

The Impact of Artificial Intelligence on Graphic Design from the Perspective of Motion Design and Animated Characters in Universities as a Model

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ABSTRACT

This research explores the impact of artificial intelligence (AI) on graphic design students at University, specifically focusing on motion design and animated characters. The study aims to investigate the relationship between AI awareness, usage, and creativity enhancement among design students, as well as to assess how AI tools influence their design processes. The population for this study consisted of graphic design students from five Egyptian universities, with a sample of 156 students from 6 University. The research employed a mixed-methods approach, combining both quantitative and qualitative data collection methods. A structured questionnaire was administered to collect data on students' AI awareness, usage, and perceived impact on creativity, while interviews were conducted to gain deeper insights into their experiences. The statistical analysis included correlation, regression, and ANOVA tests to examine the relationships between key variables. The results revealed a significant positive correlation between AI awareness and usage, with higher levels of awareness leading to more frequent use of AI tools. Regression analysis indicated that both AI awareness and usage significantly predicted students' perceptions of enhanced creativity in motion design and animation. Additionally, ANOVA results showed significant differences in AI usage across academic years, with advanced students (3rd and 4th years) reporting higher usage of AI tools compared to first- and second-year students. Based on the findings, the study recommends that universities integrate AI tools into the curriculum from the first year, offer specialized workshops to enhance AI skills, provide access to AI software, and foster collaboration between design and AI experts. Additionally, ethical concerns regarding AI's role in creative work should be addressed, and future research should explore the long-term effects of AI on students' careers in design. This research underscores the importance of AI in shaping the future of graphic design education and creative industries.

Keywords: Artificial Intelligence, Graphic Design, Motion Design, Animated Characters, AI Awareness.

INTRODUCTION

The 21st century has ushered in a technological renaissance, with artificial intelligence (AI) at its forefront, fundamentally transforming the ways we live, communicate, and create. In the domain of visual communication and digital arts (Airey, et al., 2014). AI is not merely an auxiliary tool it is becoming a co-creator, collaborator, and, in some cases, a challenger to human creativity. Nowhere is this shift more palpable than in the field of graphic design, particularly within its specialized branches such as motion design and animated character creation. (Rezk, 2023), These subfields, which merge the rigor of design with the fluidity of animation and storytelling, are undergoing a radical transformation due to the integration of machine learning, computer vision, neural networks, and other AI-driven technologies. (Tu, et al., 2018). Motion design, which incorporates animated graphic elements into visual storytelling, and character animation, which brings illustrated figures to life through movement and

