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Construction and Application of Digital Teaching Resources for English in Rural Primary Schools in Western Guangdong

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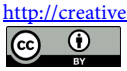

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Abstract

Digital teaching resources are meaningful for improving the quality of English teaching and students' core English literacy. Based on conducting a questionnaire survey among 54 English teachers in rural primary schools in western Guangdong and combining with interviews with 10 teachers, this research finds that digital teaching resources for English in rural primary schools in western Guangdong are particularly scarce and their functions are also lagging behind. It is difficult to meet the needs of teachers for digital teaching. The digital literacy of teachers is not high enough, and digital teaching resources have not been fully utilized. These schools also have problems such as insufficient training sessions for digital teaching skills of English teachers, low training quality, and insufficient professional training. This study investigated the construction and application of digital teaching resources in the western Guangdong region. The main factors influencing the development and application of digital teaching resources in rural primary school English education were analyzed. To a certain extent, this research also explores the effective solutions for rural primary school English education in underdeveloped areas represented by western Guangdong when facing the challenges of digital transformation.

Subject Areas

Sociology

Keywords

Rural Western Guangdong, Primary School English, Digital Teaching

1. Introduction

In this era of rapid development of information technology, educational infor-

matization has become a key driving force for promoting the modernization of education. In rural areas, the use of digital teaching resources is crucial for narrowing the educational gap between urban and rural areas and improving the quality of education [1]. Western Guangdong is an economically underdeveloped region, and it is particularly necessary to enhance the level of digital teaching here, particularly the level of English teaching. However, the construction and application of digital teaching resources can enhance the quality of English education and teaching in rural primary schools in western Guangdong. It can also stimulate students' interest in learning, increase their participation in the classroom, narrow the gap with English education in cities in the Pearl River Delta, promote more equitable education, and help rural areas achieve revitalization through digital means.

At present, the "National Medium and Long-Term Education Reform and Development Plan Outline" has been issued (2010-2020). This outline clearly states that investment in education should be increased and the construction of digital campuses should be promoted [2]. The Ministry of Education has also listed "implementing the digital education strategy" as a key task to be completed [3]. With the gradual implementation of a series of educational projects such as "Three Connections and Two Platforms", China's educational informatization is now transforming from the construction of the basic environment to the comprehensive utilization of resources, and at the same time, it is also shifting from the construction of campus informatization to the application of classroom informatization [4]. However, in rural areas and the western part of Guangdong Province, teachers' information literacy is generally at a relatively low level. Problems such as low application level of information technology and relatively weak awareness of information literacy exist [5]. These problems have restricted the quality and efficiency of digital English teaching and also affected students' learning outcomes.

Digital Resources

Digitalization is the use of digital technologies to change a business model and provide new revenue and value-producing opportunities [6]. It involves converting analog or manual processes into digital ones, enabling greater efficiency, accessibility, and scalability. It is the strategic adoption and application of digital technologies to improve processes, enhance value creation, and drive innovation across industries and societies.

When it comes to advantages of digitalization, initially, digitalization optimizes processes and reduces labor costs through automation technologies such as cloud computing and artificial intelligence. Industrial internet platforms in manufacturing reduce energy consumption and improve corporate decision-making efficiency. Secondly, digitalization breaks geographical barriers, integrating educational resources such as China's "National Smart Education Platform", which offers 27,000 courses and medical resources like telemedicine, thus promoting equity. Big data supports precise policymaking by governments, for example, through traffic flow

monitoring to optimize urban planning. Finally, digitalization fosters technological convergence, such as blockchain and metaverse, giving rise to emerging industries. In summary, digitalization, centered on efficiency, sharing, and innovation, promotes economic and social progress.

