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Developing a strategic guideline for enhancing digital skills for teachers in vocational college of Guangxi Vocational University of Agriculture, China

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ABSTRACT
The problems of this research were that the teachers in vocational colleges didn't have digital skills, so this study will find the way to enhance digital skills for teachers. This article aimed to 1) investigate problems of students, teachers, and administrators in vocational colleges for enhancing digital skills; 2) investigate needs of students, teachers, and administrators in vocational colleges for enhancing digital skills; and 3) develop a strategic guideline for enhancing digital skills for teachers in the vocational college of Guangxi Vocational University of Agriculture. And the sample was divided into 2 groups, namely 1) 392 students and 2) 316 teachers and administrators. The stratified random sampling technique selected them. The instrument for collecting data was the questionnaire. Data were analyzed by descriptive statistics and content analysis. The research yielded the following results: 1) The problems and needs for enhancing digital skills for teachers in Guangxi Vocational University of Agriculture are at the "highest" level; 2. All 8 units were assessed by 3 experts and presented with IOC values. All 8 units assessing and having IOC values from 0.67 to 1.00 means that the strategic guideline for enhancing digital skills for teachers in the vocational The College of Guangxi Vocational University of Agriculture is acceptable; it can be used as a strategic guide for teachers in the vocational college of Guangxi Vocational University of Agriculture to enhance digital skills.

Introduction

The level of digital skills among teachers in higher education institutions is critical to the quality of education and the development of students. Under the impetus of the booming digital economy development, the digital transformation of education in China has ushered in opportunities and also faces a series of challenges, among which the lack of teachers' digital teaching skills is one of the key shortcomings (Li & Cheng, 2022, pp. 63-64). There is a "more than enough, but not enough" digital literacy status quo among full-time teachers in higher vocational colleges and universities. They support and use digital teaching, but they don't know how to use and develop digital resources, and their digital teaching skills aren't very good. Two things have made teachers' digital technology knowledge and skills stronger: first, teachers in local vocational colleges and universities haven't been systematically trained in how to choose and use digital technology resources; instead, they've mostly learned on their own; and second,

teachers in local vocational colleges and universities haven't properly integrated digital technology resources into the VET system (Zhang, 2024, pp. 130–134). Imperfections in the funding guarantee system and the lack of an evaluation and assessment system for vocational education have made it difficult to effectively promote teachers' digital competency upgrading in vocational colleges and universities. This makes it challenging to motivate teachers to initiate improvements. There are also not enough learning opportunities and resources for teachers to keep their digital skills up to date, and old technology is used in the classroom that doesn't meet the needs of the students (Du, 2024, pp. 33–37). Teachers' levels of mastery of digital technology vary a lot because they are of different ages, educational backgrounds, and teaching experiences. This variation in digital skill levels affects teachers' ability to use digital technology in the classroom, which in turn affects how well they teach. In addition, teachers do not pay enough attention to students' learning outcomes and fail to use digital skills to optimize teaching strategies and improve students' learning outcomes. Li (2024, pp. 6-7) highlights this issue. Due to insufficient teachers and outdated concepts, vocational education focuses on large-scale training and neglects individualized training, resulting in a lack of personalized and innovative talent training. Teachers' digital skills do not have a sufficient impact on students' development; students have difficulty obtaining sufficient knowledge and guidance on digital skills, and teachers fail to pay sufficient attention to students' individualized development and practical needs (Huo & Huang, 2023, pp. 60–67).There is still a lot of room for teachers to improve their digital skills for teaching, and they need to be constantly pushed to do so in order to provide students with better, more valuable, and up-to-date teaching experiences and effectiveness (Chu et al., 2024, pp. 149-15).

To address these issues, it is significant to develop a guide on strategies to enhance the digital skills of teachers in vocational institutions. The guide should be targeted, practical, and forward-looking according to the needs of teachers and the characteristics of students, combined with the development trend of vocational education and the needs of society, and provide teachers with clear directions and guidance. A quality guide can stimulate teachers' enthusiasm for learning and innovation, and it can provide a good learning and development environment.

This study aims to explore the following issues: 1) What are the challenges and requirements for improving digital skills among teachers in vocational colleges? 2) How to enhance digital skills for teachers in vocational colleges?

Through In this study, we aim to gain a comprehensive understanding of the current situation. of teachers' digital skills, explore the problems and solution strategies in the enhancement, provide teachers and schools with effective guidance and suggestions, promote the enhancement of teachers' digital skills, improve the quality and level of vocational education, and cultivate high-quality skilled personnel adapted to the digital era.

Objectives

1. To investigate problems of students, teachers and administrators in vocational college for enhancing digital skills.

2. To investigate needs of students, teachers and administrators in vocational college for enhancing digital skills.

3. To develop a strategic guideline for enhancing digital skills for teachers in vocational college of Guangxi Vocational University of Agriculture.

Literature review

The current study concentrates on improving digital abilities by examining and analyzing relevant literature. Teachers at universities and vocational institutes are still developing their expertise. Since we are still in the early stages, many things need to be thoroughly investigated. An overview of some relevant literature is provided below:

In their 2023 paper, "Digital Competence of Teachers in Vocational Colleges and Universities in the Context of Digital Transformation: Development Logic, Internal Elements and Enhancement Strategies," Xu & Wu (2023) claim that the way teachers are currently evaluated places too much emphasis on their theoretical knowledge and not enough on their proficiency with digital tools. This indicates that a more impartial and scientific method of teacher evaluation is required.

According to Xie & Yu (2023, pp. 25–31), "The Value of Digital Skill Cultivation in Colleges and Universities, Dilemmas, and Countermeasures," schools do not offer enough learning resources and support, and teachers' hectic schedules leave them with little time and energy to learn new digital technologies.

The study "ICT use, digital skills, and students' academic performance: Exploring the digital divide" by Ben, Dahmani, & Ragni (2022, p. 129) demonstrated that teachers' digital literacy has a direct impact on students' learning interest and performance, and that teachers with higher levels of digital literacy can better motivate students' learning. In China Vocational Education News (2024), "Digital Literacy and Skills as a Teacher's Foundation—Observations from a Parallel Session on Teacher Digital Literacy and Competency Enhancement," it is noted that teachers should improve their own digital literacy and strengthen their own digital literacy in order to give students a better education in digital skills.

According to Li's article from 2024 (p. 5), "On the Practical Principles and Ideas for Enhancing the Digital Skills of College Liberal Arts Teachers in the Digital Era," some teachers require more guidance and training because they are afraid of using digital technology and are closed off to new ideas. According to Ren (2023), "Digitally Empowered Teachers," schools ought to invest more in training teachers in digital skills, offer more opportunities for training and learning materials, and simultaneously set up a system of incentives to motivate teachers to actively advance their digital proficiency. Teachers should actively investigate how digital technology can be used in the classroom to develop new teaching strategies and improve the effectiveness of the lessons, according to Li et al.'s article "Vision, Challenges, and Countermeasures of Digital Transformation in Higher Education Teaching and Learning" (2022, p. 8).

