

## 72-hour advertising challenge with generative AI in an undergraduate graphic design module: A case study

Shaw-Chiang Wong, Huey Wen Tan, Kok Hor Ooi  
Faculty of Arts & Design, Raffles University, Malaysia

Interest in using generative artificial intelligence (GenAI) in design education is growing, yet its impact on students' creative processes and motivation remains underexplored, especially in advertising design. This qualitative exploratory case study examined how GenAI tools influenced 12 undergraduate graphic and multimedia design students during a 72-hour advertising challenge with GenAI at a private Malaysian university. Grounded in sociocultural theory's zone of proximal development and self-determination theory, the study explored how GenAI functioned as an instructional support. Data were collected through three focus group discussions and analysed thematically. Findings suggest that GenAI enhanced ideation, visualisation and collaboration, supporting students' sense of competence and relatedness. However, concerns emerged around creative autonomy and dependence on AI. The study positions GenAI as a conditional more knowledgeable other and highlights the importance of pedagogical strategies that foster critical reflection and ethical use. These insights contribute to the emerging discourse on AI in design education by connecting theory with empirical evidence and offering practical implications for curriculum development.

### *Implications for practice or policy:*

- Design educators should integrate GenAI tools thoughtfully to enhance creativity while ensuring students retain critical thinking and originality.
- Assessments should incorporate reflection to help students critically engage with AI-generated content and develop technical proficiency.
- Higher educational institutions must update curricula to align with evolving GenAI capabilities and industry needs.
- Ethical AI use should be emphasised to ensure responsible adoption in education and professional practice.

*Keywords:* advertising design, generative artificial intelligence (GenAI), design education, case study, Malaysia

## Introduction

Generative artificial intelligence (GenAI) has emerged as a transformative force in higher education (HE), offering new possibilities to reshape teaching and learning methodologies within academic settings. The remarkable ability of GenAI to produce novel and relevant content across a variety of platforms marks a substantial shift in how educational resources are personalised and delivered (Qadir, 2023). The interest in the application of GenAI is fuelled by the increasing demand for personalised learning experiences and the integration of advanced technological tools in education. GenAI offers innovative solutions that address the diverse needs of students, which traditional educational methods often struggle to meet (Dasari et al., 2023; Marchena Sekli et al., 2024). By automating the creation of learning materials and providing customised feedback, GenAI enhances the efficiency and effectiveness of educational practices, empowering students to achieve the desired learning outcomes (Dai et al., 2023; Grassini, 2023; Y. Wu, 2023). As GenAI technology continues to evolve rapidly, demonstrating its immense potential across various fields, it becomes crucial to understand its capabilities and practical applications in education to maximise its benefits (Fathoni, 2023). This trend represents a new era in digital learning, where technology not only complements but significantly enriches the educational experience for both educators and students (Dasari et al., 2023).

Design education is not exempt from the impact of this technological wave. Recent studies have highlighted the increasing importance of integrating GenAI in art and design education (Fathoni, 2023). Beyond simple text generation, GenAI's applications in design education span a wide range of functionalities, from providing real-time, personalised feedback to students to support advanced ideation and speed up the prototyping process (Fleischmann, 2024b). ChatGPT, an AI-chatbot developed by OpenAI, is one of the most popular examples for GenAI tools. It is referred to as a *24/7 tutor* (Wu, 2023) as it can produce highly contextualised, coherent and human-like conversation based on learners' inputs in natural language as well as various types of content (Dai et al., 2023).

Despite GenAI's potential and its growing use in HE design programmes, there remains a lack of formalised approaches to its integration (Fleischmann, 2024b; Thoring et al., 2023). In addition, to the best of our knowledge, the literature on the application of GenAI specifically in learning advertising design and its impact on the motivation of students in supporting their design process in HE remains limited, with most studies focusing on the broader use of AI in education. As Bartlett and Camba (2024) have argued, educators are advised to introduce AI as one tool among many in the education of designers, encouraging its use as a process tool rather than for final deliverables. Hence, this study intended to investigate the impact of GenAI tools on supporting both the learning experience and motivation of undergraduate design students in the advertising design process, including research, ideation, visualisation, copywriting and presentation.

## Literature review

### The growth of application of GenAI in advertising design practice

GenAI is revolutionising advertising design by enabling scalable, personalised and efficient campaign creation. Harnessing technologies like machine learning, natural language processing and generative adversarial networks (GANs), GenAI has disrupted traditional workflows, transforming content creation, audience research and targeting, visual execution and campaign optimisation. As Qin and Jiang (2019) have highlighted, GenAI reorganises conventional processes, enabling dynamic, responsive and strategic advertising campaigns. Technologies like GANs and deepfakes further expand creative possibilities by synthesising or augmenting media (Campbell et al., 2022), making GenAI integral to *intelligent advertising* – a phase characterised by interactivity, automation and AI-driven personalisation (Li, 2019).

Further enhancing these advancements, the four-step process of AI advertising provides a comprehensive framework to integrate AI-driven tools effectively into advertising workflows. This process begins with consumer insight discovery, where AI-powered tools analyse extensive datasets through social network analysis and data mining to understand consumer behaviours and preferences. This insight lays the groundwork for precise audience segmentation. The second step, ad creation, employs GenAI technologies such as GANs and natural language processing to generate high-quality, personalised advertising content at scale. Platforms like Alibaba's Luban system and JD's Shakespeare demonstrate this capability, automating text and image generation while maintaining brand consistency (Qin & Jiang, 2019). Tools like deepfakes further enhance customisation by tailoring elements such as facial features or voices to specific audiences (Kietzmann et al., 2020).