China's digital development is driven forward by policy guidance and technological innovation as dual driving forces. At the strategic level, the state has advanced the "Digital China" strategy and the State Council's 14th Five-Year Plan for Digital Economic Development [7] with a marketization direction, promoting deep integration of digital infrastructure with industries. Until 2025, China has deployed over 3.377 million 5G base stations, with data centers housing 8.1 million standard server racks. Industrial internet platforms connect more than 2.18 million devices in the manufacturing sector, while e-commerce transaction volume exceeds 15 trillion yuan [8]. Mobile payment adoption surpasses 90% penetration. Technologies like artificial intelligence and big data are widely applied in healthcare and education. For instance, AI-assisted diagnosis covers over 2000 diseases [9]. Liquid-cooled server clusters are advancing green computing capacity. However, challenges persist, including regional development disparities and data security risks. Policies continue to evolve, such as the implementation of the Data Security Law, requiring enterprises to establish a full lifecycle data governance system. Overall, China's digitalization has shifted from scale expansion to quality improvement, driving economic restructuring and social development through technological innovation and practical applications.

Moreover, Foreign digital development exhibits significant regional disparities. As the global leader in digital economy, the U.S. continues to expand its digital sector, contributing 60% of GDP [10]. Tech giants like Amazon (cloud computing) and Google (AI) drive innovations in autonomous driving and intelligent assistants. In addition, the EU prioritizes digital sovereignty, regulating markets through legislation like the Digital Markets Act. By 2025, the "Digital Decade" plan will invest €207 billion in 5G and semiconductors. However, infrastructure gaps still remain, requiring an additional €150 billion annually to meet targets [11]. Germany's Industry 4.0 initiative advances manufacturing digitization. While 5G covers 87% of densely populated areas and fixed broadband reaches 96%, low fiber-optic penetration hampers progress [12]. Japan and the EU collaborate via platforms like Ouranos and Catena-X to share battery supply chain data, safeguarding critical materials and promoting green technology [13]. South Korea focuses on 5G applications in smart factories, autonomous vehicles, and metaverse projects, aiming to grow 5G-focused firms from 94 to 1800 by 2026 [14]. Serbia expands 5G coverage and accelerates data center construction through policy support [15]. And in developing countries, India's e-commerce market grows at 30% annually, but rural internet penetration remains low at 40%, highlighting stark digital divides [16].

Digital teaching resources constitute a category of educational content that is conveyed through digital means-computers, mobile devices, or online platforms-

and is explicitly crafted to support teaching and learning activities [17]. Digital teaching resources can be classified into various types. From the perspective of information presentation, these resources include digital text, graphics, images, animations, sounds, digital audio, and digital video. When categorized by source, they can be divided into specially designed resources and reusable resources [18]. Specially designed resources refer to digital teaching materials that are specifically developed for educational purposes, such as various types of instructional software (including teaching applications in a broad sense). Reusable resources, on the other hand, are those that were not originally created for teaching but can be applied in education, especially the vast array of information resources available on the Internet, such as e-books, electronic journals, and encyclopedias [19].

Additionally, digital teaching resources have many advantages, and as the world becomes increasingly interconnected and technology-driven, the advantages of digital teaching resources have become more evident. Firstly, enhancing accessibility and flexibility is one of its primary advantages. Learners can access educational resources from anywhere and anytime around the world through the use of online platforms, regardless of their physical location. Moreover, digital teaching resources provide opportunities to learns to rewatch and reread video and text to better grasp the content. Secondly, digital teaching resources are more portable compared to some heavy textbooks and dictionaries. Digital teaching resources like e-books, cloud-based platforms, and apps reduce our physical constraints. Thirdly, digital teaching resources include various formats such as videos, audio clips, animations, and interactive simulations, which make lessons more vivid and engaging. Virtual labs can be used in science classes to demonstrate experiments, while documentaries can be shown in history classes to bring historical events to life. And in English class, English songs, videos and various games are added to classes to create a more authentic context. This variety caters to different learning styles and increases students' motivation. Furthermore, digital teaching resources are updated instantly, ensuring that learners receive the most up-to-date knowledge. Finally, digital platforms allow teachers to upload and share various teaching materials and teaching methods so that teachers are able to learn from each other and make progress together.