The use of digital technology in education increases management efficiency for educators, learners, and educational institutions, according to Pakdee & Phetmalhkul's "Guidelines for Application of Artificial Intelligence (AI) in Education under the Secondary Educational Service Area Office Bangkok 2" (2024, pp. 1–6). The use of digital technology in the classroom It will assist in enhancing management effectiveness and resolving issues for educators, students, and educational establishments. Digital transformation is crucial for schools, and both instructors and students need to be highly proficient in digital abilities. Another technological advancement that can raise educational standards is artificial intelligence (AI), which can enhance teaching methods and other administrative duties in classrooms. The government sector is still apprehensive about artificial intelligence, and educational institutions, instructors, and staff still lack the skills and expertise necessary to use this digital technology to enhance teaching and learning.

The effectiveness of all educational institutions is significantly impacted by the visionary abilities of school administrators in the digital age, according to Yaemchuen & Lertamornsak (2023, pp. 16–18), "Administrative Skills of School Administrators in the Digital Era Affecting the Effectiveness of Schools under the Office of Private Education Commission." This allows us to be confident in our forecasts of the effectiveness of educational institutions and recognizes the critical role that administrators' abilities play in establishing them in the modern day. This digitization may be used to all facets of instructional development and administration. In the twenty-first century, educational administrators need to be informed, capable, and skillful. According to the report, school administrators' abilities have drastically decreased in the digital era. Because of this, school administrators are less proficient in using digital and information technology than those in other professions. This implies that in order to guarantee speed and efficiency, they must gain more knowledge about these subjects and improve their proficiency with them.

Laocharoen, Phumphongkhochasorn, & Srisuwan (2024, pp. 881–892). School administrators' proficiency with digital technology. As demonstrated by Lopburi Primary Era 4.0, advancements in digital technology are crucial for planning and adjusting to technological shifts in educational institutions both now and in the future. Executives continue to employ antiquated management techniques that are incompatible with modern technologies. The use of cutting-edge media and digital technologies is lacking, especially in terms of motivating educators to integrate these resources into their lesson plans. Analyze and quantify outcomes. A framework for enhancing the digital capabilities of educators and other educational staff has not yet been created, which is the issue with teacher development in Thailand. By classifying educators into three levels—basic, intermediate, and advanced—the present system only assesses their digital proficiency at the basic education level. Although they have not yet identified the digital competencies that need to be acquired at each level, intermediate digital competencies and advanced digital performance split development into seven phases.

According to the findings of Worapongpat, Cai, & Wongsawad (2024, pp. 1–10), Developing and Validating a Digital Leadership Model for University Teachers, Liaoning Province, Digital technology integration in the classroom is now essential. College instructors are learning how to be digital leaders. Other industries are the primary focus of the majority of current study on digital leadership. More and more government and corporate sectors are realizing how crucial it is. function in schooling. Today's educators must adjust to the rapid advancements in technology. They must not only keep up with technical developments, but also lead the charge to change the way that education is conducted in the digital era.

In conclusion, there are some issues with the existing study on improving digital abilities among instructors in universities and vocational institutions that require more thorough investigation. Therefore, this study will closely examine the strategies employed to raise the digital proficiency of instructors at universities and vocational institutions. The objective is to provide practical knowledge and suggestions for enhancing the digital proficiency of instructors in universities and vocational schools.

Conceptual framework

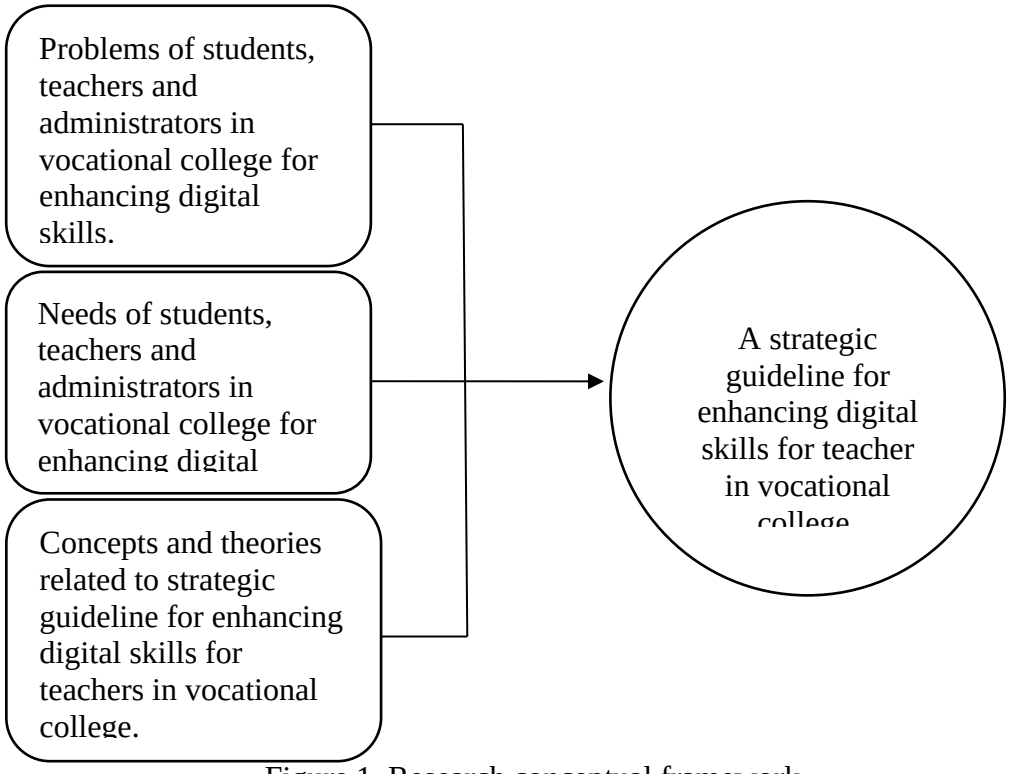

Figure 1. Research conceptual framework

Methods

1. Research design

This study will use a questionnaire survey to gain a comprehensive understanding of the current situation of teachers' digital skills in vocational colleges and universities. It will analyze the problems of teachers' digital skills and their needs through surveys of students, teachers and administrators, and at the same time explore in depth the effective strategies to enhance digital skills, develop a strategy guide to enhance the digital skills of teachers in vocational colleges and universities based on the results of the study, and finally, three experts will evaluate the validity and reasonableness of the guide.

