knowledge and skill sets, thereby aligning with the pedagogical exigencies and developmental trajectories of the digital age. This not only augments the professional

competitiveness of teachers and the caliber of education dispensed but also engenders a plethora of career advancement opportunities.

Taking Guangzhou Institute of Technology as a paradigmatic case, this study undertakes a comprehensive and in-depth analysis and discourse on the current status of digital literacy among business English teachers in local undergraduate institutions. The selection of our institution for questionnaire administration facilitates the convenient access to sample cohorts. Moreover, the familiarity of the researchers with the institutional milieu and idiosyncrasies, encompassing its cultural ethos, educational policies, and operational modalities, endows them with the capacity to formulate more incisive, targeted, and meaningful research questions, thereby enhancing the overall rigor and pertinence of the study.

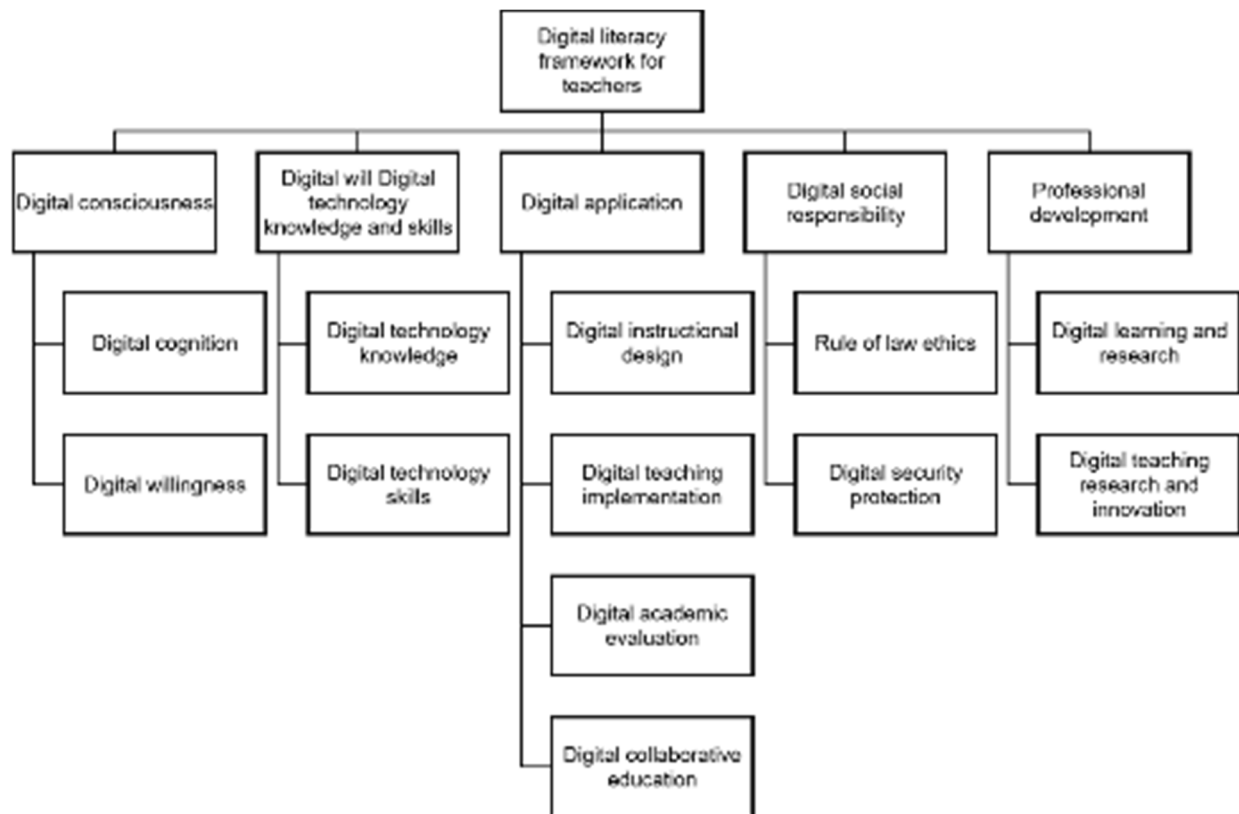
## 2. Theoretical Basis

### 2.1. Multi-dimensional analysis of digital literacy

The concept of "digital literacy," initially introduced by Israel's Yoram in 2002, characterizes it as the utilization and understanding of information in the digital era, emphasizing the crucial role of digital technology as an inherent part of daily existence<sup>[1]</sup>. Regarding the definition of digital competence, professionals from the OECD posit that it pertains to the comprehensive technical proficiency acquired within work and social contexts, whereby individuals must grasp the full potential of technology, master its application skills, and foster critical thinking and judgment.

On November 30, 2022, the "Teacher Digital Literacy" education industry standard was formally released and implemented. Initiated by the Department of Teacher Work of the Ministry of Education and involving the participation of multiple companies in its drafting, this standard was publicly presented at the World Digital Education Conference on February 13, 2023, garnering extensive attention. It represents the first educational industry standard concerning teachers' digital literacy in China, carrying substantial significance in facilitating the efficient enhancement of teachers' digital literacy. As can be seen in figure1The standard proposes a five-dimensional three-level framework for teachers' digital literacy, encompassing digital consciousness, digital technology knowledge and skills, digital application, digital social responsibility, and professional development. Beneath each primary dimension, there exist several secondary and tertiary dimensions, which together provide a comprehensive and structured framework for evaluating and developing teachers' digital capabilities.

