Journal of Integrated Arts Education

https://journals.cypedia.net/jiae

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Creative Skills in Crisis? Bridging the Gap between Arts Education and Human Capital Demands in the Age of Artificial Intelligence

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ABSTRACT

As artificial intelligence (AI) continues to transform creative industries, the definition and value of creative skills are undergoing profound and complex changes. Traditionally, arts education has prioritized originality, aesthetic expression, and manual craftsmanship. However, in today's AI-mediated creative economy, employers increasingly seek graduates who can combine artistic thinking with digital fluency, computational reasoning, and the ability to collaborate within AI-assisted design workflows. This evolving demand has introduced new tensions between educational models and labor market realities. Despite these changes, few empirical studies have investigated how arts education is adapting to this paradigm shift—particularly in China's rapidly modernizing design sector, where innovation and technology integration are advancing at an accelerated pace. To address this gap, the present study draws on in-depth interviews with four university-level arts educators and five recruitment professionals working in design-related industries. The findings point to a growing mismatch between curricular content and labor market expectations, with educators struggling to integrate emerging technologies into pedagogical practice and employers consistently identifying deficiencies in graduates' technological readiness and interdisciplinary adaptability. This misalignment underscores the urgent need for reform in arts curricula, including the incorporation of AI literacy, data-driven creativity, and cross-disciplinary project-based learning. By bridging educational and professional perspectives, this research contributes to a more nuanced understanding of the emerging creative skills crisis and proposes actionable strategies to align arts education with the evolving demands of AI-driven human capital development.

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ARTICLE INFO

Received: 7 April 2025 | Revised: 22 May 2025 | Accepted: 29 May 2025 | Published Online: 10 June 2025

DOI: https://doi.org/10.64797/jiae.v1i1.50

CITATION

Sun, Y., Gong, Y., Wong, N.H.Y., 2025. Creative Skills in Crisis? Bridging the Gap between Arts Education and Human Capital Demands in the Age of Artificial Intelligence. Journal of Integrated Arts Education. 1(1): 25–39. DOI: https://doi.org/10.64797/jiae.v1i1.50

Keywords: Creative Skills; Arts Education; AI; Human Capital; Curriculum Reform

1. Introduction

Arts education has historically been regarded as a cornerstone of holistic human development, nurturing not only aesthetic sensibilities but also complex cognitive and socio-emotional capacities[1–3]. In both Western and Eastern educational traditions, the arts have played a central role in fostering imagination, cultural expression, and problem-solving abilities[4]. In China, the integration of arts into the national education system has gained increasing attention in recent years, exemplified by initiatives such as the "Art Education Enhancement Plan for All Students" launched by the Ministry of Education, which aims to promote arts literacy and creative thinking from early childhood to higher education[5,6]. Universities such as the Central Academy of Fine Arts (CAFA) and China Academy of Art (CAA) have long been recognized as leading institutions in cultivating artistic talent, while comprehensive universities have established interdisciplinary programs that integrate design, media arts, and education. As China shifts toward an innovation-driven economy, the creative sector is being positioned as a strategic pillar of national development, further reinforcing the importance of nurturing creative skills through formal education[7–9].

Despite these advances, the role and relevance of creative skills are being rapidly redefined in the wake of artificial intelligence (AI)[10–12]. In particular, the rise of generative AI technologies—including tools like ChatGPT for text, Midjourney and DALL·E for image generation, and Suno AI for music composition—has begun to challenge the traditional value proposition of human creativity[13,14]. These technologies are increasingly being deployed in domains once considered exclusive to human artists and designers, such as branding, advertising, visual communication, and even fine arts[15]. For example, several Chinese tech companies have integrated AI-generated product mockups and marketing visuals into their design pipelines, reducing the need for junior-level design staff. Similarly, universities have begun experimenting with AI-assisted writing and portfolio tools, raising questions about authorship, originality, and the role of artistic judgment[16,17]. These developments signify more than just technological disruption—they reflect a fundamental shift in how creativity is defined, assessed, and commodified. What was once considered a uniquely human advantage is now being replicated, and in some cases surpassed, by machines trained on vast datasets and optimization algorithms[18].

This evolving landscape has profound implications for arts education. While many educators continue to emphasize traditional techniques, aesthetic theory, and expressive depth, the job market increasingly demands hybrid skill sets that include AI literacy, data-informed design, and collaborative technological fluency[19,20]. This disconnect is particularly visible in China's design and digital media sectors, where employers seek graduates who can not only conceptualize visually compelling ideas but also adapt them through tools like Adobe Firefly or Runway ML. At the same time, arts graduates often report difficulty in articulating their professional value in a technology-oriented labor market, leading to underemployment or misalignment between training and occupation[21]. Despite growing awareness, empirical research on this phenomenon remains scarce, especially studies that systematically examine how educators and industry recruiters perceive the transformation of creative skills and whether current curricula are adjusting accordingly.

To address this gap, this study investigates the emerging divide between arts education and human capital demands in the age of artificial intelligence. We conducted in-depth interviews with nine participants, including four university-level arts educators in China and five recruitment professionals from design-related industries. Through qualitative analysis of their insights, we aim to examine how creative skills are being redefined, what employers expect from arts graduates, and how educators are responding to these shifting expectations. Based on the above background, the following three research questions are proposed:

RQ1: How has artificial intelligence transformed the definition and perceived value of creative skills in design and arts-related industries?

RQ2: How do current arts education programs adapt to ongoing technological and conceptual changes?

RQ3: How can the gap between educational outcomes

and the evolving demands of the human capital market be effectively bridged in the context of AI-driven creative economies?

By exploring these questions, this study seeks to provide empirical insights into the future of creative skills and propose actionable strategies for aligning arts education with the realities of an AI-mediated workforce. By bridging perspectives from both education and industry, it aims to contribute to a more nuanced understanding of the emerging "creative skills crisis". The findings highlight the urgent need to rethink the design of arts curricula in a technological context—one in which creativity remains central, but its form, function, and value are being fundamentally redefined by the growing influence of artificial intelligence.

2. Literature Review

2.1. AI Integration in Arts Education

The integration of AI into arts education has redefined both the means and meaning of creative practice. Generative AI tools such as ChatGPT, DALL·E, and Midjourney have introduced new possibilities for automating ideation, visual creation, and language-based narrative construction. These technologies allow students to experiment with forms and media that were previously difficult to access or produce, enabling more inclusive and technologically augmented forms of artistic expression [22]. In many institutions, AI has been positioned as both a creative partner and a pedagogical tool, aiding in tasks ranging from visual prototyping to curatorial design [23].

