

## Development of Strategies for Higher Vocational Teachers' Roles based on Artificial Intelligence in Northern Guangdong

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### ABSTRACT

This study aims to define the “new roles” of vocational education teachers in the context of artificial intelligence (AI), promote the integration of AI with professional teacher development, and facilitate the sustainable development of vocational teachers' roles. The research objectives were (i) To study the current state of role cognition among vocational teachers in Northern Guangdong under AI, (ii) To explore the strategies for the sustainable development of vocational teachers' roles under AI, and (iii) To examine the feasibility of the strategies for higher vocational college teachers. The sample group include 338 full-time teachers from five vocational colleges in Northern Guangdong. The research instruments are questionnaire, semi-structured interviews, and evaluation form, and, conducting both qualitative and quantitative studies on the role development of vocational teachers under AI. The results indicated that the (i) The current state the higher vocational teachers' overall cognition of the teacher's role in the context of artificial intelligence is at a medium level ( $M=3.14$  and  $SD=0.84$ ), (ii) Development strategies for vocational teachers' roles under AI encompass five major influencing factors and 20 key measures, and (iii) The overall evaluation of the adaptability and feasibility of the strategy is very high.

**Key words:** Artificial Intelligence, Teacher Roles, Sustainable Development, Strategies

### INTRODUCTION

In the current context of rapidly advancing AI technology, vocational education faces unprecedented opportunities and challenges. The sustainable development of vocational teachers' roles has become a significant issue in the education field. In recent years, as AI technology has matured, the role of vocational teachers has shifted from traditional knowledge transmitters to technology guides and learning facilitators. Huang and Xu (2019) pointed out in their study that AI has profoundly transformed the educational ecosystem, leading to significant changes in teacher roles, and that the educational system must promptly adjust to adapt to this trend. Li et al. (2020) further explored the professional competency enhancement needs of vocational teachers in the AI era, emphasizing that teachers must possess interdisciplinary knowledge and technical application skills to meet the teaching requirements of the new era. L. Zhang (2021) suggested that to achieve the sustainable development of vocational teachers' roles, educational institutions should improve policy support, strengthen teacher training, and enhance technical literacy to ensure that teachers can effectively respond to the educational changes brought by AI.

In practice, the sustainable development of vocational teachers' roles faces multiple challenges, including

insufficient technical literacy, outdated teaching resources, and inadequate educational policy support. Wang (2020) noted in his research that the technical literacy of vocational teachers directly affects their ability to adapt to changing roles, recommending systematic training and the updating of educational resources to improve teachers' technical application skills. Chen (2021) explored the impact of educational policy on the development of teacher roles, arguing that policy support is crucial for the successful transition of teacher roles. Additionally, Zhao et al. (2022) emphasized the importance of establishing industry-academia-research collaboration mechanisms to ensure that teachers can apply cutting-edge technology in their teaching practices, thereby enhancing educational outcomes. By comprehensively utilizing strategies such as policy guidance, training enhancement, and resource optimization, the sustainable development of vocational teachers' roles can be effectively promoted, supporting educational transformation in the AI era.

In the context of rapidly developing AI, the role of vocational teachers is undergoing a profound transformation. This transformation demands new levels of cognitive awareness, competency development, self-development, and teaching cognition from teachers. Research indicates that teachers' cognitive levels regarding AI directly influence their ability to apply technology and innovate in teaching.

Li (2020) noted that while some vocational teachers have begun to engage with and understand AI technology, the overall cognitive level remains insufficient, hindering the full potential of AI in teaching practices. Y. Zhang (2019) further emphasized the necessity of improving teachers' AI literacy, considering it crucial for teachers to adapt to educational changes and enhance teaching effectiveness.

Meanwhile, the level of AI literacy among teachers has become a key indicator of their ability to respond to technological advancements and changing educational demands. Xu (2021) found that improving teachers' AI literacy not only helps optimize the teaching process but also enhances teachers' competitiveness and adaptability in their professional careers. However, current research shows that many vocational teachers remain at a basic level in this field, requiring systematic training and continuous learning to improve.

