


Teaching knowledge structure and professional development of primary school art teachers in China

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Abstract

The purpose of this study was to evaluate the teaching knowledge structure and professional development of Chinese primary school art teachers. Through literature review and survey research methods, this paper analyzed the teaching knowledge structure of primary school art teachers and explored the professional development challenges they face. Specifically, this study attempted to describe the profile of the respondents, including gender, age, education level, and tenure. The results showed that the majority of teachers were female, aged 36-45, with 11-20 years of teaching experience, and most of them have a bachelor's degree. The respondents' evaluation of teaching knowledge structure and professional development was generally positive. In terms of subject vision, subject knowledge, teaching methods, integration of technical subject knowledge, comprehensive technical teaching knowledge and professional development of primary school teachers, most of the indicators were satisfactory. This study provided an in-depth understanding and specific suggestions for the teaching knowledge structure and professional development of primary school art teachers, which is helpful to improve the quality of primary school art education and promote the professional growth of teachers. In this study, a descriptive method was used to select 385 teachers from more than 900 primary art teachers and teaching backbone in Nanning, Guangxi, China. Through questionnaire survey and literature analysis, data were collected and statistical analysis was carried out to understand the teaching knowledge structure and professional development of teachers. The survey subjects were primary school art teachers in Nanning, Guangxi, China, with a total of 385 teachers, including gender, age, education level and tenure. The results showed that the teaching knowledge structure of primary school art teachers mainly included art teaching theory, teaching method, curriculum design, student evaluation and so on. In terms of professional development, teachers generally believed that it was necessary to further improve the theoretical level of fine arts education, strengthen the ability of teaching practice, expand teaching resources and the ability to use information technology. According to the survey results, it was suggested to strengthen art education theory training, improve teaching practice ability, expand teaching resources, and strengthen

professional development support in the application of information technology. At the same time, it was suggested to provide more teaching guidance and resource support in the aspects of curriculum design and student evaluation to improve the quality of art education in primary schools. This study provides in-depth understanding and specific suggestions for the teaching knowledge structure and professional development of primary school art teachers, which is helpful to improve the quality of primary school art education and promote the professional growth of teachers.

Keywords: teaching knowledge structure, professional development, primary school art teachers

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1. Introduction

Art education, as an important part of cultivating students' aesthetic emotion, creativity and comprehensive quality, plays an important role in Chinese primary school curriculum. The art teaching knowledge level and professional development level of primary school teachers directly affect the quality of education and the overall growth of students. However, although China has a rich multi-ethnic cultural background, there are relatively few studies in this area, resulting in a research gap in the understanding of the current situation and needs of Chinese primary school art teachers. Therefore, it is necessary to deeply study the educational knowledge level and professional development needs of Chinese primary school art teachers, so as to provide useful information for policy formulation and practice, improve the quality of art education for students, and promote the professional growth of Chinese primary school art teachers.

The journal research titled “China's Regional Education System (2017)” found that China's regional education system is unique globally. With 56 ethnic groups, the Han ethnicity comprised the majority, while the remaining 55 were recognized as ethnic minorities. The diversity of ethnic cultures brings abundant resources and opportunities to education, yet it also poses challenges. In this context, primary school art education in China should emphasize the expression of cultural diversity to provide students with a broader visual experience. However, achieving this goal requires prioritizing the cultivation of professional quality among primary school art teachers, enabling them to better impart artistic knowledge, stimulate students' creativity, and meet the needs of students from different ethnic backgrounds. With the continuous changes of society, the era of science and technology has ushered in the rapid development of science and technology not only affects many industries of the public, but also has a particularly serious impact on the field of education. Through the experience of The Times and many educators, it is concluded that science and technology, as an indispensable auxiliary means of modern education, is changing and influencing the current development of education and teaching step by step. However, in order to adapt to the changes of The Times, the national and educational scholars have proposed from the policy level that the combination of science and technology and disciplines must be used to drive teaching more vividly through the assistance of science and technology, and attach great importance to the cultivation of scientific and technological information ability of teachers and educators. However, as an art discipline, fine art belongs to the visual art discipline and is deeply influenced by science and technology information education.

