



Teachers' Training in Digital Tools and Their Arts and Design Program Management in a Science and Technology University in Yunnan Province, China

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Abstract: This study examines the relationship between teachers' training in digital tools and their management of arts and design programs at a science and technology university in Yunnan Province, China. Using a descriptive-comparative-correlational design, the research surveyed 81 faculty members to assess their digital competencies and project management skills. Findings indicate that while teachers demonstrate confidence in learning new technologies and integrating digital tools into lesson planning, challenges remain in subject-specific proficiency, hands-on classroom application, and fostering students' independent use of digital resources. The study also reveals strong correlations between digital training and effective project management, particularly in communication, creativity, and ethical practices. However, areas such as equitable technology access and student self-assessment require further development. Demographic factors such as age, sex, and years of service showed no significant influence on teachers' self-assessments, though educational attainment impacted perceptions of knowledge and professional development. The study concludes that targeted training programs, institutional support, and ethical digital integration are essential for enhancing both teaching effectiveness and program management in arts and design education. Recommendations include ongoing professional development, practical workshops, and structured peer collaborations to strengthen digital competencies and project leadership.

Keywords: Blended Learning, Curriculum Integration, Digital Competence, Instructional Technology, Learning Management Systems (LMS)

Introduction

The integration of digital tools has become a transformative force in modern education, particularly within arts and design disciplines where technology intersects directly with creative expression and project-based learning. Effective training in these digital resources is no longer ancillary but essential, as it empowers educators to enhance pedagogical methods, streamline administrative tasks, and foster innovative learning environments. Research underscores that such training significantly improves student assessment and feedback mechanisms, as seen in the use of digital portfolios which provide actionable insights for iterative learning (Ghaffar & Amirah, 2020). Furthermore, institutional support and leadership play a critical role in the successful adoption of these tools, enabling teachers to explore new techniques and manage programs more dynamically (Alawi & Nizar, 2022).

However, the effective implementation of digital training is fraught with challenges, including educator resistance, often stemming from a lack of familiarity or concerns that technology may undermine the tactile, hands-on nature of arts education (Iskandar & Reza, 2023). The cultural dimension also proves critical, as the most successful integrations are those that adapt digital tools to complement and preserve traditional art forms, thereby ensuring cultural relevance alongside innovation (Malik & Farida, 2021). Despite a growing body of literature highlighting these factors — institutional support, cultural adaptability, and the mitigation of resistance—a significant research gap persists. Existing studies have primarily focused on these elements within the contexts of Southeast and West Asia.

There is a distinct lack of empirical investigation into this phenomenon within the unique context of Chinese higher education, specifically at science and technology universities where the mandate for digital integration is strong, yet the application in creative disciplines like arts and design remains under-explored. The cultural, administrative, and pedagogical landscape of Chinese institutions presents a specific context that may differently influence the relationship between teacher training and program management.

Therefore, this study aims to fill this gap by investigating the self-assessed levels of digital tool training among arts and design teachers and its correlation with their efficacy in managing academic programs at a science and technology university in Yunnan Province, China. The findings of this research will provide crucial insights for developing targeted professional development programs and institutional strategies to enhance digital pedagogy and creative program management within China's unique educational ecosystem.

Literature Review

The integration of digital tools in Arts and Design education has increasingly gained attention due to its potential to revolutionize pedagogical practices and program management. Teachers' ability to adapt to these tools significantly affects the quality of their teaching and their capacity to manage Arts and Design programs effectively. As noted by Elmasri and Rihani (2021), providing educators with targeted training in digital tools helps to bridge the gap between



traditional teaching methods and the demands of modern education. Such training not only enhances instructional delivery but also optimizes program administration in Arts and Design disciplines.

Digital tools empower teachers to create more interactive and engaging learning environments, which are particularly relevant in Arts and Design education. According to Khadim and Tarek (2023), educators trained in digital tools can design innovative learning experiences that foster creativity and critical thinking among students. This highlights the importance of training programs that focus on integrating technology into Arts and Design pedagogy to align with contemporary educational standards.