Moreover, teachers' teaching cognition in the context of AI is directly related to their ability to effectively respond to changing educational demands. Liu (2020) pointed out that with the widespread application of AI in education, teachers must reassess and adjust their teaching methods to better meet students' personalized learning needs and diverse development goals. Improving teachers' teaching cognition is essential for ensuring the quality and effectiveness of their teaching.

As for teachers' awareness of self-development, research indicates that the extent to which teachers value their professional development largely determines their ability to remain competitive in the AI era. Zhang et al. (2023) proposed that teachers need to increase their awareness of self-development in the AI era, actively exploring and mastering new technologies to adapt to the continuously changing educational environment. However, many teachers still have a vague understanding of this aspect, lacking clear development directions and effective strategies.

Finally, the level of role cognition among teachers is crucial in the transformation process during the AI era. Wang (2019) emphasized that with the rapid development of educational technology, the role of vocational teachers has shifted from traditional knowledge transmitters to technology guides and educational innovation promoters. However, due to the lag in policy support and the limitations of the educational environment, many teachers remain confused about their self-role cognition and struggle to accurately position themselves in these new roles. This situation not only limits teachers' professional development but also affects the overall quality of education.

In summary, the sustainable development of vocational teachers' roles in the AI era involves multiple key factors, including teachers' cognitive levels of AI, AI literacy, teaching cognition, awareness of self-development, and role cognition levels. How to enhance these abilities and cognition, thereby achieving the transformation and development of teacher roles, is an urgent issue in current educational research and practice.

### Research Objectives

The following objectives were addressed in this study:

1. To study the current state of role cognition among vocational teachers in Northern Guangdong under AI.
2. To explore the strategies for the sustainable development of vocational teachers' roles under AI.
3. To examine the feasibility of the strategies for higher vocational college teachers.

### Research Questions

Based on the objective above, the following research questions were posed:

1. What is the current state of role cognition among vocational teachers in Northern Guangdong under AI?
2. What are the strategies for the sustainable development of vocational teachers' roles under AI?
3. What is the level of the evaluation of the adaptability and feasibility of the strategies for higher vocational college teachers?

### METHOD

This study employed methods such as literature review, interviews, and surveys to conduct a questionnaire survey on the role cognition status and influencing factors of vocational teachers in Northern Guangdong under the context of artificial intelligence, and used evaluation methods to assess the feasibility of vocational teacher role development strategies.

### Population and Sample

This study focused on 2,689 full-time teachers from 5 vocational colleges in the northern cities of Guangdong province (Yuebei region).

According to Krejci and Morgan sampling table, the sample for this study consisted of 383 students from the five vocational colleges in northern Guangdong. These five vocational colleges are Heyuan Polytechnic College, Guangdong Meizhou Polytechnic College, Qingyuan Polytechnic College, Guangdong Songshan Polytechnic College, and Luoding Polytechnic College. A purposive sampling method was used to select 10 full-time teachers from the 5 vocational colleges as interviewees. An evaluation of sustainable development strategies for the roles of vocational teachers in Northern Guangdong under the context of artificial intelligence was conducted. These five experts all come from vocational colleges in Guangdong.

### Research Instruments

#### *The questionnaire*

The questionnaire method was used to investigate the role cognition status of vocational college teachers in China's vocational colleges under artificial intelligence background. The questionnaire included a total of 26 questions covering five aspects: (1) Vocational teachers' understanding of artificial intelligence (5 questions); (2) Vocational teachers' level of artificial intelligence literacy (5 questions); (3) Vocational teachers' awareness of teaching aspects (teaching content, methods, environment) under artificial intelligence (6 questions); (4) Vocational teachers' self-role awareness under artificial intelligence (4 questions); (5) Vocational teachers'

understanding of how artificial intelligence affects the development of teacher roles (6 questions).