Digital consciousness, the fundamental awareness for teachers in the digital age of education and teaching, consists of three secondary dimensions: digital awareness, digital will, and digital resolve. Digital awareness demands that teachers recognize the significant value of digital technology in economic, social, and educational development, understand the international digital economy's competitive landscape spurred by it, and the positive impact on educational digital transformation. Simultaneously, they should perceive the opportunities and challenges in education and teaching, realizing that digital technology drives educational innovation while also presenting ethical issues. Digital will requires teachers to actively engage in learning and using digital technology resources and initiate educational teaching exploration and innovation. Digital resolve obliges teachers to overcome difficulties and challenges in digital education practice with confidence.



**Figure 1.** Digital Literacy Framework for Teachers

Digital technology knowledge and skills form the bedrock for the seamless integration of digital technology and education teaching, comprising digital technology knowledge and digital technology skills. The former mandates that teachers possess basic knowledge of common digital technology concepts, principles, and problem-solving procedures. The latter demands that teachers master the principles and methods of selecting appropriate digital technology resources like equipment, software, and platforms in teaching and be proficient in using common digital technology resources and resolving basic technical issues.

Digital application, the core of teachers' digital literacy, reflects their comprehensive capacity in digital teaching activities and encompasses four secondary dimensions: digital teaching design, digital teaching implementation, digital academic evaluation, and digital collaborative education. Digital teaching design necessitates that teachers use digital evaluation tools for student learning analysis, acquire, manage, and produce digital educational resources, design digital teaching activities based on objectives, and create an integrated learning environment. Digital teaching implementation requires using digital technology resources to support teaching activities, optimize processes, and conduct individual guidance. Digital academic evaluation entails choosing and using evaluation data collection tools, applying data analysis models, and visualizing academic data. Additionally, teachers should focus on cultivating students' digital literacy, use digital technology resources for moral and mental health education, and achieve more effective collaborative education.

Digital social responsibility, the essential moral quality for teachers in the digital society and a prerequisite for digital education's sustainable development, includes the rule of law moral code and digital security protection. The rule of law moral code requires teachers to abide by Internet regulations, use digital products and services rationally, and maintain a healthy network environment. Digital security protection demands that teachers have a sense of digital security, manage personal and work data, and take network security precautions.

Professional development, which enables teachers to achieve individual and collective growth with digital technology and resources, consists of digital learning and research and digital teaching research and innovation. Digital learning and research require teachers to use digital technology resources for continuous learning, analyze and improve teaching practice, and participate in online training. Digital teaching research and innovation demands that teachers actively conduct digital teaching research and explore innovative teaching and learning modes.

## **2.2. Teacher digital literacy in business English curriculum**

As education informatization in China progresses, digital teaching resources have gained increasing prominence in business English teaching. The proactive utilization of digital technology and high-tech means in English teaching serves to enhance teaching efficiency and outcomes and kindle students' enthusiasm for business English. Business English education targets the cultivation of students' English communication capabilities in a business context, with quality being a manifestation of their comprehensive attributes, covering knowledge, skills, attitudes, and values.

Quality exerts a significant influence on students' language and communication competencies. Business English education emphasizes the development of students' listening, speaking, reading, writing, and other language skills, and quality augments their language application proficiency and intuition, enabling them to express viewpoints and ideas more precisely, fluently, and assuredly and engage in effective business exchanges. Quality also holds sway over students' intercultural awareness and communication abilities. Given that business English involves interactions with international partners, students need cross-cultural awareness and an understanding of diverse business norms and etiquettes. Quality literacy nurtures an open mindset, inclusiveness, and cultural sensitivity, facilitating adaptation to cross-cultural settings and the establishment of sound business relationships. Moreover, quality literacy positively impacts students' professional ethics and acumen. Business English education not only hones language skills but also focuses on instilling business and professional ethics. Quality fortifies students' professional consciousness, responsibility, and self-management, endowing them with ethical conduct, teamwork, and problem-solving capabilities to meet business demands. Importantly, quality is crucial for students' lifelong learning and self-advancement. Business English education transcends language acquisition and aims to foster learning and self-development capabilities. Quality literacy stimulates learning impetus and interest, cultivates learning strategies and independent learning aptitude, allowing students to continuously update their knowledge and skills in response to business environment fluctuations.

