



The Model of Digital Technology Teaching Ability in Fine Arts Education for Preschool Education Majors in Universities under the Digital Era in Jintang District

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Abstract

This research consists purposes were 1. to investigate the digital technology teaching abilities in art education among preschool education majors in Jintang District 2. to construct a digital teaching competency model for art education among preschool education majors in Jintang District and 3. to evaluate the effectiveness of the constructed digital teaching competency model for art education among preschool education majors in Jintang District. This research is a mixed-methods approach was employed, including a quantitative survey of 278 participants (260 students and 18 teachers) and eleven classroom observations. Based on these combined data, the study constructed a digital teaching competency model. Finally, the model was subjected to an expert evaluation survey with six specialists. The results reveal that 1) This research provides a structured framework for enhancing digital pedagogy in preschool art education and offers actionable insights for institutional development in the digital era. 2) Digital teaching competency is shaped by five interrelated dimensions: digital teaching level, curriculum innovation, teaching methods and classroom implementation, resource and technology support, and student competency and creativity. 3) The proposed model explains differences in digital competency across groups and identifies pathways for improvement. Finally, the model was further validated through an expert evaluation survey with six specialists, confirming both its theoretical soundness and practical applicability.

Keywords: Digital Teaching Competency, Preschool Art Education, Model Construction

Introduction

Global education is currently in the midst of a wave of digital transformation, with the rapid development of information technology driving changes in teaching models. Countries are increasing their investment in digital



education, optimizing the allocation of teaching resources and improving education quality through smart technology, artificial intelligence, big data, and other means. In the field of preschool education, the application of digital technology has become a trend. (Li, J. L., 2022) Technologies such as electronic whiteboards, interactive learning software, virtual reality (VR), and augmented reality (AR) have gradually penetrated into preschool classrooms, providing children with more diversified learning experiences. Digital transformation not only affects the updating of teaching methods but also poses higher capability requirements for college students majoring in preschool education. (Liu, F., and Chen, J., 2020)

China's current educational policies emphasize digital transformation and innovation in higher education, especially in the training of preschool teachers. Within this context, Jintang, a representative county-level area, provides a unique case for exploring how digital teaching competency can be effectively integrated into preschool art education. With several higher education institutions offering preschool education majors, Jintang has become a microcosm where issues of curriculum modernization, teacher preparedness, and resource allocation converge. Currently, the application of digital technology in preschool education is becoming increasingly widespread, especially in the field of art teaching. Digital painting, animation design, and interactive art have become important directions for teaching innovation. (Ni, N., 2023) The application of multimedia technology can stimulate children's interest in art and expand their creativity development. However, the popularization of digital teaching also faces many challenges, such as insufficient teacher training, low utilization rate of digital resources, and children's excessive dependence on electronic devices. (Yang, Y. Q., 2020) Therefore, how to effectively utilize digital technology in art teaching to truly promote children's development has become a topic worthy of discussion. (Zhang, J., Xie, Z. Y., Zhang, H., Yu, L., and He, D. Y., 2022)

Art education holds an irreplaceable significance in preschool education. As a crucial avenue for nurturing children's creativity and aesthetic abilities, art courses not only foster the development of children's perceptual and expressive skills but also enhance their cognitive abilities and social skills. In the context of digital transformation, art teaching needs to strike a balance between tradition and modern technology, preserving the intuitive experience of manual arts while fully leveraging digital technology to improve teaching effectiveness. (Zheng, Y. F., & Liu, X. L., 2020) As future preschool teachers, students majoring in preschool education in universities need to continuously enhance their teaching and innovation abilities amidst this transformation, in order to meet the educational demands of the new era. (Cai, Q., & Jin, Q. 2016)