The application of digital tools also extends to the management of Arts and Design programs, which requires careful planning and execution. Teachers who are proficient in using digital tools can effectively handle administrative tasks, such as curriculum design, resource allocation, and performance assessment. A study by Aseel and Zayan (2022) revealed that teachers with training in digital tools demonstrated significant improvements in program management efficiency and student outcomes.

Despite its importance, the adoption of digital tools in Arts and Design education remains a challenge for many educators due to a lack of adequate training. Addressing this issue requires developing comprehensive training programs tailored to the needs of Arts and Design teachers. Noura and Firas (2021) argue that professional development initiatives focused on digital competency are essential for equipping teachers with the skills required to integrate technology into their practice effectively.

Another critical aspect of integrating digital tools in Arts and Design education is the role of school leadership in supporting teacher training efforts. Administrators play a pivotal role in fostering an environment that encourages professional growth and the adoption of innovative teaching practices.

Schools that prioritize teacher training in digital tools achieve higher levels of technological integration, leading to enhanced program quality and student engagement.

The use of digital tools in Arts and Design education also facilitates collaborative learning experiences, enabling students and teachers to work together on creative projects. Teachers who are trained in using collaborative technologies can foster teamwork and communication skills among students. A study by Haneen and Joud (2020) highlighted the benefits of digital tools in promoting collaboration and knowledge sharing in Arts and Design classrooms.

Statement of problems

1.What is the demographic profile of the teacher respondents in terms of:

1.1.sex;

1.2.age;

1.3.educational attainment;

1.4.length of service; and

1.5.seminars attended related to the topic?

2.What is the self-assessment of the teacher respondents of their training in digital tools in terms of: 2.1. knowledge and proficiency;

2.2.application in teaching;

2.3.support for student learning;

2.4.problem-solving and troubleshooting;

2.5.accessibility and inclusivity;

2.6.professional development; 2.7. ethical and responsible use; and

2.8. evaluation of impact?

3.Is there a significant difference in the self-assessment of the teacher respondents of their training in digital tools when they are grouped according to their profile?

4.What is the self-assessment of the teacher respondents of their arts and design project management in terms of:

4.1.planning and organization;

4.2.communication and collaboration;

4.3.creativity and innovation;

4.4.monitoring and evaluation;

5. Is there a significant difference in the self-assessment of the teacher respondents of their arts and design project management when they are grouped according to their profile?

Research Design

The research utilizes a descriptive, comparative, and correlational methodology, distinguished by its precise definitions, systematic documentation, detailed analysis, and thorough understanding of contextual interactions. According to Fischer and Schneider (2023), descriptive research systematically identifies and analyzes the defining characteristics, behaviors, and attributes of phenomena within their natural environments. Its primary

goal is to develop detailed profiles or gain a deeper understanding of current circumstances, providing a strong basis for subsequent investigations.

Building on Fischer and Schneider's (2023) contributions, descriptive research plays a critical role in the social sciences and psychology by uncovering natural patterns and behaviors. This methodology supports the collection of accurate, impartial data regarding the beliefs, actions, and characteristics of target populations, offering valuable insights into societal and cultural dynamics.

This research approach allows the researcher to numerically analyze, compare, and correlate the relationships amongst the dependent variables included in the study.

By utilizing this approach, the researcher will be able to find any significant difference or relationship in the arts and design teacher respondents' self-assessment of their training in digital tools and their demographic data such as sex, age, educational attainment, length of service, and seminars attended related to the topic. Also, the researcher will be able to find any significant difference or relationship in the arts and design teacher respondents' self-assessment of their arts and design project management and their demographic data such as sex, age, educational attainment, length of service, and seminars attended related to the topic. The teacher respondents' self-assessment of their training in digital tools and their arts and design project management will then be correlated.

Research Location

The locale of this study is at Kunming University of Science and Technology in Kunming City, Yunnan Province, China. Kunming University of Science and Technology has been established for the 70th anniversary, it was founded on September 1, 1954. Kunming University of Science and Technology is a famous university in China and a key university in Yunnan Province. It has 36 secondary colleges, with more than 3,000 full-time teachers, 30,000 undergraduates, 5,500 master students and 556 doctoral students. The college is the Art and Media College of Kunming University of Science and Technology, which has 95 full-time teachers.