The third step, media planning and buying, uses AI-driven programmatic tools to optimise media strategies, ensuring precise targeting and efficient content delivery. Platforms like Baidu Union and Alibaba's advertising exchange systems are prime examples of how AI tools streamline this stage. The process concludes with advertising impact evaluation, leveraging machine learning models to assess real-time campaign performance. This step enables rapid adjustments to optimise outcomes, ensuring campaigns meet their objectives effectively (Qin & Jiang, 2019). Moreover, frameworks like the hybrid model for AI campaign optimisation add another layer of refinement by combining historical campaign performance data with real-time feedback to adjust campaigns dynamically (Huh & Malthouse, 2020).

Personalisation is a defining strength of GenAI, allowing advertisers to tailor campaigns using vast data sets. L. Wu and Wen (2021) found that consumers perceive AI-driven ads emphasising objectivity as more reliable. Furthermore, Rodgers (2021) suggested consumer insight frameworks integrating predictive analytics allow brands to anticipate future behaviours, creating a more proactive approach to targeted advertising. More and more sustainable advertising frameworks have emerged, integrating AI tools to analyse trends and design eco-conscious campaigns that resonate with modern audiences.

Despite its advantages, GenAI raises ethical and creative concerns. Transparency about how AI utilises data to create ads can alleviate consumer unease and build trust (L. Wu & Wen, 2021). However, data privacy remains a challenge, particularly with regulations like the General Data Protection Regulation and the California Consumer Privacy Act requiring clear communication of data usage (Ghosh, 2018). Moreover, creative concerns arise as computational design lacks the emotional and cultural nuance typically infused by human designers, leading to debates about whether GenAI can truly replace human ingenuity in campaigns (Rodgers, 2021). Additionally, tools like deepfakes and GANs pose ethical risks, including the potential for deceptive or intrusive content (Campbell et al., 2022).

The adoption of AI technologies is reshaping the advertising ecosystem by automating critical functions such as content creation, media planning and performance evaluation. L. Wu and Wen (2021) have argued that consumer trust in AI-driven campaigns is reshaping client-agency dynamics, necessitating strategic and creative innovation. Research by Huh and Malthouse (2020) has highlighted trends in AI-powered ad content generation and computational advertising, which are establishing transparency as a key differentiator for brands. Future research should further explore these frameworks and their implications for sustainable, ethical and consumer-centric advertising practices. As Kietzmann et al. (2020) and Rodgers (2021) have suggested, a multidisciplinary approach is essential for balancing technological innovation with ethical considerations, ensuring that GenAI continues to drive creativity, efficiency and trust in advertising design.

### **Design education and GenAI**

GenAI is increasingly integrated into design education, offering transformative tools that enhance creativity, pedagogical approaches and assessment methodologies (Hashem et al., 2024). Not only can GenAI enhance traditional teaching methods, create personalised learning experiences and provide prompt feedback to students (Alier et al., 2024), but it also enables design students to engage in collaborative ideation and iterative prototyping, with tools like ChatGPT and DALL-E to facilitate the rapid generation of ideas and visualisations (Fleischmann, 2024a). These tools can boost creativity by providing fresh visual inspiration and varied design options. However, concerns remain regarding over-reliance on AI tools, which may lead to *design fixation* – a phenomenon where designers focus too narrowly on AI outputs, potentially stifling innovation (Wadinambiarachchi et al., 2024). Iterative learning processes and human intervention are essential for fostering creativity and problem-solving in design education (Sandhaus et al., 2024).

Butterworth (2023) has highlighted the opportunities and challenges GenAI introduces for assessment in creative education, particularly for international students and creative business courses. GenAI tools, such as ChatGPT and Google Gemini, can streamline tasks, but educators must ensure that students engage critically with their outputs to avoid uncritical dependence. The importance of AI literacy must be emphasised for students to understand when and how to use GenAI effectively, critique its outputs and acknowledge its limitations. Butterworth has also underscored the significance of transparent institutional policies and the need for authentic assessments that integrate reflective practices, portfolio evaluations, and iterative learning tasks.

In support of Butterworth's (2023) view on authentic assessments, Kadel et al. (2024) have proposed a dual focus on learning-based and action-based assessments. Learning-based assessments emphasise foundational skills and knowledge, while action-based assessments focus on applying these skills to real-world scenarios. This structured approach helps maintain academic integrity by ensuring students critically engage with GenAI rather than relying on it passively. Kadel et al. have also highlighted the

necessity of incorporating GenAI evaluation tools, such as adaptive rubrics and task validation against AI capabilities, to sustain effective learning outcomes while addressing the risks of plagiarism and over-dependence.

Zheng et al. (2024) have underscored the importance of co-design approaches in integrating GenAI tools into project-based learning environments in design programmes. Their study highlighted how engaging students as co-creators in shaping AI-driven learning frameworks not only enhances their creative confidence but also ensures that educational tools remain relevant to their needs. This participatory approach aligns with the increasing emphasis on user-centred strategies for embedding AI in education, fostering ownership and deeper engagement among learners.

Ethical concerns regarding GenAI's integration in education, including plagiarism, algorithmic bias and intellectual property infringement, have been widely discussed (Farooqi et al., 2024). Lee and Low (2024) have argued that the ubiquity of AI tools in education necessitates a structured approach to critical thinking. Using frameworks like the Paul-Elder critical thinking model, they proposed equipping students with the skills to evaluate AI-generated outputs responsibly, ensuring that these tools are not only used creatively but also ethically. Marrone et al. (2022) have emphasised the importance of transparency in AI systems to build trust, while highlighting the need for fairness in deploying these technologies in educational contexts. Balancing innovation and integrity remains crucial for the responsible integration of GenAI in education (Francis et al., 2025).