Although digital technologies are increasingly visible in preschool art education, their integration remains fragmented and inconsistent. In Jintang, disparities exist between students' ability to use digital tools creatively and teachers' capacity to design and implement digital-based lessons. Limited resources, insufficient



institutional support, and uneven curriculum reform further constrain the systematic adoption of digital teaching practices. Previous studies have tended to emphasize either technological innovation or pedagogical tradition, but few have provided a holistic framework that links teaching level, curriculum development, classroom practices, and resource allocation to measurable student competencies. This gap highlights the need for a comprehensive model that can both describe current practices and serve as a guide for improving digital teaching competency in preschool art education

The Purposes

1. To investigate the digital technology teaching abilities in art education among preschool education majors in Jintang District
2. To construct a digital teaching competency model for art education among preschool education majors in Jintang District
3. To evaluate the effectiveness of the constructed digital teaching competency model for art education among preschool education majors in Jintang District

Literature Review

The rise of digital education is an inevitable trend driven by the development of information technology. It has transformed traditional education models, making teaching more intelligent and personalized. In the context of digital transformation, students majoring in preschool education in universities need to adapt to changes in artistic teaching methods, master digital tools, and enhance their teaching innovation capabilities. To gain a deeper understanding of the impact of digital education, it is necessary to explore three aspects: the development history of educational technology, the impact of digital transformation on higher education, and the comparison between digital teaching and traditional teaching. Based on these discussions, the theoretical foundation of this study is established. (Wu, J., 2021)

The introduction of digital technology has greatly enriched teaching methods in preschool education, enabling innovation in traditional art teaching models. The rise of information-based teaching forms, such as microteaching, MOOCs, and flipped classrooms, has provided new avenues for cultivating innovative talents. The advantage of digital teaching lies in its ability to provide a richer visual experience, an interactive learning environment, and personalized settings based on the needs of individual learners. Research has shown that flipped classrooms subvert traditional teaching models, enhance students' autonomous learning abilities, improve the interactivity of classroom teaching, and help cultivate students' innovative thinking. In the field of



art teaching, the application of digital technology not only enhances students' artistic expression but also broadens teaching methods, making the classroom more creative and interactive. (Dong, C., & Wang, J. J., 2021)

Methodology

1. Population and sample groups in the research include

1.1 Population The subjects of this study are undergraduate students enrolled in two universities in Jintang County that offer pre-school education majors, as well as teachers who undertake art teaching tasks. According to school statistics, there are currently a total of 800 undergraduate students majoring in pre-school education and 20 art education-related teachers in these two universities.

1.2 Sample This study adopts a combination of stratified random sampling and purposive sampling to ensure the representativeness of the sample and the scientific nature of the data. To ensure the representativeness of the data and the scientific nature of the analysis, based on the calculation of the Krejcie & Morgan sample size table, the number of preschool students and teachers in Jintang County2. Research tools include

2. Research tools include:

2.1 This study adopts a Mixed Methods Research (MMR) design, integrating both quantitative and qualitative research methods to enhance the scientific rigor and explanatory power of the research data. At the quantitative level, extensive data on digital teaching in preschool art education is collected through questionnaire surveys. At the qualitative level, interviews and classroom observations are conducted to deeply explore the specific experiences and genuine feelings of teachers and students in teaching practice. Focusing on universities in Jintang District, the study explores the evolution process of digital transformation in preschool art education across different periods through longitudinal trend analysis, striving to comprehensively reveal the main innovation paths and practical challenges faced in current digital teaching practices.

2.2 Qualitatively, eleven classroom observations were conducted to provide contextual insights into teaching practices, resource allocation, and student engagement. Based on these combined data, the study constructed a digital teaching competency model. Finally, the model was subjected to an expert evaluation survey with six specialists, which provided additional validation of its theoretical soundness and practical applicability. This sequential design ensured that the model was not only empirically grounded but also assessed for relevance and feasibility by domain experts.

