■ Conceptual and Theoretical Paper

Integrating Technology into Art-University Education in Japan: Insights from Preliminary Surveys within a STEAM Framework

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Abstract: This paper examines how digital and technological literacy is positioned across art high schools, art universities, and creative industries in Japan, and considers the implications of these shifting expectations for STEAM-oriented curriculum development in art higher education. Drawing on survey data collected between 2024 and 2026 from art high schools (n=12), art university students (n=225), and creative industry professionals (n=128), the study adopts a comparative three-stage framework that traces the progression from secondary art education to professional practice. The findings reveal a structural pattern: in art high schools, digital skills are introduced but remain secondary to traditional analogue foundations shaped by entrance examination systems; at university level, students express strong demand for deeper digital integration, yet provision remains uneven; within creative industries, digital literacy is treated as a baseline expectation embedded in everyday practice. Across this pathway, digital competence shifts from supplementary to assumed. The paper argues that art universities occupy a transitional position within this progression and suggests a move beyond additive skill training toward integrative STEAM models that connect technological capability with creative judgment, collaboration, and social application.

1. INTRODUCTION

The rapid digital transformation of society is changing how knowledge is shared, how we express ourselves creatively, and how we innovate. Emerging technologies such as artificial intelligence (AI), immersive media such as extended reality (XR), and online data systems are no longer considered tools we use; rather, they increasingly shape how we think, perceive, and even assign meaning (Crawford, 2021). Creative and professional practice now requires a level of digital and technological literacy that was previously considered specialist. Furthermore, international policy discussions stress the need for cross-disciplinary ability, arguing that the skills of the future must combine technical knowledge with creativity, critical thinking, and collaboration (OECD, 2019; World Economic Forum, 2020). With this considered, education cannot remain

focused on technical training alone, and must address how technological systems interact with human values, imagination, and social responsibility. This is the context in which STEAM education becomes particularly significant.

STEM (science, technology, engineering, and mathematics) education aims to provide the scientific and technical foundations of digital society (Bybee, 2010). The addition of the Arts, however, shifts the focus away from the acquisition of functional skills alone to one that also places importance on collaboration, culture, interpretation, and meaning (Maeda, 2013). Art universities are at a critical position because, unlike art high schools, which primarily focus on foundational skill acquisition, or industry, which prioritises efficiency and production, art universities encourage aesthetic sensitivity, creative exploration, and sustained experimentation. These abilities should be considered important for technological development as they are essential to shaping how socially and culturally meaningful the technology is (Tytler, 2020; Boy, 2013). Digital transformation, therefore, requires not only the technically skilled, but also creative practitioners who can question, interpret, and reimagine systems as they develop.

In this paper, we argue that art universities should be considered centrally important to digital and technological innovation. Their studio-based curricula encourage unconventional experimentation with concepts and ideas, and engagement with a wide range of materials and methods is key to the learning process. Artistic training also enables students to move between analogue and digital domains, connecting tactile, embodied knowledge with abstract or computational systems (Candy & Edmonds, 2018). In this sense, art universities already embody many of the core principles associated with STEAM by relating technological invention to human experience. Yet, despite the growing international interest in STEAM, less attention has been given to how different stages of art education connect structurally with their approach to digital technology, particularly outside Western contexts. In Japan, STEAM-related initiatives tend to be peripheral to core curricula, such as elective or project-based learning. While digital workshops and interdisciplinary programmes exist, there has been limited examination of how art high schools, art universities, and creative industries relate to one another within a coherent STEAM framework.

We identify an educational misalignment in the growth stages of young creatives in Japan. Art university has often been understood as a protected period of exploration, where students can experiment creatively without the economic or production pressures associated with industry employment. Japanese art education in general maintains a deep focus on studio-based traditions; with drawing, observation, material handling, and compositional discipline remaining central. Conversely, as our study reveals, art university students today express a desire for stronger digital integration and an awareness of its importance for future employment. Art high schools, however, continue to prioritise foundational expressive skills in preparation for art university entrance exams, while creative industry employers, on the other hand, view digital competency as a baseline expectation for graduates. Within this pathway, art universities occupy the structural midpoint between analogue-focused secondary training and digitally embedded professional practice.