On the other hand, research has also highlighted the potential of GenAI to enhance accessibility and inclusivity in education by reducing barriers to technical complexity (Lee & Low, 2024). GenAI tools can analyse, structure and create content quickly, potentially reducing workload across the education sector and enabling educators to focus on more meaningful instructional activities (Department for Education, 2025). However, significant gaps remain in understanding its long-term impacts on students' cognitive and creative development. For instance, Sandhaus et al. (2025) have highlighted that although GenAI has the potential to enhance design education by supporting ideation and prototyping, it also poses the risk of promoting shallow learning if not accompanied by reflective practice.

In short, GenAI offers transformative potential for design education by streamlining ideation, fostering inclusivity and enhancing learning efficiency. However, its integration requires careful consideration of ethical engagement, pedagogical strategies and the development of critical evaluation skills from various perspectives. Addressing the identified gaps, particularly in assessing the long-term effects of GenAI and adapting its integration across diverse educational contexts, is essential for maximising its benefits while mitigating risks. This approach ensures that GenAI serves as a collaborative tool, enriching learning without compromising foundational design principles.

### **Sociocultural theory**

Sociocultural theory (SCT), proposed by Vygotsky (1978), has been the foundation of much educational research and many theories in cognitive development over the past few decades. SCT suggests that learning is inherently a social process, shaped by both cultural and societal influences. It highlights the importance of social interactions, language and cultural norms in shaping how individuals learn. According to this theory, learning is not just a personal effort but is fostered through collaboration, communication and active involvement in social activities. In short, community plays a pivotal role in the process of making meaning by individuals (Vygotsky, 1978).

More specifically, Vygotsky's (1978) SCT is built around two key concepts: the zone of proximal development (ZPD) and the more knowledgeable others (MKOs; McLeod, 2025). According to Vygotsky, learners' cognitive and developmental progress is based on both their current and potential capabilities. The current level of development is defined by what learners can achieve independently, while the potential level refers to what they can accomplish with the guidance and encouragement from more experienced and skilled individuals. The difference between these two levels is known as the ZPD, a process that is "not yet mature but is in the process of maturation" (Vygotsky, 1978, p. 86). The ZPD is

achieved through the involvement, collaboration and communication of MKOs, including educators, parent, or peers, who help learners acquire knowledge and skills in specific areas, enabling them to reach a higher level of reasoning and thus bridge the gap. Figure 1 demonstrates the relationship between what learners can do independently, their ZPD and the tasks beyond their current abilities.

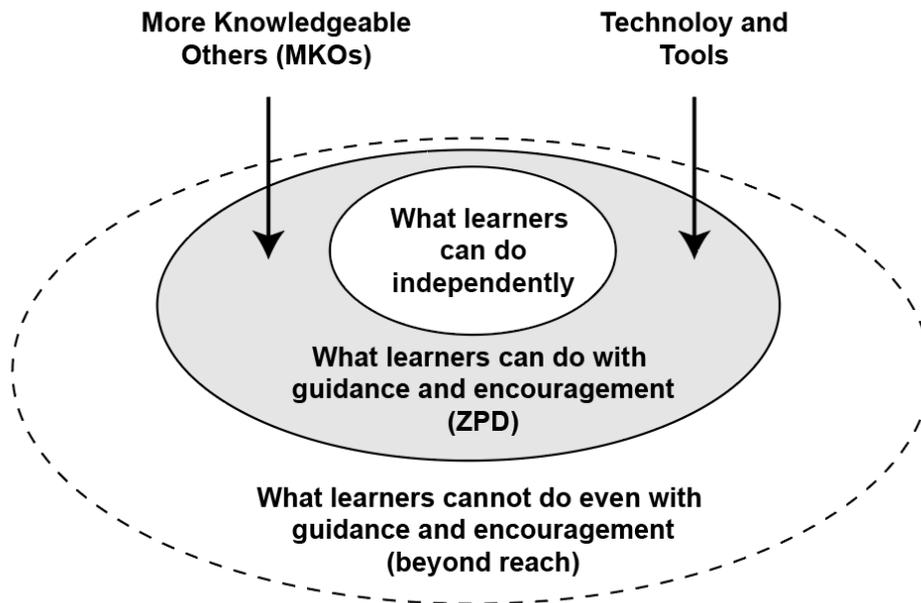


Figure 1. ZPD and MKOs (adapted from Vygotsky, 1978)

The concepts of ZPD are closely related to the idea of *scaffolding* that proposed by Wood et al. (1976). Scaffolding refers to the support provided MKOs, offering learners the necessary support structures to help them progress from one level of understanding to the next. In this framework, MKOs are viewed not merely as providers of information but as facilitators who guide learners in their educational journeys. However, it is worth noting that the MKOs do not need to be human (McLeod, 2025). A range of technologies and tools has been implemented in educational environments to assist and support students in their learning processes. The essential aspect of these types of MKOs is that they should possess (or be designed with) greater knowledge about the subject matter than the learner has (Puntambekar & Hübscher, 2005). When examining the use of GenAI in HE through a sociocultural lens, it is worth exploring how it impacts students' social interactions and relationships with peers and educators. The focus is on the social and cultural dimensions of learning (Wu, 2023) and how GenAI can serve as an MKO, facilitating learning to foster innovative solutions.