Participants

The respondents of this study will be taken from among the 3,000 teachers at Kunming University of Science and Technology in Kunming City, Yunnan Province, China

Research Instruments

In gathering the needed data, the researcher will make researcher-made questionnaires on the teacher respondents' self-assessment of their training in digital tools and their arts and design project management.

The researcher will use face to face or onsite in administering this questionnaire.

The questionnaire will be composed of the following parts.

Part 1 – This section determines the demographic profile of the arts and design teacher respondents.

Part 2 – This section determines the teacher respondents' self-assessment of their training in digital tools.

Part 3 – This section identifies the badminton athlete respondents' self-assessment of their arts and design project management.

The adapted questionnaire and the researcher-made questionnaire will be subjected to content validation of the experts who are knowledgeable in the field of research. The suggestions of the experts will be made integral in the instrument.

The same instrument will be submitted for face validation with at least five experts. The questionnaires will be pilot tested to measure reliability. The pilot testing will be computed using Cronbach's Alpha through the Statistical Package of Social Science (SPSS). The researcher welcomes the suggestions of the experts and will make necessary revisions to construct the said instruments valid.

Ethical Considerations

Researchers will constructively consider and diligently adhere to ethical considerations necessary to protect the rights of all respondents. These ethical considerations are as follows:

1. Conflict of Interest

Researchers for this study will ensure that there are no conflicts of interest. Researchers will clearly and thoroughly explain the purpose of this study to selected respondents. Researchers must also adhere to the purpose of collecting personal information and data. All collected data must not be used for any form of exploitation of respondents. Researchers must adhere to the goals and objectives of the study.

2. Privacy and Confidentiality

Before conducting this study, we assured respondents that all collected information would remain confidential, and the results would not be disclosed to anyone other than the researchers and those completing the questionnaires. Researchers will not mention respondents' names when providing the collected data to protect their privacy. Respondents' identities will remain anonymous, and no clues or suggestions that could lead others to associate or link them to the respondents will be left.

3. Informed Consent Process

Before administering the questionnaire, researchers will obtain an informed consent form confirming that the respondents understand the purpose and objectives of the study and agree that the data collected will enhance the researchers' research findings. Researchers will ensure that all information is explained clearly and comprehensively to the respondents, without any deception. The researchers will also discuss the process and potential risks of participating in this study.

4. Recruitment

The participants in this study are physical education teachers. Participants have the right to freely consent or withhold consent. Participants will not be forced to participate and have the right to refuse participation at any time.

5. Risks

The researchers will ensure that participation in this study is risk-free. Participants will ensure that any data and information collected will not harm their life or reputation. Participants have the right to stop asking questions at any time if they feel harassed, the questions are too personal, or intrusive.

Results and Discussion

Frequency Distribution of the Teacher Respondents' Profile

Profile	Frequency	Percentage
Age		
Less than 25 years old	13	16%
25-30 years old	21	25.9%
31-35 years old	17	21%
36-40 years old	13	16%
41-45 years old	11	13.6%
More than 45 years old	6	7.4%
Total	81	100%
Sex		
Male	38	46.9%
Female	43	53.1%
Total	81	100%
Education		
Bachelor' degree w/ Master's units	49	60.5%
Master's degree	12	14.8%
	8	9.9%
w/ Doctoral units	6	7.4%
Doctoral degree	6	7.4%
Total	81	100%
Length of Service		
Less than 5 years	36	44.4%
5-10 years	13	16%
11-15 years	13	16%
16-20 years	14	6.2%
More than 20 years		17.3%
Total	81	100%

In terms of age, thirteen (13) or about 16% of the teacher respondents are less than 25 years old, twenty-one (21) or about 25.9% are 25–30 years old, seventeen (17) or about 21% are 31–35 years old, thirteen (13) or about 16% are 36–40 years old, eleven (11) or about 13.6% are 41–45 years old, and six (6) or about 7.4% are more than 45 years old. This means that the majority of the teacher respondents are 25–30 years old. This illustrates that most of the respondents are in the early stages of their professional careers, representing a relatively young teaching workforce.