This study examines how attitudes and expectations surrounding digital literacy shift across art high schools, art universities, and creative industries in Japan, and what structural tensions emerge when these stages are viewed from the perspective of STEAM education. Drawing on questionnaire data collected between 2024 and 2026 from students, educators, and industry professionals, it adopts a comparative approach that tracks changes across educational transitions rather than treating each sector in isolation. In doing so, the study links the three stages in the development of young creatives in Japan and positions art university as an important hinge within the relationship. While exploratory, the findings highlight structural issues within Japan's creative education ecosystem and suggest directions for aligning technological competence with creative autonomy. Specifically, the study

examines how expectations surrounding digital literacy shift across educational stages and how these shifts inform STEAM-oriented curriculum development in art universities.

2. CONTEXT AND PREVIOUS RESEARCH

2.1. Technology and STEAM in Art Education

The relationship between art education and technology is longstanding, but the scale and speed of recent change have greatly altered its significance (Paul, 2015). Digital tools are no longer supplementary media; they increasingly form part of the basic infrastructure of creative practice, with virtual reality (VR) environments, AI-assisted image generation, and interactive art installations now shaping how artists and designers work, collaborate, and develop ideas. Art education today stands at a "digital inflection point" where established pedagogical models are brought into question due to technological acceleration (Hall & Iwasaki, 2024b). Generative AI provides a clear example of how the very process of image creation, central to art and design, is being revolutionized. Emerging platforms such as Midjourney and Dall-E, alongside Firefly from Adobe, a well-established creative platform already deeply rooted in art universities, are changing how creatives work. Not only do these processes increase efficiency, but they also shift the entire conceptual dynamics of creation, altering how students move from initial concept to visual form. In this sense, technological systems have begun to influence not only production processes but also habits of thinking (Zhang et al, 2026).

The emergence of STEAM education must be understood against this backdrop. By extending STEM to include the Arts, STEAM proposes that artistic modes of inquiry are not superficial additions but structurally important to innovation (Yakman, 2008; Land, 2013) and a framework in which aesthetic judgement and design thinking intersect with scientific and technological reasoning (Henriksen, 2014; Guyotte et al., 2014). The emphasis is not on forcing disciplines together, but on promoting creative and technical literacies through integration and synergy.

Two government-led initiatives illustrate the positive attitude to STEAM education. The "Kyoto STEAM – International Arts and Science Festival" (Kyoto STEAM–International Arts × Science Festival, n.d.) showcases forward-looking projects that bring together art, science, and technology. Meanwhile, the Japan Science and Technology Agency's "Moonshot Research and Development Program" (Cabinet Office, n.d.) supports ambitious interdisciplinary projects designed to address some of society's most complex challenges by 2050. However, policy discourse does not automatically translate into institutional change, and art universities must now decide how and to what extent such integration should occur. The challenge lies in avoiding two extremes: treating technology as a peripheral elective or formalising it so heavily that it undermines the open, experimental spirit that defines art education.

2.2. Previous Study

In our previous paper (Hall & Iwasaki, 2024b), we examined the evolving relationship between art students and digital media. The main aim of the study, based on a survey of 225 students at a private art university in the Kansai region, Japan, was to explore whether institutional provision was aligned with students' digital technology experiences and expectations.

The findings revealed several important patterns. First, digital tools were already deeply embedded in students' daily lives. Across entertainment, studying, and art production, students overwhelmingly responded that such tools were "extensively used" (see Figure 1). Students reported heavy use of digital photography, video tools, and design software, while engagement with programming, robotics, and data processing tools was less common. In summary, students were active digital creators, but primarily within creative rather than computational or technical domains.