China's digital education resources have developed rapidly, driven by policy support and technological innovation, under the "Digital China" strategy and the State Council's 14th Five-Year Plan for Digital Economic Development [20]. China has promoted education digitalization by establishing the National Smart Higher Education Platform, which offers 27,000 courses and attracts over 13 million international registered users. The MOOC Western Action Plan provides nearly 170,000 courses to 725 universities, narrowing regional resource gaps [21]. In basic education, AI-assisted teaching, smart campuses, and personalized learning tools are being piloted in multiple regions. However, challenges like regional disparities, insufficient digital literacy among teachers, and data security risks remain.

In other countries, developed countries pioneered digital education resources, emphasizing standardization and international collaboration. Especially in United States, platforms like edX and Coursera drive global MOOC sharing, reaching 220 million learners [22]. The K-MOOC platform enhances accessibility to online education in South Korea. The Smart Nation 2030 Education Technology Master Plan builds an intelligent learning ecosystem in Singapore. And in United Kingdom, the Oak National Academy offers more than 400,000 free courses. In addition, the Digital School Project addresses educational equity in remote areas in Australia. And in Germany, the National Educational Platform (NDP) allocates 90% of its "Digital Education" budget to infrastructure upgrades and enforces the Educational Strategy for a Digital Knowledge Society to establish data privacy frameworks [23].

2. Research Method

2.1. Research Purpose

This research intends to investigate the current situation of the construction and application of digital teaching resources for English in rural primary schools in western Guangdong, explore more effective ways to utilize these resources to promote educational equity and improve teaching quality, and provide some support for the revitalization of rural education. This research hopes to offer practical strategies for the construction and application of digital teaching resources for English in rural primary schools in western Guangdong. This can enhance teachers' information literacy, improve teaching quality, and promote teaching reform and development in the era of Digital Education 2.0.

2.2. Research Questions

This research aims to understand the obstacles English teachers in rural primary schools in western Guangdong encounter when applying digital teaching resources and explore the specific application of digital teaching resources in English teaching in rural primary schools.

This research intends to investigate the training situation of English teachers in rural primary schools in western Guangdong in terms of digital teaching resources, and to deeply explore some problems existing in the process of digital training.

2.3. Participant

In this research, purposive sampling is used in questionnaire and interview for the reason that this research is designed for rural primary schools in western Guangdong. Therefore, this investigation and research took the rural areas in western Guangdong as the research object. By randomly selecting 64 primary school English teachers, they were asked to participate in a questionnaire survey on the current situation of digital teaching resources. Finally, a total of 54 valid questionnaires were collected, and in-depth interviews were also conducted with 10 of the teachers. It can be seen from the basic information of the teachers

that among these 54 teachers, 49 are female, which reflects a relatively large gender difference. There are 52 teachers under the age of 35. Teachers with teaching experience of 1 - 5 years and 6 - 10 years combined account for 97% of the total. Among these teachers, 50 have a bachelor's degree, which is the largest proportion. Only a very small proportion of teachers have associate degrees or master's degrees.

2.4. Research Methods

A questionnaire was used to understand some situations. The online questionnaire survey was distributed to 54 teachers. The questionnaire was designed in four aspects: the basic information of participants, the construction of digital teaching resources, the application of digital teaching resources and the digital training situation of English teachers. In every aspect, there were nearly 5 - 8 questions. What the research wanted to know was how digital teaching resources for English in rural primary schools in western Guangdong were constructed and how these digital teaching resources were applied in actual teaching. And what exactly is the situation of teachers' participation in digital training?

Additionally, an interview questionnaire was designed and conducted with 10 English teachers. The purpose was to comprehensively and systematically understand their true views on digital English teaching. Meanwhile, what obstacles and problems they faced in the application of digital resources and the training process are important questions that need to be found out. Through these interviews, the current actual situation of the construction of digital teaching resources can be explored in rural areas of western Guangdong.

3. Findings

3.1. Construction of Digital Teaching for Primary School English in Rural Western Guangdong

Digital teaching resources include types such as text, images, audio and video. They are widely used in classroom teaching, online learning and personalized learning scenarios. They have diverse teaching models that can meet the different needs of students. By taking advantage of their interactivity and diversity, they have improved learning efficiency and made teaching better. This research conducted a questionnaire survey on the allocation of digital teaching resources for English in rural primary schools in western Guangdong. The results obtained are shown in Table 1.