3. Data Collection: Data collection employed three complementary approaches. First, a Data collection combined quantitative and qualitative approaches. A structured questionnaire survey was administered to 278



participants (260 students and 18 teachers) in preschool education majors, using a five-point Likert scale to measure dimensions of digital teaching level, curriculum renewal, teaching methods and classroom implementation, resource and technical support, and student competency and creativity. To complement the survey, interviews with 4 teachers, 6 students, and 2 administrators were conducted to capture individual experiences and institutional perspectives. In addition, 11 classroom observations were carried out to record real-time teaching practices and student engagement. After the model was constructed from these data sources, an expert evaluation survey with six specialists was conducted to assess its validity and applicability.

4. Data Analysis: Quantitative data were processed using SPSS 26.0. Descriptive statistics were applied to summarize demographic characteristics, while Cronbach's alpha coefficients assessed internal consistency reliability. The KMO measure and Bartlett's test confirmed sampling adequacy, followed by exploratory factor analysis (EFA) to validate construct dimensions. Where appropriate, further regression analyses were employed to examine the relationships among digital teaching level, curriculum innovation, teaching practice, resource support, and student competency and creativity. (Field, A., 2013).

5. Statistical used in research: This study utilizes SPSS 26.0 software to process questionnaire data. For continuous variables, mean (M), standard deviation (SD), maximum, and minimum values are calculated to reveal their overall level and fluctuation. For categorical variables, frequency and proportion are calculated to reflect the distribution of different categories in the sample. Through the comprehensive presentation of these indicators, this study can not only answer research question 1 (RQ1: What is the overall level of digital teaching ability in preschool art education in Jintang District) at a macro level, but also provide necessary reference benchmarks for subsequent difference testing. (Nunnally, J. C., 1978)

Survey data were analyzed using descriptive statistics, reliability and validity tests, and exploratory factor analysis to examine the structure of digital teaching competency. Interview transcripts from teachers, students, and administrators, together with classroom observation notes, were coded through thematic analysis to identify recurring patterns in teaching practice, resource use, and student engagement. Findings from these sources were triangulated to strengthen validity. After the model was constructed, an expert evaluation survey with six specialists was analyzed to verify its reliability, theoretical soundness, and practical applicability.

Results

This Research The researcher can classify the research results as follows

1. Research Results of study the digital technology teaching ability of Fine Arts Education For preschool education majors in Jintang District



This study first examined the current status of digital technology teaching ability among preschool education majors in Jintang District. Survey data from 278 valid respondents (260 students and 18 teachers), supported by interviews with 4 teachers, 6 students, and 2 administrators and 11 classroom observations, provided both quantitative and qualitative evidence. Together, these sources offered a comprehensive picture of how digital teaching competency is manifested in preschool art education. The constructed model was subsequently subjected to an expert evaluation survey with six specialists, which further confirmed its reliability and practical relevance.

1.1 Questionnaire survey specific statistics

1) Frequency statistics of demographic characteristics The demographic distribution of respondents revealed patterns that are directly relevant to understanding digital teaching competency. Female students represented the majority of the sample, consistent with national enrollment patterns in preschool education majors. The age distribution was concentrated in the 18–22 age group, reflecting the dominance of undergraduate students in this field, while teachers were mainly clustered in the 26–40 age range. Academic background also varied: most students were pursuing bachelor’s degrees, while the teachers held a mix of bachelor’s and master’s qualifications.

These demographic characteristics provide an important backdrop for interpreting subsequent competency results. The gender imbalance implies that the development of digital skills must particularly consider female learners’ experiences, while the concentration of respondents in younger cohorts suggests that digital competency is influenced by generational familiarity with technology. Teachers’ academic backgrounds highlight the need for differentiated training and continuous professional development to ensure consistency in digital adoption.