Nabhan et al probed into the concept of digital literacy for pre-service teachers in the context of English academic writing, with the intention of ascertaining the competencies of pre-service teachers in the principal dimensions of digital literacy, such as critical thinking, online safety skills, digital culture, collaboration and creativity, information discovery, communication, and functional skills<sup>[2]</sup>. Banatul Murtafi, ah et al<sup>[3]</sup>, upon referring to a multitude of theories related to digital literacy and text types in the curriculum recently employed in Indonesia, proposed two high school English teaching models to foster digital literacy teaching. These models encompassed teaching methods for digital literacy, grade levels, text types, goals and steps for learning activities, and assessment methods for gauging student learning. Danica Radovanovic et al<sup>[4]</sup> delved into the digital divide between students and teachers in higher education, applying Weber's stratification theory to an empirical case study of the digital divide in Serbian higher education, elucidating how stratified forms can intervene when endeavoring to integrate new technologies and technology-oriented practices into the classroom. J. Voogt et al<sup>[5]</sup> described, analyzed, and reflected on the international framework for 21st-century competencies, focusing on digital literacy as a core one. The results showed that the 21st-century competency teaching strategy is often not optimally carried out in practice. Reasons

include not integrating 21st-century competencies into curricula and assessments, teachers' lack of preparedness, and the absence of systematic attention to strategies for large-scale adoption of innovative teaching.

LAN Guoshuai et al. (23) studied the digital literacy of European educators. Their work offers novel ideas for Chinese teachers' digital literacy improvement. The construction of a digital literacy framework for Chinese educators can draw on the EU's DigCompEdu framework, which emphasizes teachers' digital education ability as the core for enhancing digital literacy and advancing its development level. Wu Junqi et al. (83) traced the evolution of teachers' digital abilities at home and abroad and constructed a framework with 11 basic points across three dimensions: basic digital ability, digital learning ability, and digital teaching ability.

Qiu Xiaochun et al. (110) systematically sorted out the research and development stages of teachers' digital competencies via database retrieval and text analysis, categorizing the framework into conceptual and content types, providing a valuable reference for related research and practice in China. Zheng Xudong et al. (121) built a teacher digital competence development model after analyzing the EU framework, aiming to promote Chinese teachers' digital competence research and practice. Shi Huan et al. (95) analyzed the history of technology in teaching, reformed traditional technology teaching, explored teaching technology functions, and improved the path for teachers' teaching technology literacy. Tong Manman (21) identified existing problems in primary school teachers' digital literacy, analyzed the causes, and proposed strategies such as establishing specific digital literacy standards, creating a good digital teaching environment, accelerating digital technology and discipline integration, providing diverse training, updating professional cognition, and enhancing digital literacy awareness.

In summary, domestic research on digital literacy in education has made significant progress. It has explored various aspects from framework construction to practical improvement strategies, providing a solid foundation for further research and the enhancement of teachers' digital literacy. Different studies have contributed unique perspectives and methods, which together are gradually shaping a comprehensive understanding and approach to improving digital literacy in the educational context in China.

### 3. Current Situation of Digital Literacy of Business English Teachers

#### 3.1. Research subject

The questionnaire is based on the framework of teacher digital literacy and the background of business English teachers in Guangzhou Institute of Technology. Based on the questionnaire data, this paper makes an in-depth study of different gender, age, teaching age and educational background, and studies the influence of the four factors of gender, age, teaching age and educational background of business English teachers in Guangzhou Institute of Technology on their digital literacy. On this basis, according to the results of the current survey on digital literacy of business English teachers, targeted suggestions are put forward to improve their digital literacy level. The basic demographic information involved in the questionnaire included gender, age, teaching age and educational background. Sample characteristics are analyzed as follows:

Gender characteristics: A total of 138 business English teachers were collected in this study, of whom 34 were male, accounting for 24.82%; There were 103 women, accounting for 75.18%.

Age characteristics: 94 people were 20-30 years old (including 30 years old), accounting for 68.61%; There were 26 people between 30 and 40 years old (including 40), accounting for 18.98%; There were 10 people aged 40-50 (including 50 years old), accounting for 7.3%; There were 7 people between 50 and 60 years old (including 60 years old), accounting for 5.11%.

Teaching age characteristics: there were 96 students under 5 years (including 5 years), accounting for 70.07%; There were 25 people from 5 to 15 years (including 15 years), accounting for 18.28%; There were 16 people from 15 to 25 years (including 25 years), accounting for 11.68%.

Educational characteristics: There are 32 people with master's degree or above, accounting for 23.36%; There are 99 undergraduate students, accounting for 72.26%; College has 6 people, accounting for 4.38%.

In general, the participating sample of this study includes a wide range of business English teachers, which is conducive to the control group data analysis.

**Table 1.** Characteristics of the Sample Population

| Sample population characteristics |                        |       |        |
|-----------------------------------|------------------------|-------|--------|
| Variable                          | Options                | Count | PCT    |
| Sex                               | Male                   | 25    | 25%    |
|                                   | Female                 | 75    | 75%    |
| Age                               | 20-30years old         | 93    | 68.40% |
|                                   | 30-40years old         | 26    | 19.10% |
|                                   | 40-50years old         | 10    | 7.40%  |
|                                   | 50-60years old         | 7     | 5.10%  |
| Teaching age                      | Less than 5 years      | 95    | 69.90% |
|                                   | Five to 15 years       | 25    | 18.40% |
|                                   | 15 to 25 years         | 16    | 11.80% |
| Educational background            | Junior college         | 6     | 4.40%  |
|                                   | Master degree or above | 98    | 72.10% |
|                                   | Undergraduate course   | 32    | 23.50% |

### 3.2. Questionnaire item design

A scientifically designed questionnaire is essential for ensuring the objectivity and reliability of survey outcomes. Initially, drawing on the questionnaires of the International Survey on the Current Situation of Digital Literacy of Pre-service Chinese Education Teachers and the Beijing Digital Education Research on Teacher Digital Literacy Standards, the questionnaire of Digital Literacy of Business English Teachers was formulated and compiled. The "Teacher Digital Literacy" education industry standard, which was officially released on November 30, 2022, comprises five digital literacy modules: digital awareness, digital technology knowledge and skills, digital application, digital social responsibility, and professional development.