In China, several top-tier institutions have begun integrating AI-related content into their arts and design programs [24]. For example, the Central Academy of Fine Arts has piloted courses in computational design and algorithmic aesthetics, while Tongji University's College of Design and Innovation incorporates machine learning tools in studio practices. These developments reflect an awareness that traditional craft-based training must evolve to meet the expectations of a digitally mediated creative economy [25]. However, the pedagogical implications of this integration remain contested. Some scholars argue that overreliance on AI may risk diminishing students' originality and critical engagement, leading to a form of "creative outsourcing" that weakens core artistic judgment [26]. Others highlight that AI systems often replicate existing patterns and lack cultural nuance, which can be particularly problematic in arts education, where diversity and context are central [27]. Therefore, while AI offers new affordances, it also demands a critical rethinking of what constitutes meaningful creative learning.

There is also a notable gap in faculty preparedness. Many arts educators report low confidence in using AI tools effectively, and there is limited institutional support for professional development in this area [28]. Without adequate training, AI integration may become superficial or reinforce existing inequalities in access to technological resources, particularly in under-resourced Chinese universities.

2.2. Human Capital Theory and the Role in Arts Education

Human capital theory views education as a form of investment in skills that improve an individual's productivity and economic potential [29]. Within this framework, arts education has traditionally been valued for its contributions to creativity, communication, and cultural literacy. However, as the global economy becomes increasingly digitized, the types of creative skills demanded by employers are evolving rapidly. Arts education is thus challenged to update its value proposition by aligning its outputs more closely with workforce realities [30].

Creative industries—particularly in design, media, and advertising—are increasingly seeking professionals who possess both aesthetic sensibility and technical fluency. This shift reflects a broader demand for "T-shaped" professionals: individuals with deep expertise in one domain and broad knowledge across complementary areas, such as AI tools, user experience, and data visualization [31]. In China's booming digital design sector, companies such as ByteDance and Alibaba expect junior designers to be proficient not only in Adobe Creative Suite but also in tools like RunwayML and Firefly, which leverage AI to accelerate production workflows.

Despite this trend, many arts graduates report difficulty finding employment that aligns with their training. This is particularly acute in China, where enrollment in design-related majors has surged over the past decade, creating an oversupply of graduates relative to high-quality job opportunities [32]. The result is a structural mismatch between the supply of creative talent and the demand for technologically

adaptive professionals—a situation that undermines both individual career outcomes and broader goals of human capital development.

From a policy perspective, this disconnect raises important questions about the role of higher education in supporting national innovation strategies. As the Chinese government positions "cultural and creative industries" as engines of soft power and economic diversification, there is a growing imperative to ensure that arts education contributes meaningfully to human capital formation [33]. This requires a reexamination of curricula, assessment models, and industry partnerships to foster both traditional artistic competencies and emerging digital literacies.

2.3. Existing Research Gaps

While the literature on AI in education has grown rapidly in recent years, most existing studies have focused on STEM fields or general digital pedagogy, leaving arts education comparatively underexplored [34]. Furthermore, the few studies that do address AI in creative disciplines tend to remain conceptual or speculative, lacking empirical investigation into how AI integration affects skill development, teaching practices, and graduate outcomes in arts-related programs.

Another gap lies in the disconnect between educational and industry perspectives. Existing research often treats curriculum reform and labor market evolution as separate domains, without exploring how the two interact in shaping students' creative capacities and career readiness [35]. Particularly absent are comparative studies that examine the expectations of educators versus recruiters—an omission that limits the capacity to design responsive educational interventions.

In the Chinese context, this gap is even more pronounced. While national policies emphasize innovation and digital transformation, academic research has yet to catch up in evaluating how these priorities translate into effective arts education models. Little is known about how Chinese arts institutions are incorporating AI into their pedagogical frameworks or how graduates perceive the adequacy of their training in navigating AI-augmented creative careers.

This study addresses these gaps by offering empirical insights drawn from interviews with both educators and employers in China. By focusing on real-world perceptions and practices, it contributes to a more grounded understanding of the "creative skills crisis" and identifies opportunities for curriculum alignment, skill redefinition, and industry-education collaboration in an AI-driven era.

3. Methodology

3.1. Participants

This study employed a purposive sampling strategy to recruit participants who could offer informed perspectives on the evolving definition and value of creative skills in the context of artificial intelligence. The sample included a total of nine individuals: four university-level arts educators and five recruitment professionals from design-related industries in China. **Table 1** provides an overview of the participants' profiles. All participants were selected based on their direct involvement in either the delivery of arts education or the evaluation of creative talent in hiring contexts.

Table 1. Overview of Interview Participants.

ID *	Gender	Role	Years of Experience **
		Educators	
E1	Male	Associate Professor (Visual Arts)	8
E2	Female	Professor (Design Thinking)	11
E3	Male	Professor (Media Arts)	17
E4	Female	Assistant Professor (Graphic Design)	5
		Recruiters	
R1	Male	HR Manager	7
R2	Male	Senior Creative Director	12
R3	Female	HR Specialist	10
R4	Female	Talent Acquisition Lead	9
R5	Male	Creative Recruiter	23

* All participants provided informed consent, and their names and institutional identifiers were anonymized to protect confidentiality.

The educators were affiliated with top-tier or regionally recognized institutions, with teaching responsibilities spanning visual arts, design thinking, and media arts. Their academic ranks ranged from lecturer to full professor, and they had a minimum of five years of experience in curriculum design or instruction. The industry participants (Recruiters), meanwhile, held positions in human resources or creative direction within companies operating in digital design, branding, animation, and advertising. Each had experience in assessing the creative and technical competencies of recent graduates for entry-level or junior roles.

The combination of academic and industry voices was essential for triangulating insights into the creative skills gap. Educators could reflect on pedagogical objectives and institutional responses to technological change, while employers could comment on the readiness of graduates and the evolving demands of the labor market.

3.2. Procedure

The study was conducted using a semi-structured, in-depth interview approach to allow for the exploration of participants' perspectives in detail while maintaining consistency across sessions. Prior to the interviews, a protocol consisting of open-ended questions was developed based on the research questions and themes identified in the literature review. The interview protocol was validated through a pilot with one educator and one recruiter not included in the final sample.

Each interview lasted between 25 and 40 min and was conducted either via Zoom or face-to-face, depending on participants' availability and location. All interviews were recorded with permission and subsequently transcribed for analysis. The interviews were conducted in Mandarin Chinese, then translated into English during the transcription process to preserve the original meaning while enabling cross-comparison and coding. **Table 2** presents a sample of the guiding interview questions organized by participant type. These questions were designed to elicit participants' views on AI's impact on creative skills, institutional or corporate responses, and expectations for future curriculum or talent development.