2. Population and samples

2.1 Population

Guangxi Vocational University of Agriculture will be used as a case study for this research. The population will be divided into 2 groups; namely, 20000 students, and 1500 teachers and administrators.

2.2 Samples

The sample groups will be divided into 2 groups, namely 1) 392 students (Yamane, 1973) 2) 316 teachers and administrators. The sample groups for the investigation of problems and needs will be obtained through stratified random sampling technique.

3. Research tools

For the collection ideas or comments towards the guidelines, a set of questions for the focus group discussion meetings will be used.

For the questionnaire, the evaluation of validity will be conducted through the IOC (Index of Congruence) by the 3 specialists. Moreover, the reliability of the questionnaires will be conducted through Alpha Cronbach Coefficient which will be at 0.80 or more.

4. Data collection

Survey on the problems and needs of students, teachers and administrators of Guangxi Agricultural Vocational University and counseling guidance, questionnaire will be used to collect data and information for the sample groups. The questionnaire will be evaluation for its validity by the three specialists through IOC(index of congruence) which will be in the range of 0.67 to 1.00.Moreover, the reliability of the questionnaire will be evaluation through Alpha Cronbach Coefficient which will be 0.80 or more. For the correction and suitability of the guidelines, the focus group discussion meeting will be set up online via zoom link. For the developing a guideline, a set of questions for the focus groups discussion meeting will be used to recruit ideas, suggestions and comment from the 3 specialists.

5. Data analysis

5.1 Quantitative survey questions were used to analyze and the statistics used for analyzing data including frequencies, means ($\bar{X}$) standard deviations ($S.D.$) The five point Likert rating scale was used to evaluate the respondents' problems and needs for enhancing teachers' digital skills.

5. 2 The qualitative method was used for focus group discussion which is analyzed and the statistics used for analyzing data were based on frequencies.

Results

1. Problems for enhancing teachers' digital skills.

In this part of the study, we found that students, teachers and administrators generally have a high evaluation for enhancing digital skills for teachers at Guangxi Vocational University of Agriculture. Most students did not believe that teachers' use of digital skills for teaching and learning had a significant impact on improving their own learning outcomes. Meanwhile, industry experts were not involved in the digital skills training of teachers in schools, and they believed that teachers' digital skills did not have enough impact on students' digital skills development, and that the digital skills training provided by schools was also lacking. Most teachers and administrators noted that teachers did not fully use digital skills in classroom

discussions and group activities; that the use of digital skills in the classroom did not have a significant impact on improving student learning; that it was difficult to use digital technology to adequately increase student engagement in the classroom; and that teachers lacked the ability to communicate with students digitally outside of the classroom.

Table 1 Problems of students in the opinion of teachers' digital skills.

Questions	n=392		Level of problems
	$\bar{X}$	S.D.	
1. You think that teachers' digital skills do not have enough influence on students' digital skill development.	4.56	0.19	Highest
2. You believe that it is not obvious that teachers improving their digital skills will improve students' interest in learning.	4.34	0.50	High
3. You think that current teachers are not as helpful as they could be in upgrading their digital skills for course design.	4.36	0.30	High
4. You think that teachers rarely use digital technology in the classroom for instruction.	4.53	0.54	Highest
5. You think that teachers are not strong in utilizing digital skills to interact effectively with students.	4.45	0.44	High
6. You think teachers are not able to utilize digital technology enough to increase student engagement in the classroom.	4.48	0.27	High
7. You think that teachers do not make good use of digital skills for classroom discussions and group work.	4.54	0.19	Highest
8. You think teachers can not make good use of digital skills for distance learning or after-school tutoring.	4.45	0.20	High
9. You believe that teachers do not make good use of digital skills for student feedback and assignment review.	4.47	0.45	High
10. You think it is not obvious that teachers' use of digital skills to teach d is not effective in improving student learning.	4.57	0.50	Highest
11. You think that teachers do not make good use of digital skills to personalize instruction.	4.53	0.38	Highest
12. You think that teachers are not able to adapt their teaching methods to the level of students' numerical skills.	4.51	0.30	Highest
13. You think that teachers' digital skills do not model students' digital skills.	4.46	0.24	High
14. You think that teachers' digital skills have not contributed to students' creativity.	4.50	0.36	High

Questions	n=392		Level of problems
	$\bar{X}$	S.D.	
15. You think there is a lack of teachers communicating more with students outside of the classroom through digital means.	4.46	0.39	High
16. You think teachers are not regularly updating their digital skills.	4.50	0.38	High
17. You don't think schools provide enough training in digital skills.	4.56	0.18	Highest
18. You don't think industry experts have been involved in training school teachers in digital skills.	4.57	0.34	Highest
19. You don't think you've had the opportunity to be involved in upgrading teachers' digital skills training.	4.36	0.30	High
20. You think Schools do not have a mechanism for assessing teachers' digital skills.	4.37	0.42	High
Total	4.48	0.34	High

It can be seen for table 1 that students have a high evaluation for enhancing digital skills for teachers at Guangxi Vocational University of Agriculture, with a total average value of $\bar{X}$=4.48 and a standard deviation of 0.34.

Most students believe that it is not obvious that teachers' use of digital skills to teach d is not effective in improving student learning (Q10) ($\bar{X}$=4.57) and they don’t think industry experts have been involved in training school teachers in digital skills. (Q18) ($\bar{X}$=4.57).

There are also most students think that teachers' digital skills do not have enough influence on students' digital skill development (Q1) ($\bar{X}$=4.56) and they don’t think schools provide enough training in digital skills (Q17) ($\bar{X}$=4.56).

Only a few students believe that it is not obvious that teachers improving their digital skills will improve students' interest in learning (Q2) ($\bar{X}$=4.34).

Table 2 Problems of teachers and administrators in the opinion of teachers’ digital skills.

