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From Technology Acceptance to Human Compute Collaborative Creation: A Conceptual Framework for Enhancing the Creative Practice of Art and Design Faculty in Higher Education

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Abstract: ***Artificial intelligence generated content (AIGC) is increasingly used in art and design education, but existing research often infers the enhancement of creativity from factors such as adoption, efficiency, or positive attitudes, neglecting how technology acceptance translates into creative value. This conceptual study integrates the Technology Acceptance Model (TAM) and the Diffusion of Innovations (DOI) theory to construct an "Acceptance Practice Creativity" (AEC) framework for art and design teachers in higher education. This framework synthesizes four conceptual insights. First, relative advantage and perceived usefulness can foster positive evaluations of innovation, but evaluation alone cannot enhance creativity. Second, perceived usability can reduce interaction friction and promote repeated experimentation. Third, behavioral intentions only promote creativity when translated into sustained human computer collaborative creative practice, a process that requires iterative prompting, comparison, improvement, and critical selection. Fourth, AIGC has a dual effect: it can both expand creativity and, in cases of weak professional judgment and governance, foster dependency, copyright risks, and aesthetic convergence. Therefore, the framework's main contribution lies in pointing out that co creative practices bridge the gap between technology acceptance and teacher creativity, while viewing creativity as novelty, utility, and pedagogical relevance, not just speed. For universities and the creative industries, the framework supports targeted faculty development, process based assessment, copyright management, and human centered AI practices.***

Keywords: AI driven collaborative creation; Art and design education; Teacher creativity; Human computer collaborative creation; Technology acceptance; Creative industries.

1. Introduction

The rapid development of AI generated content (AIGC) is transforming the digital infrastructure of higher education. Unlike traditional educational technologies primarily used for storing, retrieving, or distributing information, AIGC can directly participate in content generation, visual conception, design iteration, and knowledge production (Chen et al., 2024). In art and design education, functions such as image generation, style transfer, creative assistance, and conversational interaction are beginning to change how instruction is organized and teachers' own creative practices (Wang et al., 2025).

Art and design education is particularly well suited to examining this shift, as its outcomes depend on novelty, practicality, aesthetic judgment, and contextual relevance. Teachers are not merely transmitters of subject knowledge; they are also responsible for designing curricula, creating visual materials, demonstrating the creative process, and setting an example of professional judgment. AIGC (Artificial Intelligence Generative Capabilities) can increase the number and speed of available options, but faster output should not automatically equate to greater creativity. The core question is whether teachers can translate generative capabilities into original and pedagogically meaningful practices.

Existing research has generated valuable evidence about AIGC-supported teaching efficiency, personalized learning, resource production, and user adoption (Zhang, 2025). Nevertheless, three gaps remain. First, adoption oriented studies explain whether teachers are willing to use AIGC but seldom explain how use becomes creative value. Second, efficiency, idea quantity, and creativity are frequently treated as interchangeable, although creativity also requires novelty, usefulness, and disciplinary judgment. Third, positive and negative effects are often discussed separately, leaving the conditions under which AIGC broadens or narrows creative practice theoretically underdeveloped. These gaps are particularly important for art and design teachers, whose work combines technical experimentation with aesthetic, pedagogical, and ethical decisions.

Therefore, this study aims to explore how and under what conditions art and design teachers' perceptions and intentions regarding AI driven collaborative creation (AIGC) translate into more efficient creative practices. This paper constructs an "Acceptance Implementation Creation" (AEC) framework by integrating the Technology Acceptance Model (TAM) and the Theory of Innovation Development (DOI). This framework connects innovation assessment, behavioral intentions, implementation of human machine collaborative creation, and value creation. The contribution of this paper is not to provide empirical estimates of effect sizes, but rather to construct a theoretical framework that explains the missing transformation process between acceptance and creation, and to propose four propositions and implications for institutional and industry levels.

2. Literature Review and Theoretical Foundation

2.1 AIGC and Art & Design Education

With the development of generative artificial intelligence, AI generated content (AIGC) has become an important research topic in digital education. Unlike traditional educational technologies, AIGC can not only process information and integrate resources, but also generate text and images, optimize content, and assist creative work through algorithmic models (Wu et al., 2025). In higher education, these functions are being applied to areas such as instructional resource development, curriculum design, intelligent tutoring, and learning support.