3.3. Data Collection

All interview data were collected over a three-week period in March 2025. Semi-structured interviews were conducted in Mandarin Chinese, either via Zoom or in person, depending on participant preference and availability. With participants' consent, all sessions were audio-recorded and transcribed verbatim. Transcripts were reviewed and translated into English by the research team, then cross-verified by a bilingual expert to ensure semantic fidelity and eliminate translation bias. Any identifying information (names, institutions, project references) was anonymized or removed to protect participant confidentiality.

Table 2. Sample Interview Questions.

Type	Sample Questions *
Educators	How have AI technologies (e.g., generative AI) influenced your teaching practices or curriculum design?
Educators	What types of creative skills do you emphasize in your current teaching?
Educators	Do you believe arts education is adapting fast enough to technological changes? Why or why not?
Recruiters	In your hiring experience, what creative or technical skills do you expect from recent arts graduates?
Recruiters	How has your company integrated AI tools into its design or creative workflow?
Recruiters	Do you observe a skills gap between graduates and current industry needs? If so, in what areas?

* The structure of the interviews allowed for flexibility, enabling participants to elaborate on themes they considered important. Follow-up questions were used to clarify responses and probe deeper into specific examples or reflections.

The data were managed using NVivo 14, a qualitative analysis software that facilitated systematic transcript management, open and axial coding, and memo-based reflection. Each transcript was segmented by participant role (educator vs. recruiter) and initially categorized by broad topic clusters, including AI perceptions, curriculum experiences, and hiring practices. A codebook was developed iteratively as part of the analysis process (see **Appendix A Table A1** for an excerpt), and codes were applied to the dataset using NVivo's node-based structure to prepare for subsequent

thematic synthesis.

3.4. Data Analysis

We employed a thematic coding approach following Braun and Clarke's[34] six-phase framework: (1) familiarization, (2) initial coding, (3) theme identification, (4) theme review, (5) theme definition, and (6) reporting. The analysis was conducted using a hybrid deductive–inductive strategy. Deductive codes were generated based on our research questions and literature review (e.g., "AI tools in teaching," "skill mismatch," "curriculum reform"). Inductive codes emerged from repeated reading of transcripts and were refined through analytical memoing.

An initial codebook was developed during open coding and expanded in two iterative cycles. For instance, under the broader code "AI Integration," subcodes included "Tool awareness," "Curriculum hesitation," and "Student experimentation." A portion of the codebook is provided in **Appendix A Table A1**, including code definitions, inclusion/exclusion criteria, and example quotes.

NVivo's hierarchical coding system was used to construct a partial coding tree, which helped visualize how micro-level participant statements aggregated into meso- and macro-level themes (see **Appendix B** for a sample coding tree). Codes were applied by two researchers independently, followed by a joint reconciliation session to compare applications, discuss disagreements, and resolve discrepancies. To assess intercoder reliability, we applied Cohen's Kappa to a 20% random sample of the transcripts. The kappa coefficient across major codes was $\kappa = 0.82$, indicating strong agreement. Discrepancies were mostly related to overlapping thematic boundaries, which were clarified in the final round of codebook refinement. Coding consistency and auditability were further enhanced by keeping reflexive memos and maintaining an audit trail of code revisions within NVivo.

The resulting themes were synthesized by comparing educator and recruiter responses, allowing us to identify both converging perspectives (e.g., the urgency of AI adaptation) and diverging expectations (e.g., depth vs. breadth of skill training). These themes directly informed the Results sections, particularly the framing of the "creative skills crisis" in relation to AI-mediated transformation in China's arts education and employment systems.

4. Results

4.1. Redefining Creative Skills in the Age of AI (RQ1)

Interview insights from educators and recruiters reveal evolving perceptions of how artificial intelligence is reshaping the notion of creative skills. Traditionally, creativity was defined in terms of originality, aesthetic sensitivity, and manual craftsmanship. However, with the rise of generative AI, creative value is increasingly being tied to technological adaptability, strategic thinking, and content integration rather than solely to production-based skills.

R2 commented: "*It's not enough for designers to draw well anymore. We want candidates who understand how to direct AI—how to use tools like Midjourney to rapidly prototype or test visual directions before committing to development.*" This reflects a shift from hands-on creation to conceptual orchestration of technology-enhanced workflows. In this new context, creative professionals are expected to serve as curators or strategic thinkers who leverage AI to accelerate ideation and iterate on multiple design options efficiently.

Educators echoed similar sentiments. E2 noted: "*Our students still learn traditional skills, but I've had to add sessions on how to use AI tools not just for making things—but for expanding their thinking. They need to learn how to collaborate with algorithms.*" However, concerns were also raised about the potential devaluation of foundational artistic skills. Some educators feared that overreliance on AI might reduce students' engagement with materials, process, and critical self-reflection. As E3 remarked: "*If students jump straight to generative output, they may skip the thinking behind the image. That's a loss to the creative process.*"

These findings suggest that the definition of creative skills is undergoing a transformation: from craftsmanship to hybrid fluency, where understanding and directing AI tools is as crucial as generating original ideas. The ability to navigate digital platforms, evaluate outputs, and maintain conceptual integrity is now central to how creativity is evaluated in AI-mediated work environments.

4.2. Uneven Adaptation in Arts Education (RQ2)

The responses from educators revealed mixed levels of adaptation. While some institutions have begun integrating AI-related content into their curricula, this adaptation remains inconsistent and often limited to elective or experimental courses. Only one of the four educators interviewed reported that AI was a formal component of their department's curriculum; others relied on individual initiative to introduce students to emerging tools and methods.

E1 shared: "*There is no centralized support or curriculum reform at my university. I personally introduce AI tools to students, but it's not part of any official program. Some of my colleagues are hesitant or skeptical.*" This reflects broader institutional inertia, where curriculum change lags behind technological advancement. Educators face challenges such as limited training, lack of infrastructure, and uncertainty about pedagogical outcomes. Some also expressed concern that without a clear framework, AI use could become a novelty rather than a meaningful learning experience.

In contrast, students reportedly show strong interest in AI tools and actively explore them in their studio work, particularly in design and media art programs. However, without structured guidance, their engagement is often uncritical or purely technical. E4 noted: "*Students experiment with Midjourney or Firefly for visual effects, but few understand the ethical, conceptual, or historical implications of AI-generated work.*" This pedagogical gap is exacerbated by a lack of faculty development programs. As many older faculty members were trained in pre-digital or analogue traditions, they may feel unprepared to teach emerging technologies. Institutions rarely offer training or incentives to bridge this skills gap among instructors.

Nonetheless, there are signs of change. For instance, two educators mentioned informal faculty networks or workshops where new tools are introduced and discussed. These bottom-up efforts may signal an emerging shift toward more systematic integration of AI in arts education, especially as student and employer demand continues to grow.