expression, (Fan, et al., 2024). is disciplines traditionally grounded in manual craftsmanship, time-intensive workflows, and a deep understanding of design principles. However, the increasing availability and sophistication of AI tools have begun to significantly alter these creative processes. AI can now predict motion paths, generate in-between frames for animation, simulate real-world physics, and even create stylized motion graphics based on a set of user-defined parameters. In character animation, (Brown, et al., 2023). AI can rig 2D and 3D characters automatically, apply realistic facial expressions using emotion detection, and synchronize lip movements with dialogue using voice recognition and natural language processing. (Brinson, et al., 2012). these innovations are not occurring in a vacuum. Universities, as centers of both creative exploration and technological development, are becoming critical testing grounds for the integration of AI into design education. Design schools and departments are adopting AI-enabled software and methodologies not only to prepare students for emerging industry demands but also to reimagine the very nature of design education. Within these institutions, (Choi, et al., 2024). AI is redefining how students approach creative problem-solving, how instructors assess design competency, and how academic research explores the intersection of technology and aesthetics. For instance, (Rouse, M. (2020). AI-powered tools like Adobe Sensei, Runway ML, Deep Motion, and Google's Deep Dream are now part of the academic design ecosystem. (Sultan Alkahteb, et al., 2025) These tools enable students to automate repetitive tasks, explore generative design techniques, and enhance narrative complexity without the need for extensive coding knowledge. (Cho, et al., 2020). Faculty members are also leveraging AI in developing new curricula that combine traditional artistic techniques with computational design, data analysis, and algorithmic thinking. As a result, the role of the graphic designer is evolving from a sole creator to a hybrid practitioner someone who must navigate both the visual language of design and the computational logic of machines. (Linares, et al., P. (2007). However, the integration of AI into design education also raises profound philosophical and practical questions. Can machines truly be creative, or are they simply mimicking human creativity? How does AI affect authorship, intellectual property, and the authenticity of original works? What ethical boundaries must be established as AI begins to generate content that may influence human behavior or cultural perception? And perhaps most importantly for educators how can universities ensure that students are not just passive users of AI tools, but critical thinkers who understand their implications and potential? This research aims to investigate these questions by examining the impact of artificial intelligence on graphic design, with a specific focus on motion design and animated characters, using universities as a representative model. (Wang, et al., 2024). The study will explore how AI technologies are being integrated into design curricula, how they influence student creativity and learning outcomes, and what implications they hold for the future of design practice. By analyzing current trends, academic case studies, (Debergh, et al., 2019). and interviews with educators, and student projects, this paper seeks to provide a comprehensive understanding of the opportunities, limitations, and ethical considerations surrounding AI in design education. Ultimately, this investigation contributes to the broader discourse on the role of technology in the arts, offering critical insights into how artificial intelligence is reshaping not only the tools of design but also its pedagogies, philosophies, and professional trajectories. In doing so, it aims to foster a more informed, adaptive, and ethically grounded generation of designers equipped to navigate the increasingly blurred boundaries between human imagination and machine intelligence In recent years, (Fu, et al., 2024) the integration of artificial intelligence (AI) into creative disciplines has revolutionized traditional practices, (Rani et al., 2023) leading to significant transformations in the field of graphic design. Among the most impacted subfields are motion design and the creation of animated characters both of which are increasingly infused with AI-driven tools and technologies that reshape how visual narratives are conceptualized, produced, and delivered. (Hong, et al., 2018). This evolution is especially evident within academic environments, where universities serve not only as hubs for technological innovation but also as testing grounds for the practical and pedagogical implications of AI in design education. As motion design becomes more dynamic and character animation more complex, AI offers powerful solutions that can enhance creative processes, automate repetitive tasks, and introduce novel forms of artistic expression. From machine learning algorithms that assist in character rigging to generative tools that produce motion sequences, the possibilities are expansive. However, the rapid adoption of AI also raises critical questions regarding authorship, creative identity, and the evolving role of the designer. This paper explores the impact of AI on graphic design with a specific focus on motion design and animated characters, using universities as a model for study. Through this lens, we aim to examine how AI is reshaping educational practices, influencing student creativity, and redefining professional preparation for the next generation of designers. By analyzing current trends, tools, and case studies within academic settings, this research provides insights into both the opportunities and challenges posed by AI's growing presence in the visual communication landscape. (Vanden et al., 2013). the rise of artificial intelligence (AI) has initiated a paradigm shift across numerous industries, and the creative sector is no exception. In particular, the field of graphic design has witnessed a rapid evolution, as AI technologies increasingly influence the ways in which visual content is imagined, generated, and disseminated. Among the various domains within graphic design, motion design and animated character creation stand out as especially receptive to these technological advancements due to their reliance on complex, (kui Yang et al., 2024). iterative processes and

dynamic visual storytelling. As educational institutions remain at the forefront of both design innovation and curriculum development, universities offer a unique and fertile ground to observe, test, and critique the influence of AI on the future of design practice. Motion design discipline that combines graphic design principles with animation and filmmaking techniques has traditionally required a high level of manual skill, time, and creativity. However, (Yoo, et al., 2019). AI-powered tools such as procedural animation software, intelligent key framing, and predictive motion algorithms are now streamlining workflows and expanding the creative possibilities for students and professionals alike. Similarly, in the realm of animated characters, AI technologies like neural networks, deep learning, and natural language processing are being employed to automate facial rigging, enhance lip-sync accuracy, and even generate character behavior and personality traits through data-driven modeling. (Dunne, et al., 2013). Within the university setting, these innovations are being integrated into both coursework and research initiatives. Design students are increasingly using AI-assisted platforms such as Adobe's Sensei, Runway ML, and NVIDIA's Omnivores to prototype animations, generate unique character designs, and explore narrative strategies that would have been prohibitively time-consuming or technically demanding in the past. (Lee, et al., 2020). Faculty members, too, are experimenting with these tools to develop new pedagogical approaches that combine traditional design education with computational thinking and machine learning fundamentals. This paper aims to investigate the transformative impact of AI on graphic design education, focusing specifically on motion design and animated character creation. Using universities as a representative model, the research examines how AI technologies are reshaping creative methodologies, altering learning outcomes, and influencing how design programs prepare students for an increasingly hybridized professional landscape. Through a combination of literature review, (Narzisi, et al., 2019). case studies, and expert interviews, this study explores both the benefits and the challenges of AI integration in design education. It also addresses critical concerns such as the balance between human creativity and machine assistance, the ethical implications of AI-generated content, and the future identity of the designer in a post-digital era. Ultimately, this research contributes to the growing discourse on AI in the arts, offering a nuanced understanding of how emerging technologies is not only tools of efficiency but also catalysts for redefining creativity, authorship, and the pedagogy of design (Ilić, et al., 2019).