The questionnaire consists of two main parts. The first part pertains to a survey of the basic circumstances of business English teachers in Guangzhou Institute of Technology. In China, research on the digital literacy of business English teachers in undergraduate institutions is relatively scarce. Gender might exert an influence on digital literacy studies. For instance, men and women may exhibit differences in specific digital skills, potentially due to disparities in preferences and experiences regarding digital technology utilization and exposure. Research can thus explore gender variances in the usage of digital educational tools, online collaboration, and digital communication. Age can also have an impact on digital literacy. Younger teachers might be more adept at and at ease with emerging digital technologies, whereas older teachers may require additional time and effort to acquire and master such skills. Teaching experience is another factor. Seasoned teachers may possess a more profound comprehension and

application of technology in teaching and education, while novice teachers might need more training and support to enhance their digital literacy. Educational background, including diverse fields such as education, information technology, business, and other professional education and training, can likewise affect digital literacy studies. Teachers with relevant educational backgrounds may hold an edge in the application and pedagogical methods of digital technologies. By considering different ages, genders, education levels, and educational backgrounds, a more comprehensive understanding of teachers' perception and application of digital literacy at various levels can be achieved, and multiple influencing factors can be integrated to obtain more accurate and exhaustive research results.

The second part focuses on a survey of the current status of digital literacy of business English teachers. Questions are structured in accordance with the sequence of "digital consciousness", "digital technology knowledge and skills", "digital application", "digital social responsibility", and "professional development". Each question is accompanied by five response options: "Highly inconsistent", "Relatively inconsistent", "Consistent", "Relatively consistent", and "Highly consistent". The questionnaire encompasses the gender, age, teaching experience, and educational background of business English teachers, totaling 27 questions, with the aim of conducting an in-depth analysis based on the investigation. Subsequently, an analysis of the current situation of digital literacy of business English teachers in Guangzhou Institute of Technology will be carried out.

### **3.3. Research process**

To carry out the research on digital literacy of business English teachers, it is necessary to adopt a scientific and accurate questionnaire on digital literacy of some domestic and foreign scholars on the basis of the previous research, and combine the characteristics of science with the feedback of experts to compile a questionnaire on the current Situation of Digital Literacy of Business English teachers. To ensure the randomness of the questionnaire sample. A total of 170 questionnaires were issued in this survey, among which 170 were recovered with a recovery rate of 100%. After the invalid questionnaires were eliminated, 137 valid questionnaires were left. spss statistical software was used to verify the questionnaires and analyze the reliability and validity, and the questionnaires were compiled into a formal questionnaire.

## **4. Findings and Discussion**

### **4.1. Results and findings**

#### **4.1.1. Reliability and validity**

KMO value test and Bartley sphericity test are performed in SPSS, which can provide information about the reliability and validity of the questionnaire to help data analysis and interpretation. Where,  $KMO=0.933$ , which exceeds the common acceptable threshold of 0.6 or 0.7, and a high KMO value indicates that there is a strong correlation between the variables in the sample and a common variance suitable for factor analysis, meeting the requirement of significance level. Therefore, the survey scale can carry out major and sufficient analysis with good validity. The significance of the sphericity test can support the decomposability of the data, because if the data meets the spherical hypothesis, it means that the correlation between the variables is the same in different directions, and there is no obvious direction. In this case, the data can be more easily interpreted as differences due to overall changes, rather than differences due to changes in a particular direction.

**Table 2.** KMO and Bartlett's Test

| KMO and Bartlett's Test                          |                    |          |
|--------------------------------------------------|--------------------|----------|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. |                    | .933     |
| Bartlett's Test of Sphericity                    | Approx. Chi-Square | 3067.444 |
|                                                  | df                 | 465      |
|                                                  | Sig.               | .000     |

In summary, KMO test and sphericity test provide a method to evaluate the suitability of data for questionnaire survey. They can help researchers determine whether factor analysis or structural equation models can be used to analyze questionnaire data and provide information about the reliability and validity of the questionnaire. Through these statistical methods, the results of questionnaire survey can be better understood and interpreted.

In SPSS, Cronbach's Alpha is a commonly used internal consistency measure used to assess the level of reliability of a questionnaire or measurement tool. It measures the consistency of each indicator within the measurement tool by calculating the correlation between the indicators. Cronbach's Alpha ranges from 0 to 1, where 1 indicates complete internal consistency and 0 indicates complete inconsistency. Generally, the higher the Cronbach's Alpha value, the higher the reliability of the measurement tool, that is, the better the stability and consistency of the measurement results. Kappa>0.75 indicates that the measurement questionnaire has high reliability. The reliability coefficient obtained in SPSS is shown in the table. The Kappa value of the total items of the questionnaire is 0.963, which is much higher than the generally accepted threshold of 0.75, indicating that the overall questionnaire has good internal consistency.