Questions	n=316		Level of problems
	$\bar{X}$	S.D.	
1. You think that teachers' digital skills do not have enough influence on students' digital skill development.	4.28	0.19	High
2. You believe that it is not obvious that teachers improving their digital skills will improve students' interest in learning.	4.49	0.46	High
3. You think that current teachers are not as helpful as they could be in upgrading their digital skills for course design.	4.39	0.30	High

Questions	n=316		Level of problems
	$\bar{X}$	S.D.	
4. You think that teachers rarely use digital technology in the classroom for instruction.	4.61	0.53	Highest
5. You think that teachers are not strong in utilizing digital skills to interact effectively with students.	4.61	0.43	Highest
6. You think teachers are not able to utilize digital technology enough to increase student engagement in the classroom.	4.69	0.22	Highest
7. You think that teachers do not make good use of digital skills for classroom discussions and group work.	4.71	0.18	Highest
8. You think teachers can not make good use of digital skills for distance learning or after-school tutoring.	4.40	0.18	High
9. You believe that teachers do not make good use of digital skills for student feedback and assignment review.	4.37	0.45	High
10. You think it is not obvious that teachers' use of digital skills to teach d is not effective in improving student learning.	4.71	0.45	Highest
11. You think that teachers do not make good use of digital skills to personalize instruction.	4.30	0.35	High
12. You think that teachers are not able to adapt their teaching methods to the level of students' numerical skills.	4.52	0.29	Highest
13. You think that teachers' digital skills do not model students' digital skills.	4.47	0.21	High
14. You think that teachers' digital skills have not contributed to students' creativity.	4.44	0.34	High
15. You think there is a lack of teachers communicating more with students outside of the classroom through digital means.	4.69	0.40	Highest
16. You think teachers are not regularly updating their digital skills.	4.36	0.38	High
17. You don't think schools provide enough training in digital skills.	4.46	0.18	High
18. You don't think industry experts have been involved in training school teachers in digital skills.	4.37	0.32	High
19. You don't think you've had the opportunity to be involved in upgrading teachers' digital skills training.	4.56	0.46	Highest

Questions	n=316		Level of problems
	$\bar{X}$	S.D.	
20. You think Schools do not have a mechanism for assessing teachers' digital skills.	4.55	0.40	Highest
Total	4.50	0.33	High

After in-depth research and analysis, a set of key issues have been identified: feedback from teachers and administrators that teachers are not utilizing digital technology enough in classroom discussions and group activities; that digital technology in the classroom does not have a significant impact on student learning outcomes; that it is difficult to fully engage students in the classroom through digital technology; and that teachers lack the ability to communicate and interact with students using digital tools outside of the classroom. The ability of teachers to communicate and interact with students using digital means outside the classroom is lacking.

As the core subjects of teaching and learning activities, teachers and administrators focus on these issues, which are of great reference significance for us to plan scientific and perfect strategies to improve teachers' digital skills, which can provide a solid empirical basis and precise direction guidance for the formulation of strategies.

It can be seen from table 2 that teachers and administrators have a high evaluation for enhancing digital skills for teachers at Guangxi Vocational University of Agriculture, with a total average $\bar{X}$=4.50 and standard deviation = 0.33.

Most teachers and administrators think that teachers do not make good use of digital skills for classroom discussions and group work (Q7) ($\bar{X}$=4.71), and they also You think it is not obvious that teachers' use of digital skills to teach d is not effective in improving student learning (Q10) ($\bar{X}$=4.71).

Most teachers and administrators also think that teachers are not able to utilize digital technology enough to increase student engagement in the classroom (Q6) ($\bar{X}$=4.69) and they also think there is a lack of teachers communicating more with students outside of the classroom through digital means (Q15) ($\bar{X}$ =4.69).

Only a few teachers believe that teachers' digital skills do not have enough influence on students' digital skill development (Q1) ($\bar{X}$=4.28).

2. Needs for enhancing teachers' digital skills.

In this part of the study, we found that students, teachers and administrators generally rated the need for teachers' digital skills enhancement highly. The majority of students felt that teachers' digital skills needed to focus on improving student learning outcomes, that in terms of digital skills enhancement, there was a need for teachers to be able to adapt their teaching methods to the level of digital skills of their students, that it was important to emphasize that teachers were able to use digital skills in classroom discussions and group work, and that they also felt that there was a need to enhance the fact that teachers' digital skills could contribute to the development of student creativity. Most of the teachers and administrators believe that schools need to provide training that offers more digital skills and believe that schools need to develop mechanisms for assessing teachers' digital skills and that teachers need to update their digital skills on a regular basis, they also believe that schools need to invite industry experts to participate in the training of teachers in digital skills.

Table 3 Needs of students for teachers' digital skills.

Questions	n=392		Level of needs
	$\bar{X}$	S.D.	
1. You need teachers' digital skills to have a positive impact on students' digital skills.	4.55	0.39	Highest
2. You need teachers to improve their digital skills, which in turn will increase students' interest in learning.	4.47	0.35	High
3. You need teachers to improve their digital skills to be helpful in curriculum design.	4.48	0.19	High
4. You need teachers to use digital technology more in the classroom for instruction.	4.57	0.35	Highest
5. You need teachers who can use digital skills to interact effectively with students.	4.48	0.47	High
6. You need teachers who can use digital skills to increase student engagement in the classroom.	4.49	0.39	High
7. In terms of digital skill enhancement, it is important to reinforce that teachers are able to use digital skills in classroom discussions and group work.	4.58	0.49	Highest
8. You need teachers to be able to use digital skills for distance learning or after-school tutoring.	4.54	0.41	Highest
9. You need teachers to be able to utilize digital skills for student feedback and assignment review.	4.57	0.39	Highest
10. Teachers' digital skills need to be focused on improving student learning outcomes.	4.59	0.20	Highest
11. You need teachers to be able to use digital skills to personalize instruction.	4.51	0.36	Highest
12. In the area of digital skills enhancement, it is important to note that teachers are able to adapt their teaching methods to the level of digital skills of their students.	4.59	0.48	Highest
13. You need teachers' digital skills to model students' digital skills.	4.55	0.40	Highest
14. In the area of digital skills enhancement, it is important to reinforce the idea that teachers' digital skills can contribute to the development of students' creativity.	4.58	0.34	Highest
15. You want teachers to be able to communicate more with students outside of the classroom through digital means.	4.56	0.30	Highest
16. Teachers need to regularly update their digital skills	4.53	0.25	Highest

Questions	n=392		Level of needs
	$\bar{X}$	S.D.	
17. The school needs to provide training that offers more digital skills.	4.57	0.33	Highest
18. The school needs to invite industry experts to participate in digital skills training for teachers.	4.56	0.38	Highest
19. You wish you could be involved in upgrading teachers' digital skills training.	4.55	0.39	Highest
20. The school needs to develop mechanisms to assess teachers' digital skills.	4.48	0.19	High
Total	4.54	0.35	Highest

It can be seen from table 3 that students have a highest evaluate the needs for enhancing digital skills for teachers at Guangxi Vocational University of Agriculture, with total average $\bar{X}$=4.54 and standard deviation = 0.35.

Most students believe that teachers' digital skills need to be focused on improving student learning outcomes (Q10) ($\bar{X}$=4.59) and they also think that In the area of digital skills enhancement, it is important to note that teachers are able to adapt their teaching methods to the level of digital skills of their students (Q12) ($\bar{X}$=4.59).

Most students think In terms of digital skill enhancement, it is important to reinforce that teachers are able to use digital skills in classroom discussions and group work (Q7) ($\bar{X}$=4.58), and they also think it is essential to reinforce the idea that teachers' digital skills can contribute to the development of students' creativity (Q14) ($\bar{X}$=4.58).