4.3. Bridging the Education–Industry Gap (RQ3)

One of the most salient findings from the recruiter interviews was the disconnect between what employers value and what graduates are trained to do. Recruiters consistently emphasized the need for graduates to possess applied digital fluency, problem-solving skills, and collaborative experience. However, they observed that many arts graduates still primarily showcase individual, portfolio-driven work with limited attention to team-based or tech-integrated projects.

R3 shared: "*We receive beautiful portfolios, but many students lack experience with cross-functional teams or AI-assisted workflows. We don't just want a creative person—we want someone who can fit into a fast-moving, tech-driven pipeline.*" Recruiters also suggested that institutions should strengthen their connections with industry through internships, live briefs, or co-developed modules. R1 emphasized: "*We're open to working with universities, but there's often a disconnect. We need graduates who understand real production cycles and constraints—not just theory.*" Educators, for their part, acknowledged the need for reform but pointed to institutional and bureaucratic barriers. E2 noted that curriculum revisions often take years to implement and must go through multiple layers of approval, which makes it difficult to respond quickly to changes in the labor market.

To bridge this gap, participants recommended three main strategies: (1) embedding AI literacy and tool fluency into foundational courses; (2) incorporating interdisciplinary, problem-based learning models that mirror real-world design challenges; and (3) establishing formal partnerships between universities and creative industries for curriculum co-development and talent pipelines.

Importantly, several participants stressed that arts education should not abandon its traditional strengths in aesthetics, critical theory, and cultural literacy. Rather, it must expand its definition of creativity to include technological mediation and systemic thinking. The goal is not to replace human creativity with AI, but to prepare students to use AI as a tool for enhanced creative expression and innovation.

4.4. Recommendations

Based on the themes extracted from the interviews, this study proposes a series of targeted recommendations to bridge the gap between arts education and labor market demands in the AI era. These suggestions are organized along two critical dimensions: educational reform and human capital development.

4.4.1. Repositioning AI in Arts Curricula

The findings are evident that a strategic realignment is needed between arts education and the evolving demands of the creative labor market in the AI era. From the educational perspective, institutions must move beyond treating artificial intelligence as an optional tool and instead embed it as a core component of creative learning. This involves redesigning curricula to include AI literacy, algorithmic thinking, and critical engagement with generative tools. Faculty development programs are also essential to support educators in adopting these technologies, especially in contexts where resistance or lack of familiarity may hinder integration. Interviewed educators repeatedly emphasized the necessity of integrating AI into core teaching practices. As E1 observed, "*AI is not just a tool—it's a language today's students need to speak fluently.*" This suggests that higher education institutions should embed AI literacy, algorithmic thinking, and critical digital pedagogy into the core curriculum, rather than relegating these to optional modules. To support this shift, professional development for instructors must be scaled up. E3 acknowledged, "*Some of us are still learning what these tools can do; we need time and training.*"

4.4.2. Preserving and Expanding Artistic Intuition

Despite the technological shift, educators cautioned against over-technologizing the curriculum. Arts education must retain its traditional strengths in conceptual depth, cultural analysis, and aesthetic sensitivity. Rather than viewing AI as a threat to creativity, programs should frame it as a medium through which new forms of expression and interdisciplinary innovation can emerge. Project-based learning that blends human creativity with machine augmentation—for example, collaborative assignments using both hand-drawing and text-to-image generation—can offer students meaningful opportunities to explore hybrid creative practices. E2 noted, "*We risk losing the soul of art if we only focus on tools.*" Therefore, a dual approach is essential—one that maintains conceptual depth, cultural literacy, and aesthetic judgment, while promoting creative experimentation with AI. Project-based assignments that blend traditional skills (e.g., sketching) with AI-enhanced outputs (e.g., generative visuals or sound design) were seen as promising formats.

4.4.3. Strengthening University–Industry Linkages

From the perspective of human capital development, employers in design-related industries should actively collaborate with universities to close the skills gap. This includes co-developing courses, hosting real-world design challenges, and offering structured internships that expose students to AI-integrated workflows. Several recruiters highlighted a misalignment between graduates' training and workplace needs. R2 stated, "*We don't need perfect portfolios—we need people who can think across platforms and collaborate with AI.*" To address this, design firms and other creative employers should be involved in co-developing curricula, sponsoring real-world challenges, and offering AI-enabled internship experiences. R1 emphasized, "*When students intern with us, they often touch AI tools for the first time—that's too late.*"

4.4.4. Redefining Human Capital Metrics in Hiring

Another common theme was the need to adjust hiring standards. Recruitment criteria should also evolve to recognize not only technical proficiency but also adaptive thinking, ethical awareness, and the ability to work across domains. Employers should expand their criteria beyond technical skillsets to include interdisciplinary fluency, ethical sensibility, and adaptive thinking. As R1 put it, "*We value someone who can write a prompt as much as someone who can sketch a logo.*" These evolving demands call for better communication between universities and industry about what constitutes "creative readiness" in an AI-mediated environment.

Ultimately, addressing the creative skills crisis requires a shared responsibility between education and industry. Arts education must equip students with both expressive power and technological fluency, while employers must create pathways for these hybrid professionals to thrive. In doing so, the creative workforce can be redefined not as a casualty of AI disruption, but as a driving force of innovation in the digital age.

5. Discussion

5.1. Findings of the Results

This study reveals that the notion of creative skills is undergoing a paradigmatic transformation in the context of

AI-augmented creative industries. Through interviews with both educators and recruiters, it becomes evident that creativity is no longer defined solely by aesthetic sensibility or manual craftsmanship. Instead, it is being expanded to include a hybridized set of capabilities such as AI tool fluency, computational thinking, data literacy, and adaptive system-level design. These findings support earlier observations in the literature regarding the evolution of 21st-century competencies but go further by demonstrating how such changes are concretely reshaping hiring expectations and curricular practices in the arts.

From the perspective of human capital theory, especially as formulated by Becker[35], these findings raise critical questions about the applicability of classical models to the contemporary creative workforce. Traditionally, Becker's framework emphasizes investments in education and training as mechanisms for increasing individual productivity, where returns are often measured in wage differentials or labor market success. However, our findings suggest that in the AI era, human capital must be reconceptualized to include machine-interfacing skills—that is, the ability to not just perform tasks but to strategically collaborate with intelligent systems[36]. This reflects a shift from accumulated knowledge to interactional capability, which is not adequately captured by traditional metrics of human capital[30]. For instance, the widely observed skill gap between arts graduates and industry needs in this study does not stem from a general lack of education but rather from a misalignment between the type of human capital being produced (e.g., expressive, discipline-specific skills) and the composite, cross-functional skill sets required by modern creative industries. This challenges the assumption within classical human capital theory that formal education inherently enhances employability[37]. As R3 emphasized, "*We're looking for people who can fluidly move between tools, collaborate across domains, and think in systems. Art school doesn't really train that.*"

Moreover, the findings point toward emergent forms of human capital that classical theory does not fully account for—such as AI-mediated creativity, prompt engineering literacy, or ethico-aesthetic judgment in hybrid workflows. These skills are not easily quantifiable but are increasingly vital in contexts where human and machine outputs are co-produced. The result is a tension between education systems still largely governed by traditional human capital frameworks and labor markets that operate according to rapidly evolving, technology-driven value systems. Educators interviewed in the study are aware of this mismatch but express frustration over the lack of systemic support. E1 observed, "*We're not trained for this shift, and we're not given time to adapt. It's all on individual initiative.*" This reflects a second layer of misalignment—not only between students and employers, but also between institutional structures and the new demands of the creative economy.