**Table 3.** Reliability Statistics

| Reliability Statistics |            |
|------------------------|------------|
| Cronbach's Alpha       | N of Items |
| .963                   | 31         |

Therefore, a high Cronbach's Alpha value contributes to the credibility and reliability of the survey results. When designing and conducting surveys, efforts should be made to ensure that measurement tools have a high level of internal consistency to improve the quality and interpretability of survey results.

#### 4.1.2. Current situation of digital consciousness

Digital awareness of business English teachers refers to business English teachers' recognition and understanding of the value of digital application, which has a guiding effect on learning and life, and can make use of digital information to develop a positive attitude, awareness and habit to face difficulties encountered in digital application.

For a descriptive analysis of the specific questions, the first option "very inconsistent" and the second option "relatively inconsistent" indicate that the sample is of low literacy level, the third option "general" indicates that the sample is of average level, and the fourth option "fairly consistent" and the fifth option "very consistent" indicate that the sample is of high literacy level.

**Table 4.** A descriptive statistical table of digital consciousness of business English teachers

| Item | Low quality level | General quality level | High quality level |
|------|-------------------|-----------------------|--------------------|
| Q1   | 9                 | 8                     | 121                |
|      | 6.52%             | 5.80%                 | 87.68%             |
| Q2   | 19                | 30                    | 89                 |
|      | 13.77%            | 21.74%                | 78.71%             |
| Q3   | 13                | 15                    | 110                |
|      | 9.24%             | 10.87%                | 79.71%             |
| Q4   | 13                | 27                    | 98                 |
|      | 9.24%             | 19.57%                | 71.01%             |
| Q5   | 14                | 28                    | 96                 |
|      | 10.14%            | 20.29%                | 69.57%             |

Regarding digital consciousness, the proportions of business English teachers at the high quality level are 87.68%, 78.71%, 79.71%, 71.01%, and 69.57% respectively. Among them, the highest proportion of highly literate individuals is in Q1 "When there is a new digital media, I am willing to learn more about it" and Q5 (same content). Overall, digital awareness has reached a relatively good level. Especially in terms of business English teachers' willingness to learn about digital media, they recognize the value brought by digital media, yet there is also a psychological concern about the difficulties.

Digital media plays a significant role in business English teaching. Concerning actively following the development of the digital economy and digital education, 32.61% of teachers consider it highly consistent, 31.88% relatively consistent, and 21.74% very consistent. This indicates that 80% of them believe digital media will have an essential and irreplaceable impact on the teaching profession. In terms of integrating digital technology into teaching and innovating teaching methods, 33.33% of teachers think it is highly consistent, 37.68% relatively consistent, and 19.57% consistent. The integration of digital technology and teaching is a crucial trend in current education. By using digital technology tools and resources, teaching methods can be innovated, and learning effects and teaching quality can be enhanced. Innovative teaching methods that combine digital technology with teaching can offer a more flexible, personalized, and effective learning experience, stimulating students' learning motivation and creativity. However, teachers need to adapt to new teaching roles and skills when applying digital technologies and focus on the rational application and effective assessment of educational technology.

Furthermore, business teachers in Guangzhou Institute of Technology exhibit varying levels of literacy when dealing with difficulties in digital teaching. 69.57% of business English teachers have a high level of literacy in facing the difficulties and challenges in digital practice, 20.29% a general level. 3.62% of teachers reported being unable to solve problems when encountering difficulties with digital applications.

In general, digital awareness has generally improved, but differences and challenges remain. To better adapt to the digital society, both individuals and society need to continuously enhance their awareness, understanding, and application of digital technologies and strengthen relevant education and training support.

#### 4.2. Mastery of digital technology and knowledge skills

Digital technology and knowledge literacy of business English teachers refers to the ability of teachers to retrieve, screen, identify and understand digital information, and to deal with practical problems in a targeted way.

**Table 5.** Business English teachers digital technology and knowledge skills description statistical table

| Item | Low quality level | General quality level | High quality level |
|------|-------------------|-----------------------|--------------------|
| Q6   | 11                | 26                    | 101                |
|      | 7.25%             | 18.84%                | 73.21%             |
| Q7   | 9                 | 12                    | 116                |
|      | 7.24%             | 8.70%                 | 84.06%             |
| Q8   | 34                | 36                    | 68                 |
|      | 23.92%            | 26.06%                | 49.28%             |
| Q9   | 14                | 29                    | 95                 |
|      | 10.15%            | 21.01%                | 68.84%             |
| Q10  | 16                | 26                    | 93                 |
|      | 11.60%            | 18.84%                | 69.56%             |

In terms of digital technology and knowledge and skills, the quality level of business English teachers tends to be higher. Question 6: "I can effectively use search tools to obtain information and know several major search engines. They can download online teaching resources" and "I can master the basic operation knowledge of PPT, Word, Excel and other office software" accounted for 73.21% and 84.06% respectively, indicating that business English teachers have great room for development in the application of digital technology in mastering basic information processing software. It also means that teachers can use digital technologies and tools to support and enhance the teaching process. Teachers with basic digital tool capabilities can be combined with digital technologies necessary for effective teaching in the 21st century to create richer, personalized and interactive learning environments that improve teaching and learning outcomes for students. This combination can better meet the learning needs of modern students and cultivate their digital literacy and lifelong learning ability.