Only a few students need teachers to improve their digital skills, which in turn will increase students' interest in learning (Q2) ($\bar{X}$=4.47).

Table 4 Needs of teachers and administrators for enhancing teachers' digital skills.

Questions	n=316		Level of needs
	$\bar{X}$	S.D.	
1. You need teachers' digital skills to have a positive impact on students' digital skills.	4.53	0.38	Highest
2. You need teachers to improve their digital skills, which in turn will increase students' interest in learning.	4.51	0.35	Highest
3. You need teachers to improve their digital skills to be helpful in curriculum design.	4.53	0.18	Highest
4. You need teachers to use digital technology more in the classroom for instruction.	4.45	0.33	High
5. You need teachers who can use digital skills to interact effectively with students.	4.58	0.32	Highest
6. You need teachers who can use digital skills to increase student engagement in the classroom.	4.60	0.40	Highest

Questions	n=316		Level of needs
	$\bar{X}$	S.D.	
7. In terms of digital skill enhancement, it is important to reinforce that teachers are able to use digital skills in classroom discussions and group work.	4.52	0.50	Highest
8. You need teachers to be able to use digital skills for distance learning or after-school tutoring.	4.61	0.41	Highest
9. You need teachers to be able to utilize digital skills for student feedback and assignment review.	4.53	0.39	Highest
10. Teachers' digital skills need to be focused on improving student learning outcomes.	4.53	0.18	Highest
11. You need teachers to be able to use digital skills to personalize instruction.	4.60	0.33	Highest
12. In the area of digital skills enhancement, it is important to note that teachers are able to adapt their teaching methods to the level of digital skills of their students.	4.61	0.18	Highest
13. You need teachers' digital skills to model students' digital skills.	4.49	0.41	High
14. In the area of digital skills enhancement, it is important to reinforce the idea that teachers' digital skills can contribute to the development of students' creativity.	4.52	0.35	Highest
15. You want teachers to be able to communicate more with students outside of the classroom through digital means.	4.49	0.30	High
16. Teachers need to regularly update their digital skills	4.62	0.18	Highest
17. The school needs to provide training that offers more digital skills.	4.63	0.45	Highest
18. The school needs to invite industry experts to participate in digital skills training for teachers.	4.62	0.39	Highest
19. You wish you could be involved in upgrading teachers' digital skills training.	4.61	0.39	Highest
20. The school needs to develop mechanisms to assess teachers' digital skills.	4.63	0.44	Highest
Total	4.56	0.34	Highest

As a result of in-depth research and analysis, a number of key needs were identified: most teachers and administrators felt that schools needed to provide more training in digital skills, and felt that schools needed to develop mechanisms for assessing teachers' digital skills, that teachers needed to update their digital skills on a regular basis, and that they felt that schools needed to invite industry experts to participate in teachers' digital skills training.

As the core subjects of teaching and learning activities, teachers and administrators focus on these needs, which are of great reference significance for us to plan scientific and perfect strategies to improve teachers' digital skills, which can provide a solid empirical basis and precise direction guidance for the formulation of strategies.

It can be seen from table 4 that teachers and administrators have a highest evaluate the needs for enhancing digital skills for teachers at Guangxi Vocational University of Agriculture, with the total average $\overline{X}$=4.56 and the standard deviation =0.34.

Most teachers and administrators believe that the school needs to provide training that offers more digital skills (Q17) ($\overline{X}$=4.63) and think the school needs to develop mechanisms to assess teachers' digital skills (Q20) ($\overline{X}$=4.63).

There are also most teachers and administrators said that they need to regularly update their digital skills (Q16) ($\overline{X}$=4.62) and they think the school needs to invite industry experts to participate in digital skills training for teachers (Q18) ($\overline{X}$=4.62).

Only a few teachers believe that teachers need to use digital technology more in the classroom for instruction (Q4) ($\overline{X}$=4.45).

3. The strategic guideline for enhancing digital skills for teachers in vocational college of Guangxi Vocational University of Agriculture:

3.1 Provide more digital skills training.

Objective: To improve teachers' digital literacy and instructional effectiveness through increased digital skills training.

Implementation Strategies:

(1) Courses on the application of digital tools: Design and deliver courses on the use of educational technology and digital tools, such as whiteboards, online teaching platforms, virtual classrooms, and so on.

(2) Teachers' workshops and seminars: Organize regular workshops and seminars to share digital teaching experiences and case studies.

(3) Online Resource Library: Create a digital resource library containing teaching videos, tutorials and guides for teachers' self-learning and reference.

(4) School-based Trainers Program: To train a group of school-based trainers to provide targeted training and guidance.

3.2 Establishment of an assessment mechanism for teachers' digital skills.

Objective: Establishment of a scientific evaluation mechanism to assess and upgrade the level of digital skills of teachers.

Implementation Strategies:

(1) Development of digital skills assessment tools: develop or introduce specialized assessment tools to assess teachers' performance in digital teaching.

(2) Assessment feedback mechanism: establish a regular feedback mechanism to help teachers understand their digital skills level and areas for improvement.

(3) Individualized development plan: Based on the assessment results, develop individualized digital skills improvement plans for teachers.

(4) Peer assessment and mutual support groups: Encourage assessment and mutual support among teachers to promote common progress.

3.3 Teachers need to regularly update their digital skills.

Objective: Teachers are encouraged to continually learn and update their digital skills to adapt to the rapidly changing technological environment.

Implementation Strategies:

(1) Annual training program: develop an annual training program to ensure that all teachers are able to participate in digital skills training on a regular basis.

(2) Online learning platform: Provide a flexible online learning platform to facilitate teachers to learn new skills anytime, anywhere.

(3) Learning Points System: Introduce a learning points system to encourage teachers to upgrade their skills through participation in training and self-learning.

(4) Digital learning community: Establish a digital learning community for teachers to share learning resources and experiences.

3.4 Invite industry experts to participate in digital skills training for teachers.

Objective: Enhance teachers' digital skills by inviting industry experts to provide the latest industry trends and real-world application examples.

Implementation Strategies:

(1) Expert lectures and workshops: Industry experts are regularly invited to organize lectures and workshops to share the latest digital teaching tools and methods.

(2) Industry Collaborative Training Programs: Collaborate with industry players to provide hands-on training programs to enable teachers to learn the latest digital technologies and applications.

(3) Digital Teaching and Learning Innovation Forum: Organize digital teaching and learning innovation forums and invite experts and teachers to share successful cases and experiences.

(4) Expert Mentoring Program: Set up an expert mentoring program to provide teachers with personalized advice and guidance.

