Generative Artificial Intelligence in Graphic Design Higher Education: A Comparative Integrative Review of Western and Asian Evidence and the CACG Framework

***[1]Muhammad Nur Firdaus Nasir., [2]Nurul Farhana Nasir., [3]Muhammad Faiz Nasir., [4]Muhammad Arif Nasir**

[1]Department of Graphic and Digital Media Design, Faculty of Art and Design, Universiti Teknologi MARA (UiTM), Melaka Branch, Malaysia

[2,3]Department of Accountancy and Business, Tunku Abdul Rahman University of Management and Technology, Perak Branch, Malaysia

[4]Faculty of Business, Hospitality and Technology, Universiti Islam Melaka, Malaysia

***Corresponding Author**

DOI: https://doi.org/10.47772/IJRISS.2026.100800206

Received: 19 August 2026; Accepted: 24 August 2026; Published: 31 August 2026

ABSTRACT

Generative artificial intelligence (GenAI) has moved from an optional image-making technology to a contested component of graphic design education. Yet the evidence available to curriculum leaders remains fragmented across graphic design, visual arts, design engineering, educational technology, assessment, and policy research. This article presents a comparative integrative review of scholarship published from January 2019 to 20 August 2026, with emphasis on differences and overlaps between selected Western higher-education systems and Asian contexts. The analytic corpus comprised 39 peer-reviewed publications and seven authoritative policy or regulatory documents identified through structured searches of scholarly publisher platforms, DOI-verified records, and backward and forward citation chaining. Evidence was coded across curriculum, assessment, capability, and governance. The review finds consistent short-term benefits for ideation speed, visualisation, self-efficacy, and exploratory breadth, but substantially weaker evidence for durable gains in disciplinary knowledge, craft, independent judgement, or employability. Western studies more often foreground authorship, critique, assessment validity, and the material politics of AI, whereas recent Asian studies more often employ acceptance, self-efficacy, visual-literacy, and institutional-readiness models. These are tendencies rather than stable cultural differences, and the contrast partly reflects research design, policy maturity, and uneven access to infrastructure. Across regions, the central pedagogical risk is not simply plagiarism; it is the substitution of plausible output for observable learning. To address this problem, the article proposes the Curriculum-Assessment-Capability-Governance (CACG) framework for accountable human-AI design learning. The framework aligns AI visual literacy and foundational design knowledge with process-visible assessment, staff and student capability, and institution-level rules for provenance, copyright, data, access, and platform review. For Malaysia and Southeast Asia, the immediate research priority is discipline-specific, multi-institutional evidence that measures creative processes and learning outcomes rather than adoption intention alone.

Keywords: generative artificial intelligence; graphic design education; visual communication; higher education; artificial intelligence literacy; assessment; comparative review; Malaysia; CACG framework

INTRODUCTION

Generative artificial intelligence has altered the conditions under which graphic design is taught, practised, and assessed. Text-to-image systems can produce polished visual variations within seconds; multimodal models can draft copy, generate imagery, modify layouts, simulate audiences, and explain design decisions. These capabilities compress activities that previously required extended cycles of research, sketching, prototyping,

technical execution, and critique. In professional contexts, such compression can be productive. In education, however, the same compression creates an epistemic problem: a visually persuasive artefact no longer provides reliable evidence that a student can frame a communication problem, construct a concept, make principled formal decisions, or evaluate the social consequences of an image.

The rapid research response has produced an uneven body of evidence. Reviews of artificial intelligence in higher education consistently identify growth in personalised support, feedback, assessment, and prediction, while also noting weak theoretical grounding, limited educator involvement, and insufficient attention to ethics and context (Bond et al., 2024; Chiu, 2024a, 2024b; Crompton & Burke, 2023; Luo et al., 2025). The design-specific literature is smaller. Early graphic design studies document students' pragmatic willingness to learn GenAI alongside concerns about originality, professional identity, and the loss of productive uncertainty (Fleischmann, 2024). Subsequent work has examined AI visual literacy, prompt construction, creative cognition, self-efficacy, and anxiety (Hwang & Wu, 2025a, 2025b). By 2026, systematic reviews of art and design education had expanded the evidence base but continued to report disciplinary imbalance, methodological heterogeneity, and limited longitudinal evaluation (Fang, 2026; Hong, 2026; Zeng et al., 2026).

These limitations matter because graphic design education is not reducible to image production. It combines problem framing, audience research, visual rhetoric, typography, information hierarchy, cultural interpretation, iteration, material and digital craft, and ethical accountability. A tool that accelerates image synthesis may support some of these activities while bypassing others. The relevant question is therefore not whether GenAI is beneficial or harmful in general, but under what pedagogical, assessment, and governance conditions its use strengthens rather than obscures learning.

Regional comparison adds a further layer. Literature from Australia, the United Kingdom, Europe, and North America has often concentrated on academic integrity, authorship, critique, policy, and the changing identity of the designer (Cox & Davey, 2026; Heaton, 2025; Lee et al., 2024; Luo, 2024). Recent studies from China, Hong Kong, Malaysia, Indonesia, Sri Lanka, and Palestine more often examine adoption, perceived usefulness, self-efficacy, anxiety, visual literacy, infrastructure, and institutional readiness (Farran et al., 2026; He et al., 2025; Henadirage & Gunarathne, 2025; Hwang & Wu, 2025b; Mat Yusoff et al., 2025; Rahiem, 2026; Xue, 2026). These tendencies should not be interpreted as fixed civilisational differences. Asia includes highly diverse income levels, governance systems, languages, and educational traditions, while many studies classified as “Western” involve international students and transnational institutions. The categories are used here as an analytic heuristic for comparing emphases in the available literature, not as homogeneous cultural blocs.

The review makes three contributions. First, it updates the graphic-design-relevant evidence base through 20 August 2026 and corrects unsupported or inaccurately attributed claims that commonly circulate in rapid reviews. Second, it separates evidence about adoption and perception from evidence about learning, creativity, and assessment validity. Third, it advances a Curriculum-Assessment-Capability-Governance (CACG) framework that translates the literature into a coordinated institutional model. The framework is particularly relevant to Malaysia, where national guidance and digitalisation plans now support responsible AI integration, but discipline-specific evidence for graphic design programmes remains scarce (Department of Higher Education Malaysia, n.d.; Ministry of Higher Education Malaysia, 2025).

The review addresses four questions:

1. What pedagogical affordances and risks of GenAI are reported in graphic design and adjacent art-and-design higher education?

2. How do research emphases differ and converge across selected Western and Asian contexts?

3. What curriculum, assessment, capability, and governance conditions support accountable human-AI design learning?

4. What research priorities follow for Malaysia, Southeast Asia, and the wider international field?

Conceptual Background

Gen AI as a design medium and an epistemic participant

AI has long influenced the creative industries through recommendation, classification, prediction, and computational production. The current shift is distinctive because generative systems participate directly in the production of text, images, audio, video, and code through accessible natural-language interfaces (Anantrasirichai & Bull, 2022). In a design studio, the system may function as a search interface, ideation partner, visualisation engine, critic, production assistant, or simulator. These roles differ pedagogically. A system that helps a student generate alternative compositions is not equivalent to a system that supplies the final concept, writes the rationale, and fabricates evidence of iteration.

The language of "tool use" can therefore be misleading. GenAI does not merely extend a student's hand in the way that a vector pen or camera might. It introduces probabilistic suggestions derived from opaque training data, platform rules, and model defaults. Its outputs carry traces of prior cultural production, representational bias, optimisation choices, and commercial constraints. Responsible education must teach students to interrogate these conditions. Critical visual literacy now includes asking how an image was generated, whose visual conventions it reproduces, what data or labour may be hidden behind it, what cannot be represented well, and how its provenance should be disclosed (Cox & Davey, 2026; UNESCO, 2024a).