AIGC appears particularly well suited for art and design education. Its image generation and visual expression capabilities can provide teachers with a wealth of creative materials and sources of inspiration (Li et al., 2025), while its interactive features can support the development of instructional resources and the redesign of classroom activities. Therefore, existing research has begun to explore AIGC as part of the innovative development of art and design education (Liang, 2024).

However, existing literature delves deeper into describing the functions of AIGC than into explaining how teachers generate creative value through these functions. Teachers are primarily seen as recipients of the technology, although they also play roles as facilitators, evaluators, curators, and ethical decision

makers. Therefore, a mechanism centered explanation must link teachers' evaluation of AIGC to specific co creation activities in which generated proposals are interpreted, modified, accepted, or rejected.

2.2 AIGC and Teacher Creativity

Creativity refers to the ability to generate novel and valuable ideas, methods, or results (Tang, 2017). In education, teachers' creativity is reflected in instructional design, curriculum development, innovative teaching methods, and problem-solving. It contributes to teaching innovation and creates opportunities for students to develop their own creativity (Seechaliao, 2017; Khuana et al., 2017). Therefore, teachers' creativity is not a byproduct of educational technology, but an important professional outcome.

Teachers' creativity is influenced by both individual and environmental factors (Shermukhammadov, 2022). At the individual level, professional knowledge, innovative thinking, and learning ability are crucial (Yeh et al., 2011); while at the environmental level, organizational support, an innovative atmosphere, and technological resources are essential (Paniagua & Istance,2018). As education becomes increasingly digital, technology is also increasingly becoming an integral part of the environment in which teachers explore, evaluate, and realize creative ideas.

AIGC offers a unique approach by participating in the creative process rather than simply executing pre defined instructions. Art and design teachers can leverage it for visual brainstorming, design conceptualization, case development, and instructional resource creation, thereby enhancing the efficiency and breadth of early exploration (Huang et al., 2024). Compared to traditional digital tools, AIGC allows for more direct participation in the iterative process of human computer collaborative creation (Liu & Bezuhla, 2024).

However, technology itself does not automatically translate into greater creativity. Teachers may be more willing to try AI generated instruction (AIGC) only if they perceive it as advantageous, practical, and easy to implement; however, this willingness is merely a prerequisite. The value of creativity only becomes apparent when teachers repeatedly integrate generative outputs with subject knowledge, aesthetic judgments, instructional objectives, and critical assessment. This distinction differentiates technology acceptance from creative practice, avoiding the direct use of frequency of use or production speed as evidence of creativity.

2.3 TAM and DOI

The Technology Acceptance Model (TAM) posits that perceived usefulness and perceived ease of use are the core factors influencing an individual's acceptance of new technologies (Davis, 1989). Users are significantly more willing to adopt a technology when they perceive it as improving their work efficiency and being easy to use.

Innovation diffusion theory emphasizes the important role of relative advantage in the technology diffusion process (Rogers, 1995). Relative advantage reflects an individual's perceived superiority over existing technologies and is an important antecedent variable influencing technology adoption.

The Technology Acceptance Model (TAM) and the Theory of Design Innovation (DOI) complement each other, but without additional mechanisms, they alone are insufficient to explain the problem of creativity. DOI explains why the relative advantage of AI-generated capabilities (AIGC) makes it attractive, while TAM explains how perceived usefulness and perceived ease of use influence behavioral intentions. However, neither theory alone can specifically explain how adopting AIGC

produces novel, practical, and pedagogically meaningful outcomes. Therefore, this study expands the perspectives of these two theories by introducing human-machine collaborative creative practice as a transformation process between acceptance and creation, and by identifying professional and institutional boundary conditions that may strengthen or weaken this process.

3. From Technology Acceptance to Creative Value: The Aec Framework

3.1 Conceptual Approach

This paper employs a theoretically constructive approach rather than empirical testing. It connects the adoption concepts of the Technology Acceptance Model (TAM) and Design of Innovation (DOI) with the functions, practices, and risks repeatedly discussed in AIGC and design education literature. The analytical task is to elucidate how perceived technological value translates into creative value. Within the proposed framework, the enhancement of creativity is defined by novelty, utility, and pedagogical relevance; higher speed or output may promote creativity, but it is not itself a creative outcome.

The framework comprises three interconnected phases: innovation assessment, collaborative creative practice, and value creation, along with corresponding boundary conditions. Relative advantage, perceived usefulness, and perceived ease of use influence teachers' initial assessment of the AI driven computing (AIGC); behavioral intention opens up the possibility of use; and iterative human-computer collaborative practice translates this intention into creative outcomes. This process bridges the gap between interpretive adoption and interpretive creativity.

