INTERNATIONAL JOURNAL of Industrial Education and Technology

ART, CULTURE, AND TECHNOLOGY: RESEARCH PROCESSES FOR INTELLECTUAL VALUE CREATION AND SUSTAINABILITY IN THE AI ERA

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Received: June 4, 2025 **Revised:** June 16, 2024 **Accepted:** June 28, 2025

Citation reference:
Thipayasothorn., P (2025). Art, culture, and technology: research processes for intellectual value creation and sustainability in the ai era**. International Journal of Industrial Education and Technology. 7** (2), A1-A7

ABSTRACT

This article presents an integrated research approach between "art, culture, and technology" to create intellectual value and sustainability in the era of artificial intelligence (AI). The focus is on conceptual analysis and theoretical frameworks, not empirical experimentation. In the 21st century, technology has become a key factor profoundly transforming human learning and creativity. Therefore, art and culture serve not only as a foundation of identity but also as "cultural-intellectual capital" that can be transformed into knowledge and social value. Thipayasothorn et al. (2024, p. 112) demonstrate that the use of technology in cultural community development projects, such as the "Water Catchment Area - Water Conservation in the East of Bangkok," can tangibly enhance collaborative learning and social sustainability. Furthermore, AI plays a role as a "co-creator," helping to process, analyze, and create new knowledge from artistic and cultural data. The research processes for creating intellectual value thus encompasses exploration, integration, innovation, and reflection. Under the framework of three theoretical concepts: Cultural Capital Theory, Sociotechnical Systems Theory, and Human–AI Co-Creation Theory, which reflect the "three-dimensional balance" of art, culture, and technology, this article concludes that such integrated research is a key mechanism for creating "collaborative intelligence" that promotes the sustainability of human society in the AI era.

Keywords: Art and culture, Integrated research, Intellectual value, AI technology

I. INTRODUCTION

The 21st century is a time when the world is undergoing a full-scale transition from the industrial age to the information age, and into the era of artificial intelligence (AI). This has a direct impact on social, economic, and cultural structures worldwide. Technology has not only transformed work and communication methods, but has also created unprecedented changes in the dimensions of "learning and creativity" (Floridi, 2020, p. 24).

In the context of education and culture, AI technology has become an important tool, enabling humans to create and communicate artistic ideas in new forms. The integration of "art, culture, and technology" is therefore an important trend in contemporary research, aiming to "create intellectual value" and "sustainability" for human society (UNESCO, 2021, p. 33).

Research by Thipayasothorn et al. (2024, p. 112) shows that integrating technology into cultural community development projects, such as "water catchment areas and water conservation," can significantly impact the quality of life of the people. Bangkok-East" can enhance knowledge and create concrete collaboration between educational institutions and communities. It also serves as an example of "using technology to preserve cultural values" that is linked to the concept of urban sustainability. There are shown in Figure 1. Enhancing community life through technology.

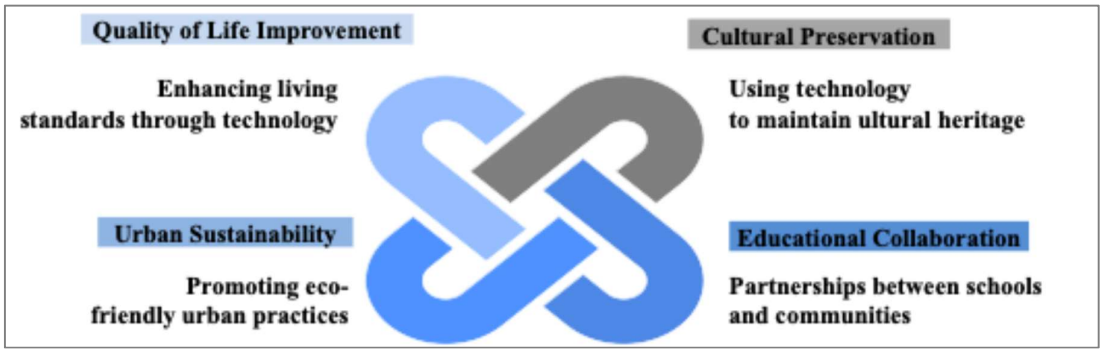

Figure 1: Enhancing community life through technology.

Therefore, this article aims to describe the concept and process of integrated research between art, culture, and technology to create intellectual value and sustainability in the AI era. This paper focuses on conceptual analysis and theoretical frameworks, with less emphasis on empirical experimentation.

II. ARTS AND CULTURE AS CULTURAL-INTELLECTUAL CAPITAL

Brown (2009, p. 59), the concept of "cultural capital" suggests that culture is not merely a social marker, but rather a capital that can be transformed into economic and intellectual value. Art, as a component of culture, thus plays a role as a "mediator of intelligence and identity" that reflects the foundations of communities.