This perspective shifts the educational goal from prompt proficiency to accountable judgement. Prompting is useful, but it is only one part of an iterative human-AI workflow. Students must also determine whether a generative route is appropriate, recognise weak or stereotyped outputs, compare alternatives against a communication brief, preserve evidence of human decisions, and understand when direct making, research, or specialist collaboration is required. The designer's role is thus not adequately described as a movement from "maker" to "curator". Curation alone can still be superficial. The more defensible role is maker-judge-accountable author: a practitioner who can create, select, transform, explain, and accept responsibility for the resulting communication.

Creativity, productivity, and the risk of homogenisation

Several studies report that GenAI can expand initial ideation, reduce the time required to visualise concepts, and increase students' confidence in early design stages (Abrusci et al., 2025; Hwang & Wu, 2025b; Mou, 2026). Controlled and quasi-experimental work in design-related higher education also suggests that AI-assisted conditions can improve some measures of ideational output or task completion (Baltà-Salvador et al., 2026; Liu et al., 2026). These findings are important, but they should not be interpreted as proof that GenAI improves creativity as a stable learner capability.

Creativity measures are sensitive to task design, prior expertise, time limits, raters, and whether originality is assessed at individual or group level. Across creative tasks, GenAI can increase the judged creativity of an individual's output while making outputs across participants more similar (Doshi & Hauser, 2024). In design education, this produces a creativity paradox: rapid variation may feel expansive to the individual, yet shared model priors can narrow collective visual diversity. Liang et al. (2026) similarly argue that AI literacy and motivation shape whether GenAI supports or constrains creative learning. The educational implication is that quantity of generated options should not be treated as equivalent to divergent thinking. Students need activities that surface conceptual distance, compare model-generated patterns with self-generated alternatives, and require transformation rather than selection alone.

AI literacy in a visual discipline

General AI literacy frameworks emphasise human agency, ethics, foundations, application, and critical evaluation (Miao & Holmes, 2023; UNESCO, 2024a, 2024b). Graphic design requires these capabilities to be translated into visual and disciplinary terms. AI visual literacy includes at least six abilities: understanding how text and reference images condition output; recognising synthetic artefacts and representational bias; evaluating visual rhetoric and audience effects; documenting provenance and transformation; distinguishing stylistic

imitation from meaningful concept development; and knowing the legal and ethical limits of training data, prompts, and outputs.

Empirical studies support the importance of these capabilities. Hwang and Wu (2025a) found that text-to-image integration required students to develop keyword precision, research, and graphic storytelling rather than merely operate a platform. Xue (2026), in a study of 418 Chinese art students, found that attitudes towards AI and AI-specific creative self-efficacy predicted visual literacy for AI-generated images. Such findings should be interpreted carefully: self-report and structural modelling can explain associations but cannot establish that students can independently critique image provenance or produce stronger design reasoning. Nevertheless, they show that confidence, attitude, and literacy are connected and should be taught together.

Why curriculum, assessment, capability, and governance must align

Isolated interventions are unlikely to produce responsible adoption. A curriculum may teach ethical prompting while an assessment rewards only a polished final artefact. A course may require process disclosure while students lack access to the approved platform. An institution may publish an AI policy without providing staff development or a clear approach to copyright and data. The literature repeatedly identifies these misalignments (Belkina et al., 2025; Chan, 2023; Luo, 2024; Parker et al., 2025; Xia et al., 2024).

The CACG framework developed in this review treats GenAI integration as a four-domain alignment problem. Curriculum defines what students must know and be able to do. Assessment determines what evidence can substantiate that learning. Capability concerns staff expertise, student literacy, access, and technical support. Governance establishes permissions, accountability, procurement, data protection, copyright, equity, and quality assurance. The domains are analytically distinct but operationally interdependent.

METHOD

Review design

This study used a structured integrative review. Integrative reviews are appropriate when a field contains heterogeneous empirical designs, conceptual papers, evidence syntheses, and policy sources that cannot be meaningfully reduced to a single effect estimate (Snyder, 2019; Torraco, 2016; Whittemore & Knafl, 2005). The method was selected in preference to presenting the paper as an exhaustive PRISMA systematic review because the research question spans disciplinary and policy literatures, and because the purpose is comparative conceptual synthesis rather than meta-analysis.

The search and update covered January 2019 to 20 August 2026. The starting point captures the period immediately preceding the public diffusion of large multimodal generative systems while retaining relevant foundations in AI and higher education. Earlier sources were used selectively for established concepts, but only publications within the review period were coded as part of the analytic corpus.

Search strategy and source identification

Two linked search streams were used. The first targeted discipline-specific evidence using combinations of:

("generative artificial intelligence" OR "generative AI" OR "AI-generated content" OR "text-to-image") AND ("graphic design" OR "visual communication" OR "visual arts" OR "art and design" OR "design education") AND ("higher education" OR universit* OR student* OR teacher*)

The second targeted cross-cutting conditions:

("generative AI" OR "artificial intelligence") AND ("higher education") AND (curriculum OR assessment OR integrity OR literacy OR policy OR governance OR adoption) AND (Asia OR Malaysia OR Indonesia OR China OR Hong Kong OR Sri Lanka OR Australia OR Canada OR Europe OR "United Kingdom" OR "United States")

Records were identified through structured searches of scholarly publisher platforms and DOI-verified journal records, followed by backward and forward citation chaining from recent reviews in AI higher education, design education, and fine-arts education. Candidate scholarly sources were retained only after the index-verification procedure described below. Conference papers, book chapters, theses, preprints, and non-scholarly web sources were excluded from the analytic corpus. Authoritative documents issued by UNESCO, Malaysia's higher-education authorities, the Tertiary Education Quality and Standards Agency (TEQSA), and the U.S. Copyright Office were retained for policy analysis but were not treated as evidence of learning effects.

Eligibility and appraisal

Publications were included when they met at least one of the following substantive criteria: (a) empirical research on GenAI in graphic design, visual communication, art, or adjacent design higher education; (b) an evidence synthesis with direct implications for creative higher education; (c) empirical or comparative higher-education research addressing assessment, adoption, literacy, or policy in a focal region; or (d) an authoritative policy or regulatory source directly relevant to curriculum, assessment, copyright, data, or responsible AI use. Publications were excluded if they were promotional, lacked a traceable scholarly record, focused exclusively on technical model performance, or made claims about education without an identifiable higher-education context.

For the scholarly corpus, journal status and temporal coverage were verified against the June 2026 Scopus Source Title List. Inclusion required an active journal and Scopus coverage that included the article's publication year; matching used ISSN or eISSN where available and normalised source-title matching as a secondary check. Policy and regulatory documents were exempt from the journal-index rule and were appraised by issuing authority, currency, scope, and relevance.

Quality appraisal was calibrated to source type. Empirical studies were examined for clarity of context and sample, fit between research question and method, transparency of analysis, and proportionality between evidence and conclusions. Reviews were assessed for search transparency, eligibility logic, and synthesis quality. Policy sources were assessed for issuing authority, currency, scope, and relevance. No numerical quality score was imposed because such a score would create false comparability across qualitative studio studies, surveys, experiments, reviews, and regulatory documents. Instead, methodological limitations were retained as part of the synthesis.

After removal of duplicates and sources with incomplete or unverifiable bibliographic information, the final analytic corpus comprised 39 peer-reviewed publications and seven policy or regulatory documents. The corpus included graphic-design-specific studies, broader art-and-design education studies, general higher-education studies used to interpret assessment or governance, and recent regional research from Malaysia and neighbouring Asian systems.