### Self-determination theory

Self-determination theory (SDT), developed by Deci and Ryan (1985), is a widely applied framework for understanding motivation and guiding educational practice (Y. Wu, 2023). It posits that all learners are inherently driven to grow, seek fulfilment and make autonomous decisions. Motivation arises from both internal desires and external influences and is sustained when specific psychological needs are met. As illustrated in Figure 2, SDT identifies three core psychological needs essential for intrinsic motivation: competence, relatedness and autonomy.

- Competence refers to the need to feel capable and effective in completing tasks. When learners perceive that they possess the necessary skills to meet a challenge, their confidence increases, motivating them to act and persist. This sense of mastery enhances their ability to navigate tasks and environments, often producing a positive feedback loop reinforced by feelings of accomplishment and intrinsic reward.

- Relatedness involves the desire to feel connected to others and to be part of a supportive community. Learners are more motivated when they feel valued, understood and included. Even those who are more introverted benefit from interpersonal connections that offer emotional support and shared perspectives. Strong relationships enrich the learning experience, helping individuals to co-create knowledge and draw on collective insights.
- Autonomy is the need to feel in control of one's actions and decisions. It goes beyond independence to encompass alignment with personal values and interests. When learners are given the freedom to make meaningful choices and direct their own learning, they are more likely to experience engagement and ownership. Conversely, overly rigid or controlling environments can stifle learner's motivation. Autonomy reinforces the belief that one's efforts matter and that outcomes are shaped by personal agency.

Together, these needs form the foundation of self-determined behaviour of learners. When educational environments support them, learners are more likely to thrive cognitively, emotionally and socially (Deci & Ryan, 1985).

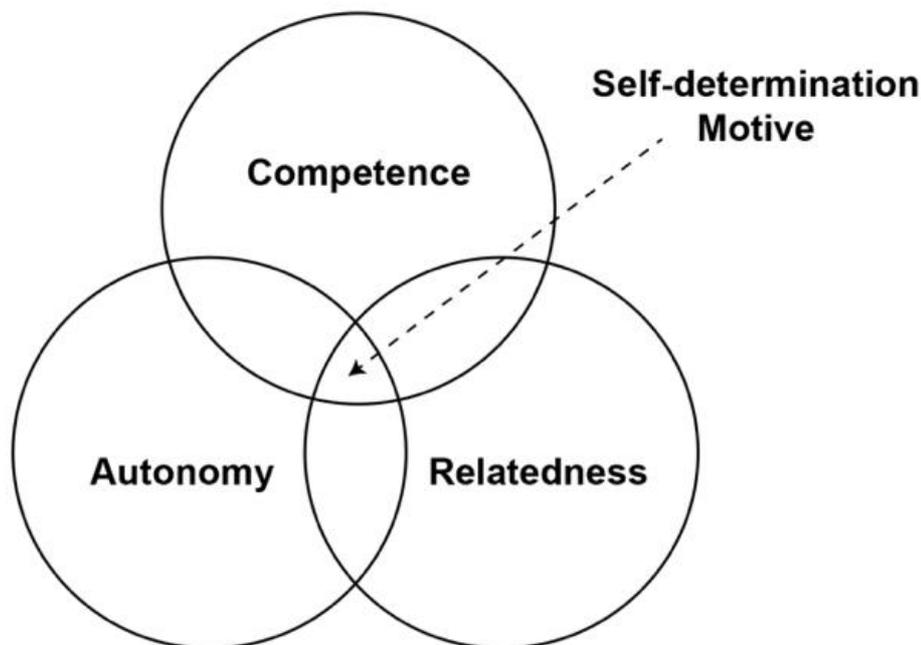


Figure 2. SDT (adapted from Deci and Ryan, 1985)

SDT has been widely applied in digital education and gamification research. It helps explain learner motivation, predict academic outcomes and guide the development of online learning environments (Cheng et al., 2022; Salikhova et al., 2020). In HE, SDT-based gamification has improved learning outcomes and engagement, especially when game elements offer meaningful experiences (Gupta & Goyal, 2022). Similarly, SDT-informed adaptive e-learning systems have shown high levels of perceived motivation and usability (Shi & Cristea, 2016), reinforcing the value of grounding educational practices in SDT principles.

According to Y. Wu (2023), GenAI enhances autonomy by enabling students to personalise their learning paths and take greater control of their educational experiences. It also supports relatedness by fostering collaboration and dialogue among peers and educators. When integrated into practices aligned with SDT – addressing the needs for competence, autonomy and relatedness – GenAI is more likely to produce positive learning outcomes. As digital technologies continue to evolve, integrating tools like GenAI into education becomes increasingly important. Beyond content generation, GenAI offers opportunities to

enhance student engagement and creativity – especially in design disciplines. However, although its potential is well recognised, empirical studies exploring GenAI’s practical impact on students’ creative processes and intrinsic motivation in advertising design education remain limited.

In response, this study proposed a conceptual framework (Figure 3) to capture the relevant theoretical constructs and guide the investigation into GenAI’s role in creative learning and motivation.