3.2 Innovation Appraisal Mechanism: From Perceived Technological Value to Creative Willingness

DOI and TAM suggest that teachers first need to determine whether AIGC has a significant advantage over existing creative and instructional tools. Relative advantage refers to comparative superiority, while perceived usefulness refers to the expected improvement in a specific task. Together, they constitute innovation assessment: a rational judgment based on whether AIGC is worth trying in design conception, resource creation, or instructional preparation (Wang et al., 2025).

Positive evaluation can reduce uncertainty about the value of technical expertise, thereby stimulating curiosity and a willingness to experiment. For art and design teachers, this can broaden their understanding of various possible ideas and approaches (Zhang et al., 2026). However, the role of evaluation is to motivate rather than produce: it can inspire a willingness to act creatively, but it does not guarantee originality or practicality. This distinction avoids misinterpreting a positive attitude towards AIGC as evidence of enhanced creativity.

Proposition 1: Relative advantage and perceived usefulness strengthen teachers' willingness to experiment creatively with AIGC, thereby establishing an appraisal-based precondition for creative enhancement.

3.3 Affordance Realization Mechanism: From Ease of Use to Exploratory Depth

Creative work depends not only on individual ability but also on the technological environment's ability to support exploration. AIGC offers rapid generation, multiple solutions, multimodal expression, and interactive editing capabilities. These advantages reduce the time and technological investment required to bring early ideas to fruition, allowing instructors to compare different solutions before determining the final direction.

Perceived ease of use is crucial because it reduces interaction friction. When teachers can operate AIGCs with lower cognitive or technological costs, they are more likely to engage in iterative cycles of prompting, viewing, comparing, and revising, rather than simply issuing a single instrumental request (Lin et al., 2025). Therefore, the benefits of creativity lie not only in ease of operation but also in the deeper exploration that ease of access enables.

This mechanism also clarifies why usability is not synonymous with creativity. A simple interface can generate more output, but to truly enhance creativity, teachers need to interpret differences, question generic results, and guide the system toward meaningful teaching or aesthetic goals. Usability facilitates experimentation; however, professional judgment determines the quality of the experiment.

Proposition 2: Perceived ease of use supports creative enhancement by reducing interaction friction and increasing the depth and continuity of human AI experimentation.

3.4 Implementation Mechanism: From Behavioral Intent to Continuous Human Machine Collaborative Creation

Behavioral intention serves as a bridge between assessment and action, but intention alone cannot produce creative results. Its value lies in practice: continuously integrating AIGC into curriculum design, visual development, case construction, and artistic practice. In these contexts, the teacher's role extends far beyond simply receiving machine output. They develop prompts, compare different approaches, identify limitations, refine presentation methods, and determine whether the output meets professional and pedagogical standards.

This iterative process constitutes the practice of human-machine collaborative creation. Artificial intelligence generative capacity (AIGC) contributes speed, diversity, and reorganization capabilities, while teachers contribute problem framing, contextual knowledge, aesthetic evaluation, and value judgments. Repeated cycles help teachers develop new ideas and refine their methods (Xin & Chen, 2025). Therefore, this framework places the mechanisms of creativity above the quality of interaction rather than the presence or frequency of technology use.

Proposition 3: Behavioral intentions enhance teacher creativity only when translated into sustained human computer collaborative creative practices involving iterative generation, comparison, improvement, and critical selection.

3.5 Boundary Mechanism: The Dual Effect of Generative Assistance

Features that expand the creative space may also diminish originality. Instant output may encourage premature conclusions, reuse may lead to technological dependence, and models trained on existing data may replicate familiar styles. The uncertainty of copyright further hinders responsible experimentation (Suryanto et al., 2025; Liu et al., 2025; Wu & Zhang, 2025). Therefore, AI-generated content (AIGC) should be understood as a conditional creative resource, rather than a tool that inherently enhances creativity.

Creative achievements are more likely to be made when teachers possess the necessary AI literacy and professional judgment to examine output, and when institutions provide technical support, ethical guidance, and clear copyright procedures. Conversely, weak critical evaluation and management mechanisms may transform convenience and richness into dependency and aesthetic convergence.

Therefore, as shown in Figure 1, the AEC framework combines empowerment pathways with clearly defined boundary conditions.

Proposition 4: The positive relationship between human computer collaboration and teacher creativity is strengthened by professional judgment, AI literacy, institutional support, and ethical governance, but weakened by uncritical reliance and aesthetic convergence.