Coding and synthesis

Each source was coded for publication year, location, disciplinary scope, participants, method, AI modality, learning or adoption outcome, reported benefit, reported risk, theoretical framework, and institutional implication. Initial codes were grouped inductively and then tested against four organising domains: Curriculum, Assessment, Capability, and Governance. Regional patterns were compared only when the underlying studies provided sufficient contextual information. Claims were classified as strong, moderate, or preliminary according to design and convergence, although these labels were used interpretively rather than as a formal grading system.

Table 1 summarises the protocol.

Table 1. Review protocol and analytic decisions.

Review element	**Operational decision**
Review type	Structured comparative integrative review

Time window	January 2019 to 20 August 2026
Core domains	Graphic design, visual communication, art and design education, higher-education assessment and policy
Discovery routes	Scholarly publisher platforms, DOI-verified records, backward and forward citation chaining
Evidence included	Peer-reviewed studies and reviews in active Scopus-indexed journals with coverage for the publication year, plus authoritative policy and regulatory documents
Main coding categories	Region, discipline, method, AI modality, learning outcome, adoption outcome, risk, theory, institutional implication
Synthesis structure	Curriculum, Assessment, Capability, Governance (CACG)
Key limitation	Integrative and English-language corpus; not an exhaustive database-indexed meta-analysis

RESULTS

Profile and maturity of the evidence

The evidence base expanded sharply after 2023, but volume should not be mistaken for maturity. Broad higher-education reviews contain hundreds of publications, yet design-specific studies remain a small subset and frequently use single-course, cross-sectional, self-report, or exploratory designs (Bond et al., 2024; Fang, 2026; Hong, 2026; Zeng et al., 2026). Fleischmann's (2024) study, for example, provides valuable detail from 17 undergraduate graphic design students but cannot establish generalisable learning effects. Hwang and Wu's (2025b) survey of 121 design students offers a stronger model of psychological mechanisms, but its cross-sectional mediation analysis does not demonstrate causal change. Newer experiments and field evaluations provide more direct evidence of creative performance, yet commonly examine short tasks or immediate outcomes (Abrusci et al., 2025; Baltà-Salvador et al., 2026; Liu et al., 2026).

Recent reviews are also heterogeneous in what they call “art”, “design”, or “fine arts”. Zeng et al. (2026) reviewed 78 studies across multiple fine-arts specialisations, finding concentration in visual arts and higher education. Fang (2026) synthesised GenAI tools, pedagogies, and practices in higher art education, while Hong (2026) focused on learning, creativity, and opportunity in visual arts. These reviews confirm rapid growth, but graphic design is often combined with painting, illustration, architecture, product design, or general creative practice. Consequently, conclusions about “design students” can conceal important differences in assessment, studio culture, professional standards, and the role of typography, audience research, and visual communication.

The most defensible overall conclusion is therefore asymmetrical: there is moderate evidence that GenAI can support short-term ideation, visualisation, feedback, and engagement, but limited evidence that it improves durable graphic-design competence. Claims about professional readiness, critical thinking, independent creativity, or long-term employability remain preliminary.

Curriculum: from software operation to AI visual literacy

Curriculum findings converge on the need to teach GenAI as an object of critical inquiry as well as a production medium. Students require more than platform demonstrations. They need to understand how prompts, reference images, seeds, model versions, interface defaults, and post-processing decisions shape outputs. Hwang and Wu (2025a) show that text-to-image assignments can foreground keyword precision, research, and visual storytelling. Fleischmann (2024) reports student interest in learning GenAI effectively and ethically, alongside concern that rapid generation may bypass the ambiguity and iteration central to studio learning.

This tension suggests a staged curriculum. At an introductory level, students should develop foundational visual language and direct-making skills before or alongside AI-supported production. At an intermediate level, they can compare human-only, AI-assisted, and hybrid workflows against the same brief. At an advanced level, they should interrogate dataset politics, stylistic appropriation, labour, environmental cost, accessibility, and professional accountability. GenAI should be located within established design knowledge rather than treated as a separate technical topic.

Evidence from AI4Design and related design studies indicates that targeted systems can help students explore alternatives, articulate concepts, and improve aspects of visual output (Abrusci et al., 2025). However, open-ended commercial generators may introduce cognitive offloading when students accept the first plausible result. Mou (2026) found that students' experiences in short visual design tasks involved both rapid visualisation and difficulties in controlling or critically interpreting output. The curriculum response should be to make evaluation criteria explicit: relevance to audience, conceptual coherence, information hierarchy, accessibility, cultural sensitivity, originality of transformation, and evidence of human judgement.

The literature also supports a shift from “prompt engineering” to prompt-and-critique literacy. Prompting can become formulaic and platform-specific. Critique is more transferable. A student who can explain why an output fails, identify the model's default visual conventions, and revise the communication strategy demonstrates a deeper capability than one who produces an attractive image through extensive prompt trial and error.

Creativity and cognition: benefits are conditional

The strongest positive pattern concerns early-stage creative support. GenAI can reduce blank-page anxiety, produce rapid visual stimuli, and enable students to externalise ideas that exceed their current technical ability (Hwang & Wu, 2025b; Mou, 2026). In the Chinese design-student study by Hwang and Wu (2025b), AI-related knowledge and perceptions were associated with creative cognition through self-efficacy and reduced anxiety. Xue's (2026) findings similarly connect AI attitudes, creative self-efficacy, and visual literacy. These studies indicate plausible psychological pathways through which GenAI may support participation.

However, psychological confidence and creative competence are not interchangeable. A student may feel more capable because the system generates a high-fidelity image, even when the conceptual contribution remains thin. Liang et al. (2026) describe a creativity paradox in which AI literacy and motivation determine whether AI supports or constrains independent cognitive engagement. Doshi and Hauser's (2024) experimental evidence outside design education reinforces this concern: GenAI can enhance individual evaluations while reducing diversity across outputs. Heigl's (2026) systematic review of creative contexts likewise finds that value depends on how human and machine contributions are configured.

Three conditions appear to moderate benefit. First, task structure matters. GenAI is more educationally productive when it supports exploration, comparison, or feedback than when it substitutes for problem definition. Second, prior knowledge matters. Novices may lack the visual and disciplinary criteria needed to reject plausible but weak outputs. Third, reflection matters. Requiring students to explain selection, transformation, and rejection decisions converts interaction into observable learning. Without these conditions, productivity gains can mask shallow cognition.

Authorship, identity, and professional formation

Graphic design education has historically linked authorship to research, intentionality, formal decision-making, craft, and responsibility for audience effects. GenAI destabilises this linkage because contribution is distributed across the student, model developers, training data, interface, and prior creators whose work informs the model. The legal and educational meanings of authorship are related but not identical. In the United States, the Copyright Office (2025) maintains that copyright protection requires sufficient human-authored expression and evaluates mixed human-AI works case by case. Other jurisdictions differ, and institutional teaching must avoid presenting one national rule as universal.

The educational task is broader than determining ownership. Students must learn to account for contribution. Heaton (2025) argues for dialogic, responsible engagement with AI in art education rather than either uncritical adoption or categorical rejection. Cox and Davey (2026) extend the debate by foregrounding the material conditions required for critical visual literacy. These perspectives resist the idea that the designer becomes merely a curator of model output. Selection is meaningful only when grounded in disciplinary judgement, research, and ethical reasoning.

Professional identity is also affected. Students may interpret GenAI as evidence that technical skills no longer matter, or conversely as a threat that invalidates their chosen profession. Fleischmann (2024) found pragmatic acceptance rather than simple fear among graphic design students, but also a clear demand for educator guidance. A balanced curriculum should frame craft and AI literacy as complementary. Foundational making develops perceptual sensitivity, tacit knowledge, and control; AI literacy enables critical participation in changing workflows. The learning outcome is not loyalty to one medium but the capacity to choose and justify an appropriate method.