Most teachers think they can master the basic operating knowledge of picture, audio and video information processing software such as PPT, Word, Excel, PhotoShop, Flash, Frontpage, etc., but there are 18.84% who cannot master the operating knowledge of picture, audio and video processing software. The survey shows that teachers are still at the stage of basic search and use of basic office software in the process of knowledge retrieval, and their processing skills of three-dimensional space such as sound and image need to be strengthened.

In-depth research on different levels of digital literacy can significantly affect the teaching effectiveness of business English teachers. Teachers with high levels of digital literacy are better able to develop and utilize teaching resources, innovate teaching methods, personalize teaching content and methods, provide timely learning assessment and feedback, and support learning across time and space. These factors help to improve students' learning motivation, participation and learning effect, thus improving the quality and effectiveness of business English teaching.

Through the analysis of the above questionnaire results, it is concluded that business English teachers perform well in knowledge retrieval, selection and integrated understanding. Teachers are often willing and able to obtain the information they need on their own and are able to use electronic materials in the classroom. However, in current business English teaching, teachers' ability to acquire multimedia data remains at the most basic stage of query and use of basic office software, and their ability to process multidimensional data such as voice and image needs to be strengthened, and they lack the ability to acquire multimedia digital data. Meanwhile, different languages lead to difficulties in retrieval, which leads to doubts about the professionalism of information retrieval results.

#### 4.2.1. Results of digital application in teaching

The digital application of business English teachers refers to the way that teachers use digital technologies and tools in the teaching process to improve the teaching effect and students' learning experience.

**Table 6.** Business English teachers digital application description

| Item | Low quality level | General quality level | High quality level |
|------|-------------------|-----------------------|--------------------|
| Q11  | 15                | 22                    | 101                |
|      | 10.87%            | 15.94%                | 73.19%             |
| Q12  | 14                | 31                    | 93                 |
|      | 10.14%            | 22.46%                | 67.40%             |
| Q13  | 14                | 19                    | 105                |
|      | 10.14%            | 13.77%                | 79.06%             |
| Q14  | 10                | 36                    | 87                 |
|      | 7.25%             | 26.09%                | 66.67%             |
| Q15  | 17                | 34                    | 87                 |
|      | 12.32%            | 24.64%                | 63.04%             |
| Q16  | 18                | 28                    | 92                 |
|      | 13.05%            | 20.29%                | 66.66%             |

In terms of digital application, the high quality level of business English teachers is above the medium level. The 11th question is "able to collect digital educational resources through multiple channels and select, manage and produce digital educational resources according to teaching needs" and the 13th question is "able to use digital technology resources to support the organization and management of teaching activities." Orderly organization of teaching activities to enhance students' participation and communication initiative accounted for 73.19% and 79.06% respectively. Business English teachers can use digital tools and platforms to create and share rich teaching resources; Business English courses and learning materials are provided to students through an online learning platform. It proves that business English teachers are proficient in the use of digital, which brings great convenience to teaching.

In the use of digital technology resources to optimize the teaching process, digital tools can be used to collect students' feedback in real time, improve teaching behavior, optimize teaching links, and regulate the teaching process, accounting for 26.06%, which needs to be improved. Teachers can flexibly use digital media to improve and enrich their teaching resources, but they are not enough to collect students' performance and feedback. 4.35% of teachers were unable to use digital media to provide individualized guidance to students and use digital technology resources to find students' learning differences.

Through the above questionnaire analysis, it can be concluded that business English teachers perform well in designing and integrating digital resources into teaching activities. Teachers can also collect, select and design their own teaching resources through multiple channels to help students better understand the concept and application of business English. However, the use of digital technology resources to carry out personalized guidance for students' learning differences needs to be improved.

#### 4.2.2. Cognition and embodiment of the sense of responsibility for the digital society

The connotation of business English teachers' sense of responsibility for the digital society is that teachers should abide by and understand the laws and norms related to the use of

information. In the process of digital information exchange, they should pay attention to protecting their own data and give sufficient respect to others' digital information and personal privacy.

**Table 7.** Business English teachers digital social responsibility description statistical table

| Item | Low quality level | General quality level | High quality level |
|------|-------------------|-----------------------|--------------------|
| Q17  | 11                | 7                     | 120                |
|      | 7.97%             | 5.07%                 | 86.96%             |
| Q18  | 9                 | 10                    | 119                |
|      | 6.52%             | 7.25%                 | 86.23%             |
| Q19  | 9                 | 15                    | 114                |
|      | 6.52%             | 10.87%                | 82.61%             |
| Q20  | 11                | 11                    | 116                |
|      | 7.97%             | 7.97%                 | 84.06%             |
| Q21  | 10                | 12                    | 116                |
|      | 7.25%             | 8.70%                 | 84.06%             |
| Q22  | 10                | 15                    | 113                |
|      | 7.24%             | 10.87%                | 81.89%             |

From the above table, in terms of digital social responsibility, business English teachers reach an "excellent" level and predominantly exhibit high literacy, with proportions of 86.96%, 86.23%, 82.61%, 84.06%, and 81.89% respectively. Among them, in Q17 "Be able to regulate the Internet according to law, abide by Internet laws and regulations, and consciously regulate various online behaviors", the proportion of highly literate individuals is the highest. However, in Q22 "To be able to collect, store, use and disseminate the data of students, parents and others at work, pay attention to data security maintenance", the performance is relatively weak. This indicates that business English teachers possess a strong sense of responsibility in digital usage and a high level of personal information protection awareness. Nevertheless, in practical application, data security maintenance is insufficient.