In this image era with the rapid development of information society, art teachers play a vital role in art education, and they shoulder the heavy responsibility of cultivating students' visual ability. With the continuous development of information technology, art teachers need to have good information literacy and make full use of information technology to design art courses. Under the dual promotion of society and policy, the professional development of primary school art teachers is bound to be closely related to technology, and their teaching knowledge structure has also changed, and technical knowledge has become an indispensable part of it. (Wang, et. al., 2020)

Since 2000, the implementation of the new curriculum reform has brought opportunities and challenges to the professional development of primary school art teachers. The release and implementation of the Art Curriculum Standards for Compulsory Education (2020 edition) is a new milestone in China's art education reform. The new curriculum standard concept and new teaching materials emphasize the overall development of students, pay attention to the improvement of students' comprehensive quality, and promote the lifelong development of students as the principle, through organizing students to carry out cooperative learning and inquiry learning, build a student-oriented humanistic situational art classroom. As the main body of curriculum

reform, art teacher's professional development is imperative. In the information society, the role of art teachers has become increasingly critical. They are tasked with developing students' visual skills to aid in their comprehension and creation of images, while also possessing strong information literacy to integrate technology into art education effectively. This highlights the necessity for primary school art teachers to continuously evolve their professional knowledge structure, with technical expertise now constituting a significant component of their teaching knowledge. Despite the growing importance of technical knowledge in primary school art education, research on the teaching knowledge structure of primary school art teachers remains limited. It is imperative to delve deeply into their teaching knowledge structure, encompassing their proficiency in art education theory, application of teaching methods, and understanding of subject knowledge. Moreover, while acknowledging the close relationship between professional development and technology application for primary school art teachers, specific research on this correlation remains scant. There is a need to further explore how professional development influences art teachers' technology application and how technology application, in turn, fosters teachers' professional development. Addressing these research gaps will contribute to a more comprehensive understanding of art teachers' teaching practices in primary schools, enabling more effective support and guidance for enhancing the quality of art education (Wang, 2018).

Therefore, the purpose of this study was to delve deeply into the educational knowledge level and professional development needs of Chinese primary school art teachers. Through methods such as investigation, interviews, literature review, and classroom observation, the aim was to comprehensively understand the knowledge structure, current status, and development requirements of primary school art teachers. The objective of this study was not only to address existing research gaps but also to provide crucial insights for policymakers and practitioners in the field of fine arts education. This will facilitate the enhancement of the quality of student fine arts education and support the professional growth of Chinese primary school art teachers. In the contemporary information age, the rapid advancement of technology presents both challenges and opportunities for art education. This study will shed light on the current situation and needs of primary school art teachers in navigating these challenges and leveraging these opportunities. Additionally, through a thorough understanding of the knowledge structure and professional development needs of primary school art teachers, valuable references can be provided for future teacher training and educational policy formulation. This will contribute to the sustainable development of primary school art education in China and offer a more profound theoretical basis and empirical evidence for research and practice in the field of art education.

Objectives of the Study - The purpose of this study was to determine the art teaching knowledge structure and professional development of primary school teachers. The study examined the significant impact of these two variables on art education teachers in China to maintain sustainable development of art education to primary schools. More specifically, this study aimed to determine the teaching knowledge structure in terms of discipline vision, subject knowledge, knowledge about teaching methods, integration of technical subject knowledge and integrated pedagogical knowledge of technology; to identify the professional development in terms of knowledge, skills and attitude; test the significant relationship between the two variables and propose a plan to enhance teachers professional development.

2. Methods

Research Design - This study adopts a descriptive research approach to comprehensively collect detailed insights into the educational knowledge level and professional development needs of Chinese primary school art teachers. This approach facilitates a nuanced understanding of the main conditions and variables being examined. Specifically, this study attempts to explore the impact of teachers' educational knowledge level and professional development needs on students' learning outcomes and on the overall quality of school art education in the context of Chinese primary school art education. In summary, the research design combined descriptive, investigative and relevant methods to help comprehensively and deeply understand the educational knowledge level and professional development needs of Chinese primary art teachers, and provided valuable insights for policy formulation and practice in the field of art education.