Assessment: final artefacts no longer provide sufficient evidence

Assessment is the most immediate institutional challenge. GenAI can produce a sophisticated final image, rationale, process narrative, and presentation, making it difficult to infer learning from submitted artefacts alone. Detection-based responses are unreliable and can produce inequitable accusations. The literature instead supports assessment redesign that collects multiple, authentic forms of evidence (Cotton et al., 2024; Luo, 2024; TEQSA, 2025; Xia et al., 2024).

For graphic design, process-visible assessment can include brief interpretation, research traces, thumbnails, decision logs, prompt histories, model and version identification, annotated iterations, peer critique, oral defence, and live adaptation. The purpose is not surveillance for its own sake. It is to make reasoning assessable. A process portfolio should show what the student accepted, rejected, and transformed, and why. Where GenAI is permitted, the rubric should assess the quality of human judgement, not the quantity of prompts.

Xia et al. (2024), reviewing 32 empirical studies on GenAI and higher-education assessment, call for transformation at student, teacher, and institutional levels, including self-regulated learning, responsible learning, professional development, and policy review. Luo (2024) cautions that many university policies treat originality as a fixed property without reconsidering how knowledge production changes under GenAI. This insight is particularly important in studio education, where appropriation, reference, remix, collaboration, and iteration already complicate individual authorship.

A resilient assessment system therefore triangulates evidence. The final design remains important, but it is considered alongside process, critique, explanation, and, where appropriate, a controlled or live task. Programmes should also distinguish three assessment purposes: formative experimentation, summative demonstration of independent capability, and professional simulation of AI-integrated practice. The permissible role of GenAI may legitimately differ across these purposes.

Capability: adoption depends on more than willingness

Capability includes AI literacy, pedagogical knowledge, disciplinary expertise, infrastructure, access, and support. UNESCO's teacher framework identifies a human-centred mindset, ethics, AI foundations and applications, AI pedagogy, and professional learning as interdependent competency areas (UNESCO, 2024b). Art-and-design research reaches a similar conclusion. Bedir Erişti and Freedman (2024) emphasise pedagogical competence within evolving digital visual culture, while Zhu et al. (2026) integrate the Technology Acceptance Model with TPACK to explain art and design teachers' acceptance of AI-generated content for tutoring.

Acceptance is not the same as readiness. Low et al. (2025), comparing students in two Asian countries, found that attitudes, perceived usefulness, and ease of communication were associated with adoption intention; contrary to some summaries of the study, fear did not significantly moderate the relationship between attitude and intention. This correction matters because it prevents an unsupported cultural-psychological narrative.

Institutions should diagnose actual capability needs rather than assume that reluctance is primarily emotional or cultural.

Access is also uneven. Paid tiers, computing resources, broadband, language performance, disability access, and availability of local or institutionally approved tools influence who can participate. Henadirage and Gunarathne (2025) show that Global South adoption is shaped by infrastructure, training, institutional support, and context, not merely individual attitude. Farran et al. (2026) similarly demonstrate the relevance of resource and task conditions among Palestinian arts and design students. Capability planning must therefore include equitable licensing, alternatives for students who cannot or do not wish to use a commercial model, and support for multilingual and accessibility needs.

Governance: policy must become operational

University policies have evolved from early prohibition or generic warnings towards more differentiated guidance, but inconsistency remains common (Chan, 2023; Parker et al., 2025). Governance in graphic design education must address at least six issues: permitted use, disclosure and provenance, privacy and confidential briefs, copyright and intellectual property, equitable access, and quality assurance of platforms. It should also specify who is accountable for decisions and how rules are updated as tools change.

Policy should be tiered rather than binary. A programme can define categories such as prohibited, restricted, permitted with disclosure, and required/embedded use. The category should be set at assessment level and linked to learning outcomes. For example, an introductory typography assessment may prohibit image generation because the outcome is direct manipulation of form, while an advanced campaign course may require a critically documented hybrid workflow. Students need a clear rationale for each category.

Institutional procurement is part of pedagogy. A platform that retains student uploads, cannot protect confidential client data, has inaccessible interfaces, or offers no meaningful provenance controls may be inappropriate regardless of its creative capability. Governance should require periodic platform review and an approved-tool register without implying that approved tools are automatically pedagogically sound.

Malaysia has moved towards a more explicit policy environment. The Department of Higher Education Malaysia has issued guidance for the use of generative AI in higher-education teaching and learning, and the Ministry of Higher Education's Digitalization of Higher Education Action Plan 2025-2030 establishes a wider transformation agenda (Department of Higher Education Malaysia, n.d.; Ministry of Higher Education Malaysia, 2025). The challenge now is programme-level translation: converting general principles into learning outcomes, assessment rules, staff development, procurement, and evidence of quality.

Comparative synthesis: tendencies, convergences, and cautions

Table 2 presents the comparative synthesis. The most visible difference is one of research emphasis. Western literature more often asks what GenAI does to authorship, critique, assessment, and the meaning of professional practice. Asian literature more often asks what predicts adoption and how AI affects self-efficacy, anxiety, visual literacy, and institutional readiness. The methods follow this pattern: qualitative studio inquiry and policy analysis are prominent in the former, while surveys and structural models are prominent in the latter.

Table 2. Comparative synthesis of research emphases and shared gaps.

Dimension	Selected Western-system evidence	Selected Asian-context evidence	Cross-regional interpretation
Dominant question	How does GenAI alter authorship, critique, assessment, and professional identity?	What predicts adoption, confidence, literacy, and effective institutional integration?	Different research traditions and policy stages shape the questions asked.

Common methods	Qualitative studio studies, educator studies, policy analysis, critical scholarship	Cross-sectional surveys, TAM/UTAUT-related models, mediation and structural models, national case studies	Both clusters need more longitudinal, experimental, and multi-institutional designs.
Curriculum emphasis	Critical practice, ambiguity, dialogue, authorship, material politics	Prompting, perceived usefulness, self-efficacy, visual literacy, scalability	A mature curriculum must combine criticality with operational competence.
Assessment emphasis	Originality, academic integrity, authentic and process-visible assessment	Adoption guidance, institutional rules, large-cohort implementation	Final artefacts are insufficient evidence in both contexts.
Capability concern	Educator workload, assessment literacy, maintaining human-centred pedagogy	Infrastructure, staff readiness, access, language, uneven institutional support	Capability is socio-technical, not an individual deficit.
Governance concern	Policy coherence, data, copyright, academic integrity	Top-down digitalisation, policy translation, equity, implementation capacity	Rules must be assessment-specific and supported by procurement and training.
Main evidence gap	Causal and longitudinal evidence of learning	Discipline-specific evidence beyond intention and perception	Shared need for validated measures of design reasoning and employability.

The convergences are more consequential than the differences. Across regions, studies warn against over-reliance, insufficient staff development, unclear assessment rules, and uncritical trust in output (Yusuf et al., 2024). Across regions, students report usefulness and demand guidance. Across regions, strong visual results can exceed the learner's independent capability. The comparison therefore does not support separate “Western” and “Asian” pedagogies. It supports context-sensitive implementation of a shared principle: GenAI use is educationally defensible when human learning and accountability remain observable.

Malaysia and Southeast Asia

The Malaysian evidence base is developing but remains general. Mat Yusoff et al. (2025), using a cross-sectional survey of 306 participants, found that satisfaction and perceived utility were the strongest predictors of AI use in higher-education curricula; content quality and perceived credibility were positively related but not statistically significant predictors in the structural model. This result is particularly important for design education. Students may adopt an easy and useful image generator even when they are not well positioned to judge the credibility, provenance, or cultural consequences of its output.