Importantly, the study also reaffirms the value of traditional creative capabilities, such as conceptual depth, cultural critique, and artistic intuition. Rather than being rendered obsolete by AI, these qualities are seen as essential for distinguishing meaningful work from mechanistic output. This supports a nuanced extension of human capital theory: one that incorporates both technological fluency and humanistic insight as co-equal contributors to economic and social value[38]. Such a view echoes recent critiques of Becker's model that call for a more pluralistic understanding of human capital—one that reflects the complex, multi-dimensional demands of creative labor in the digital age.

In summary, both educators and employers agree on the importance of maintaining traditional creative values while expanding the scope of skill training. The goal is not to replace human-centered creativity but to evolve it—positioning students as co-creators with AI rather than passive tool users. The findings do not simply illustrate a gap between education and employment; they surface a deeper structural incongruity between legacy theories of workforce preparation and the actual dynamics of value creation in the AI era. This underscores the urgency for rethinking educational investment not merely in terms of quantity or access, but in the composition, adaptability, and future-readiness of the skills being cultivated.

5.2. Educational Implications in the Digital and Chinese Context

The findings of this research hold substantial implications for the theory and practice of arts education, particularly within the Chinese context. Firstly, they call for a reevaluation of existing curricula to reflect the changing nature of creativity in the digital era. The traditional focus on form, medium, and expression must be expanded to include technological mediation, critical AI literacy, and cross-disciplinary thinking[38]. This aligns with emerging views in education

theory that emphasize adaptive, meta-cognitive competencies as key indicators of long-term learner success. In China, these calls resonate strongly with the goals of the *New Liberal Arts* initiative [39], which advocates for the integration of digital technology, humanities, and innovation-driven curricula. However, our findings suggest that the implementation of such frameworks remains inconsistent across institutions and often lacks alignment with the actual demands of AI-enhanced creative industries.

Secondly, the study underscores the importance of institutional change. While individual instructors may pioneer AI integration, long-term impact requires systemic support. This includes formal training programs for faculty, revised assessment frameworks, and the establishment of interdisciplinary teaching teams that bring together expertise from design, computer science, and digital media [40]. In the Chinese higher education system, where curriculum design is often centralized and reform cycles are long, such transformations pose particular challenges [41]. Moreover, hierarchical administrative structures may limit the agility of local departments in piloting AI-related pedagogical innovation, making bottom-up experimentation and cross-institutional collaboration especially valuable in this context.

Thirdly, the shift toward hybrid creative skills necessitates pedagogical innovation. Project-based learning, scenario-based design, and collaborative digital workshops can serve as effective formats to prepare students for AI-mediated creative practice. These approaches not only reflect real-world conditions but also foster essential soft skills such as communication, ethical reasoning, and teamwork—attributes that are increasingly valued in both artistic and commercial fields. In China, where the creative industries are expanding rapidly—particularly in areas like gaming, animation, and digital marketing—there is strong demand for graduates who can navigate technology-rich, team-oriented environments [42]. However, current teaching practices in many arts academies still rely heavily on master-apprentice models and individual studio critique, which are not always conducive to such competencies.

Finally, the research reaffirms that arts education must retain its critical and cultural foundations. In an era of rapid technological change, students need more than tool-based proficiency; they must be equipped to question the implications of AI on authorship, originality, and cultural representation. This critical literacy is essential for fostering responsible, socially engaged creators [42,43]. Within China's unique cultural production landscape—where both traditional heritage and digital consumerism intersect—such reflective capacities are crucial. Students must be able to engage with global technological trends while also navigating national narratives, policy sensitivities, and market forces that shape artistic expression in the Chinese context.

5.3. Operational Strategies and Institutional Recommendations

This study highlights a set of practical and operational strategies that universities and industry stakeholders can adopt to more effectively address the emerging creative skills gap in the AI era. These recommendations are grounded in empirical insights from interviews and aim to bridge the disconnect between educational design and real-world creative practice.

5.3.1. Institutional Collaboration and Curriculum Co-Design

One actionable recommendation is the establishment of formal partnerships between arts education institutions and AI-driven creative industries. Instead of general collaboration, partnerships should center on co-developed modules and design challenges that reflect industry-relevant workflows. For example, R3 noted, "*We want people who can adapt to fast-paced, technology-driven workflows.*" To simulate such conditions, universities could implement time-bound "AI design sprints" within existing courses. These sprints involve rapid ideation, prototyping with tools like RunwayML or DALL·E, and iterative feedback sessions with external mentors. This format mirrors industry project cycles and prepares students for high-tempo, collaborative environments.

5.3.2. Scaffolded AI Integration in Courses

Beyond merely "embedding AI literacy," institutions can operationalize this goal through modular, embedded toolkits that align with the progression of studio-based courses. For example, a visual design course might include a three-week segment on AI-assisted ideation, where students utilise generative tools to create mood boards or explore layout variations. Crucially, this technical training should be paired with critical reflection assignments on topics such as

data ethics, algorithmic aesthetics, and authorship, helping students develop not only tool fluency but also evaluative judgment.

5.3.3. Bottom-Up Strategies Amid Institutional Lag

Recognizing the time lag in formal curriculum revisions—as E2 remarked, "Curriculum revisions take years"—we propose a set of bottom-up, rapidly deployable strategies: (1) Faculty-led stackable microcredentials or short-form workshops on AI tools (e.g., using ChatGPT for scriptwriting or Midjourney for visual ideation); (2) Sandbox assignments that encourage experimentation with AI in low-stakes, ungraded settings to reduce fear of failure; (3) Support for student-led clubs, peer learning circles, or co-curricular hackathons that foster community-driven exploration of AI applications. These initiatives can be launched within a semester without requiring extensive structural changes, enabling institutions to respond more nimbly to evolving demands.