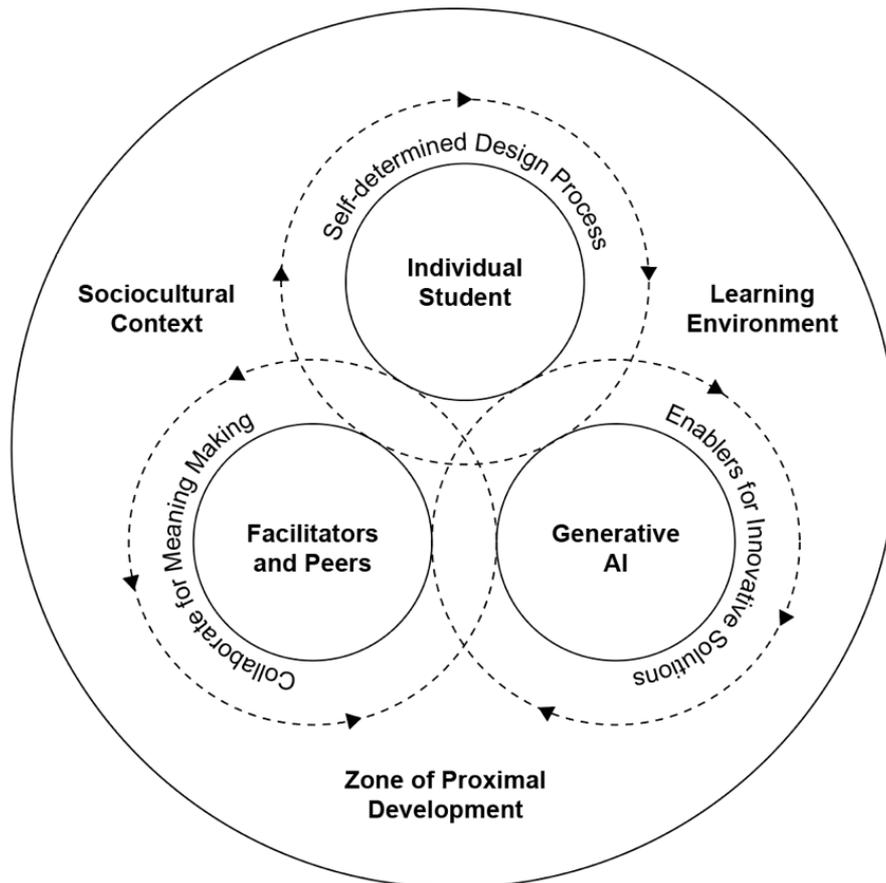


Figure 3. Conceptual framework illustrating SCT and SDT integration in GenAI-supported design learning

Accordingly, the research questions (RQs) posed by the study are:

- (1) How was the students' overall process experience when using the GenAI tools to accomplish their advertising design work?
- (2) How did the overall experience of using the GenAI tools impact students' motivation when working on the project?

## Research context and methodology

This study was conducted with 12 undergraduate students ( $N = 12$ ) enrolled in a graphic and multimedia design programme at a private Malaysian university. The students, aged 20 to 23, were divided into three groups to undertake the 72-hour advertising challenge as part of their coursework. The challenge required teams to produce a comprehensive advertising campaign for a real client using GenAI tools within a tight deadline. The assignment intended to simulate real-world pressure while exploring the pedagogical integration of GenAI in design practice.

The instructional design of the challenge was explicitly informed by SCT and SDT. From the SCT perspective, GenAI tools were conceptualised as potential MKOs that could support students within their ZPD. By embedding GenAI into the workflow, the aim was to scaffold students' learning in a collaborative environment, particularly in research, ideation and visual execution areas, where they typically require guidance and feedback. On the other hand, SDT framed the challenge to meet the three fundamental psychological needs for motivation: autonomy, competence and relatedness. The structure provided students with autonomy in decision-making (e.g., creative direction and tool usage), opportunities to develop competence (e.g., mastering GenAI prompts) and collaboration for relatedness (e.g., teamwork in executing tasks). As shown in Table 1, a series of designated learning activities and sessions, facilitated by academics with extensive experience using GenAI tools in design processes, were conducted to support prompt engineering and AI use, ensuring they could complete the assignment tasks effectively (Hashem & Hakeem, 2024). Students then applied these skills during the challenge and reflected on their experiences in post-assignment focus group discussion. The follow-up discussions explored how the students experienced the design process with GenAI, focusing on both instructional scaffolds and motivational dynamics.

Table 1  
*Teaching activities and instructional design*

Learning activity	Description	Instructional purpose	Theoretical relevance
Day 1: Orientation, scaffolding and ideation (24 hours)			
Briefing session	Overview of the goals, client brief, deliverables, and timeline	Establish context and clarify expectations	Autonomy support
GenAI workshop	Hands-on introduction to GenAI for visual generation by the facilitators. Students practised prompt crafting in teams.	Build technical competence through trial and error.	MKO scaffolding Competence building
Research and idea critique	Students conducted market and brand analysis using ChatGPT and presented early ideas. Facilitators and AI-guided critical evaluation.	Stimulate critical thinking and peer learning.	ZPD via critique Relatedness enhancement
Day 2: Creation and iteration (48 hours)			
Design execution with GenAI	Teams used GenAI to iteratively create and refine visuals, as well as develop copy. Facilitators provided individual or team consultations for feedback.	Encourage autonomy while offering in-time scaffolding, peer review and reflection.	MKO scaffolding Autonomy support Competence building Relatedness enhancement
Day 3: Finalisation and presentation (72 hours)			
Final touch-ups	Students refined copy and visuals, built presentations using GenAI (ChatGPT or Gemini) together.	Strengthen ownership and application of learned skills.	Autonomy support Competence building
Group presentations (pitch)	Formal presentation to the client.	Simulate real-world scenario, reinforce communication skills.	Authentic learning Relatedness enhancement

Learning activity	Description	Instructional purpose	Theoretical relevance
Debrief and reflection	Students shared their challenges and takeaways. Guided reflection was facilitated using SCT and SDT prompts.	Consolidate learning and promote higher level of cognitive engagement.	ZPD reflection Autonomy reinforcement

This study adopted an exploratory qualitative methodology to examine how GenAI tools influence students' learning experiences and motivation in advertising design. With a small sample of 12 students from the same class and institution, the study aligns with Mabry's (2008) concept of a typical case study – focusing on ordinary, representative situations rather than outliers. The selected module reflects a broader trend in HE towards integrating GenAI into creative curricula. Its course structure, student profile and instructional design are broadly indicative of similar design programmes, offering insights likely relevant and transferable to comparable educational settings.