### *Semi-structured interviews*

This study conducted semi-structured interviews with full-time teachers. The interviews focused on five main topics: 1) Vocational teachers' current opinions on artificial intelligence and suggestions for improving teachers' understanding of artificial intelligence; 2) Vocational teachers' current opinions on levels of artificial intelligence literacy and suggestions for enhancing teachers' artificial intelligence literacy; 3) Vocational teachers' opinions on the current level of teaching awareness under artificial intelligence and suggestions for improving teachers' teaching awareness level; 4) Vocational teachers' current opinions on self-development awareness under artificial intelligence, and suggestions for enhancing teachers' self-development awareness level; 5) Vocational teachers' current opinions on role cognition under artificial intelligence, and suggestions for optimizing teachers' role awareness. A total of 10 full-time teachers were interviewed, and after processing, the interview results will serve as the basis for formulating appropriate strategies.

### *Evaluation form*

The 5 experts to rate and evaluate 23 strategies for adaptability and feasibility.

Before data collection, approval was obtained from five vocational schools and ten professional experts. All participants were informed and voluntarily agreed to participate in the questionnaire. The research process was as follows:

1. The research objectives were stated. The literature on the current status of vocational teachers' role cognition under artificial intelligence was reviewed and the research objectives were determined by identifying existing issues.
  2. The research tools were validated.
  3. The questionnaire "Role Cognition of Vocational Teachers in Northern Guangdong under Artificial Intelligence," semi-structured interview outline "Role Cognition of Vocational Teachers in Northern Guangdong under Artificial Intelligence," and evaluation form "Role Strategy Assessment of Vocational Teachers in Northern Guangdong under Artificial Intelligence" were developed using the International Olympic Committee analysis method, and their reliability and validity were tested.
  4. Semi-structured Interviews. We interviewed 10 full-time teachers, discussed and improved the influencing factors and suggestions for sustainable development of vocational teachers' roles in Northern Guangdong under artificial intelligence, and invited 5 experts to rate and evaluate 23 strategies for adaptability and feasibility.
- 4) Data processing and analysis. The collected data was processed and analyzed using the SPSS 27.0 statistical software.

### **Data Analysis**

The data analysis in this study was conducted as detailed below: Descriptive statistics methods, including frequency and percentage, were used to analyze respondents' personal information, categorized by gender, teaching grade, subject taught, education level, etc., while mean and standard deviation were used to analyze the current status of vocational teachers' role cognition under artificial intelligence and its influencing factors. These measures were also used to evaluate the adaptability and feasibility of improving sustainable development strategies for vocational teachers' roles under artificial intelligence. Other analysis methods that were used included content analysis of the structured interviews on sustainable development strategies for vocational teachers' roles under artificial intelligence, combined with SWOT and PEST analysis, to draft strategies for sustainable development.

## **RESULTS**

### **Demographics**

The results of the analysis of the personal information of the respondents is presented in Table 1.

An examination of the demographics of the sample, as shown in Table 1, indicates a balanced distribution of different categories of each of these variables, including gender, age, teaching experience, teaching subject, teaching grade, and educational background. This study involved a total of 338 effective participants, all of which were fairly balanced in terms of gender, age, teaching age, teaching grade and teaching subjects. It can be seen that the overall distribution of the population surveyed in this questionnaire was relatively uniform.

### **Current State of Role Cognition Among Vocational Teachers**

The results of the first research question, *What is the current state of role cognition among vocational teachers in Northern Guangdong under AI?* are presented in Table 2.

According to Table 2, the higher vocational teachers' overall cognition of the teacher's role in the context of artificial intelligence is at a medium level ( $M=3.14$ ,  $SD = 0.84$ ). From the average values of the five dimensions, the teachers are at a medium level in all dimensions. The following is the ranking of each level, from high to low: the first is the cognition of the level of artificial intelligence literacy ( $M=3.46$ ), the second is the cognition of artificial intelligence ( $M=3.11$ ), the third is the self-development awareness ( $M=3.08$ ), the fourth is the cognition of teaching content and teaching methods in the context of artificial intelligence ( $M=3.04$ ), and the fifth is the cognition of self-role awareness ( $M=3.01$ ).