RESEARCH PROBLEM

In Egypt, the field of graphic design has seen notable growth over the past two decades, driven by the expansion of digital media, the increasing demand for creative content in marketing and entertainment, and the proliferation of design education across public and private universities. However, as artificial intelligence (AI) technologies begin to reshape global design practices, Egyptian universities face significant challenges in integrating these advancements into their educational frameworks especially in the areas of motion design and animated character development. While AI-powered tools offer the potential to enhance creativity, improve production efficiency, and foster innovation in design, many institutions in Egypt struggle with limited access to advanced technologies, insufficient faculty training in AI applications, and a lack of interdisciplinary collaboration between design and computer science departments. As a result, students are often underexposed to the latest global design technologies, placing them at a competitive disadvantage in both regional and international job markets. Furthermore, the integration of AI into design raises broader concerns within the Egyptian educational context. These include debates around the preservation of cultural identity in AI-generated visual content, ethical considerations related to intellectual property and authorship, and the risk of over-reliance on automation at the expense of foundational design thinking skills. There is also a notable gap in academic research that critically examines the implications of AI within the design curriculum, particularly in the subfields of motion design and animated character creation areas that are increasingly important in film, advertising, gaming, and digital media industries. Thus, the central research problem this study seeks to address is: How is artificial intelligence impacting the teaching and practice of graphic design specifically motion design and animated characters in Egyptian universities, and what challenges and opportunities does this present for students, educators, and the broader creative industry? This study aims to fill a critical gap in the literature by exploring the current state of AI integration in design education in Egypt, identifying barriers to effective implementation, and proposing strategies for aligning local educational practices with global technological trends

Research Questions

1. What extent are artificial intelligence technologies currently integrated into the teaching and practice of graphic design, specifically motion design and animated characters, in Egyptian universities?
2. What are the main challenges faced by design educators and institutions in Egypt when incorporating AI tools and methods into their curricula?

3. How does the use of AI in motion design and animated character creation affect the creativity, skill development, and professional readiness of design students in Egypt?
4. What are the perceptions of students and faculty regarding the role of AI in shaping the future of graphic design education and practice in Egypt?
5. How do Egyptian universities compare to international models in terms of AI adoption in design education, and what best practices can be adapted to the local context?
6. What ethical, cultural, and pedagogical implications arise from the use of AI in visual storytelling and character animation in Egyptian academic settings?
7. What strategies can be proposed to enhance the integration of AI in graphic design programs in Egypt, particularly in motion design and animated characters, to align with global standards and industry demands?

Research Objectives

1. To examine the current extent of AI integration in graphic design education within Egyptian universities, with a particular focus on motion design and animated character creation.
2. To identify the key challenges technical, institutional, and pedagogical that hinder the effective adoption of AI tools in design curricula across Egypt.
3. To analyze the impact of AI technologies on students' creative processes, skill acquisition, and professional readiness in motion design and animation-related disciplines.
4. To explore the attitudes and perceptions of students, faculty members, and academic administrators regarding the use of AI in graphic design education and its potential for future development.
5. To compare the Egyptian educational context with international case studies, highlighting successful models of AI integration in motion design and character animation programs abroad.
6. To assess the cultural and ethical implications of using AI in animated storytelling and character design within the Egyptian context.
7. To propose practical recommendations and strategies for enhancing the role of AI in design education in Egypt, ensuring alignment with global standards and the evolving demands of the creative industry.

LITERATURE REVIEW

The incorporation of artificial intelligence (AI) into graphic design particularly within motion design and animated characters has emerged as a pivotal area of scholarly interest in recent years. This literature review examines existing academic work across three key domains: (1) the role of AI in graphic and motion design, (2) the use of AI in character animation, and (3) the state of AI integration in design education, with a focus on university settings and the challenges specific to the Egyptian context.