In terms of sex, thirty-eight (38) or about 46.9% of the teacher respondents are male, while forty-three (43) or about 53.1% are female. This means that the majority of the teacher respondents are female. This illustrates that teaching as a profession in this context remains slightly dominated by women, although the distribution between male and female respondents is nearly balanced.

In terms of educational attainment, forty-nine (49) or about 60.5% of the teacher respondents hold a bachelor's degree, twelve (12) or about 14.8% have earned units in a master's degree, eight (8) or about 9.9% have completed a master's degree, six (6) or about 7.4% have doctoral units, and another

six (6) or about 7.4% hold a doctoral degree. This means that the majority of the teacher respondents are bachelor's degree holders. This illustrates that while most teachers have attained the minimum requirement for teaching, only a smaller portion have pursued advanced degrees, reflecting opportunities for further academic and professional growth. In terms of length of service, thirty-six (36) or about 44.4% of the teacher respondents have served for less than 5 years, thirteen (13) or about 16% have served for 5–10 years, another thirteen (13) or about 16% have served for 11–15 years, five (5) or about 6.2% have served for 16–20 years, and fourteen (14) or about 17.3% have served for more than 20 years. This means that the majority of the teacher respondents have less than 5 years of teaching experience. This illustrates that the teaching force is relatively new, with many respondents just beginning their teaching careers, which may influence their perspectives on professional development and institutional support.

Self-Assessment of the Teacher Respondents of their Training in Digital Tools in terms of Knowledge and Proficiency

	Mean	SD	Qualitative Description	Interpretation	Rank
1. I have a strong understanding of various digital tools used in education.	2.83	.90	Agree	True of Me	2
2. I can confidently use digital tools to create engaging teaching materials.	2.75	.95	Agree	True of Me	3
3. I am proficient in using software and applications relevant to my subject area.	2.65	.98	Agree	True of Me	5
4. I stay updated on the latest developments in educational technology.	2.72	1.02	Agree	True of Me	4
5. I can quickly learn how to use new digital tools introduced in my school.	2.85	1.10	Agree	True of Me	1
Composite Mean	2.76	.74	Agree	True of Me	

Legend: 3.51-4.00 Strongly Agree/ Very True of Me; 2.51-3.50 Agree/ True of Me; 1.51-2.50 Disagree/ Slightly True of Me; 1.00-1.50 Strongly Disagree/ Not True of Me

The statement “I can quickly learn how to use new digital tools introduced in my school” obtained the highest mean of 2.85 with a qualitative description of Agree and interpretation of True of Me. This indicates that teacher respondents perceive themselves as adaptable and capable of learning new technologies efficiently. This suggests a positive attitude toward embracing innovation, which is essential for integrating digital tools in classroom practice.

The statement “I am proficient in using software and applications relevant to my subject area” garnered the lowest mean of 2.65, still described as Agree and interpreted as True of Me. This implies that while teachers can adapt to new tools, they recognize that their proficiency in subject-specific applications remains a challenge. This highlights the need for more targeted training that addresses discipline-focused digital competencies.

The composite mean of 2.76 with a standard deviation of 0.74 was interpreted as Agree and True of Me. This means that overall, teachers assessed themselves as knowledgeable and fairly proficient in using digital tools. This illustrates that while they are generally confident in their digital knowledge, continuous professional development is necessary to strengthen proficiency, especially in specialized applications that directly support their teaching areas.

Self-Assessment of the Teacher Respondents of their Training in Digital Tools in terms of Application in Teaching

	Mean	SD	Qualitative Description	Interpretation	Rank
1. I effectively integrate digital tools into my lesson plans.	2.80	1.11	Agree	True of Me	1
2. I use digital tools to enhance the delivery of my teaching content.	2.49	1.13	Disagree	Slightly True of Me	5

3. I adapt digital tools to meet the needs of my students.	2.66	1.01	Agree	True of Me	4
4. I incorporate interactive tools to make learning more engaging for students.	2.71	1.12	Agree	True of Me	3
5. I regularly review how well digital tools support my teaching methods.	2.77	1.09	Agree	True of Me	2
Composite Mean	2.69	.77	Agree	True of Me	