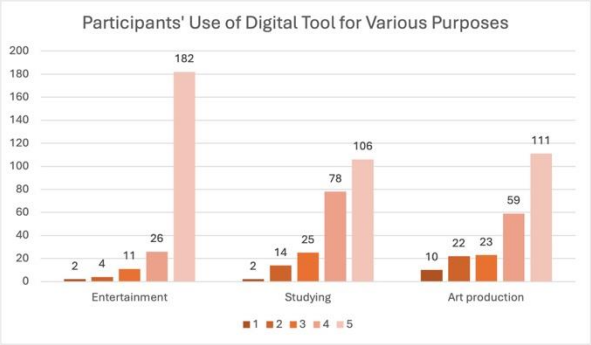

Figure 1 - Survey participants ranked their usage on a scale from '1: never' to '5: extensively used' of digital tools for 'entertainment', 'studying', and 'art production.'

Second, attitudes toward digital media were overwhelmingly positive. When asked to evaluate the value of digital forms compared to physical counterparts, students consistently rated digital media highly (see Figure 2). Similarly, an earlier study (Hall & Iwasaki, 2024a) explored perceptions of "reality" associated with digital environments which were generally favourable. Digital-native students did not position the digital world as secondary or artificial; rather, they moved fluidly between physical and digital contexts. These findings supported the argument that the conceptual boundary between "real" and "virtual" had shifted for this generation (Ito et al., 2010).

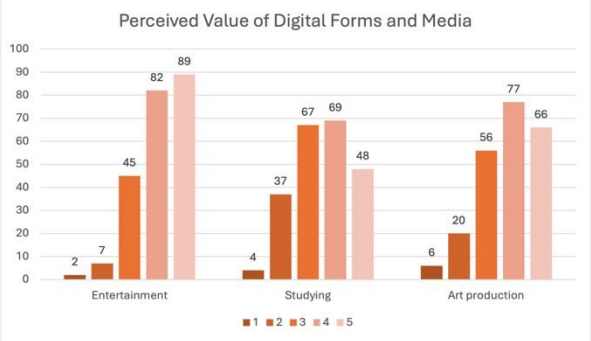

Figure 2 - Participants were asked to rank their perceived value from '1: very low' to '5: very high' of digital forms and media for the purposes of 'entertainment', 'studying', and 'art production.'

Third, and most relevant to the present study, there was a notable gap in pre-university exposure to IT subjects. Many respondents reported limited engagement with programming, coding, data analysis, or related topics prior to entering university (see Figure 3). Despite this limited exposure, interest in IT-related subjects, perceived benefits, and demand for increased curricular provision were consistently high (see Figure 4).

Cross-analysis indicated a positive correlation between prior exposure and interest or perceived benefit, but even students with minimal exposure expressed substantial demand for further digital education.

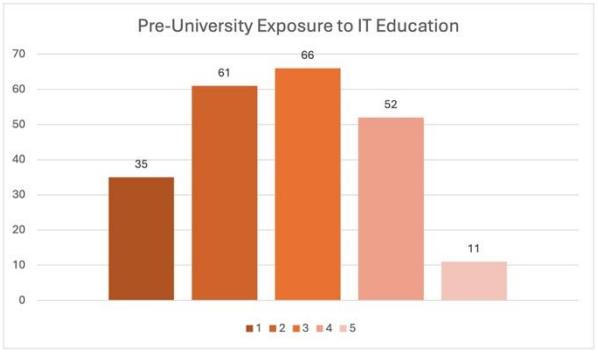

Figure 3 - Participants were asked to rank their pre-university exposure to IT education (such as computer programming, code creation, internet usage, robotics, data analysis, etc.) from '1: very low' to '5: very high.'

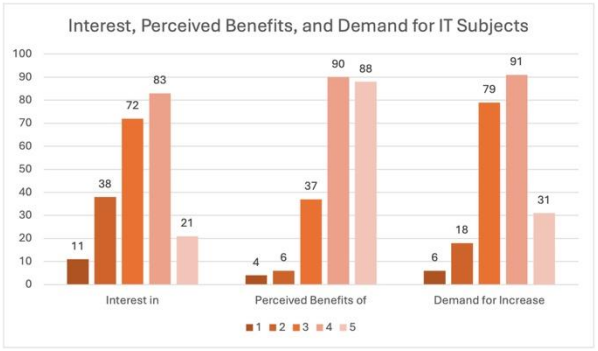

Figure 4 - Participants were asked to rank their interest in, perceived benefits of, and demand for more IT education in the current art university curriculum from '1: very low' to '5: very high.'