3.5 Digital skills need to be centered on improving student learning outcomes.

Objective: Ensure that digital skills training for teachers directly improves student learning and engagement.

Implementation Strategies:

(1) Assessment tools for student learning outcomes: develop or introduce assessment tools to monitor student learning outcomes in digital instruction.

(2) Data-driven instruction: train teachers on how to use learning data analytics to adjust instructional strategies to improve student achievement.

(3) Case-based pedagogy: Demonstrate through case-based pedagogy how digital tools can be used effectively to improve student learning outcomes.

(4) Student Feedback Mechanism: To establish a student feedback mechanism to help teachers understand students' responses and suggestions on digital teaching and learning.

3.6 Teachers' digital skills need to focus on students' digital skills.

Objective: To prepare teachers to be able to flexibly adapt their teaching methods to the digital skill levels of their students in order to achieve better teaching and learning outcomes.

Implementation Strategies:

(1) Differentiated Instruction Training: provide training on differentiated instruction methods so that teachers can adapt instruction to students' skill levels.

(2) Student skill assessment tools: develop tools to help teachers assess students' digital skill levels.

(3) Courses on Innovative Teaching Methods: Provide courses on innovative teaching methods and strategies to accommodate diverse student populations.

(4) Individualized lesson plan design: to help teachers design individualized lesson plans to meet the needs of diverse students.

3.7 Teachers' digital skills need to focus on discussions and group work in classroom.

Objective: Strengthening teachers' capacity to apply digital skills in classroom discussions and group work.

Implementation Strategies:

(1) Digital Collaboration Tools Training: provide training on how to use collaboration tools (e.g., Ding Talk, Wps Cloud Documents, etc.) for group work and classroom discussions.

(2) Interactive classroom technology: train teachers on how to utilize interactive technology (e.g., e-voting, real-time Q&A tools) to enhance classroom interaction.

(3) Virtual Group Collaboration Projects: Design virtual group collaboration projects to help teachers become proficient in using digital tools for teamwork.

(4) Digital Teaching Case Sharing: Demonstrate how to effectively use digital skills in classroom discussions by sharing successful digital teaching cases.

3.8 Promoting the development of students' creativity.

Objective: Improvement of teachers' digital skills for the development of students' creativity.

Implementation Strategies:

(1) Training on the use of creative tools: train teachers on how to use creative tools (e.g., drawing software, video editing software, etc.) to stimulate students' creativity.

(2) Workshops on Innovative Teaching Methods: organize workshops to share how to use digital technology to promote students' innovative thinking and creativity.

(3) Interdisciplinary Innovation Projects: Design interdisciplinary projects to encourage students to use digital skills to innovate between different fields.

(4) Creative Education Curriculum: Introducing the concept of creative education to help teachers design and implement a creativity-focused curriculum.

Discussion

1. Discussion on the existing problems on enhancing Digital Skills for Teacher in Vocational College of Guangxi Vocational University of Agriculture.

According to the survey results, there are some urgent problems in the current situation of teachers' digital skills in Guangxi Vocational University of Agriculture.

First, the training system of teachers' digital skills is not perfect, and many teachers lack systematic digital skills training, which makes it difficult for them to fully apply digital technology in teaching (Liu & Li, 2023, pp. 72-76). Secondly, schools lack an effective assessment mechanism for teachers' digital skills, which cannot accurately assess the level of teachers' digital skills and makes it difficult to motivate teachers to take the initiative to improve their skills (Lei et al., 2017, pp. 1-3). In addition, the updating speed of teachers' digital skills is slow, making it difficult to keep up with the pace of rapidly developing information technology and affecting the improvement of teaching quality. Strengthening the teaching force and upgrading teachers' digital skills to meet the requirements of information technology in education. (Guangxi Zhuang Autonomous Region People's Government, 2021). Meanwhile, teachers' application of digital skills in teaching is deficient. On the one hand, teachers' frequency of using digital skills for teaching in the classroom is low, and they are unable to give full play to the advantages of digital skills to enrich the teaching content and form (Wang, 2023, pp. 95-101). On the other hand, teachers still have a lot of room for improvement in using digital skills for personalized teaching, failing to provide accurate teaching support according to individual differences of students. Personalized teaching is the fulcrum of educational change, and the application of the smart classroom provides a new environment for the realization of personalized teaching, emphasizing the importance and path for teachers to realize personalized teaching in the smart classroom. (Fan, 2018). In addition, teachers do not pay enough attention to the cultivation of

students' digital literacy in teaching, and fail to organically integrate the cultivation of digital skills into curriculum teaching (Sun, 2023, pp. 60-63).

2. Discussion on the needs on enhancing Digital Skills for Teachers in Vocational College of Guangxi Vocational University of Agriculture.

The findings show that students, teachers and administrators fully recognize the importance of improving teachers' digital skills. In order to meet the needs of teaching and student development, colleges and universities need to establish a sound training system for teachers' digital skills and provide teachers with continuous learning and development opportunities (Chen, 2024, pp. 70-73). The improvement of teachers' digital skills should be carried out throughout the teaching process. Schools should encourage teachers to actively participate in all kinds of training and learning activities to continuously update their knowledge of digital skills and improve their application ability (Wang, 2022, pp. 144-146). At the same time, teachers should focus on combining digital skills with teaching practice, exploring innovative teaching methods and modes, and improving teaching effects (Zhou, 2024, pp. 90-93). In addition, schools should strengthen the support and guidance for teachers' digital skills application. Provide the necessary technical equipment and resources to encourage teachers to fully utilize digital skills in classroom teaching, curriculum design, student evaluation, etc. (Zheng, 2023, pp. 100-103). At the same time, schools should also establish corresponding incentive mechanisms to encourage teachers to actively carry out digital teaching practices and share their experiences and achievements (Li & Chen, 2023, pp. 33-38). In the process of improving teachers' digital skills, cooperation with the industry should also be emphasized. Industry experts are invited to participate in teacher training to understand the latest digital technology applications and development trends in the industry, so that teachers' digital skills can be closer to the actual needs (Ma & Ren, 2024, pp. 64-68). At the same time, cooperation with enterprises should be strengthened to provide teachers with practice opportunities so that they can improve their digital skills in actual work (Guo, 2024).

3. Discussion on the strategic guideline for enhancing digital skills for teachers at Guangxi Vocational University of Agriculture

Wang (2022, pp. 55-58), “Research on the Influencing Factors and Enhancement Strategies of Higher Education Teachers' Digital Skills” points out that The digital skills of college teachers are mainly affected by internal self-factors and external factors, and the digital skills enhancement strategies for college teachers should be proposed from the teacher level and the school level.

I. Teacher Level

(1) Stimulating self-efficacy among university teachers.