Data were collected through semi-structured focus group discussions using open-ended questions designed to elicit in-depth responses. This approach allowed for a rich understanding of students' experiences with GenAI, particularly regarding its impact on creativity and motivation throughout the 72-hour challenge. The discussion questions focused on how GenAI supported various phases of the design process, including research, ideation, execution, copywriting and presentation. The questions were validated by three design educators and one industry expert, each with over a decade of experience. Ample time and a supportive setting were provided to encourage open and honest participation from the students. Table 2 outlines the 10 questions guiding the focus group discussion mapped to the study's RQs.

Table 2  
*Open-ended questions for the discussion*

In relation to	Key aspect	Question
RQ1	General learning experience	Can you describe your overall experience participating in the 72-hour advertising challenge using GenAI?
	research phase	How did GenAI influence your approach to researching the product, target audiences and market trends?
	Idea generation and creativity phase	Can you share any specific examples where AI-generated ideas influenced your creative process, especially in helping you brainstorm better ideas for your advertising campaign?
	Execution of visuals	How did GenAI contribute to the execution of your visual designs? How did you critically assess the quality of the visuals produced with the help of GenAI compared to traditional methods?
	Copywriting	How well did the AI-generated copy match the desired tone and style of your campaign?
	Presentation	In what ways did GenAI help you prepare, organise or enhance the presentation of your advertising campaign?
RQ2	Competence	How did using GenAI influence your sense of accomplishment or mastery during the advertising campaign development?
	Autonomy	Did GenAI provide you with more freedom or control over your creative decisions within the campaign?
	Relatedness	In what ways, if any, did GenAI give a more exploratory environment and influence your sense of connection or collaboration with your team (team dynamics) during the project?

The validation process of the interview transcripts followed Merriam’s (1998) guidelines:

- (1) Go through the interview transcript with the participants to get their verification.
- (2) Review the interview transcript with two design educators who have more than 10 years' experience in design education.
- (3) Ensure the interview results in-line with the scope of the research and the RQs.

Thematic analysis was conducted using Braun and Clarke’s (2006) framework, adopting a deductive approach informed by SCT and SDT. The aim was to identify patterns in participant responses that reflected theoretical constructs such as MKO and ZPD, and autonomy, competence and relatedness. The analysis involved the following steps:

- (1) Familiarisation through repeated reading of transcribed data
- (2) Generation of initial codes and analytical notes, highlighting data relevant to the study’s aims
- (3) Grouping of codes into sub-themes
- (4) Refining of sub-themes to identify core themes, with iterative checks for consistency and accuracy
- (5) Interpretation of core themes to derive meaningful insights.

Table 3 summarises the thematic analysis findings, organised by key themes and sub-themes, illustrating students’ experiences with the design process and their motivation.

Table 3  
*Summary of thematic analysis of qualitative data*

Theme	Sub-theme	Interpretation	Example quotes
GenAI as a scaffold: Support and tension with the ZPD	GenAI as a conditional MKO	Students expressed varying opinions on GenAI’s effectiveness in supporting creativity and productivity. While some found it helpful, others experienced limitations.	“AI is just a reference. It helps with imagination, but I still do most of the design myself”. “I spent, like, around 1 entire day figuring out what prompt and stuff I had to use”.
	Cognitive scaffolding for research and ideation	GenAI supported early design phases, particularly generating ideas, brainstorming and prompting further research.	“AI generated really helps a lot because they give, like, the idea for me to, like, to search more on that topic”. “When we prompt them in AI, like, it lists us, like, a lot of things, and it helps us to store more ideas ... it helps us to, like, store more ideas”.
	Frustration and the return to human expertise	Students encountered limitations in using GenAI for tasks requiring more nuanced or high-quality creative outcomes.	“I don’t really use much the AI for especially when it comes to, like, designing, content because I was in charge of the key visual”. “We couldn’t get the exact design we wanted with AI, so we ended up doing it ourselves in Photoshop”. “We struggled a lot ... we spent hours trying to create prompts that really matched the design we wanted”.

Theme	Sub-theme	Interpretation	Example quotes
	Scaffolding under pressure	The limited timeframe of the 72-hour challenge contributed to stress and affected students' ability to fully utilise GenAI tools.	"I think it was time-consuming work ... we had to do, like, within the, like, 72 hours, including the research".
Motivation and learning: Mapping SDT constructs onto student experience	Autonomy: Navigating control and creativity	Students reported both empowerment and restriction in using GenAI, noting the need to retain control over the creative process.	"I felt more competent doing the visuals myself, as AI was not giving me the desired quality". "Sometimes, AI gives you a direction, but after a while, you realize it restricts you ... so you need to use your own ideas" "For visual generation, it was time-consuming and didn't meet our design style expectations". "Even when AI generates something, I still need to modify and adjust it to fit my vision".
	Competence: Confidence, skill development and technological engagement	Use of GenAI fostered learning and confidence, pushing students to explore new creative and technical boundaries.	"I get to learn a lot and then also, like, I saw, like, push myself to a limit that I didn't know I could". "It helped us brainstorm more quickly and give us ideas we hadn't thought of, leading to a sense of accomplishment" and to break through creative blocks".
	Relatedness: Team dynamics and collaboration	GenAI encouraged peer communication and collaborative ideation, strengthening team cohesion.	"When the AI gives us a very nice idea, like, me and my teammates will talk like, based on the idea". "I ask them opinion and share my generated outcomes with them, like, how to support and work together to come out with better solutions".