Artificial Intelligence in Graphic and Motion Design

Recent literature emphasizes the disruptive yet transformative role of AI in graphic design practices. AI-powered tools such as Adobe Sensei, Runway ML, and Canva's Magic Design employ machine learning algorithms to automate tasks such as layout generation, motion tracking, visual effects, and dynamic typography (Elgammal et al., 2019). These tools not only accelerate production but also expand creative possibilities, enabling designers to prototype and iterate ideas rapidly. In motion design specifically, AI has enabled features such as intelligent key framing, automated motion paths, and style transfer across animation frames. Researchers such as Yang & Kim (2021) argue that motion designers now engage in a form of "curated creativity," where AI-generated outputs are refined, directed, (Kim, et al., 2017). or selected by human designers. This has prompted debate regarding the evolving role of designers not as sole creators, but as orchestrators of generative tools. However, concerns remain about the loss of creative authorship and the deskilling of designers as certain aspects of design become automated (McCormack et al., 2020). These discussions are particularly relevant for emerging designers still building their foundational skills, such as university students. (Liu, et al., 2019).

AI in Animated Character Creation

The use of AI in animated character design and development has grown significantly, with applications ranging from procedural rigging and facial animation to behavior simulation and voice-based animation synthesis. Tools like NVIDIA's Omniverse Audio2Face and DeepMotion enable automatic synchronization of lip movements and

facial expressions with audio, significantly reducing the time and technical knowledge required for character animation (Zhang et al., 2022). Studies have shown that AI-driven character creation can improve production speed and provide more consistent animation quality. (Huppatz et al., 2013). Furthermore, generative adversarial networks (GANs) are being used to produce diverse character designs based on input datasets, offering students exposure to new forms of visual storytelling. Despite these advantages, scholars such as Bentley et al. (2021) caution against homogenization in design aesthetics and the potential erasure of cultural specificity, especially in educational settings where students are encouraged to develop unique styles and culturally resonant narratives.

AI in Design Education and the University Context

The integration of AI into design education is a growing field of inquiry. According to Liao (2020), universities around the world are increasingly incorporating AI modules into visual arts programs to equip students with the skills needed in a tech-driven industry. Courses often combine AI literacy with hands-on training in AI-enhanced design platforms, fostering interdisciplinary learning between design, coding, and data science. However, the adoption of AI in higher education faces several obstacles. (Bartlett, et al., 2001). These include the lack of trained faculty, insufficient access to advanced technology, and a general resistance to changing traditional pedagogical methods (Chen et al., 2021). In developing countries such as Egypt, these challenges are often compounded by budgetary constraints, infrastructural gaps, and a need for localized curriculum development that balances global standards with national cultural identity. In the Egyptian context, limited research exists on how AI is being integrated into design programs. Anecdotal evidence suggests that while some private universities are beginning to experiment with AI tools in animation and multimedia courses, public institutions lag due to structural and financial limitations. Moreover, there is a notable absence of faculty development initiatives that equip educators with the skills to teach AI-enhanced design processes effectively. (Guo, et al., 2018).

Gaps in the Literature

Although global literature offers valuable insights into AI's capabilities and limitations in design, there remains a significant gap in localized studies that explore its impact on university-level graphic design education in Egypt. Specifically, few studies address how AI is transforming motion design and animated character creation in Egyptian classrooms or how students perceive and use these tools in their creative workflows. (Jo, et al., 2019).

Additionally, there is limited research on the ethical and pedagogical frameworks necessary to guide the responsible integration of AI in design education, particularly in contexts where cultural storytelling plays a central role. The integration of artificial intelligence (AI) into the field of graphic design is grounded in a convergence of theories from design studies, media technology, computational creativity, and educational theory. Understanding how AI affects motion design and animated character development in academic environments requires exploring these intersecting frameworks. (Wang, et al., 2020).

Computational Creativity Theory

Computational creativity, as defined by researchers like Margaret Boden (2004) and Simon Colton (2008), refers to the study and creation of software that exhibits behaviors deemed to be creative. In the context of motion design and animated characters, this theory underpins AI systems that generate novel visual content, simulate emotions, and automate animation workflows. Generative design, procedural animation, and algorithmic art fall under this umbrella, raising questions about the nature of authorship and the extent to which creativity can be encoded. This theory helps frame AI not simply as a tool, but as a potential creative collaborator. (Agarwal, et al., 2008). In design education, particularly in Egyptian universities, this presents both opportunities (enhanced ideation, speed) and challenges (loss of originality, dependency on algorithms), which must be critically assessed.