As can be seen from the table, in the survey conducted among 54 English teachers in rural primary schools in western Guangdong, only 11.11% of the teachers indicated that their schools have network computer rooms, only 37.04% of the teachers indicated that their schools are equipped with multimedia classrooms, and 50% of the teachers felt that the speed of hardware maintenance in their schools was particularly slow. 70.07% of the teachers think that the efficiency of the school's hardware update is not ideal. Only 12.96% of the teachers said that

their schools have online examination systems. This actually indicates that the hardware resources are relatively weak and unevenly distributed. Digital software resources are scarce, the content is monotonous, and the quality is not very high. The level of promotion and application of digital educational resources is also not very high. Rural teachers have a rather vague understanding of the specific concept of digital literacy.

Table 1. Allocation of existing digital hardware resources.

Options	Numbers	Percentage
Video presenter	12	22.22%
Multimedia classroom	20	37.04%
Personal computer	42	77.78%
Network computer room	6	11.11%
Digital camcorder	7	12.96%
Television	4	7.41%
Recording equipment	5	9.26%
Slide projector	9	16.67%
Electronic reading room	5	9.26%
Language lab	1	1.85%

Teachers' satisfaction with digital teaching resources actually reflects their inner expectations, personal needs and evaluations of these resources when they actually use them. High-quality digital teaching resources have many characteristics, such as usability, sustainability, diversity and interactivity, which can meet the needs of personalized teaching and learning. By means of resource sharing between teachers and students, the teaching effect can be significantly improved. This paper adopts the method of combining interviews and questionnaires to investigate the satisfaction of English teachers in rural primary schools in western Guangdong with digital teaching resources. The results obtained from the questionnaire survey are shown in Table 2.

Table 2. Satisfaction with the construction of teaching digital resources.

Options	Very Satisfied	Satisfied	Average	Dissatisfied	Very Dissatisfied
Numbers	6	6	4	5	33
Percentage	11.11%	11.11%	7.41%	9.26%	61.11%

It can be seen from the table that 61.11% of the teachers are very dissatisfied with the digital teaching resource construction work carried out by the school. This indicates that the level of digital teaching resource construction for the subject of primary school English in rural areas of western Guangdong is relatively low and urgently needs to be improved. When interviewing 10 teachers, four teachers

felt that their school lacked advanced digital teaching equipment. Currently, the functions of the existing teaching facilities in the school have become outdated. Teachers all think that the digital teaching equipment provided by schools is just some impractical decorations. The funds invested by schools in digital teaching resources are insufficient, and the importance attached to the construction of digital teaching resources is also not high.

3.2. Application Status of Digital English Teaching in Rural Primary Schools in Western Guangdong

First of all, the frequency with which teachers use digital English teaching resources in their daily teaching can reflect to a certain extent the application of the digital teaching model in this region. From Table 3, it is obvious that 24.07% of English teachers often use digital teaching resources, and 64.81% of teachers only use these resources in the classroom. And 11.1% of the teachers do not use English digital teaching resources at all. This indicates that, on the whole, English teachers in rural primary schools in western Guangdong have a relatively low frequency of using digital teaching resources. Most of them only limit their use to the classroom, which leads to a low application level of digital English teaching resources and makes it impossible to maximize the potential of these resources.

What follows is that motivation is actually a key factor influencing whether teachers will choose to use digital teaching resources. This research mainly starts from three aspects: teachers' own factors, policy support, and objective existing conditions, and comprehensively analyzes the incentive factors affecting the application of digital English teaching resources in rural primary schools in western Guangdong. Just as shown in Table 4, 57.41% of English teachers support the digital teaching mode, while 74.07% of teachers think that combining traditional teaching methods with the digital teaching mode would be better. However, the survey results show that 62.96% of teachers are not very familiar with the operation of digital teaching resources. Among the 10 English teachers interviewed, 7 of them believe that the preparatory work for digital teaching, such as the production of PPT, it takes time and increases the workload of the curriculum plan, thus causing their resistance to digital teaching. As can be seen from Table 5, 77.78% of English teachers in rural primary schools in western Guangdong think that their schools have not established a complete incentive mechanism for digital teaching models. Among the 54 teachers surveyed, 64.81% felt that the lack of digital teaching resources was a major challenge faced by digital teaching.