Table 1 Frequency analysis of demographic characteristics

variable	category	Frequency (Number of people)	Percentage (%)
gender	male	31	11.9
	woman	229	88.1
level	freshman	64	24.6
	sophomore	69	26.5
	junior student	72	27.7
	fourth grade	55	21.2
age	18-20 years old	78	30.0

	21-23 years old	130	50.0
	Aged 24 and above	52	20.0
Professional Background	preschool education	182	70.0
	art education	78	30.0

gender	male	4	22.2
	woman	14	77.8
age	Under 30 years old	5	27.8
	31-45 years old	9	50.0
	Aged 46 and above	4	22.2
teaching experience	Less than 5 years	4	22.2
	6-15 years	9	50.0
	16 years and above	5	27.8
Job type	Frontline teaching teacher	13	72.2
	Teaching and research/management personnel (part-time teaching)	5	27.8
Professional Background	Majors related to preschool education	12	66.7
	Majors related to art education	6	33.3

Note: This table is based on statistical data from valid questionnaire samples (N = 18, teachers).

2) Reliability test Reliability analysis was conducted to examine the internal consistency of the measurement scale. Cronbach's alpha coefficients across the five dimensions—digital teaching level, curriculum system renewal, teaching methods and classroom implementation, resource and technical support, and student competency and creativity—all exceeded the threshold of 0.80. This indicates a high level of internal consistency, suggesting that the items within each construct reliably measure the intended dimensions.



In particular, the dimensions of teaching methods and classroom implementation, as well as student competency and creativity, achieved the highest alpha values, reflecting the stability of these constructs. Slightly lower but still acceptable coefficients were observed in the dimension of resource and technical support, which may reflect contextual variability in infrastructure and institutional provision. Nonetheless, the results confirm that the instrument is robust enough to support further factor analysis and model construction.

3) Validity test The validity of the measurement scale was tested using the Kaiser-Meyer-Olkin (KMO) measure and Bartlett’s test of sphericity. The KMO value exceeded 0.90, far above the minimum acceptable threshold, indicating excellent sampling adequacy. Bartlett’s test was significant at $p < 0.001$, confirming the suitability of the data for factor analysis.

Subsequent exploratory factor analysis (EFA) extracted five clear factors, consistent with the theoretical framework. Factor loadings for all items exceeded 0.40, confirming strong relationships between items and their underlying constructs. Communality values further indicated that the majority of variance in the observed variables was accounted for by the extracted factors.

The cumulative variance explained exceeded 70%, surpassing the benchmark for educational and social science research. This demonstrates that the measurement instrument not only aligns with the theoretical framework but also possesses strong construct validity. These findings validate the structural soundness of the competency model and justify its use for further empirical evaluation.

Table 2 Current Status of Digital Teaching Level (Students)

No.	Indicator Category	\bar{x}	S.D.	level	Ranking
1	Digital teaching ability - high	4.35	0.51	high level	1
2	Digital teaching ability - medium	3.75	0.58	intermediate	3
3	Digital teaching ability - low	3.10	0.66	low-level	5
4	Frequency of technology usage – high	4.20	0.54	high level	2
5	Frequency of technology use – medium	3.65	0.59	intermediate	4
6	Frequency of technology usage – low	2.95	0.68	low-level	6
	total	3.67	0.61	intermediate	–

Table 3 Current Status of Digital Teaching Level (Teachers)

No.	Project	Average	S.D.	Level	Sort
1	Digital teaching ability (high)	4	0.48	higher	1
2	Digital teaching ability (medium)	3.6	0.55	moderate	2
3	Digital teaching ability (low)	2.9	0.62	lower	3
	overall average	3.5	0.55	moderate	-

Note: This table is based on the statistics of valid student questionnaire samples (N = 18, teachers). The scale adopts a 5-point Likert scoring system.