5.3.4. Faculty Development and Incentive Structures

To enable sustained change, institutions must also prioritize educator upskilling. A tiered faculty development model can support this effort: (1) At the foundational level, self-paced digital modules introduce core AI concepts and tools; (2) At the intermediate level, faculty from different departments collaborate in AI-infused co-teaching labs to experiment with integrated pedagogy; (3) At the advanced level, institutions can provide small internal grants or teaching innovation awards for instructors developing AI-enriched syllabi or assignments[44]. Such efforts address both knowledge barriers and cultural resistance to AI integration, as noted by multiple educators in our study.

5.3.5. Industry Engagement and Recruitment Reform

On the employer side, recruiters should move beyond traditional portfolio evaluations. R2 emphasized the value of adaptability and collaborative capacity. Accordingly, hiring processes can incorporate AI-based design simulations where candidates complete tasks using specified generative tools under time constraints. This offers a more authentic measure of workplace readiness. Additionally, industry partners should engage in structured feedback loops with universities—e.g., through internship debriefs or advisory boards—to ensure curricula remain responsive to evolving toolsets and workflow expectations[45–47].

In summary, addressing the creative skills gap necessitates a networked, iterative, and data-informed approach to institutional change. By implementing these specific, actionable measures, stakeholders can cultivate a future-ready workforce that is equipped to thrive in AI-augmented creative ecosystems.

5.4. Limitations and Reflections

While this study offers valuable insights into the evolving definition of creative skills in the age of artificial intelligence, several methodological limitations should be acknowledged. Firstly, the sample size is relatively small, consisting of only nine participants—four educators and five recruiters. Although the interviews yielded rich qualitative data, the limited number of informants constrains the representativeness of the findings and may not capture the full range of perspectives within China's diverse educational and industry contexts.

Secondly, the study is geographically restricted to China. While China presents a unique and dynamic landscape for both arts education and AI-driven industry innovation, the cultural, institutional, and policy-specific factors present in this context may limit the generalizability of the conclusions to other national or regional settings. Comparative studies across different countries or regions would be valuable to understand how the challenges and responses to the creative skills crisis vary in other educational systems and labor markets[48].

Finally, the use of purposive sampling introduces potential bias in participant selection. While this strategy allowed us to target information-rich cases, it may have inadvertently excluded voices that hold alternative or dissenting views. Future research could benefit from broader sampling strategies—such as stratified or snowball sampling—and incorporate survey-based or mixed-methods approaches to triangulate findings and enhance external validity.

6. Conclusions

This exploratory study examined how artificial intelligence may be reshaping the definition, valuation, and teaching of creative skills within arts education, with a particular

focus on China's evolving creative industries. Drawing on in-depth interviews with university-level educators and design-sector recruiters, the findings suggest an emerging misalignment between traditional arts curricula and the hybrid skill sets increasingly valued in AI-mediated creative labor markets. While creativity continues to be a central value, its modes of expression are shifting—from manual craftsmanship to strategic, digitally augmented creation—reflecting broader technological and economic transformations.

Furthermore, the results indicate a pressing need for arts education to consider reforming both content and pedagogy. Institutions are encouraged to explore ways of embedding AI literacy and digital fluency into foundational training, while simultaneously preserving the critical, cultural, and aesthetic dimensions of creative learning. Furthermore, the study highlights the potential benefits of strengthening university-industry collaboration to reduce structural mismatches, better align graduate capabilities with workforce expectations, and enhance student employability.

These insights contribute to a growing body of knowledge on the so-called "creative skills crisis," particularly in contexts undergoing rapid digital transition. However, given the limited sample size and exploratory nature of the study, the conclusions should be interpreted with caution. Future research could build on these findings through cross-national comparative studies and larger-scale mixed-method investigations. Longitudinal research tracking the career trajectories of arts graduates trained in AI-enriched programs may also offer valuable perspectives on the long-term impacts of curriculum innovation on professional identity and labor outcomes.

Author Contributions

Conceptualization, Y.S. and Y.G.; methodology, Y.S.; validation, Y.S., Y.G. and N.H.Y.W.; formal analysis, N.H.Y.W.; investigation, Y.S.; resources, Y.G.; data curation, Y.G.; writing—original draft preparation, Y.S.; writing—review and editing, N.H.Y.W.; visualization, Y.G.; supervision, Y.S.; project administration, Y.G. All authors have read and agreed to the published version of the manuscript.

Funding

This work received no external funding.

Institutional Review Board Statement

Informed consent was obtained from all participants prior to data collection. Participants were informed of the purpose of the study, their right to withdraw at any time, and how their responses would be anonymized and used solely for academic purposes.

Informed Consent Statement

All participants provided informed consent prior to their participation in the study. They were fully informed about the purpose of the research, the voluntary nature of their involvement, and their right to withdraw at any time without consequence. Participants were also assured that their responses would be anonymized and used solely for academic research purposes. No personally identifiable information was collected or disclosed.

Data Availability Statement

The data supporting the findings of this study are not publicly available due to privacy and ethical restrictions. The interview transcripts contain sensitive information and cannot be shared in order to protect participant confidentiality. However, anonymized excerpts or additional details may be made available by the corresponding author upon reasonable request, subject to institutional ethical approval and compliance with confidentiality agreements.

Conflicts of Interest

The authors declare no conflict of interest.

Appendix A

In accordance with institutional ethical guidelines and participant consent agreements, full interview transcripts cannot be disclosed. Several participants specifically requested that their responses remain confidential and not be published in full. Therefore, the materials included in this appendix—such as selected codebook entries and simplified coding trees—represent anonymized excerpts that illustrate the analytical process without compromising participant privacy. These examples have been carefully selected to reflect the core themes

and methodological rigor of the study while respecting the confidentiality commitments made to our interviewees.

Table A1. Sample Codebook (Excerpt).

Code	Definition	Inclusion Criteria	Example Quote
AI Tool Awareness	References to participants' knowledge or use of AI tools	Mentions specific AI tools like Midjourney, ChatGPT, RunwayML, etc.	"Some students have started using Midjourney to generate storyboards." – E4
Curriculum Hesitation	Expressions of uncertainty or lack of institutional support for AI integration	Describes slow reform, lack of training, or resistance from faculty	"There's no official guideline, so I just experiment with my own class." – E2
Student Experimentation	Mentions of students independently experimenting with AI tools	Students using AI without formal instruction	"They're using Firefly in their final projects, even though we never taught it." – E1
Technical Readiness	Recruiter assessments of graduates' technical competence	Graduates' ability to use design software, AI tools, etc.	"Most graduates know Photoshop, but few understand how to use RunwayML efficiently." – R3
Creative-Technical Balance	Tensions between creative originality and tool-based production	Statements about balancing AI use with artistic integrity	"AI can generate layouts, but we still need people with real creative thinking." – R2
Industry Expectations	Recruiters' expectations for industry-aligned skills in new hires	Mentions of adaptability, AI fluency, production speed expectations	"We look for designers who can collaborate with AI to speed up delivery." – R1
Training Needs	Mentions of faculty needing support or training to integrate AI	References to training gaps, workshops needed, lack of incentives	"I have no idea how to teach these tools, and no one is helping us." – E3
Reform Challenges	Structural or policy-related challenges to curriculum reform	Mentions of delays or obstacles in institutional change	"It takes years to get a new course approved; by then the tech has changed." – E2
Collaborative Skills	References to the importance of teamwork or cross-disciplinary ability	Team-based project experience, communication, collaboration	"We need people who can work in agile teams, not just solo artists." – R5
Conceptual Creativity	Mentions of original idea generation or aesthetic judgment as a valued skill	Cognitive originality, narrative depth, or aesthetic expression	"Creative ideas still matter, even if machines can generate the visuals." – E1