### **Strategies for Sustainable Development Of Vocational Teachers' Roles Under AI**

The data of the second research question, *What are the strategies for the sustainable development of vocational teachers'*

**Table 1.** Personal information of participants (n=338)

Personal information	Number of people	Percentage (%)
Gender		
Male	160	47.33
Female	178	52.67
Total	338	100
Age		
30 years old and below	92	27.22
31~40 years old	90	26.63
41~50 years old	87	25.74
51 years old and above	69	20.41
Total	338	100
Teaching experience		
0~10 years	180	53.25
11~20 years	116	34.32
More than 20 years	42	12.43
Total	338	100
Teaching grade		
First Grade	124	36.69
Second Grade	112	33.14
Third Grade	102	30.18
Total	338	100
Teaching subject		
science	170	50.30
liberal arts	168	49.70
Total	338	100
Educational background		
Bachelor degree	98	28.99
Master's degree	180	53.25
Doctoral degree	60	17.76
Total	338	100

roles under AI?, was analyzed using content analysis of interviews on strategies to promote sustainable development of higher vocational teachers' roles. The results are presented in Table 3.

Based on semi-structured interviews, this study analyzed the aforementioned SWOT, PEST, and TOWS methods and proposed a draft strategy for the sustainable development of the role of higher vocational teachers under artificial intelligence. These draft strategies are based on the questionnaire results and identify the items with the lowest average core for each variable. These suggestions are supported by the interview results and related literature. The draft strategy mainly encompasses five aspects and a total of 20 measures.

According to the research question no. 3 What is the level of the evaluation of the adaptability and feasibility of the strategies for higher vocational college teachers? The researchers wanted to present the results strategies for the sustainable development of vocational teachers' roles widely recognized as follow in Table 4.

**Table 2.** Analysis of the current state of role cognition of teachers in higher vocational colleges in northern Guangdong under artificial intelligence

(n=338)	M	SD	Level	Order
Awareness of artificial intelligence	3.11	0.91	medium	2
AI literacy	3.46	0.66	medium	1
Teaching content and methods	3.04	0.89	medium	4
Self-role awareness	3.01	0.88	medium	5
Self-development awareness	3.08	0.87	medium	3
Total	3.14	0.84	medium	

The adaptability and feasibility evaluation and analysis results of sustainable development strategies for the roles of higher vocational teachers under artificial intelligence. Data are presented in the form of mean and standard deviation.

According to Table 5, the data show that the experts' overall evaluation of the adaptability and feasibility of the strategy is very high, with the overall evaluation of feasibility being the highest ( $=4.73$ ), and the overall evaluation of adaptability is also at a high level ( $M=4.61$ ), indicating that the strategy has high adaptability and feasibility.

## DISCUSSION

1. The current state of role cognition among vocational teachers in Northern Guangdong under AI revealed that the cognitive awareness of High Vocational school teachers towards artificial intelligence in Northern Guangdong is at a moderate level, largely due to insufficient understanding of AI's basic concepts, limited application in teaching, and a lack of depth in comprehending AI's impact on education (Li, 2020; Zhang, 2019). This aligns with Li's (2020) and Y. Zhang's (2019) perspectives that teachers' literacy in AI is crucial for effective educational technology implementation. The cognitive awareness of teachers' literacy level is similarly moderate, affected by an incomplete incentive mechanism for AI usage, insufficient national promotion, and an underdeveloped training system (Li, 2020; Y. Zhang, 2019; Xu, 2021). X. Zhang (2019) and Xu (2021) emphasize that the technological environment and incentive systems need enhancement to boost teachers' enthusiasm for adopting AI. The teaching cognition level is also moderate, hindered by inadequate incentive mechanisms, imperfect training systems, and insufficient national promotion of AI education, which inhibit teachers' in-depth understanding of AI's educational potential (Li, 2020; X. Zhang, 2019; Xu, 2021). This situation is exacerbated by the mismatch between current training systems and teachers' actual needs (Xu, 2021). In terms of self-development cognition, teachers show a moderate level of understanding, influenced by their perception of technological changes, career planning clarity, and research innovation capabilities (Zhang