Table 4 Curriculum System and Content Updates (students)

No.	Indicator	\bar{x}	S.D.	Level	Ranking
1	Timeliness of course content updates	3.85	0.61	moderate	4
2	Digital art/new media content coverage	4.20	0.55	higher	1
3	Combining tradition with digital innovation	4.10	0.58	higher	2
4	Opportunities for interdisciplinary content	3.65	0.66	moderate	5
5	The appropriateness of the speed of course updates	3.90	0.60	moderate	3
	total	3.94	0.60	Moderate to high	-

Note: This table is based on statistical data from valid questionnaire samples (N=260, students)

The demographic analysis (Table 2) confirmed the representativeness of the sample, while the reliability results (Table 3) established strong internal consistency. The validity tests (Tables 4–6) provided robust evidence that the five-factor structure of digital teaching competency is both empirically grounded and theoretically sound. Together, these results not only support the integrity of the measurement instrument but also provide the basis for constructing and evaluating the digital teaching competency model in preschool art education.

1.2 Digital teaching capability results

Overall competency level: Descriptive statistics showed that the average scores of the five dimensions digital teaching level, curriculum system renewal, teaching methods and classroom implementation, resources and technical support, and student competency and creativity were all above the midpoint of the five-point scale, indicating a generally positive situation. However, variance across groups suggested uneven development. Students demonstrated stronger familiarity with digital drawing tools (e.g., Procreate,



Photoshop) and online platforms, while teachers showed more conservative adoption, with many still relying heavily on traditional classroom methods.

Group differences: Further analysis revealed that younger teachers and higher-grade students were more active in applying digital tools creatively, whereas senior teachers and freshmen students tended to remain at a basic operational level. Gender differences were minimal, but notable contrasts emerged between institutions with stronger infrastructure and those with limited access to equipment. These disparities illustrate the critical role of resource allocation and institutional policy in shaping digital teaching ability.

Classroom practices: Observation data revealed a coexistence of digital and traditional practices. In several lessons, digital media such as projectors, tablets, and online resource platforms were effectively integrated into teaching, stimulating student engagement and creativity. Yet in other classrooms, traditional hand-drawing remained dominant, and digital elements appeared only as auxiliary tools. This imbalance demonstrates that integration is not yet systematic, but rather dependent on individual teacher initiative and resource availability.

Synthesis of findings: Taken together, the results indicate that digital technology teaching ability in Jintang's preschool art education is at a developing but uneven stage. Students are generally open and adaptive to digital tools, but teachers display mixed levels of proficiency. Curriculum updates remain partial, and resource support is inconsistent. Qualitative data reinforce the survey results, highlighting the urgent need for systematic integration.

The findings underscore that while digital elements have begun to enrich preschool art education, challenges in teacher proficiency, curriculum alignment, and resource provision hinder full effectiveness. This situation validates the necessity of constructing a competency model that can systematically guide institutions and educators toward more balanced and sustainable digital transformation.

2. Results of create and evaluate the model of digital technology teaching ability of Fine Arts Education for preschool education majors in Jintang District

2.1 Model creation results

Drawing upon the survey results, expert interviews, and classroom observations, this study created a digital teaching competency model tailored to preschool art education in Jintang District. The model was theoretically grounded in the conceptual framework (Table 1) and empirically supported by the factor structure confirmed in Section 3. Five interrelated components were identified as the foundation of the model: Digital teaching level – the mastery and application of digital tools in teaching and learning. Curriculum system renewal – embedding digital resources and activities into preschool art curricula. Teaching methods



and classroom implementation – adaptation of pedagogical strategies to digital contexts. Resources and technical support – infrastructure, software, and institutional backing. Development of students’ teaching ability and innovation – enhanced competency and creativity as the ultimate educational outcomes.

These five elements form a closed-loop structure, highlighting reciprocal reinforcement: stronger resources improve teaching methods, innovative curricula enhance student creativity, and student outcomes, in turn, drive the demand for higher digital teaching levels. Expert validation emphasized that the model successfully integrates both technological and pedagogical dimensions, making it contextually relevant for preschool art education.