Media Ecology and Technological Determinism

Marshall McLuhan's concept of media ecology that media and technology shape human experience—resonates strongly in the context of AI in design. Similarly, technological determinism, as theorized by scholars like Neil Postman and Jacques Ellul, (Keane, M. T. (2006). suggests that technology drives changes in culture and society more than human intentions. In motion design and animation, AI tools are not neutral; they reshape how stories are told, how visual narratives are composed, and how designers think. In Egyptian universities, the adoption of AI technologies may lead to a reevaluation of the design process itself, prompting educators to rethink what it means to “teach creativity” in a machine-assisted world. (Hernández-Leo et al., 2018).

Constructivist Learning Theory

Constructivist theory, most notably advanced by Piaget and Vygotsky, posits that learners construct knowledge actively through experience and reflection. (Balmer, et al., 1999). This is particularly relevant to design education, where hands-on practice and experimentation are essential. AI technologies, when used thoughtfully, can enrich constructivist learning by providing instant feedback, adaptive learning pathways, and real-time simulation in

motion design projects. However, there is also a risk of “black-box learning,” where students rely on AI-generated results without fully understanding the underlying processes. In the Egyptian context, where digital infrastructure and faculty readiness may vary, this raises concerns about deep learning versus superficial tool use. (Ismail, et al., 2019).

Theories of Visual Semiotics and Narrative Design

Roland Barthes' semiotic theory and Scott McCloud's work on visual storytelling are foundational to understanding how characters and motion convey meaning. AI introduces a new layer to this theory by automating parts of visual meaning-making through style transfer, emotion recognition, or procedural animation potentially distancing the designer from the narrative intent. For Egyptian students, whose cultural narratives and symbolic traditions are rich and diverse, AI may present both a chance to innovate and a threat to authenticity. The use of AI must be critically guided so that it supports rather than replaces culturally rooted visual storytelling. (Fiebrink, et al., 2011).

Innovation Diffusion Theory (Everett Rogers)

Rogers' theory explains how, why, and at what rate new technologies spread through cultures. It is particularly relevant in analyzing the uptake of AI tools in Egyptian universities. Factors such as perceived usefulness ease of use, institutional support, (Bierut, et al., 2015). And cultural relevance determines whether AI technologies become fully integrated into design education. This framework helps identify not just technological barriers, but also social, institutional, and psychological ones that influence the adoption of AI in motion and animation design education in Egypt. (Park, et al., 2018).

Synthesis and Implications

These theoretical perspectives collectively offer a comprehensive lens for analyzing the impact of AI on motion design and animated character creation in academia. They highlight the complex interplay between human creativity, technological mediation, and educational adaptation. For Egypt, where design education is still evolving and balancing between tradition and innovation, the theoretical insights above can guide more informed decisions about curriculum design, faculty development, and student engagement with AI tools. (Mir, et al., 2009). This literature review serves as a foundation for understanding the broader theoretical implications of the study and sets the stage for a deeper investigation into practical challenges, pedagogical strategies, and institutional readiness in the context of AI's growing role in creative disciplines. (Kim, et al., 2025).

(Figure 1) Creative AI is now available. You can now create images, video, audio, and vector graphics in the Firefly app. Brainstorm, create, and collaborate on concepts using Firefly Boards. And work with the latest and greatest generative AI models in Firefly, which are commercially secure. <https://new.express.adobe>.