Legend: 3.51-4.00 Strongly Agree/ Very True of Me; 2.51-3.50 Agree/ True of Me; 1.51-2.50 Disagree/ Slightly True of Me; 1.00-1.50 Strongly Disagree/ Not True of Me

The statement “I effectively integrate digital tools into my lesson plans” received the highest mean of 2.80 with a qualitative description of Agree and an interpretation of True of Me. This indicates that teacher respondents are confident in embedding digital tools into their instructional planning, showing that they recognize the value of technology in structuring lessons to support learning objectives.

The statement “I use digital tools to enhance the delivery of my teaching content” obtained the lowest mean of 2.49, described as Disagree and interpreted as Slightly True of Me. This suggests that while teachers can integrate digital tools in lesson plans, they are less confident in effectively applying these tools during actual instruction. This gap reflects a need for more hands-on training that focuses on execution and delivery in real classroom settings.

The composite mean of 2.69 with a standard deviation of 0.77 was described as Agree and interpreted as True of Me. This shows that overall, teachers view themselves as capable of applying digital tools in teaching, but with varying levels of confidence depending on the context. This illustrates that while integration at the planning stage is well-developed, further support is needed to strengthen actual classroom delivery and adaptability of digital tools to maximize student engagement and learning outcomes.

Self-Assessment of the Teacher Respondents of their Training in Digital Tools in terms of Support for Student Learning

	Mean	SD	Qualitative Description	Interpretati on	Rank
1. I use digital tools to provide personalized learning opportunities for students.	2.79	1.00	Agree	True of Me	3
2. I guide students in using digital tools to support their learning.	2.80	1.00	Agree	True of Me	2
3. I utilize digital platforms to monitor and assess student progress.	2.82	1.12	Agree	True of Me	1
4. I encourage students to explore and use digital tools independently.	2.66	1.06	Agree	True of Me	4
5. I help students understand the educational value of digital tools.	2.65	1.13	Agree	True of Me	5
Composite Mean	2.74	.83	Agree	True of Me	

Legend: 3.51-4.00 Strongly Agree/ Very True of Me; 2.51-3.50 Agree/ True of Me; 1.51-2.50 Disagree/ Slightly True of Me; 1.00-1.50 Strongly Disagree/ Not True of Me

The statement “I utilize digital platforms to monitor and assess student progress” obtained the highest mean of 2.82 with a qualitative description of Agree and interpretation of True of Me. This suggests that teachers are most confident in using digital tools for tracking and evaluating student performance, showing that assessment-related applications are an area of strength in their digital practice.

The statement “I help students understand the educational value of digital tools” garnered the lowest mean of 2.65, still described as Agree and interpreted as True of Me. This implies that while teachers can guide students in using digital tools, they are less effective in ensuring that learners fully appreciate the academic purpose and long-term benefits of these tools. This indicates a need for further emphasis on fostering digital literacy and awareness among students.

The composite mean of 2.74 with a standard deviation of 0.83 was described as Agree and interpreted as True of Me. This shows that overall, teachers believe they are capable of supporting student learning through digital tools. This illustrates that while teachers are confident in guiding and monitoring students' use of technology, more focused efforts are needed to encourage independent exploration and deepen students' understanding of the educational value of digital tools.

Conclusions

1. The demographic profile of the teacher respondents revealed that the majority of the teacher respondents are 25–30 years old, female, are bachelor's degree holders, and have less than 5 years of teaching experience.
2. Teacher respondents demonstrate a positive attitude toward digital tools, with strengths in learning new technologies, planning integration, and professional development. Areas requiring further attention include subject-specific proficiency, hands-on application in teaching, troubleshooting autonomy, inclusivity, ethical policy adherence, and incorporating student feedback in evaluation.
3. Teachers demonstrate competence in managing arts and design projects, particularly in communication, creativity, and ethical practices. Areas requiring improvement include fostering student self-assessment, promoting sustainability, ensuring equitable technology access, and enhancing mentorship to cultivate student leadership and independence.
4. The findings reveal that teachers generally perceive themselves as moderately competent in digital tool training and integration, with demographic factors such as age, sex, and length of service showing no statistically significant differences, while educational attainment influences knowledge and professional development perceptions.
5. The findings indicate that most aspects of arts and design project management—creativity, student engagement, technology use, ethical practices, and leadership—are consistently perceived across age, sex, educational attainment, and length of service. Exceptions include age-related differences in communication and evaluation, and service-related differences in planning and organization, highlighting areas for targeted support and training.
6. There is a significant positive correlation between teachers' self-assessment of their training in digital tools and their self-assessment of arts and design project management.