2.2 Model evaluation results

The constructed model underwent empirical evaluation through reliability and validity testing, as presented in Tables 3–6. Cronbach’s alpha coefficients confirmed internal consistency, while KMO and Bartlett’s results established structural validity. Exploratory factor analysis revealed that all five factors aligned with theoretical expectations, explaining over 70% of total variance. These results demonstrate the statistical robustness of the model.

Beyond quantitative validation, expert interviews reinforced the model’s practical value. Specialists noted that the framework provides a structured approach to diagnosing strengths and weaknesses in digital competency. For instance, insufficient infrastructure was consistently identified as a bottleneck, yet the model situates this factor within a larger system, linking it to pedagogy, curriculum, and student outcomes. Classroom observations supported these insights, showing that when teachers implemented lessons consistent with the five model components, students exhibited higher engagement, more creative outputs, and stronger digital fluency.

Overall, the evaluation results demonstrate that the model is both valid and applicable. It functions as an analytical tool for assessing current conditions, as well as a roadmap for institutional and pedagogical improvement. The model highlights priority areas for intervention such as teacher training, curriculum redesign, and sustained resource provision while also reinforcing the interdependence of these components.

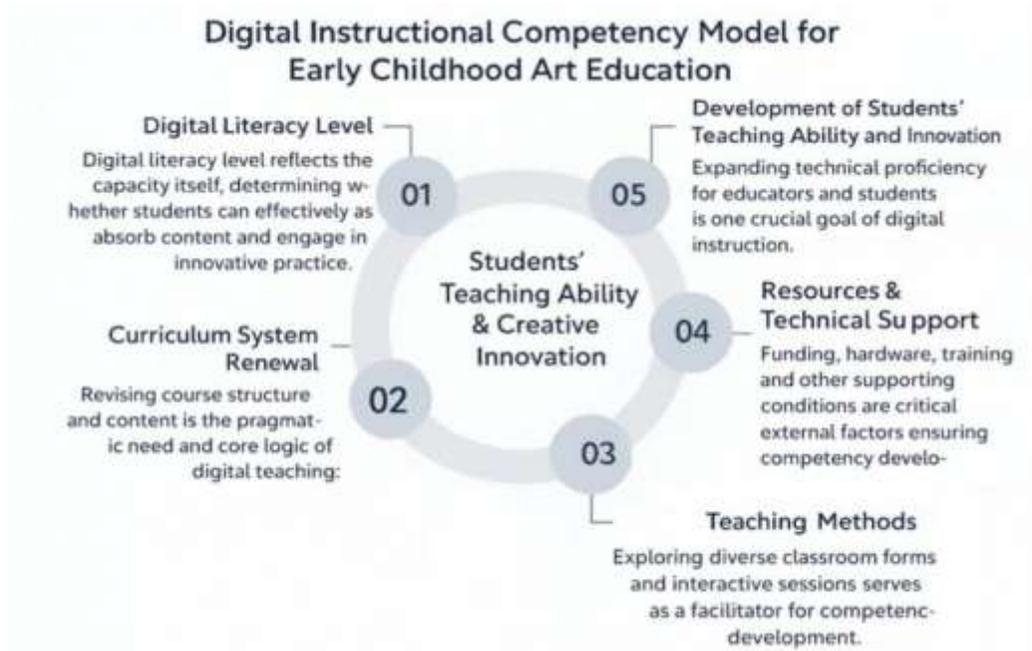


Figure 1 Figure: Digital teaching competency model for preschool art education in Jintang District (Zhenni Hu, 2025)

The creation and evaluation of the digital teaching competency model provide both theoretical and practical contributions. The model integrates five core components into a coherent system, validated through quantitative reliability and validity tests, and enriched by qualitative insights from experts and observations. It offers a diagnostic framework and strategic guide for advancing digital teaching competency in preschool art education, particularly within county-level higher education contexts such as Jintang.