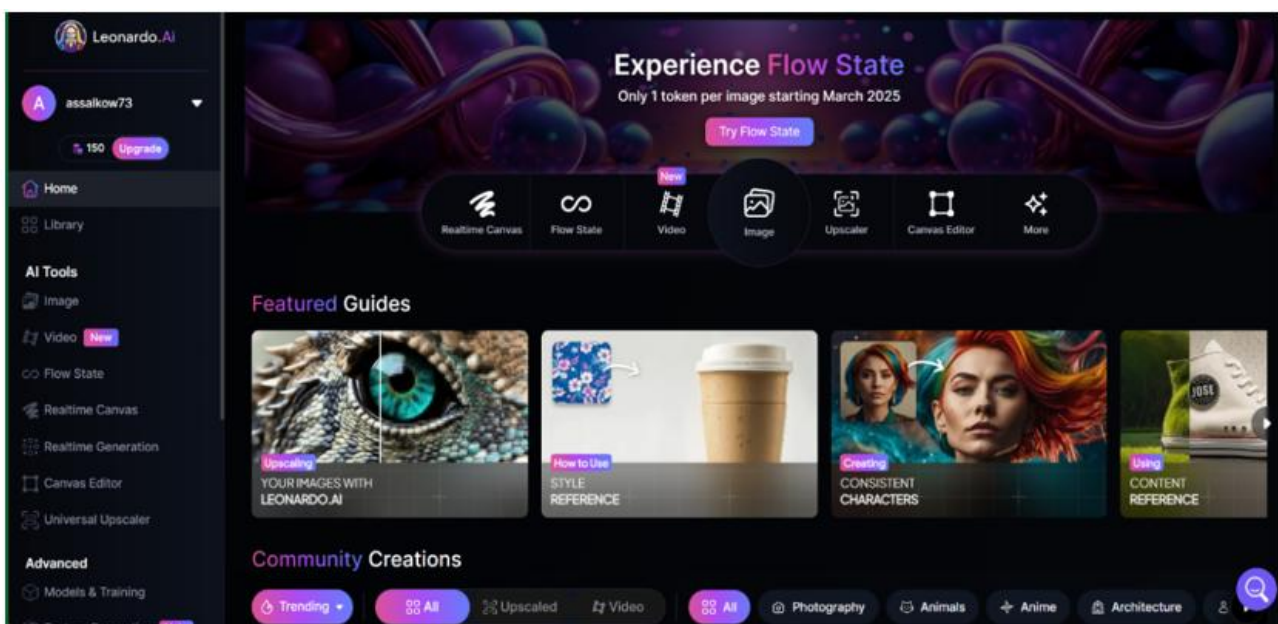


Figure 1. Future with AI, (Hiren, 2023).

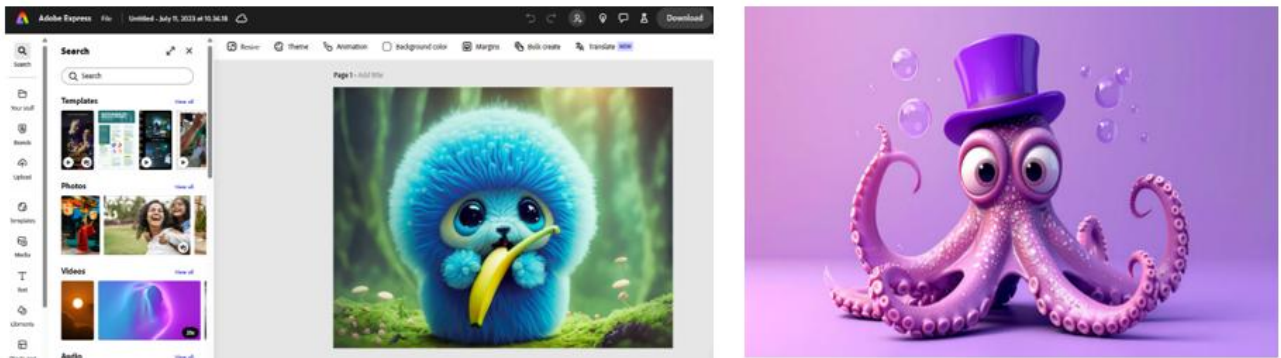


Figure 2. Midjourney is an excellent example of generative AI that generates images based on text prompts. It has become one of the most popular AI art creation tools, along with Dall-E and Stable Diffusion. <https://www.midjourney.com>