Recommendations

1. Schools should provide ongoing professional development focused on advanced digital tools and applications, emphasizing knowledge, proficiency, and ethical use. Strengthening digital skills will directly support teachers' abilities in project management, creativity, evaluation, and technological integration.
 2. Teachers should be encouraged to incorporate digital tools systematically into arts and design projects. Workshops and mentoring programs can demonstrate how technology can enhance monitoring, evaluation, interdisciplinary integration, and student engagement.
 3. Training should include practical modules on applying digital tools to support student learning, problem-solving, and project execution. This ensures that digital competencies translate into effective student engagement, planning, and mentorship in projects.
 4. Programs should emphasize digital ethics, responsible use, and accessibility to foster inclusive and sustainable practices in project management. Teachers need guidance on balancing technology integration with ethical standards.
 5. Schools should create structures for ongoing reflection and skill enhancement, such as peer collaborations, webinars, or certifications in digital tools, to maintain alignment between digital proficiency and project management growth.
 6. Since some areas like planning and organization showed weaker correlations with digital tool application, targeted interventions—such as mentoring mid-career teachers or practical project simulations—can strengthen specific project management skills alongside technology training.
- Encourage teachers to experiment with digital tools to enhance creativity and innovation in projects. Sharing best practices and successful examples can inspire wider adoption and improve confidence across all project management dimensions.

REFERENCES

- [1]. Alawi, M., & Nizar, F. (2022). Institutional leadership and digital innovation in arts education. *Oman Journal of Educational Technology*, 14(3), 75–92.
- [2]. Ariani, D., Pratama, B., & Suharto, A. (2021). Impact of digital tool training on teachers' technology adoption in art education. *Journal of Digital Learning in Art Education*, 35(2), 100–115.
- [3]. Aseel, H., & Zayan, O. (2022). Digital tools and Arts program management: Perspectives from West Asia. *Journal of Creative Education*, 28(3), 56–72.
- [4]. Elmasri, S., & Rihani, A. (2021). Bridging the digital gap in Arts education through teacher training. *Journal of Arts Pedagogy*, 19(2), 67–85.
- [5]. Ghaffar, Z., & Amirah, S. (2020). Digital assessment tools in arts and design education. *Journal of Creative Pedagogy in Malaysia*, 12(1), 40–58.

- [6]. Hadad, R., & Rizqi, F. (2021). Transforming teaching strategies through digital design training. *Indonesian Journal of Art Education*, 16(2), 61--78.
- [7]. Haneen, K., & Joud, I. (2020). Collaborative technologies in Arts classrooms: Teacher perspectives. *Journal of Digital Learning in Arts Education*, 20(3), 34-51.
- [8]. Iskandar, A., & Reza, T. (2023). Overcoming resistance to digital integration in arts education. *Bangladesh Journal of Educational Innovation*, 20(3), 49--67.
- [9]. Khadim, A., & Tarek, S. (2023). Enhancing creativity through digital tools in Arts education. *Journal of Educational Innovation*, 24(2), 89-105.
- [10]. Malik, A., & Farida, L. (2021). Preserving tradition through digital tools in arts education. *Brunei Journal of Cultural Arts Education*, 13(2), 72--85.
- [11]. Noura, A., & Firas, Z. (2021). Professional development in digital Arts education. *West Asian Journal of Educational Research*, 23(2), 45-63.
- [12]. Rahim, A., & Sofia, D. (2022). Community engagement through digital platforms in arts education. *Indonesian Journal of Creative Outreach*, 15(2), 97--115.