The social responsibility of business English teachers encompasses digital privacy protection, security and network literacy, rational use of digital resources, addressing digital inequality and promoting inclusion, and adhering to digital ethics. They can cultivate students' digital social responsibility, guiding them to become rational, safe, and ethical digital citizens and contribute to the digital society's development.

Based on the survey data, teachers' digital social responsibility literacy is at an "excellent" level, demonstrating sound moral concepts. However, in daily work and study, occasional "digital infringement" may occur. Thus, higher education institutions should enhance publicity efforts to ensure that pre-service teachers of international Chinese education have a clearer understanding of unethical digital behaviors. Business English teachers have strong confidence in digital security and recognize the significance of information protection, yet they share common concerns about network information privacy. Therefore, colleges and universities can incorporate detailed explanations of information security protection operations in course content, such as listing common information and data leakage handling methods. Strengthening the education and training of business English teachers regarding digital social responsibility is crucial. It helps to heighten their awareness and understanding, enhance professional competence, drive sustainable development, and foster students' digital social responsibility.

Through these endeavors, teachers can more effectively fulfill their digital social responsibilities and contribute to students' growth and social progress.

#### 4.2.3. The role and implementation of digital literacy in professional development

Digital literacy in the professional development of business English teachers refers to the ability of teachers to use digital information technology to make digital products and use digital means to guide learning and resource interaction.

**Table 8.** Business English teacher professional development description statistical table

| Item | Low quality level | General quality level | High quality level |
|------|-------------------|-----------------------|--------------------|
| Q23  | 10                | 2                     | 105                |
|      | 7.24%             | 16.67%                | 76.09%             |
| Q24  | 13                | 21                    | 104                |
|      | 9.35%             | 15.22%                | 75.37%             |
| Q25  | 10                | 23                    | 105                |
|      | 7.25%             | 16.67%                | 76.08%             |
| Q26  | 13                | 20                    | 105                |
|      | 9.42%             | 14.49%                | 76.08%             |
| Q27  | 21                | 29                    | 88                 |
|      | 15.21%            | 21.01%                | 63.77%             |

In terms of digital literacy in teacher professional development, generally speaking, the samples are above the average level, and the high quality level tends to be higher. The highest is the 23rd question, "Can use digital technology resources to carry out learning according to personal development needs." For example: The use of digital education resources to learn subject knowledge, pedagogical knowledge, technical knowledge, and education and teaching management knowledge accounted for 76.09%, followed by the 25th question "can solve the problem of digital teaching, The use of digital technology resources to support teaching and research activities" and the 26th "can use digital technology resources to continuously innovate teaching mode, improve teaching activities, and change students' learning mode" accounted for 76.08%. Digital literacy can help teachers make better use of technological tools and resources to design and carry out innovative teaching activities. Teachers can use digital tools to make teaching materials, design interactive classrooms, and carry out online learning to enrich teaching methods and improve students' learning effect and interest.

In terms of "being able to use digital technology resources to continuously innovate teaching models, improve teaching activities, and transform students' learning methods", 5.07% of the teachers think that it is very inconsistent, and the continuous innovation ability of business English teachers needs to be improved. 15.21% of the teachers were at a low quality level in terms of "regular participation in online professional courses and relevant training for online teachers' professional ability development", and teachers lacked motivation in promoting personal development and ability.

Based on the above survey data, digital literacy in teachers' professional development has reached a "good" level. Teachers can use digital media technology to learn according to their own development needs, enrich their knowledge reserves, improve their teaching methods, and constantly reflect on progress. Most teachers often take online training courses to learn from each other. Through effective implementation methods, it can help teachers improve teaching innovation ability, personalized teaching level and professional development level, and then improve the learning effect and quality development of students.

Teacher quality plays a vital role in the development of education field, which covers teachers' knowledge, ability, attitude and values. Teachers' quality and accomplishment have direct influence on teaching quality. Teachers with high quality can master scientific teaching theories and methods, flexibly use diversified teaching strategies, teach students according to their aptitude, and stimulate their learning interest and potential.

## **5. Strategies for Improving Digital Literacy of Business English Teachers**

In light of the issues identified in the research, this paper formulates and presents corresponding strategies to enhance teachers' digital literacy. The elevation of teachers' digital literacy is conducive to their better adaptation and response to the requisites of digital teaching, the enrichment and diversification of teaching resources and methods, the augmentation of teaching efficiency, and the facilitation of teachers' professional development.

### **5.1. Multi-level and Diversified Training Course Design**

**Customized Training Programs:** Training regimens are crafted in accordance with teachers' specific requirements and proficiency levels. These can be stratified into beginner, intermediate, and advanced tiers to cater to the diverse digital literacy levels of teachers.