3. The result of evaluate the model of digital technology teaching ability of Fine Arts Education For preschool education majors in jintang district

After the model was constructed, an expert evaluation survey with six specialists was administered to verify its scientific rigor and practical applicability. Experts were selected from preschool education, art education, and educational technology with balanced academic and practice profiles (2 professors, 2 associate professors, 1 senior kindergarten teacher, 1 education administrator; 100% return rate). The evaluation tool comprised four parts: (1) ratings of structural elements (utility, feasibility, suitability, accuracy) for the five core components; (2) ratings of overall model quality on the same four criteria; (3) open-ended feedback on strengths and suggestions; and (4) a global acceptance rating using a five-level scale (from “very recognize” to



“very unrecognize”). Data were processed with means/SD and coefficient of variation, and open comments were coded thematically with team cross-checks to enhance reliability.

Results. Experts showed unanimously positive acceptance of the model: 4/6 “very recognize” and 2/6 “recognize,” with 0 in the remaining categories. Thematic feedback highlighted that the model has a clear structure and logic, a solid theoretical foundation, and promotes student creativity in classroom application; experts also noted cross-regional applicability and suggested further refinement of variable granularity for complex teaching scenarios. These findings collectively affirm that the model is both valid and applicable for guiding teacher development, curriculum renewal, and institutional policy.

Conclusion

This study not only provides theoretical support for enhancing the digital literacy of teachers and students but also offers a path reference for promoting the development of digital art teaching in regional preschool education. Conclusion as follows:

1. This research provides a structured framework for enhancing digital pedagogy in preschool art education and offers actionable insights for institutional development in the digital era.
2. Digital teaching competency is shaped by five interrelated dimensions: digital teaching level, curriculum innovation, teaching methods and classroom implementation, resource and technology support, and student competency and creativity.
3. The proposed model explains differences in digital competency across groups and identifies pathways for improvement. Finally, the model was further validated through an expert evaluation survey with six specialists, confirming both its theoretical soundness and practical applicability.

Discussion

This Research The researcher can discuss the research results as follows

1. The result of study the digital technology teaching ability of Fine Arts Education For preschool education majors in jintang district: Teachers generally possess basic digital awareness and frequently use demonstration tools in the classroom, but there is a lack of curriculum integration and feedback mechanisms, and teaching methods still tend to be traditional. Students have a high acceptance of digital tools and can initially operate mainstream software, but they lack systematic training and creative guidance, and there are differences in learning adaptability. Although managers recognize the trend of digital teaching, resource allocation and policy mechanisms have not yet formed a synergistic effect. Including: 1) Digital teaching enhances classroom



presentation, and it is currently in the early stage of integration. 2) Teachers' ability to design digital courses needs to be strengthened. 3) Students are actively participating, but there are significant differences in their adaptability.

2. The result of create the model of digital technology teaching ability of Fine Arts Education For preschool education majors in jintang district: The model emphasizes a spiral progression structure that spans from tool operation to curriculum integration, and then to individual development and resource collaboration, reflecting the practical path of digital teaching. The model not only responds to the practical needs of ability enhancement in teaching, but also constructs a systematic framework that combines theory with practice. Including: 1) The five-dimensional structure of the model is clear and can accurately reflect teaching scenarios. 2) The logical progression is reasonable, structured, and operable 3) It is applicable to various educational scenarios such as curriculum reform, teacher development, and resource optimization.

3. The result of evaluate the model of digital technology teaching ability of Fine Arts Education For preschool education majors in jintang district: Through the assessment of model applicability conducted among six experts, the study found that the model received high recognition in terms of its explanatory power, dimensional coverage, and development orientation in teaching practice. Expert evaluations pointed out that the model has a clear hierarchical structure and can effectively guide teachers in self-diagnosis, curriculum design, and teaching improvement. It also has a positive significance for student ability cultivation.