2.3. Previous Study Results: From Student Demand to Structural Alignment

The previous study concluded that art universities face growing pressure to integrate STEAM-oriented content more systematically into their curricula. Survey data indicated strong student demand for expanded digital learning, coupled with a clear awareness that such skills are increasingly necessary for future employment. However, the analysis was largely inward-looking. It focused on the relationship between student expectations and institutional provision within art universities themselves, without fully situating these results within the wider educational and professional trajectory. The earlier research did not

examine how art university connects to secondary art education, nor how effectively they prepare students for employment in creative industries. Digital integration should not be considered solely as a response to student preferences. In reality, art universities sit within a defined pathway, and any suggested change needs to come with this awareness, rather than risk being reactive. As our recent survey results will show, art high schools often emphasise traditional foundations such as drawing, observation, and material handling, as these analogue skills are essential for art university entrance examinations. By contrast, creative industries increasingly assume digital fluency as a baseline competence. Universities therefore occupy a transitional space between analogue-oriented entry systems and digitally embedded workplaces.

With this considered, the present study extends the research in two key respects. First, it situates the student survey within a comparative framework that includes data from art high schools and creative industry professionals, allowing analysis of how expectations concerning digital competence vary across stages. Second, the focus shifts from demand to structure. Rather than asking whether students want more digital education, the study examines where digital skills are treated as foundational, presumed, or peripheral within the broader system. Looking across these stages makes it possible to understand digital integration in relation to the broader educational and professional context, rather than within one institution alone.

3. METHODOLOGY

3.1. Research Design

This study uses a three-stage framework: art high school, art university, and the creative industries. These stages reflect the typical educational and professional trajectory of young creatives in Japan. Rather than treating them separately, the analysis considers them as sequential and structurally related. If art university is positioned as the formative central stage, then art high school functions as the “entry” point into specialised artistic training, while the creative industries represent the “exit” into professional practice. By analysing the pathway as a continuum, the research looks to identify where assumptions about digital literacy and STEAM education agree or disagree. Building on the previously conducted survey of art university students, the present study expands the scope by introducing the two additional surveys targeting art high schools and creative enterprises. In turn, the three datasets are analysed comparatively to find patterns across the entire pathway.

3.2. Data Sources

The art high schools (n=12) and creative industry professionals (n=128) surveys were conducted between December 2025 and January 2026, and the previously reported art university survey (n=225) in April 2024. All surveys were administered anonymously via Google Forms.

The art high school survey responses primarily came from public institutions (91.7%) and one board of education representative (8.3%). Respondents were directly involved in art education or administration and ranged in age from their twenties to sixties. The questionnaire addressed respondent attributes, student progression patterns, digital technology and STEAM initiatives, institutional constraints, and relationships with art universities. It consisted mostly of closed-response questions, with selected open-ended questions for qualitative data.

Responses to the creative industry survey came from professionals across creative and cultural sectors in which art university graduates are likely to be employed; mostly represented were printing and publishing (82%), graphic design (19.5%), and digital fabrication (15.6%). A range of other fields were represented, including animation, illustration, system development, and game development. The types of roles in the companies included creative directors (26.6%), managers or producers (23.4%), technical leads (7%) and system engineers (6.3%). The questionnaire contained 15 items covering company characteristics, professional role, digital competencies in practice, recruitment and training perspectives, and relationships with educational institutions, and likewise relied primarily on closed-response questions, with limited open-

ended fields.

4. FINDINGS I: ART HIGH SCHOOL PERSPECTIVES

4.1. Overview

Specialised art high schools are a common route through which students enter art universities in Japan. Responses to this survey came from public (including municipal) art high schools in Kyoto. The questionnaire was designed to examine how digital, IT, and technology-related skills are positioned within art and design education. The responses therefore reflect institutional priorities and curriculum structures rather than student perceptions.