Participants of the Study - The training targets were primary school art teachers and teaching backbone in seven districts of Nanning City. Nanning has trained more than 900 primary school art teachers and teaching backbone. From this number, 385 samples were constructed using the Rao soft calculator. The researchers employed simple random sampling to select the participants deliberately. This method enabled them to choose individuals who were able to attend various trainings prior to their appointments (Richards & Morse, 2022).

Data Gathering Instrument - This study used an adapted questionnaire from different sources. The researchers prepared an online survey using Wenxing, the most widely used online survey, examination, assessment and voting platform in China, with flexible questionnaire production, questionnaires suitable for different terminals, real-time online statistical data collection, and the ability to view mobile phone data at any time. The survey consisted of three parts. The first part collected the personal information of the respondents, the second part investigated the teaching knowledge structure of the participants for art teachers, and the third part assessed the professional development of the participants for art teachers.

The first part focused on the art teaching knowledge structure of primary school teachers. It included five parts (subject vision, subject knowledge, teaching method knowledge, integration of technical subject knowledge, comprehensive technical teaching knowledge). Each section contained a set of statements related to the structure of the taught knowledge, and respondents were asked to rate their level of agreement on a scale from strongly agree (4) to disagree (1). These statements covered all aspects of teaching knowledge structure, teachers' knowledge of subject development, historical evolution, teaching methods, and how they adjusted teaching pace and style in classroom teaching, evaluated student performance, and used appropriate technology to support teaching activities. This was adapted from "Research on teaching knowledge structure of art teachers in primary schools with integrated technology", Northeast Normal University, Doctoral dissertation. (Wang, et. al., 2020).

The second part focused on the professional development of primary school teachers, including three parts (knowledge, skills, attitudes). Each section contained a set of overviews related to teacher professional development, and respondents were asked to rate their level of agreement on a scale from strongly agree (4) to disagree (1). These statements covered a range of perspectives on educators' teaching theories and methods, student needs and characteristics, teaching skills, and attitudes. Educators' understanding of pedagogy, psychology, curriculum teaching theories and methods, teaching evaluation, teaching design, and their ability to apply the theories and methods learned in teaching practice, use technology to support teaching, manage the classroom, create a positive learning environment, motivate students to learn, personalize teaching to meet the needs of different learners, Collaboration with other teachers and colleges, as well as a love of the teaching profession, an attitude of continuous learning and growth. This part contains a total of 29 items, all of which are adapted from the Teacher Professional Development Level Scale adapted from the Teacher Professional Development Level Scale in Chen Lixin's Educational Research (2018), and have good validity in the evaluation of professional development level nationwide.

The content of the instrument used in this study underwent a rigorous validation and validation process to ensure its reliability. First, the instrument was reviewed and validated by a panel of experts in the field to ensure that it adequately measured the intended construct. Subsequently, the research instrument was tested for reliability. The following are the results of the reliability testing of the components of the tool: According to the results of the reliability measurement scale, the instrument used in this study showed good reliability on all indicators. Cronbach's alpha value of About discipline vision was 0.848, and that of Subject knowledge was 0.863. Knowledge about teaching methods Cronbach's alpha was 0.867, of course, Cronbach's alpha of Integrated pedagogical knowledge of technology was 0.921; Cronbach's alpha of Knowledge was 0.929. Cronbach's alpha value of Attitude was 0.913. However, the Cronbach's alpha of Integration of technical subject knowledge was 0.755, but was still at an acceptable level. Based on the reliability measurement results used in this study, it can be concluded that the tool has good reliability and reliability in measuring the teaching knowledge structure and professional development related indicators of Chinese primary school art teachers.

Data Gathering Procedures - The data collection process for this study included the use of a valid questionnaire and a rating scale to collect data from respondents. The online questionnaire was produced through Wanxing, China's largest online survey, examination, assessment and voting platform. The questionnaire consisted of three parts. With the consent of the staff of the Education Bureau of Nanning, Guangxi, China, the questionnaire was distributed to in-service primary school art teachers and key teachers who met the research criteria. Data collection for this questionnaire stopped after 397 participants responded, and a total of 385 complete and valid questionnaires were obtained.