## Findings and discussion

This section presents findings from the focus group discussions, interpreted through the lenses of SCT, SDT and the functional role of GenAI as a potential learning scaffold to answer the two RQs posed by the study.

### RQ1: GenAI as a scaffold: Support and tension with the ZPD

Drawing from SCT, particularly ZPD and the role of the MKO, this study explored the students' process experience with GenAI. Findings reveal that although GenAI acted as a form of MKO, supporting ideation and reducing cognitive load in early phases, its support was conditional and uneven across different stages of the design process.

#### *GenAI as a conditional MKO*

Students articulated diverse views on the effectiveness of GenAI tools in enhancing their creativity and productivity. While many acknowledged the potential of GenAI to assist in the design process, there was a consensus that it could not fully substitute for human creativity. One student noted, "AI is just a reference. It helps with imagination, but I still do most of the design myself". This statement reflects SCT's

notion of mediated learning, where GenAI reorganises traditional processes but should not be seen as a complete replacement for human input.

However, the struggle to find the right prompts for optimal output led to frustration, with one student stating, “I spent, like, around 1 entire day figuring out what prompt and stuff I had to use”. These experiences highlight the limits of GenAI as an effective MKO and the ongoing necessity for human intuition and decision-making in creative applications. The tool’s utility depends on the student’s ability to frame the prompts effectively, underscoring Vygotsky’s (1978) principle that scaffolding must be dynamic and adaptive to individual student needs. These findings also echo Bartlett and Camba’s (2024) assertion that GenAI works more appropriately as a process-oriented tool when the users are guided to understand its limitations and how to navigate them critically.

#### *Cognitive scaffolding for research and ideation*

The students recognised GenAI’s significant role in the research and ideation phases of their projects, suggesting it operated effectively within their ZPD at these stages. Comments such as “AI-generated really helps a lot because they give, like, the idea for me to ... search more on that topic” reveal how GenAI extended their cognitive capacity, providing entry points into unfamiliar content areas and thereby facilitating knowledge co-creation.

However, concerns around authenticity emerged. Although students acknowledged the usefulness of AI-generated suggestions, they remained sceptical about its originality – mirroring Fleischmann’s (2024b) findings that GenAI often accelerates ideation but lacks critical depth. Butterworth (2023) similarly stressed the need for structured reflection to help learners evaluate GenAI outputs. In this study, that need became evident when students questioned the creative validity of AI-generated content, signalling a partial dissonance between cognitive support and authentic authorship.

#### *Frustration and the return to human expertise*

Despite recognising GenAI’s advantages, students encountered considerable obstacles when applying AI to visual design and copywriting tasks. Many students preferred to rely on their skills, stating, “I felt more competent doing the visuals myself, as AI was not giving me the desired quality”. The challenges faced during these tasks echo the observations made in the literature whereby AI tools, although innovative, may not always meet the nuanced demands of high-quality creative outputs.

The frustrations experienced by students, reflected in comments like “We struggled a lot ... we spent hours trying to create prompts that really matched the design we wanted”, were compounded by the perceived limitations of GenAI output. This misalignment indicates a breakdown in scaffolding when applied to more advanced or nuanced tasks. Nevertheless, this may indicate a need for greater integration of training or best practices in using these AI tools, alongside traditional skill development, to better equip students for creative tasks when using GenAI. GenAI may go beyond as initiator of learning and be served as a comprehensive facilitator when the mastery of the students increased (Gao et al., 2025).

#### *Scaffolding under pressure*

The time-sensitive nature of the 72-hour advertising challenge significantly impacted students’ engagement with GenAI tools, introducing additional stress into the process. The statement “I think it was time-consuming work ... we had to do, like, within the, like, 72 hours, including the research”, emphasises the pressures of meeting tight deadlines. The stress experienced by students was further heightened by their preparations before the assignment: “We did the research part the day before the challenge starts”. Such challenges highlight the need for structured support and potentially more extended timeframes to allow students to fully leverage GenAI’s capabilities for effective scaffolding to occur to enriching their educational experience.

## **RQ2: Motivation and learning: Mapping SDT constructs onto student experience**

The second RQ was examined through SDT, which identifies autonomy, competence and relatedness as core psychological needs that support intrinsic motivation and engagement. The findings show how GenAI tools both supported and challenged these needs in nuanced ways.

### *Autonomy: Navigating control and creativity*

The use of GenAI introduced a dual experience regarding autonomy. On one hand, students felt empowered to explore multiple creative directions: “It helps me think in many different directions”. The concept of autonomy is satisfied as the students involved in the study voluntarily engage with activities perceived as valuable or interesting.

However, some students also reported perceived constraint, noting, “AI gives you a direction, but after a while, you realise it restricts you”. This paradox reveals how uncritical use of GenAI can lead to overreliance, potentially diminishing students’ sense of ownership over their creative outcomes. This highlights the critical viewpoint by Fathoni (2023) that the successful integration of GenAI depends not just on its capabilities but on how well educators guide students in using these tools as extensions of their own creative processes. A structured approach to critical thinking to counter the application of AI tools in education is needed, as suggested by Lee and Low (2024).