In Thailand, research by Thipayasothorn et al. (2020, p. 65) on the development of mobile phone applications to support urban elderly demonstrates the link between "technology" and "community culture" that promotes participation and self-reliance among older generations. This research serves as an example of the use of cultural capital to create social and intellectual value.

Arts and culture also serve as a value-based data base for AI technologies to learn behavioral patterns, cultural heritage, and create artistic content. For example, using Thai painting image data trains an automated image creation model (Creative AI) for digital preservation (Wang & Lee, 2022, p. 19).

From a process perspective, art and culture are tools for "meaning-making," a core value of human intelligence (Kester, 2013, p. 42). Research in the AI era must be therefore taking an approach that prioritizes value understanding, not just quantitative data as shown in Figure 2.

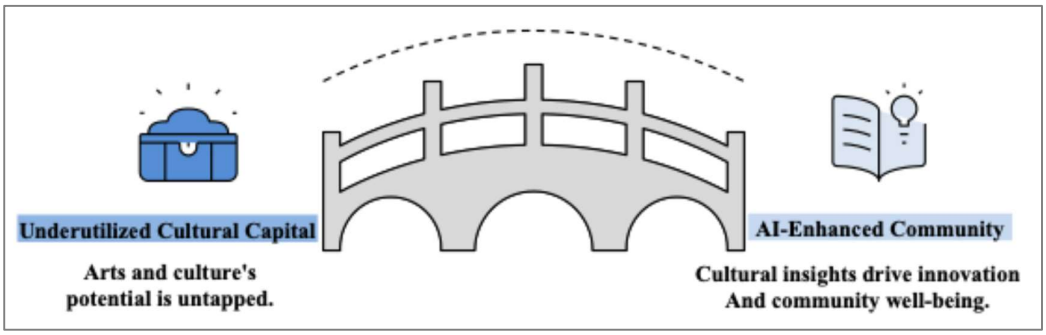

Figure 2: Leveraging arts and culture for AI-driven community development

Arts and culture serve as intellectual capital that reflects the foundations of society and communities, and can be translated into economic value and knowledge. Thipayasothorn et al. (2020, p. 65) research demonstrates the link between technology and community culture to promote collaborative learning. Meanwhile, AI uses art and culture databases to create meaning and value innovation.

III. TECHNOLOGY AND AI AS A VALE CREATION TOOL

AI plays a role as a "co-creator" of humans in the creative and research process (Kaplan & Haenlein, 2022, p. 51). Machine learning and natural language processing technologies enable the automated creation of knowledge that can reflect artistic and social concepts. Thipayasothorn et al. (2023, p. 37) proposed the development of an "application for research standards compliance in higher education institutions," emphasizing the use of digital technology to monitor quality and manage knowledge within institutions. This is an example of "AI for Research Management" that enhances the efficiency of academic knowledge creation.

AI has also been used for cultural analysis, such as using machine vision to classify artifacts or creating 3D cultural reconstructions to preserve virtual historical sites (Craig, 2013, p. 105). Furthermore, the use of chat-based AI expands access to artistic and cultural knowledge for the public.

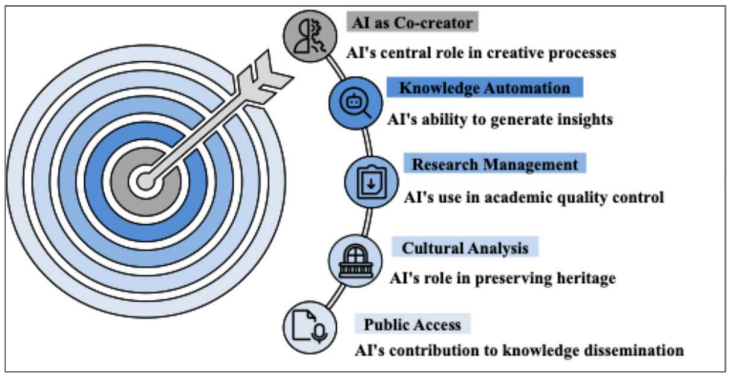

Figure 3: AI in creative and research processes

In social terms as shown of Figure 3, AI enables “collective intelligence” that allows artists, cultural scientists, and scientists to collaborate in digital spaces, particularly in virtual labs where real-time information can be exchanged.