To sum up, although English teachers in rural primary schools in western Guangdong generally hold a positive attitude towards the digital teaching model, due to their relatively low level of digital teaching literacy, schools do not pay enough attention to the transformation of the digital English teaching model. At the same time, digital teaching resources are relatively scarce. This makes the impetus for promoting the application of digital English teaching resources insufficient.

Table 3. Usage of digital teaching resources by teachers.

Options	Frequently Use	Only Use During Class	Do Not Use
Numbers	13	35	6
Percentage	24.07%	64.81%	11.1%

Table 4. Teachers' views on traditional vs. digital classroom effectiveness.

Options	Support Traditional Classroom	Support Digital Classroom	Support Combined Classroom
Numbers	3	31	20
Percentage	5.56%	57.41%	74.07%

Table 5. Whether schools have established a sound incentive mechanism for digital teaching.

Options	Yes	No
Numbers	12	42
Percentage	22.22%	77.78%

3.3. Digital Training Situation of English Teachers in Rural Primary Schools in Western Guangdong

First of all, throughout the entire process of carrying out digital teaching, teachers' possession of high-level information skills can play a fundamental role. The basic information skills level of all teaching staff is crucial for determining whether digital training can achieve good results. If teachers' basic information skills level is relatively low and they are not proficient enough in basic technologies, then the difficulty of digital training needs to be adjusted accordingly, and the progress of the entire course also needs to be adjusted accordingly. Just as shown in **Table 6**, among the 54 rural primary school English teachers surveyed in western Guangdong, 87.04% of the teachers can do text editing work, 79.63% of the teachers can search and download materials online, 61.11% of the teachers can make presentations, and

Table 6. Information technology skills possessed by teachers.

Options	Number of People	Percentage
Text Editing	47	87.04%
Presentation Making	33	61.11%
Animation Making	17	31.48%
Webpage Creation	19	35.19%
Online Search & Download	43	79.63%
Video Production	23	42.59%
Audio Production	15	27.78%
Others	0	0%

42.59% of the teachers can make videos.

This indicates that primary school English teachers in rural areas of western Guangdong are still at the primary stage of mastering basic information skills.

In addition, the digital training related to this is particularly crucial for enhancing teachers' IT proficiency and classroom quality. The frequency with which schools provide digital training can also reflect the degree of emphasis on digital teaching. As we can see from Table 7, 66.67% of teachers have not received any training in each semester. 18.52% of the teachers receive 1 to 2 trainings per semester, and 14.81% of the teachers receive 3 or more trainings per semester. This data indicates that the overall frequency of digital training for English teachers in rural primary schools in western Guangdong is relatively low.

Table 7. Frequency of digital training for teachers.

Options	No Sessions Per Term	1 - 2 Sessions Per Term	More Than 3 Sessions
Number of People	36	10	8
Percentage	66.67%	18.52%	14.81%

Table 8. Teacher satisfaction with digital training.

Options	Very Satisfied	Satisfied	Average	Unsatisfied	Very Unsatisfied
Number of People	5	9	3	7	30
Percentage	9.26%	16.67%	5.56%	12.96%	55.56%

Finally, teachers' views on digital training will directly affect the effects it generates. Teachers' opinions on digital training can be comprehensively assessed by investigating their satisfaction with it, their emphasis on it, and the specific types of training they participate in. It can be seen from Table 8 that 55.56% of the teachers are very dissatisfied with digital training. From Table 9, 42.59% of the people think that digital training is not crucial at all. From Table 10, it can be found that 94.44% of the teachers have participated in school-based training, but only 18.52% of the teachers have participated in municipal-level training. Only 9.26% of the teachers participated in provincial-level training, and only 5.56% of the teachers participated in national-level training. Of the 10 teachers interviewed, 7 felt that the content of the school-based digital training was too basic and monotonous. Such training content is not conducive to the improvement of teaching, and the frequency of training is also insufficient. This indicates that the school's attention to this aspect is relatively low, and it is said that the overall understanding of digital training among teachers is not very optimistic. They are not satisfied with digital training and do not attach much importance to it either.