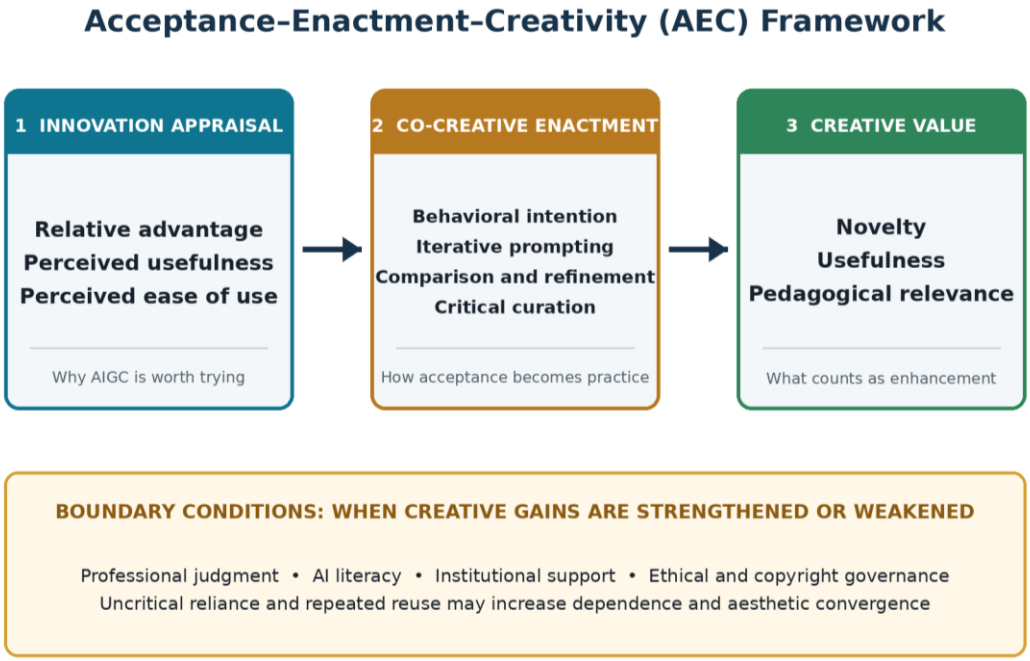

Figure 1: The Acceptance–Enactment–Creativity framework for AIGC-enabled teacher creativity

4. Theoretical Contributions and Industry Implications

The conceptual analysis yielded a core insight: AIGC (Artificial Intelligence Assisted Collaboration) itself does not enhance teacher creativity. The value created depends on whether positive evaluation and intention can be achieved through iterative, critically guided human computer collaboration practices. This result shifts the focus of explanation from the technology itself or user attitudes to the quality of the collaborative creation process.

4.1 Theoretical Contributions

This study makes three theoretical contributions. First, it expands upon the traditional adoption outcomes of the Technology Acceptance Model (TAM) and Design of Innovative Ideas (DOI), specifically elucidating the post acceptance process of technology use transforming into creativity. Second, it introduces the concept of human-machine collaborative creative practice as a missing bridge between behavioral intention and creative value, thus distinguishing iterative professional practice from mere frequency of use. Third, it constructs a dual effect model: while the richness of generative resources can broaden the scope of exploration, it may also reduce originality through dependency and aesthetic convergence. By defining the enhancement of creativity as novelty, practicality, and pedagogical relevance, this framework also distinguishes creativity from efficiency and output.

4.2 Implications for Higher Education and the Creative Industries

This framework is significant at three interconnected levels. At the faculty level, professional development should gradually transition from tool-based operations to iterative guidance, comparative evaluation, improvement, and ultimately, authorship recognition. At the curriculum level, assignments should assess the creative process: including the construction of the problem framework, selection of criteria, revision, and AI assisted disclosure, rather than simply rewarding the final product. At the industry level, art and design courses can strengthen the talent pool by cultivating graduates who combine creative speed with aesthetic judgment, client and audience understanding, copyright awareness, and responsible documentation. Therefore, its potential industry value lies not in replacing creative professionals, but in cultivating a workforce better able to guide, evaluate, and manage human-machine collaborative creation.

These insights also point to areas where institutional action may fail. Providing access to software without changing assessment, support, and governance mechanisms may increase output, but not the quality of creation. Ambiguous copyright practices, unequal access, weak AI literacy, and opaque use all undermine trust in education and professional ethics. Therefore, universities should view the adoption of AI and computer-aided development (AIGC) as an organizational capacity-building project, rather than a one off technology purchase.