Indonesian studies likewise show growing use but uneven institutional development. Helmiatin et al. (2024) examined adoption in public universities, and Rahiem (2026) documented patterns of GenAI use and perceived learning impact. Sri Lankan evidence highlights infrastructure, training, and policy barriers characteristic of resource-constrained environments (Henadirage & Gunarathne, 2025). Together, these studies caution against transferring policies from highly resourced universities without attention to licensing, connectivity, staff workload, multilingual needs, and local creative industries.

No study in the reviewed corpus provided multi-institutional, discipline-specific evidence on GenAI learning outcomes in Malaysian graphic design programmes. This is a substantive gap, not merely a missing geographic case. Malaysia's multilingual, multicultural, public-private, and branch-campus higher-education system offers a strong setting for testing whether AI visual literacy, process-visible assessment, and faculty capability predict

design learning beyond adoption intention. Such work could contribute internationally while directly informing Malaysian programme standards.

DISCUSSION

The central problem is learning assurance, not tool acceptance

The field has devoted substantial attention to whether students and teachers intend to use AI. Acceptance models are useful for implementation, but acceptance is a weak proxy for educational value. A platform may be perceived as useful because it reduces effort, produces attractive images, or helps complete a task. Those benefits do not establish that the learner has developed design judgement. Conversely, discomfort or slower performance does not necessarily indicate poor learning; productive difficulty and ambiguity are central to creative development.

The more important construct is learning assurance: credible evidence that a student has achieved specified outcomes under known conditions. In graphic design, this requires distinguishing between output quality, process quality, and learner capability. GenAI may raise output quality while leaving process quality unchanged or reducing independent capability. It may also enable a student with strong ideas but limited execution skill to communicate more effectively. Assessment must be designed to identify which of these possibilities occurred.

This argument reframes academic integrity. Misconduct remains a concern, but a policy centred only on cheating treats GenAI as an external contaminant. In reality, GenAI is becoming part of professional practice. Programmes need to assess both independent capability and responsible collaboration with AI. The goal is not to make every assessment AI-proof; it is to make each assessment explicit about what capability is being demonstrated and what role, if any, AI may play.

The Curriculum-Assessment-Capability-Governance framework

The CACG framework synthesises the review into four coordinated domains. Curriculum establishes disciplinary and AI visual literacy. Assessment makes learning and human contribution visible. Capability ensures that staff and students have the knowledge, access, time, and support required. Governance creates legitimate, equitable, and reviewable conditions for use. Misalignment in any domain weakens the others.

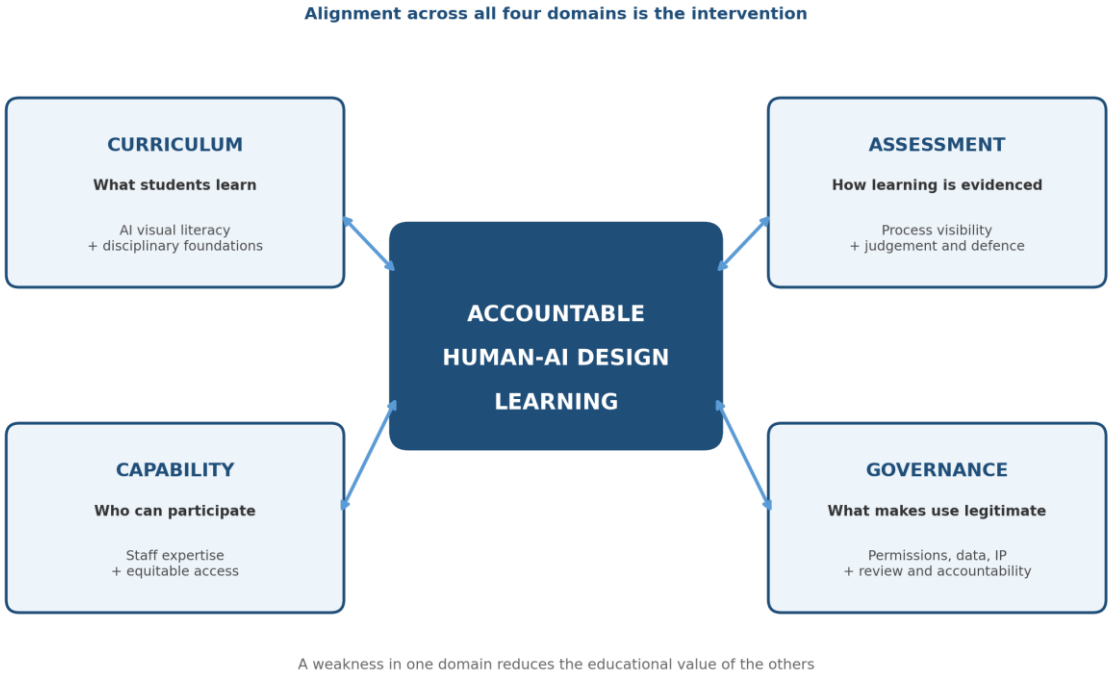

Figure 1. The Curriculum-Assessment-Capability-Governance (CACG) framework for accountable human-AI design learning. Source: Author's synthesis.

Table 3 operationalises the framework.

Table 3. Operationalising the Curriculum-Assessment-Capability-Governance (CACG) framework.

Domain	**Core objective**	**Minimum actions for a graphic design programme**	**Evidence of implementation**
Curriculum	Develop accountable AI visual literacy within disciplinary knowledge	Map GenAI to programme outcomes; retain foundational typography, composition, research, and making; teach prompt-and-critique literacy, bias, provenance, copyright, accessibility, and audience effects; use comparative human-only and hybrid tasks	Curriculum map; revised learning outcomes; annotated briefs; student work demonstrating critique and transformation
Assessment	Ensure that grades represent observable learning, not only plausible output	Use process portfolios, decision logs, prompt/version records, oral defence, critique, staged submissions, and selective live tasks; distinguish formative, summative, and professional-simulation uses; assess judgement and transformation	Assessment blueprint; AI-use category on each brief; rubric criteria for reasoning and disclosure; moderation evidence
Capability	Build staff and student competence with equitable access	Provide discipline-specific staff development; offer student induction; maintain approved and alternative tools; support multilingual, disability, and low-bandwidth needs; allocate time for assessment redesign	Capability framework; training participation; access audit; support materials; staff communities of practice
Governance	Create clear, lawful, equitable, and adaptable institutional conditions	Define tiered permissions; require proportionate disclosure; review data retention, confidentiality, copyright, procurement, accessibility, and environmental implications; assign responsibility for updates and appeals	Policy and approved-tool register; privacy and IP review; annual programme audit; incident and appeal process

The framework's value lies in alignment. Teaching disclosure without assessing it makes disclosure ceremonial. Requiring process evidence without providing tool access penalises disadvantaged students. Publishing a policy without staff development creates inconsistent enforcement. Introducing AI literacy while removing foundational design practice leaves students unable to judge outputs. CACG therefore functions as a programme-design and audit framework rather than a checklist of independent initiatives.

A three-layer model of student capability

The review supports three layers of capability that should be developed and assessed separately.

First, independent design capability includes research, problem framing, ideation, typography, composition, visual rhetoric, technical execution, critique, and presentation without substantive generative assistance. Programmes need protected opportunities to establish this baseline.

Second, AI-interaction capability includes selecting an appropriate model, constructing and revising prompts, controlling references, comparing outputs, checking claims, recognising limitations, and combining AI-generated and human-made elements. This layer concerns effective collaboration.