Appendix B

Partial Coding Tree (Simplified)

- AI in Education
  - AI Tool Awareness
  - Curriculum Hesitation
  - Student Experimentation
- Skills Gap
  - Technical Readiness
  - Creative-Technical Balance
  - Industry Expectations
- Institutional Adaptation
  - Training Needs
  - Reform Challenges
- Workplace Competencies
  - Collaborative Skills
  - Conceptual Creativity

References

[1] Roege, G.B., Kim, K.H., 2013. Why we need arts education. Empirical Studies of the Arts. 31(2), 121–130. DOI: https://doi.org/10.2190/EM.31.2.EOV.1

[2] Pente, P., Adams, C., Yuen, C., 2022. Artificial Intelligence, ethics, and art education in a posthuman world. In: Global media arts education: Mapping global perspectives of media arts in education. Springer International Publishing: Cham, Switzerland. pp. 197–211. DOI: https://doi.org/10.1007/978-3-031-05476-1_12

[3] Li, Q., Li, Z., Han, J., 2021. A hybrid learning pedagogy for surmounting the challenges of the COVID-19 pandemic in the performing arts education. Education and Information Technologies. 26(6), 7635–7655. DOI: https://doi.org/10.1007/s10639-021-10612-1

[4] Vogel, D., Lisboa Sohn, A.P., Santucci de Oliveira, B., 2024. Analysis of scientific production on competencies models in culinary arts education on EBSCO, web of science and scopus databases. Journal of Culinary Science & Technology. 22(3), 533–546. DOI: https://doi.org/10.1080/15428052.2022.2060890

[5] Hu, B., Zheng, L., Zhu, J., et al., 2024. Teaching plan generation and evaluation with GPT-4: Unleashing the

potential of LLM in instructional design. IEEE Transactions on Learning Technologies. 17, 1445–1459. DOI: https://doi.org/10.1109/TLT.2024.3384765

[6] Basak, R., 2021. Teacher Opinions and Perspectives of Visual Culture Theory and Material Culture Studies in Art Education. Online Submission. 6(2), 186–211. DOI: https://doi.org/10.31578/jebs.v6i2.242

[7] Rallis, N., Leddy, S., Irwin, R.L., 2024. Relational ethics through the flesh: Considerations for an anti-colonial future in art education. Qualitative Inquiry. 30(2), 212–219. DOI: https://doi.org/10.1177/10778004231176091

[8] Sun, Y., Yang, H., Yu, H.K., et al., 2025. Boon or Bane? Evaluating AI-driven Learning Assistance in Higher Education Professional Coursework. Education and Information Technologies. 1–34. DOI: https://doi.org/10.1007/s10639-025-13642-1

[9] Ke, M.F., 2023. Applications and challenges of artificial intelligence in the future of art education. Pacific International Journal. 6(3), 61–65. DOI: https://doi.org/10.55014/pij.v6i3.405

[10] Park, Y.S., 2023. Creative and critical entanglements with AI in art education. Studies in Art Education. 64(4), 406–425. DOI: https://doi.org/10.1080/00393541.2023.2255084

[11] Kim, H., So, H.J., Park, J.Y., 2022. Examining the effect of socially engaged art education with virtual reality on creative problem solving. Educational Technology & Society. 25(2), 117–129. DOI: https://www.jstor.org/stable/48660128

[12] Yang, X., Cheng, P.Y., Liu, X., et al., 2024. The impact of immersive virtual reality on art education: A study of flow state, cognitive load, brain state, and motivation. Education and Information Technologies. 29(5), 6087–6106. DOI: https://doi.org/10.1007/s10639-023-12041-8

[13] Lee, U., Han, A., Lee, J., et al., 2024. Prompt Aloud!: Incorporating image-generative AI into STEAM class with learning analytics using prompt data. Education and Information Technologies. 29(8), 9575–9605. DOI: https://doi.org/10.1007/s10639-023-12150-4

[14] Kawakami, R., Venkatagiri, S., 2024. The impact of generative AI on artists. In Proceedings of the 16th Conference on Creativity & Cognition, Orlando, FL, USA, 23–26 June 2024; pp. 79–82. DOI: https://doi.org/10.1145/3635636.3664263

[15] Duncum, P., 2002. Visual culture art education: Why, what and how. International Journal of Art & Design Education. 21(1), 14–23. DOI: https://doi.org/10.1111/1468-5949.00292

[16] Zhang, W., Shankar, A., Antonidoss, A., 2022. Modern art education and teaching based on artificial intelligence. Journal of Interconnection Networks. 22(Supp01), 2141005. DOI: https://doi.org/10.1142/S021926592141005X

[17] Vartiainen, H., Tedre, M., 2023. Using artificial intelligence in craft education: crafting with text-to-image generative models. Digital Creativity. 34(1), 1–21. DOI: https://doi.org/10.1080/14626268.2023.2174557

[18] Fang, F., Jiang, X., 2024. The analysis of artificial intelligence digital technology in art education under the internet of things. IEEE Access. 12, 22928–22937. DOI: https://doi.org/10.1109/ACCESS.2024.3363655

[19] Chiu, M.C., Hwang, G.J., Hsia, L.H., et al., 2024. Artificial intelligence-supported art education: A deep learning-based system for promoting university students' artwork appreciation and painting outcomes. Interactive Learning Environments. 32(3), 824–842. DOI: https://doi.org/10.1080/10494820.2022.2100426

[20] Miralay, F., 2024. Use of Artificial Intelligence and Augmented Reality Tools in Art Education Course. Pegem Journal of Education and Instruction. 14(3), 44–50. DOI: https://doi.org/10.47750/pegegog.14.03.04

[21] Sáez-Velasco, S., Alaguero-Rodríguez, M., Delgado-Benito, V., et al., 2024. Analysing the impact of generative AI in arts education: A cross-disciplinary perspective of educators and students in higher education. Informatics. 11(2), 37. DOI: https://doi.org/10.3390/informatics11020037