### *Competence: Confidence, skill development and technological engagement*

The utilisation of GenAI tools emerged as a catalyst for enhancing students’ competence and confidence in navigating innovative technologies, fostering a sense of mastery over their designs. Comments such as “I get to learn a lot and then also, like, I saw, like, push myself to a limit that I didn’t know I could” reflect this correlation. This suggests that GenAI acted as a supportive mechanism that enhanced their belief in their ability to perform design tasks.

Moreover, the ability of GenAI to facilitate brainstorming and overcome creative blocks, as stated by the participants, illustrates its role in accelerating the ideation process, aligning with the conclusions drawn by Fleischmann (2024b) regarding GenAI’s capabilities in expediting the prototyping phase and providing personalised feedback. Yet the earlier noted struggles in different phases suggest that competence can be undermined if the tool’s output fails to match the complexity of the user’s intent – highlighting the importance of calibrating task-tool alignment.

### *Relatedness: Team dynamics and collaboration*

The students’ experiences highlight that GenAI tools contributed positively to their collaborative efforts and team dynamics. The sentiment that “when AI generated ideas, it sparked more conversations in the team” resonates with the emphasis on user-centred approaches in education. Such collaboration appears vital for enhancing communication and fostering a cooperative learning environment. By collaboratively discussing AI-generated outputs, students not only deepened their discussions but also enhanced their problem-solving capabilities. Transparency and open dialogue in educational settings on the AI-generated outcome can lead to richer collaborative learning experiences (Hashmi & Bal, 2024). The increased communication and shared brainstorming initiatives indicate that GenAI tools can indeed act as a catalyst for building stronger team dynamics rather than replacing interpersonal interactions.

## **Implications, limitations, recommendations and conclusion**

This research set out to examine how students experienced the design process when using GenAI tools and how such tools influenced their motivation during a short-term advertising design challenge. Interpreted through SCT and SDT, the findings reveal that GenAI tools served as both enablers and constraints – functioning as conditional scaffolds that enhanced ideation and collaboration but occasionally limited creativity and autonomy. The study contributes to design education literature by providing a dual theoretical lens to interpret GenAI’s pedagogical role. It underscores the importance of aligning GenAI’s integration with students’ developmental readiness and their psychological needs for autonomy, competence, and relatedness. For instance, although GenAI supported brainstorming and

team dialogue, its limited utility in some other design stages such as visualisation and copywriting points to the need for targeted scaffolding strategies and not blanket integration. These insights stress the importance of adaptive instructional design and reinforce calls for integrating authentic assessments, reflective practices (Butterworth, 2023; Kadel et al., 2024) and ethical AI literacy (Farooqi et al., 2024). The findings also provide practical implications for curriculum development. Educators should consider embedding GenAI tools into design modules not as one-size-fits-all solutions but as context-sensitive aids. Thoughtful integration must be accompanied by guidance on prompt engineering, critical evaluation and creative agency to avoid diminishing students' role as authors and designers.

Despite these insights, several limitations must be acknowledged. This was a small-scale, exploratory case study limited to 12 students and one 72-hour task. The short timeframe restricted prolonged engagement with GenAI, which may have limited the emergence of deeper patterns in learning behaviour or motivation. Future studies should consider longitudinal designs across varied contexts to assess how GenAI influences students over time and in diverse modules. Also, although this study focused on five advertising design stages – research, ideation, visualisation, copywriting and presentation – other key areas like problem-solving, ethical reasoning and critical thinking were beyond its scope. These dimensions warrant exploration in future research to deepen our understanding of GenAI's role in holistic design education.

In conclusion, this study demonstrates that although GenAI presents promising opportunities for innovation in HE, particularly in creative disciplines, its integration must be intentional, ethically grounded and pedagogically informed. In the context of advertising design education, students' experiences revealed that GenAI tools functioned best as conditional scaffolds – supporting ideation and collaboration within the ZPD, but often falling short in tasks demanding higher-order creativity and judgment. The findings also show that GenAI use influenced students' motivation in nuanced ways, enhancing their sense of autonomy, competence and relatedness when critically and collaboratively engaged. These insights point to the need for educators to not only adopt GenAI tools but also design reflective, student-centred learning environments that guide their effective use. Although GenAI is prompting a re-evaluation of educator roles and curriculum design, its adoption in HE remains uneven (Malik et al., 2023; Ogunleye et al., 2024). This study offers a structured approach for meaningful integration, providing a foundation for future curricula, research and policy frameworks in design education. As these technologies continue to evolve, it is vital that educators foster not just technical fluency but also critical thinking, ethical awareness and creative agency, ensuring that GenAI becomes a catalyst – not a crutch – for student learning and innovation.

## Author contributions

**Shaw-Chiang Wong:** Conceptualisation, Data curation, Investigation, Writing – original draft, Writing – review and editing; **Huey Wen Tan:** Conceptualisation, Data curation, Investigation, Writing – original draft, Writing – review and editing; **Kok Hor Ooi:** Writing – review and editing.

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**Corresponding author:** Shaw-Chiang Wong, [shawchiangwong@raffles-university.edu.my](mailto:shawchiangwong@raffles-university.edu.my)

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**Please cite as:** Wong, S.-C., Tan, H. W., & Ooi, K. H. (2025). 72-hour advertising challenge with generative AI in an undergraduate graphic design module: A case study. *Australasian Journal of Educational Technology*, \*(\*) , 102–118. <https://doi.org/10.14742/ajet.10418>