**Table 3.** Strategies and frequency statistics of development strategies

No.	Strategy	Interviewee										f
		1	2	3	4	5	6	7	8	9	10	
1	Organize AI technology training and seminars	√		√				√	√		√	5
2	Strengthen the cultivation and learning of intellectual literacy	√	√		√	√		√	√	√	√	8
3	Carry out practical technical training			√	√			√		√	√	5
4	Widely publicize the applications and advantages of AI technology	√			√	√						4
5	Establish support mechanisms to cope with technological change	√		√		√				√		4
6	Clarify misunderstandings about AI technology through special lectures, case studies, etc.		√				√	√				3
7	Organize a visit				√	√				√	√	3
8	Strengthened publicity		√				√	√				3
9	Establish the concept of lifelong learning				√		√		√	√		4
10	Increase investment in teaching resources	√		√		√	√					4
11	Promote the intelligent upgrade of teaching platforms	√	√		√		√		√	√		5
12	Update teaching concepts	√		√		√	√			√		5
13	Strengthen the promotion and training of student-centered teaching concepts	√	√		√		√		√	√		6
14	Encourage teachers to innovate teaching methods			√		√	√		√			4
15	Establish a sound teaching feedback mechanism		√		√		√		√	√	√	5
16	Actively seek support from the government and society	√	√	√					√	√	√	6
17	Regularly carry out teaching concept updates and innovation training	√	√			√			√			4
18	Strengthen interdisciplinary cooperation and exchanges	√	√	√			√	√		√		7
19	Strengthening school-enterprise cooperation	√				√			√	√	√	5
20	Establish incentives for professional development	√	√			√		√	√			6
21	Strengthen ethics and privacy education		√							√	√	3
	Total	13	11	8	9	9	8	8	10	13	9	

**Table 4.** List of strategies

No.	Aspects of Strategies	Number of strategies	Numbers of measures
1	Strategies for Awareness of artificial intelligence	4	6
2	Strategies for Teacher AI literacy	4	6
3	Strategies for teaching content and methods	4	5
4	Strategies for Self-development awareness	4	5
5	Strategies for Self-role awareness	4	6
Total	5	20	28

et al., 2021; Li, 2021; Liu, 2022). Vocational colleges should enhance technical training and career guidance to address these gaps (Li, 2021). Additionally, the role cognition level of High Vocational school teachers remains moderate, influenced by AI literacy, self-role understanding, national policies, and shifting student needs (Wang, 2019; Y. Zhang, 2019). The rapid development of AI has redefined teachers' roles from mere knowledge disseminators to technology guides, but the lack of clear policy direction and organizational support limits role cognition (Wang, 2019; W. Zhang, 2019). National policies and social environments significantly impact role cognition, and the current lag in policy adaptation, along with rapid student needs changes, has left many teachers struggling to adapt (Liu, 2020). Therefore, improving High Vocational school teachers'

cognitive awareness in the context of AI requires not only enhanced literacy but also policy reforms, optimized training systems, and robust support mechanisms to facilitate adaptation to technological and student demand shifts (Xu, 2021; Liu, 2020).

- The strategies for the sustainable development of vocational teachers' roles under AI consisted of five aspects and 20 measures. The strategies to improve the cognitive level of higher vocational teachers towards artificial intelligence (AI) involve several measures such as strengthening policy support, enhancing professional training, emphasizing ethics and privacy protection, and reinforcing occupational stability to reduce regional disparities. These recommendations align with the views of Ofojebe and Ezugoh (2010), who highlight the significance of clear policy support and systematic training

**Table 5.** Mean and standard deviation of expert evaluation on adaptability and feasibility strategies of higher vocational teachers under artificial intelligence