IV. RESEARCH PROCESS FOR INTELLECTUAL VALUE CREATION

Research for intellectual value creation in the AI era emphasizes the integration of knowledge from three main disciplines: art, culture, and technology. This aims to create "collaborative intelligence," which drives society toward sustainability in terms of creativity, economy, and spiritual value. This approach shifts the role of research from a singular knowledge search to a co-creation process of knowledge, in which researchers, communities, and technology collaborate to develop it. The research process for intellectual value creation consists of four main sequential steps: 1) Exploration – Exploring artistic and cultural capital. The first step is to study the artistic and cultural capital available in an area or community to understand the foundations of creativity, values, and local wisdom (Sangdee, 2021, p. 27). This exploration includes the collection of qualitative data, such as traditions, folk art, local design, and the transmission of local stories. These are symbolic capital that can be further developed into creative technologies. 2) Integration – Integrating data on art, culture, and technology. Once cultural data is acquired, the next step is to digitize it so that it can be processed by AI systems, such as scanning artwork, recording folk songs, or creating a community story database. This integration allows for broader access to art and culture, transforming it into a database for machine learning that helps preserve and advance local wisdom in new ways. 3) Innovation – Creating innovations for learning and communication. The third step involves developing tools or technological media to promote cultural learning, such as designing virtual exhibitions, interactive museums, or applications that simulate cultural experiences. These innovations allow users to directly interact with cultural knowledge, fostering both emotional and intellectual learning. 4) Reflection – Reflecting and evaluating intellectual outcomes. The final step is evaluating the research and learning process, using qualitative analysis methods to measure the level of understanding, attitude change, or the development of creative ideas among learners and participants (Suwanachot, 2021, p. 84). This reflection not only measures project effectiveness but also fosters a collaborative learning process (reflective learning) that leads to the continuous development of new knowledge.

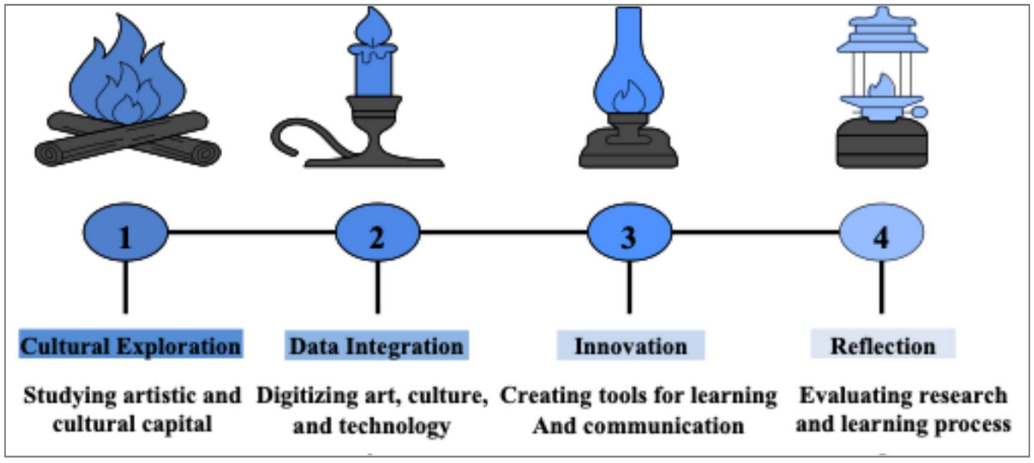

Figure 4: Intellectual value creation in the AI era

As shown in Fig. 4. Intellectual value creation in the AI era, Overall, this four-step process aligns with Zimmerman et al. (2010, p. 45) Research-Based Design (RBD) concept, which emphasizes the use of design processes as part of research, and Chanthep (2023, p. 31) Participatory Action Research (PAR) concept, which allows stakeholders to participate in knowledge creation. This type of research processes therefore it does not only aim to create technological innovation but also aims to create "intellectual value" that connects people, culture, and technology for balanced and sustainable growth.

V. THEORETICLE FRAMEWORK

The theoretical framework of this article aims to explain the relationship between art, culture, and technology through three main theoretical perspectives, reflecting the integration of knowledge to create intellectual value and sustainability in the digital age as shown in Table 1.

Table 1: The theoretical perspectives between art, culture, and technology

No.	Theory / Scholar	Core Concept	Application in Research
1	**Cultural Capital Theory** (Bourdieu, 1986, p. 247)	Culture is an intellectual capital that can be transformed into economic and social value.	Used as a foundation for analyzing Thai cultural capital and transforming it into creative technology.
2	**Sociotechnical Systems Theory** (Trist & Emery, 1951, p. 9)	Technology and society are interrelated and must be developed in balance.	Applied to the design of AI systems that consider cultural and humanitarian contexts.
3	**Human–AI Co-Creation Theory** (Davis, 2019, p. 58)	Humans and AI can collaboratively create knowledge through shared learning.	Used to define research models that allow human–AI co-creation in art and education.

This conceptual framework reflects a "three-dimensional balance" that dynamically integrates art, culture, and technology to create sustainable intellectual value and learning for society. 1) The Artistic Dimension emphasizes the role of beauty and inspiration as creative forces that stimulate imaginative thinking and human emotion. Art is thus a tool for connecting spirituality and innovation. 2) The Cultural Dimension aims to create meaning, identity, and the intellectual roots of society. Culture serves as a reference frame that enables technology to guide development in a way consistent with local contexts and values. 3) The Technological Dimension aims to develop tools and systems that enhance learning, communication, and creativity. Technology expands the reach of art and culture.