**Interactive Hands-on Training:** Hands-on segments, workshops, and simulations are incorporated into training activities to afford teachers practical experience with digital tools and platforms.

**Continuing Professional Development:** The impetus for continuous learning is provided via webinars, online courses, and professional learning communities, ensuring that teachers remain abreast of the latest digital trends and tools.

### **5.2. Establishment of a Perfect Technical Support and Service System**

**Accessible Tech Support:** Assurance is given that teachers can readily access technical support for resolving digital tool-related glitches and seeking assistance.

**Professional Development Opportunities:** Regular training and workshops are furnished to assist teachers in refining their technical skills and seamlessly integrating technology into their teaching.

**Collaboration with IT:** The collaboration between teaching personnel and IT departments is promoted to guarantee that teachers' digital requirements are met and that they are cognizant of available resources.

### **5.3. Academic Environment Conducive to Digital Literacy Enhancement**

**Academic Environment Resource Sharing Platform:** A platform is developed to enable teachers to exchange digital teaching resources, lesson plans, and exemplary practices, thereby fostering a collaborative learning milieu.

**Innovative Teaching Spaces:** Technology-imbued classrooms and learning spaces are created to stimulate interactive and collaborative learning.

**Encourage Experimentation:** Teachers are spurred to experiment with novel digital tools and teaching methodologies, and a supportive environment is provided for them to share their experiences and learn from one another.

Collectively, these strategies strive to fashion a conducive and dynamic environment for business English teachers to augment their digital literacy, empowering them to proficiently integrate technology into their teaching praxis and equip students for the digital era.

#### **5.4. Establishment of Evaluation and Incentive Mechanisms Compatible with Digital Literacy Enhancement**

**Diversified Evaluation System:** Multi-faceted evaluation modalities, encompassing teaching outcomes, student appraisals, peer reviews, etc., are instituted to comprehensively mirror teachers' performance in classroom teaching, academic research, and teaching management. Such an evaluation framework proffers a more holistic assessment of teacher quality and achievements.

**Encouragement and Evaluation of Academic Research:** The outcomes of academic research are integrated into the teacher evaluation mechanism, and teachers are incentivized to publish academic papers, partake in academic conferences, and compile textbooks as one of the benchmarks for gauging teacher quality.

**Teaching Effect Evaluation:** The teaching efficacy of teachers is appraised through student evaluations, academic achievements, and employment scenarios, rendering it a crucial index for assessing teacher quality and accomplishments.

**Improvement of Incentive Measures:** Tangible and intangible rewards, such as bonuses, honorific titles, and professional development opportunities, are bestowed upon teachers who exhibit outstanding performance in enhancing digital literacy, thereby kindling their enthusiasm and innovation.

#### **5.5. The Formation of a Self-Development Concept of Digital Literacy among Teachers**

In the digital age, teachers face the rapid technological advancements, the impact of multiculturalism, the demand for high-quality education, and the challenges of the digital environment. While digital knowledge and skills are significant, digital awareness is of even greater import. Hence, the cultivation of teachers' digital literacy awareness should be intensified to arouse their impetus for enhancing digital literacy. The subject consciousness of teachers' digital literacy can be enhanced through the following avenues:

**Concept Change:** Teachers ought to duly recognize that digitalization represents an ineluctable trend in contemporary education and teaching. They should take the initiative to adapt to digital progress, foster a correct digital learning stance, and embrace the concept and awareness of lifelong learning.

**Active Learning and Practice:** Teachers should actively engage in the learning and practice of digital technologies and tools and ceaselessly enhance their digital literacy through online courses, seminars, workshops, and other modalities.

**Build Learning Communities:** Teachers are encouraged to join or establish digital technology learning communities to swap experiences and skills with peers and progress in tandem. The efficacy and quality of digital education can be augmented via community support.

**Reflection and Self-Improvement:** Teachers should routinely reflect on their digital teaching practices, pinpoint areas for amelioration, and perpetually explore more efficacious digital teaching strategies and methods.

### **6. Conclusion**

In the digital era, with the rapid evolution of cloud computing, big data, and artificial intelligence, the essential digital literacy for teachers to proficiently conduct education and cultivate high-caliber, innovative talents has become a global concern. To promptly adapt to the digital age's opportunities and challenges, enhancing teachers' digital literacy is imperative. As cultivators of the new generation, teachers must embrace lifelong learning, boost their

professional qualities and capabilities, bridge the gap between the new era and students' growth, and help students adapt to the digital society.

This paper consolidates relevant research on business English teachers' digital literacy and spotlights issues from various aspects through a survey of Guangzhou Institute of Technology teachers. To address these, teachers need to establish proper digital technology values, enhance integration of digital technology in teaching, and institute a long-term guarantee mechanism. Simultaneously, multiple parties should collaborate to standardize training and evaluation, update digital literacy standards, build communication platforms for rural teachers, and conduct reasonable evaluations.

Future research on business English teachers' digital literacy should expand samples and scope. By delving deeper into their development status, understanding curriculum and training model changes, focusing on the inherent laws and influencing factors, a comprehensive theoretical system can be constructed. Moreover, a hierarchical digital literacy framework should be built to assist teachers in self-assessment and improvement, facilitating more targeted training.

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