Third, accountable professional capability includes disclosure, provenance, copyright reasoning, data protection, client confidentiality, cultural sensitivity, accessibility, and the ability to defend a decision. This layer determines whether technically effective use is professionally legitimate.

Students may be strong in one layer and weak in another. A detailed prompt history does not prove independent design capability; a strong hand-crafted outcome does not prove readiness for AI-integrated practice; and efficient production does not prove responsible use. Programme-level assessment should sample all three layers across the course of study.

Implications for educators and programme leaders

For educators, the immediate priority is to redesign briefs around decisions rather than tools. A brief can specify the communication problem, audience, constraints, and evidence required while allowing the technology to change. Learning activities should include comparative critique of human- and AI-generated work, reverse engineering of generic visual patterns, bias audits, provenance mapping, and exercises in transforming rather than merely selecting output.

Critique culture also needs adaptation. Students should be expected to discuss model choice, input construction, rejected results, post-processing, and ethical concerns. Educators should avoid rewarding "prompt theatre", in which a long prompt log substitutes for design reasoning. The relevant evidence is the relationship between decisions and the brief.

For programme leaders, implementation should begin with an assessment and capability audit. The audit should identify where final artefacts carry too much evidential weight, which outcomes require independent performance, where students face unequal access, and which staff require development. A programme does not need one universal AI rule. It needs coherent rules across the assessment map.

For institutions, policies should enable local disciplinary interpretation within a common governance structure. Graphic design, nursing, law, and computer science do not face identical risks or professional expectations. Central policy can define principles, disclosure standards, privacy, procurement, and appeals, while programmes define assessment-specific permissions and evidence.

Research Agenda

The next stage of research should move beyond descriptive adoption. Table 4 specifies priority studies.

Table 4. Priority research agenda for GenAI in graphic design higher education.

Priority	**Recommended design**	**Key variables or evidence**	**Contribution**
Durable design learning	Longitudinal or quasi-experimental studio studies across multiple semesters	Independent design performance, transfer, retention, critique quality, technical and conceptual development	Tests whether short-term gains persist and transfer beyond the tool
Creativity paradox	Controlled comparison of human-only, AI-assisted, and structured hybrid workflows	Ideational fluency, originality, diversity across cohort, fixation, transformation distance	Separates individual output gains from collective homogenisation
Assessment validity	Validation study of process-visible assessment and AI-use rubrics	Inter-rater reliability, construct validity, student workload, equity, misconduct appeals	Establishes whether redesigned assessment measures intended capabilities

Cross-regional comparison	Multi-country study using measurement invariance and matched course types	AI literacy, self-efficacy, access, pedagogy, policy clarity, learning outcomes	Tests whether observed regional differences are cultural, institutional, or methodological
Faculty capability	Design-based implementation research with professional development	TPACK, assessment literacy, workload, confidence, classroom practice	Identifies effective and sustainable staff-development models
Provenance and authorship	Studio-based provenance trials using decision logs and content credentials	Accuracy, usability, student understanding, privacy, moderation value	Connects disclosure technology with educational judgement
Malaysia and Southeast Asia	Multi-institutional mixed-methods study in graphic design and visual communication	Public/private and urban/rural contexts, multilingual use, access, learning outcomes, industry expectations	Builds discipline-specific regional evidence and informs national guidance
Equity and sustainability	Comparative access and environmental-impact audit	Cost, bandwidth, disability access, language performance, energy awareness	Broadens responsible AI beyond integrity and copyright

Four propositions can guide hypothesis-driven work:

Proposition 1: GenAI will improve ideational breadth most reliably when tasks require divergent exploration followed by explicit human critique and transformation.

Proposition 2: Where assessment relies predominantly on final artefacts, GenAI-assisted output quality will overestimate independent design capability.

Proposition 3: AI visual literacy and disciplinary prior knowledge will moderate the relationship between GenAI use and learning outcomes more strongly than adoption intention alone.

Proposition 4: Institutions with stronger alignment across curriculum, assessment, capability, and governance will show more equitable and educationally productive GenAI use than institutions relying on policy statements alone.

Limitations

This review has four limitations. First, it is an integrative review rather than an exhaustive database-indexed meta-analysis. Searches were structured and bibliographic details were verified, but the fast-moving field, publisher coverage, and English-language criterion mean that relevant regional or non-English studies may have been missed. Second, the evidence is heterogeneous. Graphic design, visual arts, product design, design engineering, and general higher education use different tasks and outcome measures, limiting direct comparison.

Third, the regional categories are necessarily imperfect. “Western” and “Asian” identify patterns in the reviewed literature rather than coherent cultures or levels of development. Japan, South Korea, Singapore, China, Malaysia, Indonesia, Sri Lanka, and Palestine cannot be treated as a single educational context, just as Australia, Europe, Canada, and the United States differ substantially. The comparative claims should therefore be read as tendencies in research emphasis, not causal cultural explanations.

Fourth, GenAI systems change faster than conventional publication cycles. Findings tied to a specific platform or model version may age quickly. The framework consequently emphasises durable design outcomes, decision evidence, and governance processes rather than tool-specific instructions.

CONCLUSION

Generative AI is now part of the environment in which graphic designers learn and work, but its educational value is conditional. The literature provides credible evidence of faster ideation, visualisation, engagement, and self-efficacy. It provides much weaker evidence that these gains translate into durable design knowledge, independent creativity, professional judgement, or employability. The decisive issue is whether learning remains observable when production is shared with a generative system.

The comparative evidence reveals different emphases but a common challenge. Western-system studies tend to foreground authorship, critique, assessment, and professional identity; Asian-context studies increasingly foreground adoption, self-efficacy, visual literacy, infrastructure, and implementation. Neither cluster can resolve the problem alone. Critical theory without operational capability can remain abstract, while adoption without learning assurance can reward efficiency at the expense of education.

The CACG framework offers a coordinated response. Curriculum develops disciplinary and AI visual literacy. Assessment captures process, judgement, and human contribution. Capability provides staff expertise and equitable access. Governance clarifies permissions, provenance, data, copyright, and accountability. For Malaysia and Southeast Asia, the opportunity is to move early from general adoption studies to discipline-specific evidence. Multi-institutional research in graphic design can test how GenAI affects not only what students produce, but how they think, decide, explain, and accept responsibility for visual communication.

Statements and Declarations

Funding: No specific funding was received for this work.

Competing interests: The author declares no known competing financial or non-financial interests that could have influenced this work.

Author contributions: Muhammad Nur Firdaus Nasir: Conceptualisation; methodology; investigation; formal analysis; writing—original draft; writing—review and editing; visualisation. Nurul Farhana Nasir: Methodology; validation; data curation; supervision; writing—review and editing. Muhammad Faiz Nasir: Investigation; resources; data collection; data curation; writing—review and editing. Muhammad Arif Nasir: Formal analysis; validation; visualisation; project administration; writing—review and editing.

Data availability: No new primary dataset was generated. The representative evidence matrix used in the synthesis is provided in Appendix A.

Use of generative AI: During preparation of this manuscript, OpenAI ChatGPT was used to support language refinement, source organisation, and document formatting. All substantive arguments, source verification, interpretations, and final wording were reviewed and approved by the author, who takes full responsibility for the manuscript.