(2) Improve college teachers’ digital teaching intention.

2. School level

(1) Optimize the training system for college teachers.

(2) Strengthen the construction of digital resources.

(3) Establishing a cloud society for college teachers' learning and exchanges.

Li (2024, pp. 114), “Challenges and responses to digital transformation enabling quality development in education” points out that Vocational education in China at the present time is taking multiple measures to meet the challenges of digital transformation of education by In terms of enhancing teachers' digital competence, the following measures are included: First, strengthen training in the application of digital technology, especially the school needs to invite industry experts to participate in digital skills training for teachers. Second, enhance teachers' ability to integrate digital tools and resources into teaching design and assessment. Third, form digital learning communities. In addition, in order to continuously and efficiently improve technical support services and enhance teachers' digital competence, universities should establish regular feedback and evaluation mechanisms. Feedback data should be analyzed and systematically to summarize common problems and weaknesses in the support process, so that targeted improvements can be made. At the same time, the assessment mechanism also includes regular review and updating of the

technical support content to ensure that it is in sync with the development of cutting-edge technology and teaching needs. Comprehensively enhancing the support for the development of teachers' digital competence will help teachers to effectively solve technical problems in actual teaching and ensure that they can adapt to the rapidly developing technological environment (Wang & Li, 2024, pp. 17-24). At the same time, in terms of digital skills enhancement, we should help teachers focus on how the application of digital skills can improve student learning (Huo & Huang, 2023, pp. 60-67).

In summary, this study draws the following conclusions through an in-depth study of the digital skills of teachers in Guangxi Vocational University of Agriculture: the improvement of digital skills of teachers in vocational colleges and universities is of great significance to the quality of teaching and the development of students. At present, teachers' digital skills have problems such as insufficient training, imperfect assessment mechanism and slow updating of skills. In order to improve teachers' digital skills, systematic training should be strengthened and targeted learning resources should be provided; a perfect assessment mechanism should be established to motivate teachers to actively improve their skills; and teachers should be encouraged to learn independently and update their digital skills in a timely manner. At the same time, teachers should focus on combining digital skills with teaching practice, carry out personalized teaching, and improve teaching effectiveness. In conclusion, enhancing the digital skills of teachers in vocational colleges and universities requires the joint efforts of schools, teachers and relevant departments to meet the development needs of education information.

Body of knowledge

The knowledge of the research includes the strategic guideline for enhancing digital skills for teachers in vocational college, provide more digital skills training, Establishment of an assessment mechanism for teachers' digital skills, Teachers need to regularly update their digital skills, Invite industry experts to participate in digital skills training for teachers, Digital skills need to be centered on improving student learning outcomes, Teachers' digital skills need to focus on students' digital skill, Teachers' digital skills need to focus on discussions and group work in classroom, Promoting the development of students' creativity. It is shown in Figure 2.

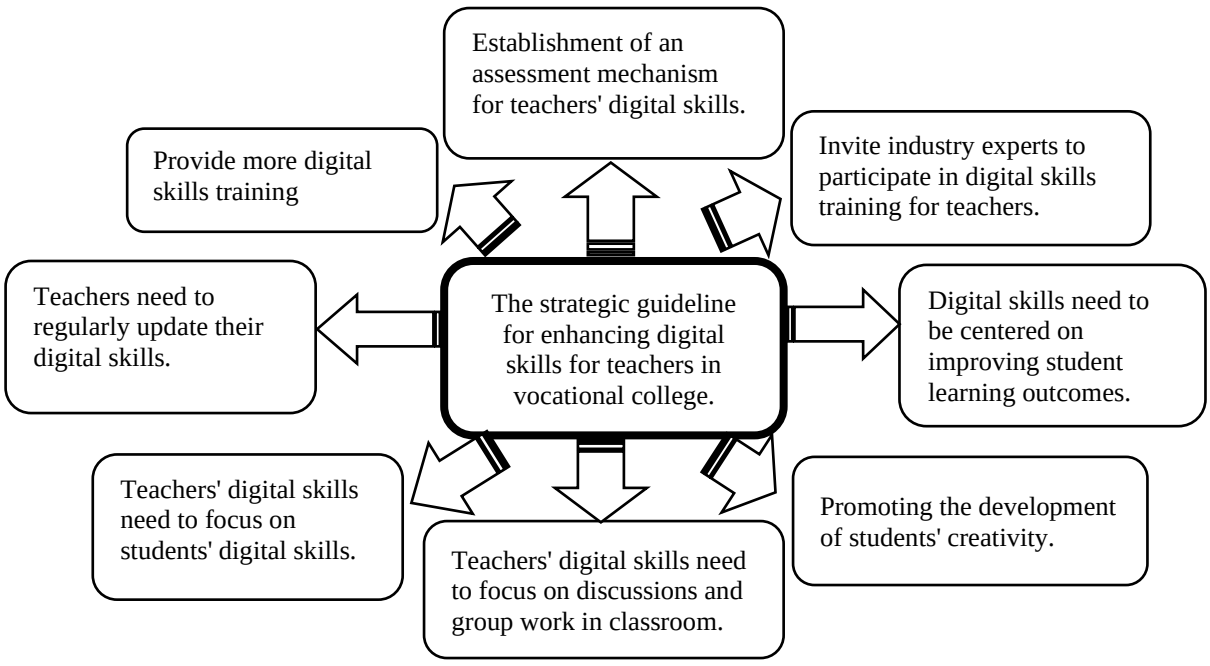

Figure 2. Body of knowledge

From this model, we can find a strategic guideline for teachers in vocational colleges to enhance their digital skills, which centers on establishing a mechanism for assessing teachers' digital skills, inviting industry experts to participate in the training, focusing on improving students' learning outcomes, promoting students' creativity, focusing on classroom discussions and group work, paying attention to students' digital skills, and teachers need to update their skills and receive more training on a regular basis, so as to improve teachers' digital skills in a comprehensive and systematic way to help teaching and students' development. Teachers are required to regularly update their skills and receive additional training to systematically improve their digital skills in all aspects to facilitate teaching and student development.

Suggestions

For enhancing the digital skills of teachers in Guangxi Vocational University of Agriculture is a great significance for promoting the digital transformation of education and teaching in the school, improving the quality and efficiency of teaching, and promoting the development of the school.

1. Enhancing teachers' digital skills is an urgent and important task, which requires the joint efforts of schools, students, teachers and relevant departments to take effective measures to continuously improve the training system, strengthen support and guidance, and promote cooperation and exchanges, so as to continuously improve the level of teachers' digital skills, to provide strong support for the cultivation of high-quality talents adapted to the digital era, and to promote the digital transformation of school education and teaching.