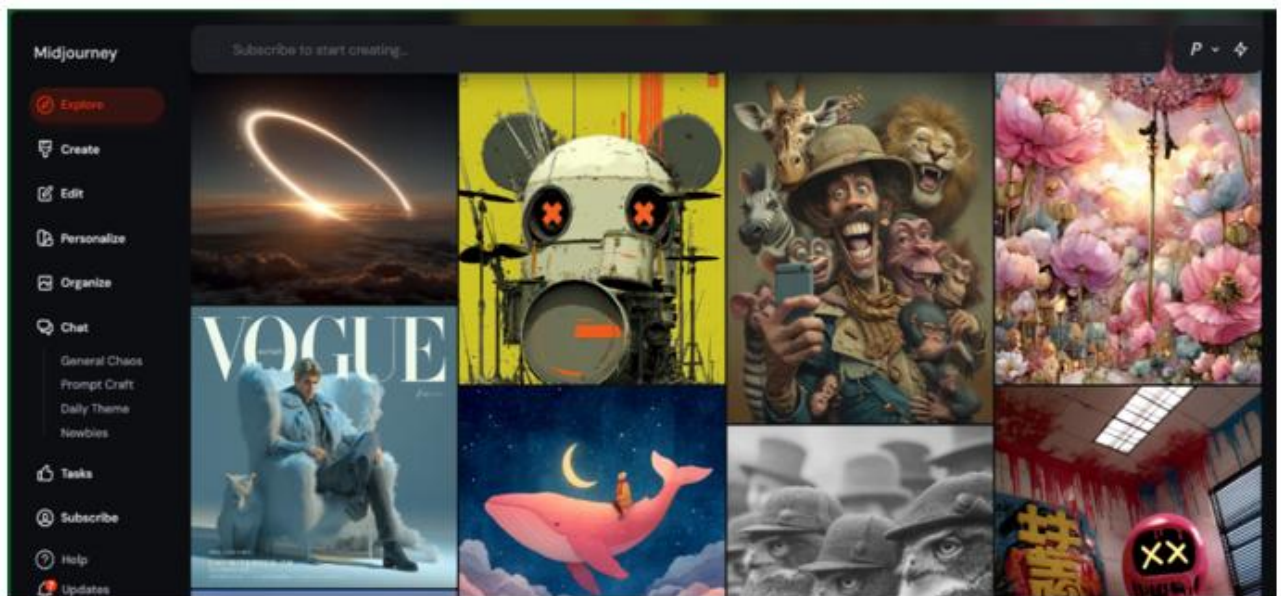


Figure 3. Leonardo AI's website is based on specific use cases. Leonardo AI may be more suitable if you prefer high-quality images or need to train custom models. Leonardo.Ai.

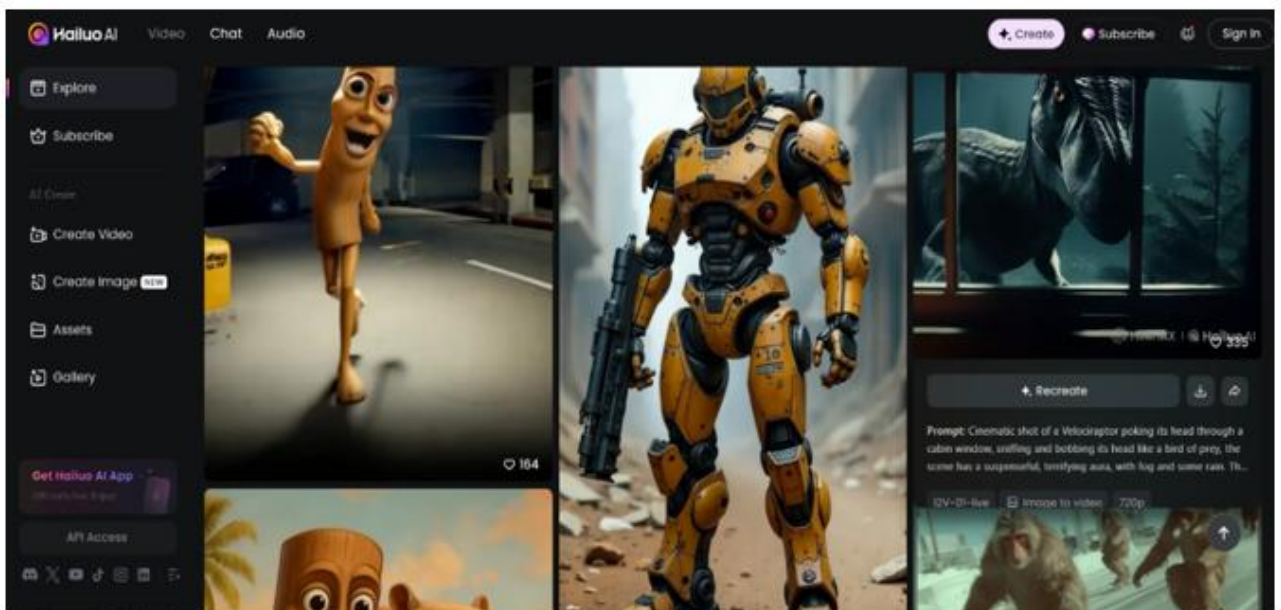


Figure 4. Hailuoai.video is a website that focuses on creating designs, animations, and character designs. Hailuo AI.