Data Analysis - To perform data analysis, the following statistical tools was used. Weighted means and ranking were used to determine the teaching knowledge structure in terms of discipline vision, subject knowledge, knowledge about teaching methods, integration of technical subject knowledge and integrated pedagogical knowledge of technology and professional development in terms of knowledge, skills and attitude. Likewise, Spearman rho was used to test the significant relationship of the treated variables. In addition, post hoc test was also be conducted. In addition, all data were treated using a statistical software known as PASW version 26 to further interpret the result of the study using an alpha level of 0.05 and 0.01.

Ethical Considerations - To protect the privacy of the respondents, the researchers avoided revealing any personally identifiable information. The researcher ensured personal interactions with participants, respect their privacy, and seek their consent before accessing any sensitive information. When conducting the analysis, priority was given to participants and ensured that their data were accurately represented in the study. The researcher did not express personal opinions, but presented information and conclusions drawn from the collected data. The researcher assured respondents that their responses were confidential and informed them that the survey would be used only for the purposes of this study.

3. Results and discussion

Table 1
Summary Table on Teaching Knowledge Structure

Indicators	Weighted Mean	Verbal Interpretation	Rank
Discipline vision	3.14	Agree	1
Subject knowledge	2.98	Agree	2.5
Knowledge about teaching methods	2.98	Agree	2.5
Integration of technical subject knowledge	2.97	Agree	4
Integrated pedagogical knowledge of technology	2.96	Agree	5
Composite Mean	3.01	Agree	

Legend: 3.50 – 4.00 = Strongly Agree; 2.50 – 3.49 = Agree; 1.50 – 2.49 = Disagree; 1.00 - 1.49 = Strongly Disagree

Table 1 is a summary of teaching knowledge structure, and the composite average of the results is 3.01, indicating that Chinese primary school art teachers were consistent in five indicators: subject vision, subject knowledge, education method knowledge, technical subject knowledge integration, and comprehensive technology teaching knowledge, and had a positive impact on the teaching knowledge structure of Chinese primary school art teachers. Chinese primary school art teachers have shown a higher level in all aspects of teaching knowledge structure, and they have a more comprehensive understanding and mastery of subject vision, subject knowledge, educational methods, integration of technical subject knowledge and comprehensive teaching knowledge. This consistency and motivation helps to improve the teaching level and quality of teachers, which in turn promotes the learning and development of students. Li (2019) conducted an empirical study on the teaching knowledge structure of art teachers in primary schools in China and found that teachers' integrated use of technology and mastery of comprehensive teaching knowledge showed their flexible use of teaching tools and methods, which helped them better adapt to different teaching environments and students' needs. The in-depth understanding of subject knowledge and educational methods also provides them with more abundant teaching resources and strategies, which is conducive to improving teaching effects and promoting students' learning.

The weighted average of "subject vision" was 3.14, which was the highest among all indicators, while the other four indicators were relatively average, indicating that teachers believed that subject vision was relatively

more important, because it determined the depth and breadth of teaching content, influenced the choice of teaching methods and strategies, aligned with teaching objectives, and played an important role in teachers' personal development. By deeply understanding the nature and development dynamics of the subjects taught, teachers can better grasp the key and difficult points of teaching, choose more appropriate teaching methods and strategies, ensure that the teaching content matches the teaching objectives, and improve the teaching quality.

Subject vision can help teachers grasp the key and difficult points of teaching, and carry out teaching design and teaching arrangement more effectively. Having a good subject vision can improve teachers' sensitivity to the development trend of the subject, update the teaching content and methods in time, and keep the teaching vitality. Teachers can better communicate and cooperate with their peers, share teaching experience and resources, and promote the improvement of teaching level. However, Wang (2018) also pointed out in his research that focusing too much on disciplinary vision may neglect the importance of other teaching knowledge areas, resulting in single teaching content, lack of diversity and innovation. Too narrow discipline vision may lead to teachers' lack of ability in interdisciplinary integration and affect the quality of comprehensive teaching.