[22] Li, Q., Zhao, R., 2025. A study on the inheritance and innovation of modern art history for sustainable development from the perspective of contemporary art history. Design and Art Studies. 1(1). DOI: https://doi.org/10.63623/v9p68322

[23] Tian, M.C., Eschrich, J., Sterman, S., 2024. Designing AI with metaphors: Leveraging ambiguity and defamiliarization to support design creativity. In Proceedings of the 16th Conference on Creativity & Cognition, New York, NY, USA, 23–26 June 2024; pp. 537–541. DOI: https://doi.org/10.1145/3635636.3664250

[24] Anderson, B.R., Shah, J.H., Kreminski, M., 2024. Homogenization effects of large language models on human creative ideation. In Proceedings of the 16th Conference on Creativity & Cognition, New York, NY, USA, 23–26 June 2024; pp. 413–425. DOI: https://doi.org/10.1145/3635636.3656204

[25] Li, C., Jiang, Y., Ng, P.H., et al., 2024. Collaborative learning in the edu-metaverse era: An empirical study on the enabling technologies. IEEE Transactions on Learning Technologies. 17, 1107–1119. DOI: https://doi.org/10.1109/TLT.2024.3352743

[26] Ibrahim, A.B., 2024. Assessing the knowledge and perception of artificial intelligence for teaching and research among lecturers in the faculties of arts in Nigeria. Journal of Global Research in Education and Social Science. 18(2), 25–33. DOI: https://doi.org/10.56557/JOGRESS/2024/v18i28671

[27] Xu, Y., Nazir, S., 2024. Ranking the art design and applications of artificial intelligence and machine learn-

ing. Journal of Software: Evolution and Process. 36(2), e2486. DOI: https://doi.org/10.1002/smr.2486

[28] Isakov, A., 2025. Fostering creativity in art education through digital tools. Society and innovations, 5(12), 170–181. DOI: https://doi.org/10.47689/2181-1415-vol5-iss12/S-pp170-181

[29] Woessmann, L., 2024. Skills and earnings: A multidimensional perspective on human capital. Annual Review of Economics. 17. DOI: https://doi.org/10.1146/annurev-economics-081324-081733

[30] Leoni, S., 2025. A historical review of the role of education: From human capital to human capabilities. Review of Political Economy. 37(1), 227–244. DOI: https://doi.org/10.1080/09538259.2023.2245233

[31] Auerbach, P., Green, F., 2024. Reformulating the critique of human capital theory. Journal of Economic Surveys. DOI: https://doi.org/10.1111/joes.12675

[32] Wei, Y., 2025. Developing students' creativity and critical thinking in higher education: a human capital theory perspective. In Proceedings of the 2025 11th International Conference on Humanities and Social Science Research (ICHSSR 2025), Beijing, China, 12–14 July 2025; Vol. 945, p. 52. DOI: https://doi.org/10.2991/978-2-38476-440-2_7

[33] Thomson, P., 2025. Why bother with arts education in schools? The Australian Educational Researcher. 52(1), 781–801. DOI: https://doi.org/10.1007/s13384-024-00741-0

[34] Braun, V., Clarke, V., 2019. Reflecting on reflexive thematic analysis. Qualitative Research in Sport, Exercise and Health. 11(4), 589–597. DOI: https://doi.org/10.1080/2159676X.2019.1628806

[35] Becker, G.S., Murphy, K.M., Tamura, R., 1990. Human capital, fertility, and economic growth. Journal of Political Economy. 98(5, Part 2), S12–S37. DOI: https://doi.org/10.1086/261723

[36] Mao, J., Chen, B., Liu, J.C., 2024. Generative artificial intelligence in education and its implications for assessment. TechTrends. 68(1), 58–66. DOI: https://doi.org/10.1007/s11528-023-00911-4

[37] Li, S., Wang, C., Wang, Y., 2024. Fuzzy evaluation model for physical education teaching methods in colleges and universities using artificial intelligence. Scientific Reports. 14(1), 4788. DOI: https://doi.org/10.1038/s41598-024-53177-y

[38] Rane, N., Choudhary, S., 2024. Role and challenges of ChatGPT, Google Bard, and similar generative artificial intelligence in Arts and Humanities. Studies in Humanities and Education. 5(1), 1–11. DOI: https://doi.org/10.48185/she.v5i1.999

[39] Jennings, W.B., 2014. Liberal arts in a new era. On the Horizon. 22(1), 19–22. DOI: https://doi.org/10.1108/OTH-09-2013-0035

[40] Tsao, J., Nogues, C., 2024. Beyond the author: Artificial intelligence, creative writing and intellectual emancipation. Poetics. 102, 101865. DOI: https://doi.org/10.1016/j.poetic.2024.101865

[41] Jiawei, W., Mokmin, N.A.M., 2023. Virtual reality technology in art education with visual communication design in higher education: a systematic literature review. Education and Information Technologies, 28(11), 15125–15143. DOI: https://doi.org/10.1007/s10639-023-11845-y

[42] Farahani, M.S., Ghasmi, G., 2024. Artificial intelligence in education: A comprehensive study. In Proceedings of the Forum for Education Studies, July 2024; pp. 1379–1379. DOI: https://doi.org/10.59400/fes.v2i3.1379

[43] Wang, T., Wu, D., 2024. Computer-aided traditional art design based on artificial intelligence and human-computer interaction. Computer-Aided Design and Applications. 21(1). DOI: https://doi.org/10.14733/cadaps.2024.S7.59-73

[44] Kovačević, M., Dekker, T.J., van der Velden, R., 2024. Employability development in undergraduate programmes: how different is liberal arts education? Teaching in Higher Education. 29(8), 2184–2204. DOI: https://doi.org/10.1080/13562517.2023.2212602

[45] Burgess, S., 2016. Human capital and education: The state of the art in the economics of education. IZA Discussion Papers, 9885. Available at: https://hdl.handle.net/10419/141644

[46] Dorn, D., Schoner, F., Seebacher, M., et al., 2025. Multidimensional skills on LinkedIn profiles: Measuring human capital and the gender skill gap. Available at: https://doi.org/10.48550/arXiv.2409.18638

[47] Bille, T., 2024. The values of cultural goods and cultural capital externalities: state of the art and future research prospects. Journal of Cultural Economics. 48(3), 347–365. DOI: https://doi.org/10.1007/s10824-024-09503-3

[48] Mellander, C., Florida, R., 2021. The rise of skills: Human capital, the creative class, and regional development. In: Handbook of Regional Science. pp. 707–719. DOI: https://doi.org/10.1007/978-3-662-60723-7_18