5. Conclusion, Limitations, and Policy Recommendations

5.1 Conclusion and Limitations

This conceptual study integrates the Technology Acceptance Model (TAM) and the Theory of Design for Innovation (DOI) to elucidate how AI-driven collaboration (AIGC) can enhance the creative practices of art and design teachers in higher education. Its main conclusion is that while innovative assessment and behavioral intention are necessary, they are not sufficient conditions. Creativity emerges when teachers translate their acceptance of AI into sustained human computer collaborative creative practices and apply professional judgment to transform the generated solutions into novel, practical, and instructionally relevant outcomes. The four propositions presented in this study elaborate on the assessment, availability realization, practice, and boundary mechanisms that constitute this process.

The AEC framework's contribution lies in expanding the discussion beyond the broad notion that "AIGC supports creativity" to a deeper level. It clarifies the necessary shift from acceptance to value creation, explains why efficiency should not be used as a substitute indicator of creativity, and elucidates why the impact of AIGC can both promote and hinder creativity. In practice, the framework provides a foundation for universities and creative industry partners to design faculty development, curriculum assessment, and governance around collaborative creative capabilities rather than simply tool adoption.

Limited by its conceptual design, this paper does not provide empirical estimates or causal verification. Therefore, its arguments should be understood as theoretical inferences awaiting future testing, rather than observed effects. Future research could measure collaborative creative practices as an independent framework, comparing novelty, practicality, and pedagogical relevance as different outcomes, and examining whether professional judgment, AI literacy, institutional support, and governance moderate these relationships. Longitudinal, experimental, survey, and qualitative process studies are particularly important for distinguishing between short term efficiency gains and lasting creative development.

5.2 Policy Recommendations

The following recommendations translate these four mechanisms into actionable measures by the institutions:

First, universities should establish a phased professional development system for AIGC (Artificial Intelligence-Assisted Content Creation). Training should begin with perceived practicality and ease of use, gradually transitioning to iterative guidance, solution comparison, critical content selection, and reflection on improving outcomes. Assessment should focus on whether teachers can guide the collaborative creation process, rather than simply generating content.

Secondly, universities should redesign creative assignments and review processes to present process evidence alongside the final outcome. Hints, alternative versions, reasons for selection, and records of manual revisions can clearly identify authors, support formative feedback, and prevent blind reliance.

Third, institutions should establish clear management mechanisms for copyright, attribution, privacy, fair use, and information disclosure. A cross departmental mentoring team comprised of art and design faculty, legal or intellectual property experts, technical personnel, and creative industry consultants can ensure that educational practices meet professional requirements.

Fourth, universities should focus on the quality and equity of creative output, not just report adoption rates. Indicators should include the novelty, utility, diversity, and pedagogical relevance of outcomes; faculty critical assessment capabilities; and disparities in access to tools and support. This human centered approach positions AIGC as a complement to professional judgment and supports responsible, equitable, and creativity driven innovation in art and design education.

References

[1] Chen, P. K. A. (2025). How AIGC enhances the teaching quality of the guided-discovery teaching method: driving factors and moderators. The TQM Journal.

[2] Chen, X., Hu, Z., & Wang, C. (2024). Empowering education development through AIGC: A systematic literature review. Education and Information Technologies, 29(13), 17485-17537.

[3] Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). Technology acceptance model. J Manag Sci, 35(8), 982-1003.

[4] Han, S., Liu, S., & Ren, L. (2023). Application of human–computer interaction virtual reality technology in urban cultural creative design. Scientific Reports, 13(1), 14352.

[5] Hu, Z., Wu, Y., & Xu, X. (2025). Research on the Practice of Reconstructing Classroom Teaching Mode Based on AIGC. Innovative Applications of AI, 2(2), 122-131.

[6] Huang, K. L., Liu, Y. C., Dong, M. Q., & Lu, C. C. (2024). Integrating AIGC into product design ideation teaching: An empirical study on self-efficacy and learning outcomes. Learning and Instruction, 92, 101929.

[7] Khuana, K., Khuana, T., & Santiboon, T. (2017). An Instructional Design Model with the Cultivating Research-Based Learning Strategies for Fostering Teacher Students' Creative Thinking Abilities. Educational research and reviews, 12(15), 712-724.

[8] Li, X., Tang, X., Zheng, X., Huang, Y., & Tu, Y. (2025). Exploring the AIGC-driven co-creation model in art and design education: insights from a student workshop and exhibition. International Journal of Technology and Design Education, 1-31.