Table 2
Summary Table on Professional Development

Indicators	Weighted Mean	Verbal Interpretation	Rank
1. Knowledge	2.99	Agree	2
2. Skills	3.11	Agree	1
3. Attitude	2.96	Agree	3
Composite Mean	3.02	Agree	

Legend: 3.50 – 4.00 = Strongly Agree; 2.50 – 3.49 = Agree; 1.50 – 2.49 = Disagree; 1.00 - 1.49 = Strongly Disagree

Table 2 is a summary of professional development, and the composite average of the results was 3.02, indicating that the indicators of professional development and teaching knowledge structure of Chinese primary school art teachers were consistent, which had a positive impact on Chinese primary school art teachers. This means that there was a positive correlation between teachers' professional development and teaching knowledge structure, that is, with the improvement of teachers' professional development, their teaching knowledge structure was correspondingly improved and enriched. This may mean that in the process of professional development, teachers not only improve their own education level and professional accomplishment, but also better understand and apply teaching knowledge, thus improving the quality and effect of teaching. This finding provides an important reference for teacher training and development, emphasizes the close correlation between professional development and teaching knowledge structure, and encourages teachers to pay attention to the accumulation and improvement of teaching knowledge in the process of career development. Wang (2018) pointed out in their research that continuous professional development can improve the professional quality and competitiveness of teachers, and help them obtain more career development opportunities, such as promotion, post adjustment and education management. Teachers can continuously improve their own education level and teaching ability, better guide and stimulate students' learning interest, improve students' learning effect and comprehensive quality.

The weighted average of "skills" was 3.11, ranking first among the three indicators; the weighted average of "knowledge" was 2.99, ranking second among the three indicators; the weighted average of "attitude" was 2.96, ranking third among the three indicators, indicating that the development of teachers' skills was considered the most important. Because it plays a direct and practical role in teachers' teaching practice. The second is the development of knowledge, teachers need to constantly be updated and enrich their knowledge reserves to adapt to the changing educational environment and students' needs. Attitudinal development is also crucial, as teachers' attitudes have a direct impact on their teaching effectiveness and relationships with students, parents and colleagues. (Li, 2019) also pointed out in his research that teachers' professional development needs all-round and multi-angle improvement, among which skills, knowledge and attitude are the most critical aspects.

Table 3
Relationship Between Teaching Knowledge Structure and Professional Development

Discipline vision	rho-value	p-value	Interpretation
Knowledge	.374**	0.000	Highly Significant
Skills	.331**	0.000	Highly Significant
Attitude	.195**	0.000	Highly Significant
Subject knowledge			
Knowledge	.502**	0.000	Highly Significant
Skills	.334**	0.000	Highly Significant
Attitude	.167**	0.001	Highly Significant
Knowledge about teaching methods			
Knowledge	.181**	0.000	Highly Significant
Skills	.347**	0.000	Highly Significant
Attitude	.375**	0.000	Highly Significant
Integration of technical subject knowledge			
Knowledge	.198**	0.000	Highly Significant
Skills	.308**	0.000	Highly Significant
Attitude	.517**	0.000	Highly Significant
Integrated pedagogical knowledge of technology			
Knowledge	.633**	0.000	Highly Significant
Skills	.257**	0.000	Highly Significant
Attitude	.580**	0.000	Highly Significant

Legend: Significant at p -value < 0.01

Table 3 presents the association between teaching knowledge structure and professional development. The computed R-values indicates a moderate direct correlation and the resulted p-values were less than the alpha level. This means that there was significant relationship exists and implies that the better is the teaching knowledge structure, the better the is the professional development. There was an obvious relationship between Discipline vision and Knowledge, Skills and Attitude. It showed that the wider the subject vision of teaching knowledge structure, the more comprehensive the professional development of teachers. Liu, et. al., (2019) In the preliminary design of teaching knowledge structure, the incentive effect of teachers' motivation to participate in professional development should be considered in order to conform to the intrinsic attributes of teachers' motivation for professional development. Teachers who participate in teacher professional development activities are more inclined to choose activities that can improve teaching skills and promote students' learning and development, which is in line with their love and responsibility for education.