According to the survey results, the overwhelming majority of students progress to art and design universities, with few entering regular universities or training colleges and almost none moving directly into employment. 75% of respondents described digital skills as "important but forming only part of the curriculum," while only 16.7% identified them as a "core" component of art and design education, and no respondent considered them unimportant. However, when asked about the degree of integration with core artistic training, 75% of respondents indicated that digital skills are "partially integrated but often taught separately," and 8.3% reported they were "mostly taught separately". No participants described them as "strongly embedded within the same learning process" (see Figure 5). This suggests that digital skills are frequently positioned alongside, rather than within, foundational studio training. Digital and IT-related content is most commonly provided as elective subjects, with all respondents indicating some form of elective provision and the majority also reporting short workshops, external lecturers, and compulsory components. Taken together with the strong progression of students to art and design universities, the data suggests that while the importance of digital competencies is recognised, it remains structurally secondary to analogue skill development at the high school stage.

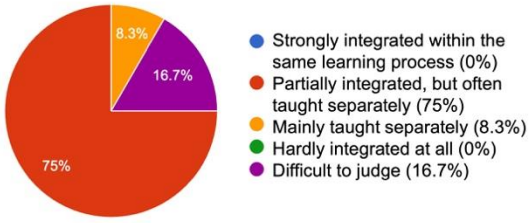

Figure 6 - Degree of integration between digital/IT skills and traditional studio-based art skills in specialised art high schools (N = 12).

4.2. Digital Familiarity and University Entrance Expectations

The survey responses also reveal the scope and frequency with which digital tools are taught. Digital art and design tools such as imaging, video, 3D and graphic design software are widely introduced, however, there is much more limited teaching of physical computing, programming, AI, immersive media (VR, AR, MR), digital fabrication, or data processing. Student interest in digital and STEAM-related areas was generally perceived as high, with 75% of respondents describing student interest as "relatively high," and a further 8.3% indicating it was "very high". When asked about students' level of preparation upon entering art university, 75% reported that students were "mostly prepared," while 16.7% noted considerable variation and 8.3% considered them "very well prepared". However, expectations regarding university entrance seem to prioritise foundational and analogue-based artistic ability: all respondents reported basic observational and compositional skills as essential, and 75% emphasised presentation and communication abilities, while only 8.3% identified digital production or programming as expected skills (see Figure 6). Taken together, these responses suggest that although students are viewed as familiar and interested in digital and technological skills, traditional artistic foundations remain the core emphasis in art high schools.

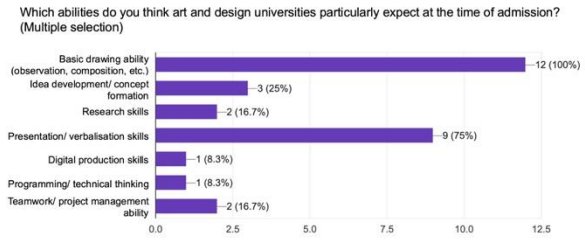

Figure 7 - Perceived abilities expected by art and design universities at the point of admission (multiple responses permitted; N = 12).

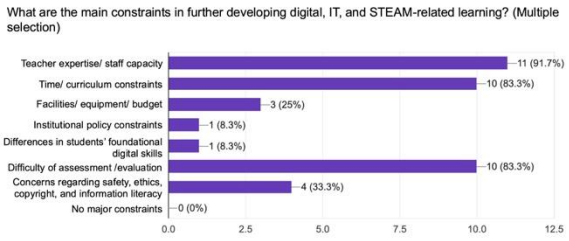

Figure 8 - Perceived constraints in expanding digital, IT, and STEAM-related learning in specialised art high schools (multiple responses permitted; N = 12).

4.3. Institutional Limitations

Institutional restraints regarding digital and STEAM content integration may shed light on these results. The most frequently identified limitation was teacher expertise and staff capacity, selected by 91.7% of respondents (see Figure 7). Time and curriculum constraints were also largely reported, with 83.3% indicating that existing course structures leave limited space for expanded digital content. A similar number highlighted the difficulty of evaluating digital and STEAM-related projects within established assessment criteria. Access to equipment and facilities was noted, but less than structural and staffing concerns. Notably, no respondent indicated that there were no major constraints. These responses suggest that the limited integration of digital technologies is primarily not ideological, but shaped by practical limitations of staffing, curriculum design, and assessment systems. Open responses further showed an awareness of rapid technological change, particularly in relation to AI and the growing importance of language-based interaction with digital systems. However, respondents also commented that such developments place additional demands on both students and teachers. Again, several comments highlighted perceived gaps between art high school curricula and art university entrance systems, suggesting that the importance of digital and STEAM-related learning is not yet recognised within current structures. In summary, digital skills, while recognised, remain supplementary to the traditional analogue foundations that continue to define progression into art university.