Table 9. Teachers' attitudes towards digital training.

Options	Very Important	Important	Average	Not Important	Very Unimportant
Number of People	7	6	6	12	23
Percentage	12.96%	11.11%	11.11%	22.22%	42.59%

Table 10. Types of digital training participated in by teachers.

Options	School-Based Training	City-Level Training	Provincial-Level Training	National-Level Training
Number of People	51	10	5	3
Percentage	94.44%	18.52%	9.26%	5.56%

3.4. Factors Influencing the Digital Literacy of English Teachers in Rural Primary Schools in Western Guangdong

In this research, teachers' age, teaching experience and digital hardware and software infrastructure are closely tied to teachers' digital literacy; the following analysis will therefore explore the relationship between these factors and teachers' digital literacy.

Firstly, the relationship between age and the digital literacy of teachers was argued below. In this research, 54 valid questionnaires were collected from teachers across different age groups: 6 teachers aged under 25, 46 aged 26 - 35, 1 aged 36 - 45, and 1 over 46. The data revealed a significant imbalance in age distribution, with underrepresented middle-aged and older participants. Three key factors were identified to contribute to this skew: Firstly, the online questionnaire favored younger demographics with higher internet engagement and prolonged digital presence. Secondly, technical barriers such as limited familiarity with mobile devices may have hindered participation from older teachers. Lastly, as the research team consists of novice teachers, common interests and similar communication patterns were shared with peers of the same or similar age groups. In the education profession, young teachers not only form the backbone of the workforce but also represent the primary contributors to educational research. Consequently, young teachers are more likely to identify with research topics and recognize the value of participating in surveys. This shared context fosters a greater willingness to engage, making young teachers more attentive to and more likely to complete questionnaire.

Given the uneven age distribution, the analysis focused exclusively on the two most populous groups (under 25 and 26 - 35) to enhance result reliability. The questionnaire assessed seven core information skills: text editing, presentation design, animation production, web development, online resource retrieval, video editing, and audio processing. Analysis indicated that 14.8% of teachers mastered two skills, 33.3% three skills, 22.2% four skills, 14.8% five skills, and 7.4% six skills. Notably, 85.1% of respondents demonstrated proficiency in three or more skills,

which established this threshold as a standard. Among the 8 teachers with skills less than three, 2 were under 25 and 6 were aged 26 - 35, translating to 33.3% and 13.0% respectively.

In conclusion, compared to teachers aged under 25, higher digital literacy was exhibited by teachers aged 26 - 35.

Secondly, investigations have revealed that there is a close and complex relationship between teaching experience and teachers' digital literacy.

Rich teaching experience lays a solid foundation for the improvement of teachers' digital literacy. The data from this survey sample shows that among the 38 teachers with 1 - 5 years of teaching experience, 50% can skillfully use computers. Among the 15 teachers with 6 - 10 years of experience, 80% can skillfully master computers. This indicates to some extent that, in general, the richer the teaching experience, the more proficient teachers are in computer technology and teaching resources, and their digital literacy improves accordingly. However, it should also be noted that teachers with rich teaching experience may be influenced by factors such as the solidification of teaching habits, leading to a lower willingness to improve their digital teaching literacy. For example, in this survey questionnaire, a teacher with over 20 years of teaching experience indicated that they rarely use digital teaching modes in their teaching activities. In contrast, younger teachers are more innovative and better able to adapt to the digital transformation of teaching.

Nevertheless, in the digital age, the improvement of teachers' digital literacy has a significant positive impact on the deepening of teaching experience. Teachers who master advanced digital teaching technologies can carry out a variety of teaching activities, such as online interactive teaching and using data analysis to assist in teaching evaluation, thereby accumulating new teaching experience. Moreover, digital literacy also enables teachers to more efficiently obtain cutting-edge educational concepts and methods, broaden their teaching horizons, and further enrich their teaching experience.

In summary, teachers' teaching experience and digital literacy are generally complementary and mutually reinforcing, jointly contributing to the continuous improvement of teaching quality.