Subject knowledge is obviously related to Knowledge, Skills and Attitude. It shows that the richer the subject knowledge of teaching knowledge structure, the more comprehensive and in-depth the professional development of teachers (Wang, et. al., 2020). In the design of teaching knowledge structure and professional development, it should be considered that teachers should pay attention to the comprehensiveness and depth of subject knowledge in the design of teaching knowledge structure and professional development, flexibly use teaching methods and strategies, constantly improve professional quality and teaching skills, continue to reflect and improve, and actively participate in academic research and innovative practice. And strengthen cooperation and exchanges with the teacher community to jointly promote the improvement of teaching quality and professional development. Knowledge about teaching methods is also significantly related to Knowledge, Skills and Attitude. The more extensive and comprehensive the Knowledge about teaching methods, the more flexible and innovative the professional development of teachers will be. Chen (2018) Teachers should consider constantly updating and enriching their knowledge of teaching methods, and constantly learning new teaching concepts, methods and skills. At the same time, teachers should actively participate in teaching practice and teaching innovation activities, and constantly try and apply new teaching methods to improve their teaching level and professional quality. In addition, teachers should pay attention to the latest trends in subject development and the application of educational technology, and constantly explore innovative methods and tools suitable for their own teaching practice, so as to better meet the learning needs of students and promote the continuous improvement and development of education and teaching.

In the integration of technical subject knowledge, there was also an obvious relationship between Knowledge, Skills and Attitude. It showed that the more comprehensive and in-depth the Integration of technical subject knowledge, the more innovative and practical the professional development of teachers will be. Pay attention to the integration of technical subject knowledge and teaching practice, combine theoretical knowledge with practical teaching, and promote the innovation and practicality of professional development. Carry out teaching practice activities continuously, accumulate rich teaching experience, strengthen the understanding and application of teaching methods and teaching resources. Actively participate in teaching research and professional development activities, exchange experiences with peers, and continue to learn and grow. Pay attention to students' learning needs and development, adjust teaching methods and teaching contents according to different students' characteristics and needs, and realize the organic combination of teaching knowledge structure and professional development.

In the integrated pedagogical knowledge of technology, there was also an obvious relationship between Knowledge, Skills and Attitude. In the design of teaching knowledge structure and professional development, teachers should consider deepening and expanding technology teaching knowledge, improving the innovation ability of teaching methods, and cultivating a good educational attitude, so as to adapt to the changing educational environment and promote the all-round development of students. Teachers' Discipline vision, Subject knowledge, Knowledge about teaching methods, Integration of technical subject knowledge and Integrated pedagogical knowledge of technology are closely related to teachers' teaching knowledge structure. There is a strong positive correlation, which plays a very important role in the professional development of teachers.

Table 4

Proposed Plan to Improve the Teaching Knowledge Structure and Professional Development of Chinese Primary Art Teachers

Key Result Area	Activities	Strategies	Success Indicators	Persons Involved
Teaching knowledge structure 1.1. Integrated pedagogical knowledge of technology	By improving teachers' comprehensive technology teaching knowledge level and teaching methods, teaching quality can be effectively improved and students' learning experience can be enhanced.	1. Determine teachers' training needs for integrated technology teaching knowledge structure and teaching methods: Survey and interview teachers to assess their specific training needs and preferences in integrated technology teaching knowledge. 2. Analyze feedback and identify public areas that need improvement, such as curriculum design, teaching evaluation, comprehensive technical knowledge acquisition, etc. 3. Develop a training plan for comprehensive technology teaching knowledge structure and teaching methods: Cooperate with technical experts, education experts and teaching designers to design a comprehensive training plan for comprehensive technology teaching knowledge structure and teaching methods according to the background and needs of the school. 4. Ensure that the training content includes in-depth study of comprehensive technical knowledge, flexible application of teaching methods, innovation of course design, etc.	90% of teachers must participate in training with a basic understanding of integrated technology teaching knowledge.	University management, all teachers.
1.2. Educational technology and information literacy	By improving the educational technology and information literacy of teachers, we effectively	1. Training in the effective use of educational technology: Organize workshops and seminars to improve teachers' skills in the field of educational technology, including the use of instructional software, multimedia instructional design and online instructional platforms. Through role-playing exercises,	Ensure that 90% of teachers participate in training and gain an understanding of basic strategies for	University management, all teachers.