Assessment checklist	Adaptability			Feasibility		
	$\bar{X}$	S.D.	Level	$\bar{X}$	S.D.	Level
1. Strategies to improve teachers' understanding of artificial intelligence	4.53	0.42	highest	4.83	0.41	highest
1.1 Strengthen policy support	4.40	0.55	high	4.85	0.35	highest
1.2 Strengthen publicity efforts	4.75	0.40	highest	4.88	0.45	highest
1.3 Organize professional training	4.35	0.20	high	4.84	0.45	highest
1.4 Strengthen ethics and privacy protection education	4.65	0.55	highest	4.75	0.40	highest
1.5 Strengthening career stability and reducing the impact of regional differences	4.53	0.40	highest	4.83	0.38	highest
2. Improving teachers' intelligence literacy and ability strategies	4.70	0.28	highest	4.85	0.22	highest
2.1 Increase investment in construction funds	4.75	0.00	highest	5.00	0.00	highest
2.2 Strengthening intelligence literacy training	4.80	0.45	highest	5.00	0.45	highest
2.3 Promoting collaboration between schools and society	4.60	0.25	highest	4.60	0.00	highest
2.4 Promoting interdisciplinary integration	4.65	0.45	highest	4.80	0.45	highest
2.5 Regional support program to improve AI literacy of teachers in underserved areas	4.71	0.27	highest	4.84	0.23	highest
3. Deepening teachers' teaching cognitive strategies	4.65	0.37	highest	4.48	0.26	high
3.1 Promoting teaching innovation of human-computer collaboration	4.55	0.20	highest	4.60	0.20	highest
3.2 Optimizing teaching resources to promote educational equity	4.80	0.45	highest	4.20	0.40	high
3.3 Establish learning communities and share resources	4.65	0.40	high	4.45	0.00	high
3.4 Improve teaching evaluation mechanism	4.60	0.45	highest	4.70	0.45	highest
4. Improving teachers' self-development Cognitive strategies	4.40	0.30	high	4.60	0.25	highest
4.1 Enhance teachers' awareness of technological change	4.65	0.20	highest	4.60	0.00	highest
4.2 Improve teachers' career development planning	4.10	0.30	high	4.75	0.45	highest
4.3 Enhance scientific research and innovation capabilities	4.25	0.25	high	4.45	0.10	high
4.4 Promoting teachers' professional growth and lifelong learning	4.60	0.45	highest	4.60	0.45	highest
5. Improve teachers' self-awareness of their roles	4.80	0.31	highest	4.92	0.18	highest
5.1 Help teachers change and adapt to their roles	4.80	0.30	highest	5.00	0.00	highest
5.2 Establish a life-oriented role consciousness	4.75	0.40	highest	4.90	0.40	highest
5.3 Improve teachers' professionalism and abilities	4.85	0.20	highest	5.00	0.00	highest
5.4 Improve teachers' self-efficacy	4.80	0.35	highest	4.80	0.35	highest
5.5 Develop a personalized role recognition enhancement plan	4.81	0.30	highest	4.91	0.19	highest
Total	4.61	0.34	highest	4.73	0.22	highest

in improving teachers' technological understanding and application, as well as Wang et al., (2022), who suggest that increased publicity and ethics education can boost AI awareness among teachers. Furthermore, addressing regional disparities through reinforced occupational stability is consistent with Jiang and Nielsen (2019), who emphasize the importance of teacher stability for embracing technological changes. In the context of Northern Guangdong, strategies for improving AI literacy levels include enhancing infrastructure investment, professional training, and interdisciplinary collaboration, as discussed by Wang (2017), Shen and Wang (2016), and Song and Feng (2018). Additionally, promoting regional support and integrating policy measures to aid teachers in underdeveloped areas are recommended by Cui (2018). In terms of enhancing teaching strategies, researchers suggest measures such as promoting human-machine collaboration, optimizing

teaching resources, and establishing learning communities to facilitate resource sharing and knowledge exchange, which are supported by Chen and Liu (2016), Ji (2017), and Zhang (2018). The emphasis on creating scientific and reasonable evaluation standards to improve teaching assessments is crucial for aligning teaching practices with AI, as highlighted by Song and Feng (2018). Meanwhile, improving self-development cognitive awareness through better career planning and lifelong learning is recommended by Li and Zhang (2018), Wang (2019), and Zhao (2020), who suggest that comprehensive support from schools is necessary for teachers to adapt to AI-driven changes. Finally, the adaptation of teachers' roles through targeted training and establishing student-centered approaches is proposed by Li (2019) and Liu (2020), who emphasize continuous professional development and the creation of professional learning communities to enhance teachers' competence

and confidence in the AI context. These strategies are further supported by Cui and Huang (2020), who advocate for regional support programs to bridge educational resource gaps and promote equity across different regions.