2. The strategic guideline for enhancing digital skills for teachers at Guangxi Vocational University of Agriculture can effectively help school teachers improve their digital skills to adapt to the development trend of education digitization. It provides teachers with a clear development direction and action guide, which helps to improve teaching quality, promote teaching innovation, cultivate students' digital literacy and innovation ability, and promote the modernization and development of the school. At the same time, the guide also helps to strengthen school-enterprise cooperation, enhance teachers' professionalism, optimize the allocation of teaching resources, and create a positive learning atmosphere, so as to improve the overall education and teaching standards and competitiveness of schools.

References

Ben Y. A., Dahmani, M., & Ragni, L. (2022). ICT use, digital skills and students' academic performance: Exploring the digital divide. *Information*, 13(3), 129-145.

Chen, T. (2024). The Importance of Building a Digital Skills Training System for Teachers. *Research on Education Development*, pp. 70-73.

Chu et al. (2024). An Investigation and Research on the Digital Teaching Abilities of Young and Middle-aged Teachers in Jiangsu Application-oriented Undergraduate Universities. *Journal of Hubei Open Vocational College*, 21, 149-151.

China Vocational Education News. (2024). *China Vocational Education News Digital literacy and skills are the foundation of teachers - Observations from the parallel conference on teachers' digital literacy and competency enhancement*. https://www.chinazy.org/info/1006/15732.htm

Du, Z. Q. (2024). Promotion of Digital Competence of Vocational College Teachers: Motivation, Challenges and Paths. *Journal of Wuhan Polytechnic*, 06, 33 - 37.

Fan, C. (2018). *Research on the realization path of personalized teaching in intelligent classroom*. Doctoral dissertation, Southwest University.

Guangxi Zhuang Autonomous Region People's Government. (2021). *Notice of the People's Government of*

Guangxi Zhuang Autonomous Region on Issuing the 14th Five-Year Plan for the Development of Education in Guangxi.

Guo, Y. (2024). Review of the progression of vocational education talent cultivation by industry-teaching integration under the background of digital transformation. *Outstanding Papers of Education and Teaching Development Forum on "Integration of Industry and Education, Cooperation between Schools and Enterprises".*

Huo, S. J., & Huang, J. C. (2023). Digital Transformation of Vocational Education Driven by Technology: Operating Mechanism and Promotion Path. *Chinese Vocational and Technical Education*, 19, 60 - 67.

Lei et al. (2017). Reflections on Skills Assessment in Higher Vocational Education Teaching. *Contemporary educational practice and teaching research: electronic version (9X)*, 1-3.

Li et al. (2022). Vision, Challenges and Countermeasures of Digital Transformation of Higher Education Teaching and Learning. *China Electronic Education,* (7), 8.

Li, F. (2024). Practical Principles and Ideas for Enhancing the Digital Skills of College Liberal Arts Teachers in the Digital Era. *Innovative Education Research*, 12(2), 5.

Li, M. & Chen, S. (2023). Exploring the Professional Development of Teachers in Higher Vocational Colleges and Universities Empowered by Digital Technology. *Vocational and Technical Education*, 44(7), 33-38.

Li, M. & Cheng, J. G. (2022). Research Report on the Digital Transformation of Higher Education Teaching. *United Nations Educational, Scientific and Cultural Organization Innovation Center for Higher Education, Beijing,*pp. 63-64.

Laocharoen, N., Srisuwan, P., & Phumphongkhochasorn, P. (2024). Competency for digital technology of school administrators in Lopburi Primary Era 4.0. *Interdisciplinary Academic and Research Journal*, 4(3), 881-892.

Li, J. L. (2024). Challenges and Countermeasures of Digital Transformation Empowering High-quality Education Development. *Journal of Longyan University*, 06, 112 - 116.

Liu, Y. & Li, S. (2023). A study on strategies for improving digital literacy of higher education teachers in the digital era. *China Adult Education,* (12), 72-76.

Ma, K. & Ren, X. (2022). Elements and Paths of Strengthening Digital Skills Training for All. *Journal of Beijing Xuanwu Hongqi Amateur University,* (3), 64-68.

Pakdee, S., & Phetmalhkul, T. (2024). Guidelines for application of artificial intelligence (AI) in education under the Secondary Educational Service Area Office Bangkok 2. *Interdisciplinary Academic and Research Journal*, 4(6), 555–572.

Ren, Y. (2023). Digital empowerment of teachers. *Education International Exchange* (5).

Sun, X. (2023). The impact of teachers' digital literacy on student development. *Education Watch*, 60 - 63.

Wang, W. C..(2022). *Research on the Influencing Factors and Enhancement Strategies of Higher Education Teachers' Digital Competence.* Master's thesis, Qingdao University.

Wang, Y. (2022). The current situation of digital skills of pre-service international Chinese language teachers and ways to improve them. *Chinese Character and Culture*, (S1), 144-146.

Wang, Y. (2023). Scenarios of educational practice and the construction of teachers' digital competence in the era of digital transformation. *China Education Informatization*, 29(12), 95-101.

Wang, Z. N., & Li, X. H. (2024). Connotative characteristics, practical dilemmas and enhancement strategies of teachers' digital competence. *Journal of Chongqing Open University*, 04, 17-24.

Worapongpat, N., Cai, Q., & Wongsawad, T. (2024). Creating and validating a digital leadership model for university teachers in Liaoning Province.*Journal of Education and Learning Reviews*, 1(3), 1-10.

Xie, J. & Yu, B. (2023). The value, dilemma and countermeasures of cultivating digital skill talents in colleges and universities. *China Adult Education,* (1), 25-31.

Xu, Q. & Wu, X. (2023). Digital competence of teachers in vocational colleges and universities under the background of digital transformation: development logic, connotation elements and enhancement strategies. *Vocational and Technical Education*, 44(23), 13-20.

Yaemchuen, N., & Lertamornsak, K. (2023). Administrative skills of school administrators in the digital era affecting the effectiveness of schools under the Office of Private Education Commission. *Interdisciplinary Academic and Research Journal*, 3(6), 331-348.

Yi, Y. & Xue, F. (2022). Research on the Improvement of Digital Literacy of Vocational College Teachers in the Context of the "Digital Economy" - An Empirical Analysis Based on 335 Full-time Teachers in Zhejiang Province. *Chinese Vocational and Technical Education*, 05, 55 - 61.

Zheng, L. (2023). Supporting and guiding teachers' digital skills in schools. *Journal of Educational Technology*, 100 - 103.

Zhang, H. Y. (2024). Research on the Digital Literacy of Teachers in Local Vocational Colleges in the Context of Digital Transformation. *Western China Quality Education*, 14, 130 - 134.

Zhou, Q. (2024). The practice of digital skills in teaching innovation. *Innovative Education Research*, 90 - 93.