However, experts also point out that the model still needs to be refined in terms of differentiated support strategies, in-depth teaching mechanisms, and external resource guarantees. The comprehensive promotion of the model still relies on the supporting construction of resource base, training system, and mechanism guarantees. Including: 1) The model is scientifically sound and well-adapted, providing practical guidance. 2) It can promote mutual improvement in both teacher growth and student development. 3) Further optimization of capability levels and supporting guarantees is needed to enhance promotional power.

Discoveries or New Knowledge

The art teaching in preschool education in Jintang District has formed a trend of active exploration in digital transformation. Teachers and students have demonstrated preliminary abilities in the application of digital tools, and the vitality and interactivity of classroom teaching have been significantly enhanced. The proposed model not only outlines the core competency dimensions in teaching but also provides a clear structural path for practice. Under expert evaluation, the model demonstrates strong adaptability and guiding value. In the future, efforts should be made to focus on teacher capacity building, curriculum optimization, and institutional



guarantees to promote the transition of digital teaching from initial integration to deep application, thereby facilitating the high-quality development of regional preschool education.

Suggestion

1. Suggestions for use

1.1 Suggestions for teachers: Teachers are the key to the implementation of digital courses. Due to significant differences in digital skills among teachers, it is recommended to enhance their digital literacy through systematic training, covering content such as drawing software, multimedia tools, AR/VR technology, etc. Traditional and digital means should be integrated in teaching, with flexible adjustments in usage proportion to ensure the achievement of teaching objectives. Teaching design should emphasize interactivity, incorporating group cooperation, task-driven learning, and personalized feedback to enhance student participation and classroom effectiveness: 1) Conduct multi-level training on digital tools to enhance teachers' digital application capabilities; 2) Promote the integration of traditional and digital teaching methods to enhance the comprehensive effectiveness of courses; 3) Enhance interactive design and personalized feedback to stimulate students' active participation.

1.2 Suggestions for students: Students are key participants in the effectiveness of the curriculum. It is recommended that students enhance their awareness of autonomous learning and make good use of extracurricular resources to improve their ability to operate digital tools. Encourage them to combine digital art with language, science, and other fields in early childhood education to enhance the educational value of their works. At the same time, students should be trained to transform their creative abilities into teaching practical abilities, accumulate experience through internships and simulated classrooms, and enhance their professional competency: 1) Encourage students to practice outside of class and learn on the platform to enhance their independent exploration ability; 2) Advocate interdisciplinary integration to enhance the educational function of works; 3) Guide students to transform their numerical abilities into teaching skills, and strengthen career orientation.

1.3 Suggestions for managers: Managers need to provide institutional and resource support. It is recommended to increase investment in both hardware and software to ensure that equipment updates and technical support are advanced simultaneously. Establish a normalized teacher training mechanism and incorporate digital literacy into teachers' professional development plans. The curriculum system should promote the deep integration of digital art with traditional art and preschool education, and establish scientific teaching evaluation standards. At the same time, set up teaching support services, promote resource sharing,



and narrow regional development gaps: 1) Enhance equipment and technical support to promote the balance of regional educational resources; 2) Establish a long-term mechanism for teacher training to enhance overall teaching adaptability; 3) Improve the curriculum system and evaluation mechanism, and promote interdisciplinary integration.

2. Suggestions for future research

Future research should expand sample coverage, enhance model universality, and conduct longitudinal tracking to assess the sustained effectiveness of digital teaching. In terms of methodology, it is advisable to integrate quantitative, qualitative, and learning analytics techniques to improve the scientific nature of research. Additionally, efforts should be made to strengthen interdisciplinary and international comparisons, draw on STEM and overseas experiences, and expand the development path of digital art education: 1) Expand the research sample and regional coverage to enhance the breadth of model applicability; 2) Promote longitudinal research design to capture the dynamic changes in ability development; 3) Introduce multidimensional evaluation tools and data analysis methods to enhance research accuracy; 4) Drawing on international experience, we should promote the continuous updating of digital art education concepts.

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