Lastly, there is a significant interdependent relationship between digital hardware, software facilities, and teachers' digital literacy, and training serves as a bridge to connect these two aspects, which can be summarized as follows: to start with, according to the data in the above survey report, only 37.04% of the schools have multimedia classrooms, 11.11% have computer labs, and 50% of the teachers reported that hardware maintenance is lagging behind. The shortage of hardware and inefficient maintenance make it difficult for teachers, even those with basic skills, such as 87.04% who are proficient in text editing, to effectively integrate technology into their regular teaching practices. Only 24.07% of the teachers regularly use digital resources. The scarcity, homogeneity, and low quality of resources, for example, only 12.96% of the schools have online examination systems, force teachers to rely on traditional methods. As a result, 61.11% of the teachers are

"very dissatisfied" with the resource development, which further diminishes their motivation to explore digital teaching methods.

Then, 42.59% of teachers are proficient in video production, 35.19% know how to create web pages, and 61.11% of teachers avoid using available resources due to unfamiliarity with the operation or the time-consuming nature of lesson preparation (70% of teachers mentioned this in interviews), reflecting a vicious cycle of low competence and underutilized resources.

Last, 66.67% of teachers did not receive any training during the semester, and 94.44% participated only in school-based training. Such low-quality training is unable to enhance teachers' ability to cope with hardware deficiencies or software shortcomings, leading to the fact that 77.78% of schools are less inclined to engage in digital teaching when there are no incentive mechanisms in place. 55.56% of teachers are "very dissatisfied" with the training, while 42.59% consider the training to be "unimportant." These perceptions further reduce their willingness to participate in training, exacerbate the stagnation of skills, and ultimately make it difficult for hardware and software investments to translate into actual improvements in teaching outcomes.

In summary, the survey report reveals a closed-loop of "inadequate hardware → restricted usage → stagnant skills → ineffective training → waste of resources", and it is only by simultaneously enhancing the quality of resources, the effectiveness of training, and the pedagogical skills of teachers that this impasse can be broken.

4. Conclusions and Recommendations

This research, through conducting an investigation and research on the construction and application of digital English teaching resources in rural primary schools in western Guangdong, finally reaches the following main conclusions.

First of all, there are many problems in the construction of digital teaching resources. For instance, the digital teaching resources are insufficient, the degree of widespread use is relatively low, the functions are relatively backward, and the practicality is not sufficient. Most teachers are not very satisfied with the current situation of the construction of digital English teaching resources in rural primary schools in western Guangdong. The investment in digital English teaching resources is not sufficient either. Local primary schools should enhance the construction of infrastructure, which includes regularly updating and upgrading hardware and network equipment. This is done to ensure the stable operation of IT teaching equipment and a relatively high data transmission speed, and to introduce high-quality educational resources to poverty-stricken areas. This is a very crucial approach to narrowing the educational gap among different regions in China. It is highly necessary to increase financial input for the construction of digital English teaching resources in rural primary schools in western Guangdong, enrich multimedia facilities, library resources and course resource libraries, and at the same time strengthen the construction of network infrastructure. When using digital teaching resources

to carry out English teaching, it is necessary to take into account that the development of rural primary schools in western Guangdong is relatively lagging behind. And the situation where there are cultural differences, so as to adapt to students' English proficiency.

Then, in terms of the application of digital teaching resources, the preparatory work for digital teaching is particularly complex and time-consuming. This makes teachers' willingness to adopt digital teaching models relatively low. Moreover, the school authorities do not attach sufficient importance to the digital transformation of teaching models. The incentive mechanism that encourages everyone to adopt the digital teaching mode is also not perfect, which leads to insufficient motivation for the transformation into the digital teaching mode. In the face of such a situation, rural primary schools in western Guangdong must first promote the digital transformation of English teaching models, actively establish some clear evaluation standards and indicators, so as to encourage teachers to adopt digital teaching models and provide impetus for digital teaching. Schools should also reasonably arrange teachers' class schedules to ensure that teachers have sufficient time for lesson preparation. In this way, the quality of teaching plans and classroom teaching can be improved. Schools should also offer support in aspects such as curriculum planning and classroom teaching resources, so as to reduce the difficulty of digital teaching. In this way, teachers' willingness to use digital teaching models can be enhanced.