[9] Liang, J. (2024, November). Enhanced art design education: Integrating artificial intelligence for resource optimization and innovative teaching. In 2024 4th International Conference on Internet Technology and Educational Informatization (ITEI 2024) (pp. 239-247). Atlantis Press.
[10] Lin, J., Ge, Y., Lin, J., & Pu, H. (2025). Opportunities and challenges of AIGC in smart education. International Journal of Crowd Science, 9(4), 239-250.
[11] Liu, N., & City, G. P. X. C. (2025, May). AIGC-Assisted Design: Ethics and Perception. In Proceedings of the 2025 5th International Conference on Informatization Economic Development and Management (IEDM 2025) (p. 264). Springer Nature.
[12] Liu, W., & Bezuhla, R. (2024). Comparative analysis and collaborative innovation of parametric generation and AIGC. Art and design, (4), 22-32.
[13] Paniagua, A., & Istance, D. (2018). Teachers as designers of learning environments the importance of innovative pedagogies. Organisation for Economic Co-operation and Development (OECD).
[14] Rogers, E. M. (1995). Diffusion of innovations (4th ed.). Free Press.
[15] Seechaliao, T. (2017). Instructional strategies to support creativity and innovation in education. Journal of education and learning, 6(4), 201-208.
[16] Shermukhammadov, B. (2022). Creativity of a Teacher in an Innovative Educational Environment. Journal of Higher Education Theory & Practice, 22(12).
[17] Suryanto, A. F., Wajdi, M., Sahoo, P. K., Wu, Q., Yusof, N. M., & Chan, Y. F. (2025). The impact of artificial intelligence on logic skills, critical thinking, and student creativity. Journal of Language, Literature, Social and Cultural Studies, 3(3), 283-299.
[18] Tang, M. (2017). Creativity and innovation: basic concepts and approaches. In Handbook of the management of creativity and innovation: Theory and practice (pp. 3-32).
[19] Wang, K., Yang, Z., & Jaehong, K. (2025). AIGC changes in teaching practice in higher education visual design courses: Curriculum and teaching methods. Innovations in Education and Teaching International, 1-17.
[20] Wang, X., Li, M., Yao, Y., & Zhu, X. (2025). A study of factors influencing Chinese design students' adoption of AIGC tools. Ieee Access.
[21] Wu, D., & Zhang, J. (2025). Generative artificial intelligence in secondary education: Applications and effects on students' innovation skills and digital literacy. PLoS One, 20(5), e0323349.
[22] Wu, J., Cai, Y., Sun, T., Ma, K., & Lu, C. (2025). Integrating AIGC with design: dependence, application, and evolution-a systematic literature review. Journal of Engineering Design, 36(5-6), 758-796.
[23] Xiang, X., & Xiong, Y. (2025). Research on the Application of AIGC Technology in Digital Arts Education in Colleges and Universities. Journal of Exploration of Vocational Education, 2(1), 42-60.
[24] Xiao, J., Wang, Z., Yu, Z., & Xiaocong, D. (2026). Exploration of an AIGC-driven intelligent course design and automated teaching resource generation model. International Journal of High Speed Electronics and Systems, 35(05), 2540777.
[25] Xin, Y., & Chen, Z. (2025, May). Research on cross disciplinary practice of creative design curriculum in the era of cultural and technological integration. In International Conference on Human-Computer Interaction (pp. 128-145). Cham: Springer Nature Switzerland.
[26] Yang, Y., & Zhang, L. (2025). Research on multi-modal data-driven AIGC graphic design generation model.
[27] Yeh, Y. C., Huang, L. Y., & Yeh, Y. L. (2011). Knowledge management in blended learning: Effects on professional development in creativity instruction. Computers & Education, 56(1), 146-156.
[28] Zhang, G., Zhang, Y., & Li, Y. (2026, January). Empowering AIGC: exploring new pathways for cultivating interdisciplinary abilities in art and design education. In International Conference on Mechanical, Engineering, and Interaction Design (ICMEID 2025) (Vol. 14018, pp. 408-417). SPIE.

[29] Zhang, R., & Wang, H. P. (2025). The Impact of Teaching Beliefs on Creative Teaching Behavior Among Chinese University Educators: The Mediating Roles of Technology Acceptance and Organizational Innovation Climate. International Journal of Technologies in Learning, 32(1).
[30] Zhang, Y. (2025). The impact of generative AI on creativity and design education in Chinese higher education.