3. The overall evaluation of the adaptability and feasibility of the strategy is very high could discuss that The strategies to enhance High Vocational school teachers' cognitive levels of artificial intelligence are considered highly adaptable and feasible due to the rapid development of AI technology, which imposes new requirements on vocational education. Teachers need to elevate their cognitive levels to effectively guide students in addressing future career challenges and ensuring the modernization of educational content and methods, as emphasized by Li (2020) and W. Zhang (2019). Similarly, improving AI literacy is crucial because the extensive application of AI is rapidly changing the skill requirements across various industries. Teachers must not only grasp basic AI knowledge but also possess practical skills to drive curriculum reform and enhance teaching quality (Wang, 2021; M. Zhang, 2021). Additionally, optimizing the cognitive teaching levels of vocational schoolteachers ensures they can effectively address the new teaching environments and educational requirements brought by AI, thereby enhancing both teaching quality and student learning outcomes (Liu, 2020; Zhang, 2021). In terms of self-development cognition, rapid AI advancements require teachers to continuously update their self-awareness to adapt to the evolving educational environment, thereby promoting active learning of new technologies and enhancing professional competence (Li, 2020; Wang, 2021). Finally, improving teachers' cognitive role awareness is critical as AI profoundly transforms education. Vocational teachers must evolve from knowledge transmitters to learning facilitators and supporters of innovation, aligning with the views of Liu (2020) and Zhao (2021) on reshaping teachers' roles in the AI era to respond effectively to these new challenges.

## CONCLUSION

The conclusion of the study based on the research questions could present as follows:

1. What is the current state of role cognition among vocational teachers in Northern Guangdong under AI?  
The higher vocational teachers' overall cognition of the teacher's role in the context of artificial intelligence is at a medium level ( $M=3.14$ ). From the average values of the five dimensions, the teachers are at a medium level in all dimensions. The following is the ranking of each level, from high to low: the first is the cognition of the level of artificial intelligence literacy ( $M=3.46$ ), the second is the cognition of artificial intelligence ( $M=3.11$ ), the third is the self-development awareness ( $M=3.08$ ), the fourth is the cognition of teaching content and teaching methods in the context of artificial intelligence ( $M=3.04$ ), and the fifth is the cognition of self-role awareness ( $M=3.01$ ). The standard deviations of each

dimension of teacher role cognition are between 0.6 and 1, indicating that the questionnaire design is reasonable and the survey results are credible and effective.

2. What are the strategies for the sustainable development of vocational teachers' roles under AI?  
Based on Semi-structured interviews, this study analyzed the aforementioned SWOT, PEST, and TOWS methods and proposed a draft strategy for the sustainable development of the role of higher vocational teachers under artificial intelligence. These draft strategies are based on the questionnaire results and identify the items with the lowest average core for each variable. These suggestions are supported by the interview results and related literature. The draft strategy mainly encompasses five aspects and a total of 20 measures.
3. What is the level of the evaluation of the adaptability and feasibility of the strategies for higher vocational college teachers?

The data showed that the experts' overall evaluation of the adaptability and feasibility of the strategy is very high, with the overall evaluation of feasibility being the highest ( $M=4.73$ ), and the overall evaluation of adaptability is also at a high level ( $M=4.61$ ), indicating that the strategy has high adaptability and feasibility.

The following recommendations could be offered based on the findings of our study:

1. Schools should implement comprehensive AI training programs to enhance teachers' technical proficiency. These programs should focus on interdisciplinary knowledge, AI application skills, and case-based learning to ensure that teachers can effectively integrate AI into their teaching practices and guide students in AI-related vocational skills.
2. Institutions should prioritize funding for AI-related infrastructure and provide access to advanced technology tools. This includes AI labs, teaching platforms, and data analysis tools, which will support teachers in adopting innovative teaching methods and staying updated with the latest AI advancements.
3. Educational policymakers should create a supportive framework that includes clear guidelines for the integration of AI in vocational teaching. Policies should address professional competency standards, provide continuous training incentives, and promote a supportive environment for teachers adapting to new AI roles.

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