REFERENCES

1. Abrusci, L., Dabaghi, K., D'Urso, S., & Sciarrone, F. (2025). AI4Design: A generative AI-based system to improve creativity in design-A field evaluation. Computers and Education: Artificial Intelligence, 8, 100401. https://doi.org/10.1016/j.caeai.2025.100401
2. Anantrasirichai, N., & Bull, D. (2022). Artificial intelligence in the creative industries: A review. Artificial Intelligence Review, 55(1), 589-656. https://doi.org/10.1007/s10462-021-10039-7
3. Baltà-Salvador, R., Brasó-Vives, E., & Peña, M. (2026). Evaluating AI-assisted creative ideation: A crossover study in higher education. Thinking Skills and Creativity, 59, 101958. https://doi.org/10.1016/j.tsc.2025.101958
4. Bedir Erişti, S. D., & Freedman, K. (2024). Integrating digital technologies and AI in art education: Pedagogical competencies and the evolution of digital visual culture. Participatory Educational Research, 11, 57-79. https://doi.org/10.17275/per.24.94.11.6

5. Belkina, M., Daniel, S., Nikolic, S., Haque, R., Lyden, S., Neal, P., Grundy, S., & Hassan, G. M. (2025). Implementing generative AI (GenAI) in higher education: A systematic review of case studies. Computers and Education: Artificial Intelligence, 8, 100407. https://doi.org/10.1016/j.caeai.2025.100407
6. Bond, M., Khosravi, H., De Laat, M., Bergdahl, N., Negrea, V., Oxley, E., Pham, P., Chong, S. W., & Siemens, G. (2024). A meta systematic review of artificial intelligence in higher education: A call for increased ethics, collaboration, and rigour. International Journal of Educational Technology in Higher Education, 21, 4. https://doi.org/10.1186/s41239-023-00436-z
7. Chan, C. K. Y. (2023). A comprehensive AI policy education framework for university teaching and learning. International Journal of Educational Technology in Higher Education, 20, 38. https://doi.org/10.1186/s41239-023-00408-3
8. Chiu, T. K. F. (2024a). Future research recommendations for transforming higher education with generative AI. Computers and Education: Artificial Intelligence, 6, 100197. https://doi.org/10.1016/j.caeai.2023.100197
9. Chiu, T. K. F. (2024b). The impact of Generative AI (GenAI) on practices, policies and research direction in education: A case of ChatGPT and Midjourney. Interactive Learning Environments, 32(10), 6187-6203. https://doi.org/10.1080/10494820.2023.2253861
10. Cotton, D. R. E., Cotton, P. A., & Shipway, J. R. (2024). Chatting and cheating: Ensuring academic integrity in the era of ChatGPT. Innovations in Education and Teaching International, 61(2), 228-239. https://doi.org/10.1080/14703297.2023.2190148
11. Cox, G., & Davey, A. (2026). Seeing AI in the art and design classroom: Exploring the material conditions for critical visual literacy. International Journal of Art & Design Education. Advance online publication. https://doi.org/10.1111/jade.70043
12. Crompton, H., & Burke, D. (2023). Artificial intelligence in higher education: The state of the field. International Journal of Educational Technology in Higher Education, 20, 22. https://doi.org/10.1186/s41239-023-00392-8
13. Department of Higher Education Malaysia. (n.d.). Garis panduan penggunaan teknologi kecerdasan buatan generatif dalam pengajaran dan pembelajaran pendidikan tinggi [Guidelines on the use of generative artificial intelligence technology in higher-education teaching and learning]. Retrieved August 20, 2026, from https://jpt.mohe.gov.my/portal/index.php/ms/penerbitan/175-garis-panduan-penggunaan-teknologi-kecerdasan-buatan-generatif-dalam-pengajaran-dan-pembelajaran-pdp-pendidikan-tinggi
14. Doshi, A. R., & Hauser, O. P. (2024). Generative AI enhances individual creativity but reduces the collective diversity of novel content. Science Advances, 10(28), eadn5290. https://doi.org/10.1126/sciadv.adn5290
15. Fang, Z. (2026). Integrating generative AI in higher art education: A systematic review of tools, pedagogies, and practices. SN Computer Science, 7(2), 215. https://doi.org/10.1007/s42979-026-04788-x
16. Farran, H., Khlaif, Z. N., Saifi, A. G., Hijjawi, T., & Bani Ismail, H. (2026). Generative AI adoption among arts and design students in Palestinian higher education: Impacts on task completion. Cogent Education, 13(1), 2594885. https://doi.org/10.1080/2331186X.2025.2594885
17. Fleischmann, K. (2024). Generative artificial intelligence in graphic design education: A student perspective. Canadian Journal of Learning and Technology, 50(1), 1-17. https://doi.org/10.21432/cjlt28618
18. He, A. J., Zhang, Z., Anand, P., & McMinn, S. (2025). Embracing generative artificial intelligence tools in higher education: A survey study at the Hong Kong University of Science and Technology. Journal of Asian Public Policy, 18(2), 352-376. https://doi.org/10.1080/17516234.2024.2447195
19. Heaton, R. (2025). Making peace with artificial intelligence (AI) in art education. International Journal of Art & Design Education, 44(4), 932-947. https://doi.org/10.1111/jade.12614
20. Heigl, R. (2026). Generative artificial intelligence in creative contexts: A systematic review and future research agenda. Management Review Quarterly, 76(1), 955-992. https://doi.org/10.1007/s11301-025-00494-9

21. Helmiatin, Hidayat, A., & Kahar, M. R. (2024). Investigating the adoption of AI in higher education: A study of public universities in Indonesia. Cogent Education, 11(1), 2380175. https://doi.org/10.1080/2331186X.2024.2380175
22. Henadirage, A., & Gunarathne, N. (2025). Barriers to and opportunities for the adoption of generative artificial intelligence in higher education in the Global South: Insights from Sri Lanka. International Journal of Artificial Intelligence in Education, 35(1), 245-281. https://doi.org/10.1007/s40593-024-00439-5
23. Hong, T. (2026). Reframing artificial intelligence in art education: A systematic review of learning, creativity and opportunities in visual arts. European Journal of Education, 61(2), e70676. https://doi.org/10.1111/ejed.70676
24. Hwang, Y., & Wu, Y. (2025a). Graphic design education in the era of text-to-image generation: Transitioning to contents creator. International Journal of Art & Design Education, 44(1), 239-253. https://doi.org/10.1111/jade.12558
25. Hwang, Y., & Wu, Y. (2025b). The influence of generative artificial intelligence on creative cognition of design students: A chain mediation model of self-efficacy and anxiety. Frontiers in Psychology, 15, 1455015. https://doi.org/10.3389/fpsyg.2024.1455015
26. Lee, D., Arnold, M., Srivastava, A., Plastow, K., Strelan, P., Ploeckl, F., Lekkas, D., & Palmer, E. (2024). The impact of generative AI on higher education learning and teaching: A study of educators' perspectives. Computers and Education: Artificial Intelligence, 6, 100221. https://doi.org/10.1016/j.caeai.2024.100221
27. Liang, X., Jiang, D., Tadesse, E., & Hu, P. (2026). The creativity paradox of generative AI in design education: How AI literacy and motivation reshape creative learning. European Journal of Education, 61(3), e70727. https://doi.org/10.1111/ejed.70727
28. Liu, R., Wu, T., Chu, J., & Qu, P. (2026). Enhancing human-computer collaboration in the design process: How AI-generated content elevates students' creativity. Thinking Skills and Creativity, 59, 101967. https://doi.org/10.1016/j.tsc.2025.101967
29. Low, M. P., Wut, T. M., & Pok, W. F. (2025). Artificial intelligence facilitators in higher education institutions: A student-centric exploration with comparative analysis in Asian countries. Education and Information Technologies, 30, 18485-18511. https://doi.org/10.1007/s10639-025-13513-9
30. Luo, J. (2024). A critical review of GenAI policies in higher education assessment: A call to reconsider the "originality" of students' work. Assessment & Evaluation in Higher Education, 49(5), 651-664. https://doi.org/10.1080/02602938.2024.2309963
31. Luo, J., Zheng, C., Yin, J., & Teo, H. H. (2025). Design and assessment of AI-based learning tools in higher education: A systematic review. International Journal of Educational Technology in Higher Education, 22, 42. https://doi.org/10.1186/s41239-025-00540-2
32. Mat Yusoff, S., Mohamad Marzaini, A. F., Hao, L., Zainuddin, Z., & Basal, M. H. (2025). Understanding the role of AI in Malaysian higher education curricula: An analysis of student perceptions. Discover Computing, 28, 62. https://doi.org/10.1007/s10791-025-09567-5
33. Miao, F., & Holmes, W. (2023). Guidance for generative AI in education and research. UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000386693
34. Ministry of Higher Education Malaysia. (2025). Digitalization of Higher Education Action Plan 2025-2030. https://www.mohe.gov.my/muat-turun/penerbitan-jurnal-dan-laporan/pelan-tindakan-pendigitalan-pendidikan-tinggi-2025-2030
35. Mou, T.-Y. (2026). Artificial intelligence and student creativity: An exploratory study of students' experiences with AI tools. Computers in Human Behavior Reports, 21, 100988. https://doi.org/10.1016/j.chbr.2026.100988
36. Parker, L., Loper, A. J., Hayes, J., Karakas, A., White, S. H., & Hallman, H. (2025). Comparative analysis of artificial intelligence policies in universities across five countries. Discover Computing, 28, 267. https://doi.org/10.1007/s10791-025-09745-5
37. Rahiem, M. D. H. (2026). Generative AI in higher education in Indonesia: Patterns of use and learning impact. Social Sciences & Humanities Open, 13, 102672. https://doi.org/10.1016/j.ssaho.2026.102672
38. Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines. Journal of Business Research, 104, 333-339. https://doi.org/10.1016/j.jbusres.2019.07.039