5. FINDINGS II: CREATIVE INDUSTRY PERSPECTIVES

5.1. Overview

This section reports findings from the creative industry survey, focusing on how digital and technology-related skills are positioned within workplaces art university graduates are likely to enter. Most respondents came from large-scale creative organisations with over 100 employees (86.7%). As mentioned above (*3.2 Data Sources*) a wide range of business types and job roles were represented, giving a diverse representation of current creative industries in Japan.

5.2. Positioning of Digital Literacy

Digital and technology-related skills were widely reported as central to professional activity. Half of respondents stated that such skills are "core and indispensable in most projects," while an additional 28.9% described them as "very important alongside non-digital practices." Only a small minority positioned them as supplementary or limited (see Figure 8). This indicates that, within the surveyed companies, digital competencies are not peripheral but embedded in routine creative work. When asked which specific skills were particularly important, the most frequently selected were Web and interactive media (82.8%), AI-related tools and processes (69.5%), data-related skills such as analysis and visualisation (61.7%), and programming or scripting (62.5%). More traditional digital production skills such as digital illustration (39.1%) and motion graphics (34.4%) were also selected but at lower rates. These responses clearly show a broad range of digital competence is important, extending beyond digital

art and design software toward systems thinking, data literacy, and AI integration.

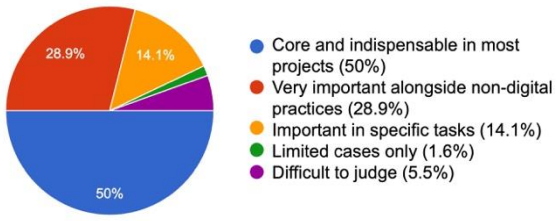

Figure 9 - Positioning of digital, IT, and technology-related skills within creative industry practice (N = 128).

Digital skills were reported as being acquired mainly through workplace experience. On-the-job training (OJT) was selected by 84.4% of respondents, followed by internal training and mentoring (56.3%) and online learning resources (39.8%). Only 6.3% reported strong collaboration with schools or universities as a main method of skill development. This suggests that currently professional digital skills are largely gained post-hire rather than directly from formal education. Respondents also identified significant constraints in maintaining and developing digital capabilities. The most common were time and workload pressures (75.8%), the speed of technological change (62.5%), and difficulty securing appropriately skilled personnel (58.6%). Tool and software costs were also noted (43.8%).

5.3. Hiring Expectations

Digital and technology-related skills were considered overwhelmingly important in hiring new staff. 36.7% described such skills as "very important," and 31.3% as "important to some degree," while 23.4% regarded them as indispensable (see Figure 9). Very few considered them unimportant. In terms of timing, 35.9% indicated that digital skills are expected within the first one to two years of employment, while 15.6% expected them at the point of entry. A further 25% responded that expectations vary significantly by role or field. This suggests that although not always required at the time of recruitment, digital competencies are expected to be rapidly developed or demonstrated early in professional practice. Regarding educational background, general universities (89.8%) and art and design universities (55.4%) were both listed as common sources of recruits. In evaluating candidates, communication and teamwork abilities were selected most frequently (85.2%), followed by digital and technical skills (53.9%), conceptual thinking (47.7%), and willingness to learn new tools (41.4%). These responses indicate that digital skills are evaluated alongside broader professional and interpersonal attributes. However, the available data does not allow us to determine whether expectations vary across specific roles, or whether such variation affects how art and design graduates are assessed in comparison to graduates from general universities.