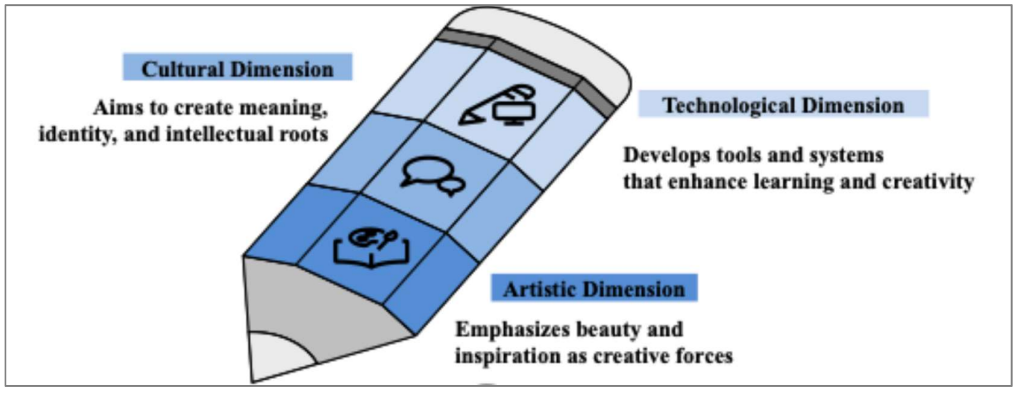

Figure 5: Three-dimensional balance

When all three dimensions are integrated, it leads to the creation of "Collaborative Intelligence," a key driver of human development in the digital age.

VI. CONCLUSION AND RECOMMENDATIONS

Creating intellectual value in the AI era requires recognizing the relationship between art, culture, and technology as the "three pillars of contemporary human intelligence." Integrating these three dimensions not only focuses on developing cutting-edge technologies but also fostering a value-based understanding that reflects the "humanistic spirit" in the digital world (Kara, 2023, p. 33). Policy development guidelines to drive such value are as follows: 1) Educational institutions should establish an Art–Culture–Tech Innovation Lab to integrate cross-disciplinary knowledge between the arts, humanities, and information technology. This serves as a creative space for cultural innovation. 2) Develop "Humanistic AI" that can learn and process from databases of Thai art, literature, and local wisdom to create AI models that understand the subtleties of human culture. 3) Co-creation of learning between humans and technology at the higher education level to enhance design thinking and co-creation of knowledge.

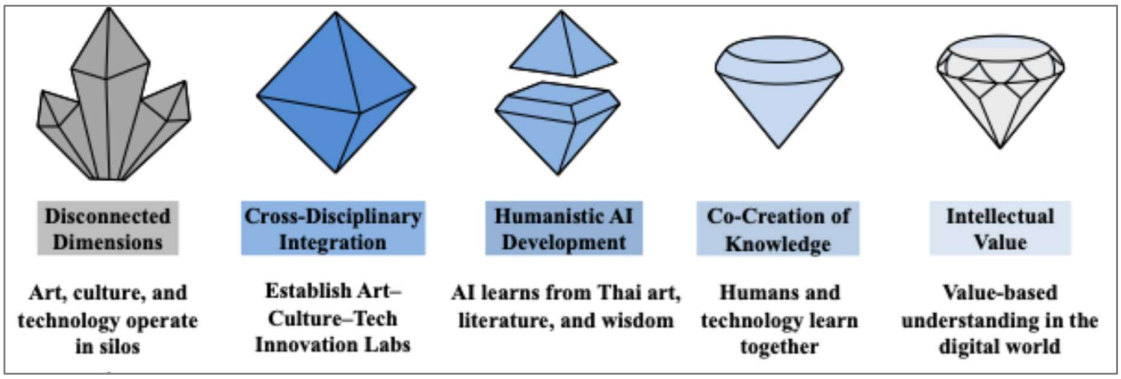

Figure 6: Integrating art, culture, and technology

Policy development guidelines to drive intellectual value in the era of artificial intelligence aim to create a cross-disciplinary learning system integrating art, culture, and technology through the Art–Culture–Tech Lab innovation research center as in Figure 6. This includes developing "humanistic AI" that draws on local wisdom, and promoting co-creative learning between humans and technology in higher education.

In summary, "art, culture, and technology" do not exist in isolation. Rather, they combine to form a collaborative intelligence system that connects humans and the digital environment in a balanced way. Art is the power of imagination, culture is the foundation of values, and technology is the engine of change. When all three come together, they create sustainability across the dimensions of the mind, society, and innovation. This will lead humanity into the AI era with a true understanding and responsibility for the world.

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