Moreover, in terms of digital training, the information technology skills of English teachers in rural primary schools in western Guangdong are relatively low. The schools do not conduct digital training frequently, and the quality of the training is not very good either. This is because the schools do not attach much importance to digital training, and teachers have little understanding of its criticality. More than half of the teachers think that digital training is not crucial. This has led to the fact that digital training has not played a good role, and teachers' ability to implement digital teaching is relatively weak. Generally speaking, the application degree of digital teaching by English teachers in rural primary schools in western Guangdong is not high, and the effect of using digital teaching resources is also not good. Rural primary schools in western Guangdong need to keep up with the new requirements put forward by the digital age for teachers and pay more attention to digital training. It is necessary to actively organize various forms of digital training and provide practical and professional guidance to teachers through many different channels so as to help teachers improve their information technology skills and enhance their ability to apply digital teaching resources.

Finally, teachers' digital literacy has a close relationship with their age, teaching experience, and digital hardware and software facilities in schools. By comparing educators under 25 years old with those aged 26 - 35, it was found that the latter group demonstrated relatively higher levels of digital competence. This suggests that, within the studied age range, digital literacy tends to increase with age. Therefore, younger teachers should actively learn from their more experienced colleagues,

engaging in knowledge exchange and resource sharing. Schools, in turn, can facilitate this process by organizing experience-sharing sessions and collaborative forums to promote overall improvement in digital capabilities. Moreover, teaching experience and digital literacy generally exhibit a mutually reinforcing relationship, jointly contributing to enhanced teaching quality. For teachers at different career stages, differentiated training strategies are recommended. Novice teachers should receive support in mastering fundamental digital skills and integrating them into instruction, while more experienced educators can benefit from advanced training in emerging technologies. For some senior teachers who may be resistant to change, efforts should focus on building confidence and interest in digital teaching, helping them overcome attachment to traditional methods. Encouraging peer collaboration can further strengthen collective digital development. Finally, inadequate or poorly maintained hardware, combined with insufficient and low-quality software resources, restricts teachers' ability to implement digital tools effectively. At the same time, limited digital skills, lack of training, or ineffective professional development lead to underutilization of existing resources, creating a vicious cycle among infrastructure, software, and teacher competence. Although training is seen as a key pathway to breaking this cycle, current programs often suffer from narrow coverage and low effectiveness, failing to translate digital investments into sustainable classroom practice. To overcome these challenges, a coordinated advancement in resource quality, training efficiency, and teacher capacity is essential.

5. Conclusions

The rapid development of Education Informatization 2.0 should move forward in tandem with the development of underdeveloped regions represented by western Guangdong. Through investigation, it can be found that for rural primary school English teaching in western Guangdong to achieve digital transformation, it is a long road and will encounter many challenges, such as insufficient digital resources and inadequate information skills training.

Although this survey has achieved certain results, it also has some limitations. Firstly, the scope of the investigation is confined to some rural primary schools in Western Guangdong. The limited number of samples and their narrow distribution restrict the generalization of this thesis. Second, in terms of interviews, due to time and communication ability constraints, the depth of communication with teachers is insufficient, and the teachers' answers also have strong subjectivity. In addition, the survey did not involve students' feedback on digital teaching, and thus it is impossible to comprehensively assess the situation of English digital teaching from the perspective of learning outcomes.

Future research needs to expand the sample scope, optimize the questionnaire and interview methods, and include the student perspective in order to more comprehensively and deeply understand the current situation of English digital teaching in rural primary schools in Western Guangdong. At the same time, it is hoped

that the relevant departments can attach importance to the digital transformation of English teaching in rural primary schools in western Guangdong, introduce high-quality digital teaching resources and high-standard digital teaching skills training courses into rural primary schools, and promote the digitalization process of English teaching in rural primary schools in underdeveloped areas represented by western Guangdong through this project.

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Conflicts of Interest

The authors declare no conflicts of interest.

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