39. Tertiary Education Quality and Standards Agency. (2025). Enacting assessment reform in a time of artificial intelligence. https://www.teqsa.gov.au/guides-resources/resources/corporate-publications/enacting-assessment-reform-time-artificial-intelligence
40. Torraco, R. J. (2016). Writing integrative literature reviews: Using the past and present to explore the future. Human Resource Development Review, 15(4), 404-428. https://doi.org/10.1177/1534484316671606
41. U.S. Copyright Office. (2025). Copyright and artificial intelligence, Part 2: Copyrightability. https://www.copyright.gov/ai/
42. UNESCO. (2024a). AI competency framework for students. https://www.unesco.org/en/articles/ai-competency-framework-students
43. UNESCO. (2024b). AI competency framework for teachers. https://www.unesco.org/en/articles/ai-competency-framework-teachers
44. Whittemore, R., & Knafl, K. (2005). The integrative review: Updated methodology. Journal of Advanced Nursing, 52(5), 546-553. https://doi.org/10.1111/j.1365-2648.2005.03621.x
45. Xia, Q., Weng, X., Ouyang, F., Lin, T. J., & Chiu, T. K. F. (2024). A scoping review on how generative artificial intelligence transforms assessment in higher education. International Journal of Educational Technology in Higher Education, 21, 40. https://doi.org/10.1186/s41239-024-00468-z
46. Xue, Y. (2026). Investigating the influence of AI attitudes on visual literacy for AI-generated images through AI-specific creative self-efficacy among Chinese art students. SAGE Open, 16(1), 1-16. https://doi.org/10.1177/21582440251410368
47. Yusuf, A., Pervin, N., & Román-González, M. (2024). Generative AI and the future of higher education: A threat to academic integrity or reformation? Evidence from multicultural perspectives. International Journal of Educational Technology in Higher Education, 21, 21. https://doi.org/10.1186/s41239-024-00453-6
48. Zeng, Y., Md Noor, H., & Sabri, M. F. (2026). Artificial intelligence in fine arts education: A systematic literature review. SAGE Open, 16(2), 1-23. https://doi.org/10.1177/21582440261447959
49. Zhu, Z., Gan, Q., & Duan, P. (2026). Art and design teachers' acceptance of AI-generated content for assisted tutoring: An extended TAM-TPACK framework. Humanities and Social Sciences Communications, 13, 362. https://doi.org/10.1057/s41599-026-06692-4

Appendix A. Representative Evidence Matrix

Table A1. Representative evidence matrix for sources central to the comparative synthesis.

Source and context	Design/sample	Primary focus	Interpretation used in this review
Fleischmann (2024), Australia	Survey with qualitative comments; 17 undergraduate graphic design students	Student attitudes, benefits, concerns, curriculum	Students want guided, ethical integration; single-course evidence cannot establish learning effects.
Hwang and Wu (2025a), Asian graphic design course	Workshop/case-based graphic design study	Text-to-image use, TPACK, visual literacy	Prompt precision must be connected to research, storytelling, and design judgement.
Hwang and Wu (2025b), southern China	Cross-sectional survey; 121 design students; mediation analysis	Creative cognition, self-efficacy, anxiety	Suggests psychological pathways, but causal claims require longitudinal or experimental confirmation.

Abrusci et al. (2025), Europe/Middle East	Field evaluation of an AI-supported design system	Ideation and creativity support	Targeted scaffolding can support concept exploration; tool design and task structure matter.
Baltà-Salvador et al. (2026), Europe	Crossover study in higher education	AI-assisted creative ideation	Stronger than perception-only evidence, but measures immediate task performance.
Liu et al. (2026), design education	Mixed/experimental comparison with design students	Human-AI collaboration and creativity	AIGC can improve some design outcomes; transfer and long-term competence remain uncertain.
Mou (2026), Taiwan	Exploratory visual design task	Student experience and creativity	Rapid visualisation coexists with control and evaluation difficulties.
Xue (2026), China	Survey of 418 art students; PLS-SEM	AI attitudes, creative self-efficacy, visual literacy	Confidence and attitudes are associated with literacy, but performance-based validation is needed.
Zhu et al. (2026), China	Extended TAM-TPACK model with art/design teachers	Acceptance of AI-generated tutoring content	Teacher readiness is both technological and pedagogical.
Farran et al. (2026), Palestine	Arts/design higher-education adoption study	Task completion and adoption	Resource and context conditions shape adoption and benefit.
He et al. (2025), Hong Kong	University-wide survey study	Student use and institutional implications	Provides Asian policy and adoption evidence, but is not design-specific.
Low et al. (2025), two Asian countries	Comparative SEM study	Attitude, usefulness, ease, fear, intention	Fear did not significantly moderate intention; avoids overstating cultural anxiety.
Mat Yusoff et al. (2025), Malaysia	Cross-sectional survey; 306 participants; PLS-SEM	Utility, satisfaction, content quality, credibility	Satisfaction and utility predicted use; design-learning outcomes were not measured.
Helmiatin et al. (2024), Indonesia	Public-university adoption study	Adoption factors and institutional context	Supports the need for institutional readiness beyond student interest.
Henadirage and Gunarathne (2025), Sri Lanka	Global South contextual study	Infrastructure, training, policy, opportunity	Equity and capacity constraints are central implementation variables.
Rahiem (2026), Indonesia	Higher-education use study	Patterns of use and perceived learning impact	Provides current regional evidence but does not isolate graphic design.
Lee et al. (2024), Australia	Educator perspectives	Teaching, learning, and assessment change	Shows widespread educator concern and assessment redesign activity.

Cox and Davey (2026), United Kingdom	Critical art/design education scholarship	Material conditions and critical visual literacy	Extends AI literacy from technical skill to infrastructure, politics, and visual culture.