	support and assist teachers, staff, students and parents to create a positive learning environment.	teachers can practice the effective application of educational technology in simulated scenarios. 2. Build digital Partnerships: Organize conferences to highlight the importance of building digital partnerships with parents, community members and other stakeholders. Teachers and principals can work with parents to learn how to use digital platforms to participate in school activities and decision-making processes. 3. Digital literacy training: Provide digital literacy training commensurate with academic qualifications, including knowledge and skills in information retrieval, data processing, network security, etc. Teachers and principals need to be able to adapt to the digital learning environment to better meet the needs of students and parents.	educational technology and information literacy.	
Professional development 2.1. Attitude	By enhancing teachers' subject knowledge and teaching skills, they are able to better guide students and promote students' learning progress and performance improvement, thereby having a positive impact on the overall performance of the school.	Improve schools in a data-driven way by enhancing subject knowledge and teaching skills that enable teachers to better analyze academic and non-academic data, set clear and measurable goals, and develop action plans accordingly. At the same time, professional development training is organized for teachers to help them identify and provide relevant professional development opportunities to improve teaching practice.	Ensuring that 90% of teachers participate in training, have a basic understanding of subject knowledge, and improve teaching skills is an important measure to improve teaching attitudes.	University management, all teachers.
2.2. Knowledge	To enhance teachers' integrated understanding and application of educational theory and practice to support effective teaching and learning.	Improve teachers' teaching skills and abilities, focusing on the integration of educational theory and practice; 2. Design and implement diversified teaching strategies and methods, fully draw on educational theories, and combine practical experience for innovation.	90% of teachers must have attended seminars on teaching methods, teaching methods and strategies to integrate with their academic community and provide better support for improving teaching and learning.	University management, all teachers.

4. Conclusions and recommendations

Most of the respondents were female, aged 36-45, with 11-20 years of art teacher teaching experience, mostly with bachelor 's degree. The respondents' overall evaluation of teachers' teaching knowledge structure was positive, and their responses to most indicators of subject vision, subject knowledge, teaching method knowledge, integration of technical subject knowledge and comprehensive technical teaching knowledge were consistent, which was reflected in the evaluation report. The participants' performance in subject vision was impressive, indicating that they have achieved good results in teaching knowledge structure. But in the subject knowledge, the knowledge about teaching methods, the integration of technical subject knowledge, the comprehensive teaching knowledge and technology, the evaluation was satisfactory. According to observations,

respondents under 45, with 11- 20 years working experience and with a master degree had better knowledge structure. There was a very strong correlation between Teaching Knowledge Structure and professional development, that is, the better Teaching Knowledge Structure the teacher has, the better the professional development will be. An action plan has been formulated to improve the knowledge structure and professional development of art teachers in primary schools.

Teaching Management may strengthen the mastery of art concepts, laws and principles is a crucial part of the professional development of primary school art teachers. Education department may encourage primary school art teachers to deeply understand the trends and frontiers of basic education reform and development at home and abroad and maintain a global consciousness and an open mind. Schools and education departments may actively organize various professional training and learning activities to provide more educational resources and support for primary school art teachers. Primary school art teachers may need to actively participate in various teaching seminars, professional training and academic conferences, and take the initiative to learn the latest educational concepts, methods and skills in order to continuously improve their teaching level and professional quality. The proposed action plan may be tabled for discussion and implementation. Future researches may also explore the potential of digital art tools and virtual platforms in primary school art education, investigating their effectiveness in fostering creativity, digital literacy, and artistic expression among young learners.

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