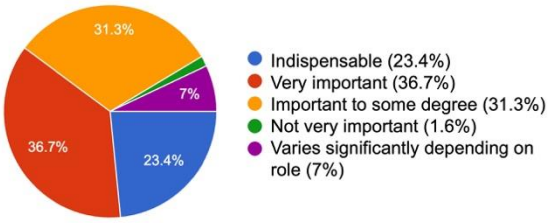

Figure 10 - Perceived importance of digital and technology-related skills when hiring early-career creative professionals (N = 128).

5.4. Perceived Gaps and Future Outlook

When asked whether a gap exists between current art and design education and industry needs, 25% reported "a certain level of gap," while a smaller proportion indicated a large gap. However, 58.6% selected "difficult to judge," suggesting ambivalence or limited visibility into educational practice. Open-ended comments on this topic, however, referred to disparity between skills taught in schools and practical implementation. The pace of technological change was also noted as an issue with education not being able to keep up with cutting-edge industry-level technology. Looking ahead (see Figure 10), 71.9% anticipated that the importance of digital and technology-related skills would "increase significantly" over the next five to ten years, with a further 21.9% expecting a moderate increase. Very few predicted no change or decline.

Overall, the findings show an industry environment in which digital competencies are structurally embedded, rapidly evolving, and expected early in professional careers, while also

being shaped by organisational constraints and broader communicative capacities.

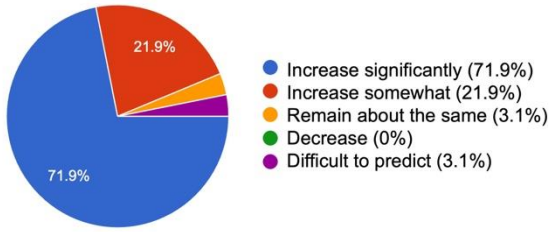

Figure 11 - Anticipated change in the importance of digital and technology-related skills over the next 5–10 years (N = 128).

6. SYNTHESIS

Read together, the three surveys indicate a developmental pathway structured by shifting expectations regarding digital and technological skills. Across art high schools, art universities, and creative industries, digital skills are broadly acknowledged as important, but what changes across these stages is their positioning, depth, and viewed importance. In art high schools, digital technology content is introduced and is popular, yet remains supplementary to foundational artistic training centred on drawing, observation, and material practice. This reflects institutional restraints connected to assessment systems and university entrance procedures, where technological competencies are rarely evaluated as core requirements. At the university level, perceptions change and students widely recognise digital competence as necessary for future employment, yet many report uneven preparation. Technology is present within curricula, but its integration varies in depth and consistency, producing a gap between demand, perceived importance, and perceived readiness. Within creative industries, conversely, digital literacy is treated as an expected condition rather than an optional enhancement. Employers describe technological competence as a requirement at entry level, and it is embedded within all areas of professional practice. In this context, digital technologies are not optional tools but part of the basic environment in which professional creative work takes place.

Across the three stages, the pattern is clear: technology moves from being introduced, to being recognised as important, to being taken for granted. The difference is not whether digital competence matters, but at what point it becomes an embedded and expected part of creative education. This places the art university in a particularly important position, where the shift from exam-oriented preparation to professionally structured production begins to take shape. It is at this point that digital skills move from being useful or interesting additions to becoming expected capabilities. These underlying structural tensions are discussed below.

7. DISCUSSION AND PROPOSAL: REFRAMING STEAM EDUCATION IN ART UNIVERSITIES

The comparative findings can be understood as a structured progression across three institutional environments. Art high schools prioritise expressive foundations; creative industries operate within conditions of social implementation; and art universities occupy the transitional space between them. This progression may be represented schematically as a shift across several axes: from foundational expression to social translation to implementation; from technology introduced, to technology integrated, to technology assumed; from individual to collaborative to organisational production; and from exploratory inquiry to problem-oriented design to outcome responsibility (see Figure 11). The art university stands at the hinge position where these developments meet.

Art High Schools	Art Universities	Creative Industries
Foundations of Expression	Social Translation	Social Implementation
Introduction to Technology	Integration of Technology	Technology as Prequisite
Individual Production	Team-Based Production	Organisational Production
Exploration and Experimentation	Problem-Solving Design	Accountability for Outcome

Figure 12 - Conceptual model of the structural progression across art high schools, art universities, and creative industries.

From this perspective, the art university's role is not as a place of simple skill accumulation, but as a mediating layer within the broader creative pathway. Digital education at this stage cannot be reduced to software training alone; rather, it must connect creative exploration with real-life social

implementation. Industry respondents do not simply demand narrow technical specialisation at entry level. Instead, they emphasise adaptability, problem-solving, collaborative capacity, and the ability to work within evolving technological environments. In this sense, digital competence functions less as a fringe skill set and more as a basic condition of participation.

An interview conducted in Kyoto on 24 February 2026 with cultural producer Mr. Misugi Terada, an experienced practitioner working across art, technology, and creative production, reinforces this interpretation. The interview was conducted to supplement the survey findings with qualitative insight from professional practice. While concerns are often raised that art universities struggle to keep pace with rapid technological change, Terada argues that attempting to incorporate every emerging development into the curriculum is neither possible nor desirable. What matters, according to Terada, is not breadth of coverage, but depth of inquiry. Intensive engagement with a specific domain cultivates ways of thinking that enhance adaptability. By pursuing a subject to its conceptual and practical limits, students can develop the capacity to respond to technological shifts without being defined by them. From this perspective, the acquisition of technical skills should not be limited to operational proficiency. A basic level of digital literacy is essential, but its real educational value lies in how it helps students shape ideas, set direction, and connect different elements within a project. Art university students often stand out for their originality and sensitivity; however, the challenge is to turn that sensibility into skills that function in social and professional contexts, without diluting what makes it distinctive.

This reframes the frequently cited demand for "communication skills" within the creative industries survey. From this perspective, communication does not simply mean smooth functioning within groups, rather, it involves articulating singular visions with clarity, engaging with difference, and sustaining collaborative processes without erasing creative tension. Communication, in this sense, functions as mediation: the capacity to transform and translate individual creative expression into shared production. Seen this way, STEAM in art universities is not about layering technology onto existing practice, but about developing technical skill, conceptual thinking, and communication together, within a space that prepares students to move from individual exploration to shared creative work.

8. CONCLUSION

The comparative findings from these surveys suggest that the central issue surrounding the integration of technology into art education in Japan is not disagreement over its value, but the stage and method by which it becomes structurally embedded. Art universities occupy the transitional space in which digital literacy can shift from peripheral tool to professional expectation. The question, therefore, is not whether digital technology should be included, but how it should be integrated within the existing template without detriment to the creative experimentation available at art university.

One solution may be to integrate digital education within existing studio practice and project development rather than confine it to isolated technical instruction or elective projects. A foundational level of competence is necessary, yet its significance lies in how it supports idea formation, collaboration, and socially oriented solutions. In this sense, STEAM education in art universities concerns the integration of creative thinking, technological capability, and communicative mediation.

The interview with Misugi Terada suggests that art universities do not need to chase every new technological development; what matters more is depth of knowledge and ability to apply it. Sustained engagement within a discipline builds the kind of thinking that allows students to adapt as technologies inevitably change. In an era shaped by AI, technical skills may no longer be sufficient; the priority, then, is not simply mastering more tools, but developing the ability to set new directions. Digital systems and technology can recombine and optimise, but creative education must continue to nurture the capacity to imagine and create

something genuinely new.

This suggests the need for structured spaces where experimentation, collaboration, and technological integration can be explored in a sustained and critical way. To support this, we are currently in the foundational stages of developing the "Sensory STEAM Lab," a proposed interdisciplinary research and pedagogical platform building on earlier work (Hall & Iwasaki, 2024a, 2024b). Rather than serving primarily as a site for technical training, the Lab would provide an environment in which new teaching approaches can be tested and refined, linking artistic inquiry with contemporary technological conditions. By bringing together educators, artists, technologists, and industry practitioners, it would create opportunities for ongoing dialogue and collaborative experimentation, both within Japan and internationally.

Seen in this light, STEAM education in art universities is not about imitating technological trends, nor about forcefully layering technology on top of existing creative practices, but more about developing judgment within a technological context. The role of the art university is to ensure that technological fluency strengthens and complements, rather than replaces or restricts, distinctive and socially meaningful creative learning.

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