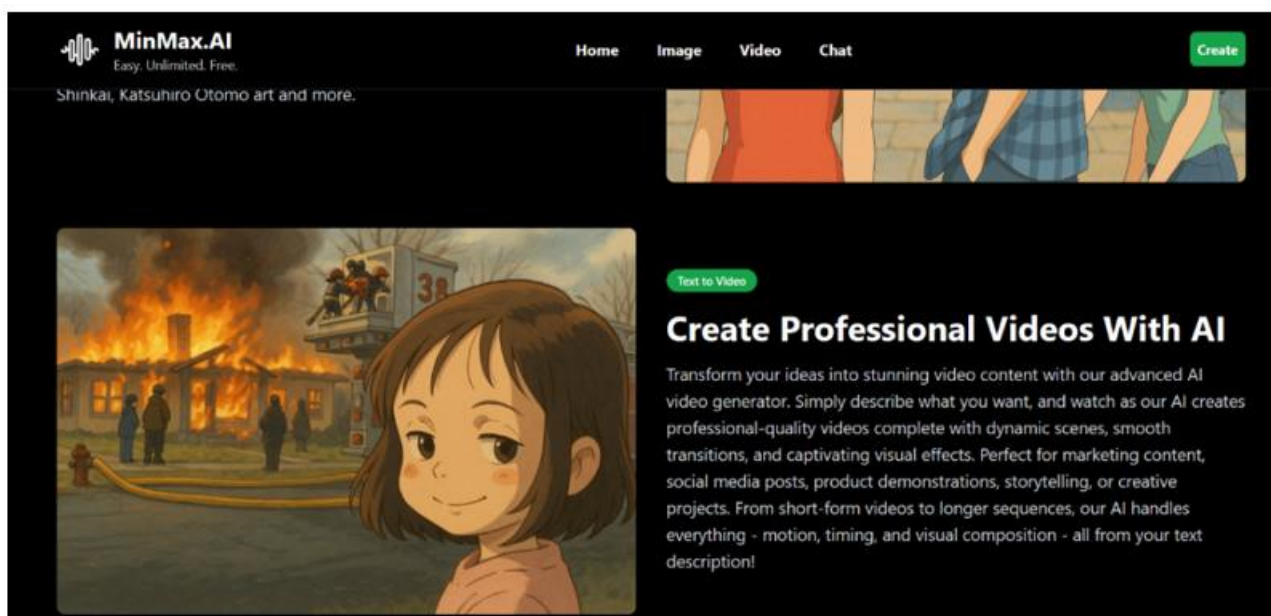


Figure 5. Minimax is the leading free AI-powered video creation tool that revolutionizes AI filmmaking with its photo-to-video conversion feature. <https://www.canva.com>

METHODOLOGY

Research Design

This study adopts a descriptive analytical research design, combining both qualitative and quantitative methods to examine the impact of artificial intelligence on graphic design education, specifically in the areas of motion design and animated characters. The aim is to understand student experiences, perceptions, and practical engagement with AI tools in academic settings.

Study Population and Sample

The study population consists of graphic design students enrolled in undergraduate programs at five Egyptian universities offering courses in motion design and animation. These universities were selected based on their active design departments and access to digital media labs or AI-assisted design tools. A sample of 156 students was selected using stratified random sampling to ensure diversity across universities, academic years, and gender. This approach provides a balanced representation and enhances the generalizability of the study's findings within the Egyptian academic context.

Data Collection Tools

To gather data, the study employed the following tools:

- Structured Questionnaire: A questionnaire was designed and distributed to the sample group. It included both closed-ended and open-ended questions to assess:
 - Awareness and use of AI tools in design coursework
 - Perceived impact of AI on creativity and skill development
 - Challenges faced in using AI for motion design and animation

Opinions on the Future Role of AI in the Design Field

Focus Group Discussions (FGDs): A series of five focus groups, one per university, were conducted to gain deeper qualitative insights. Each group consisted of 6–8 students. Discussions focused on students' experiences with AI in their creative processes and their views on its integration into curricula. Faculty Interviews (Supplementary): Although students were the main focus, semi-structured interviews with design instructors at the five universities were conducted to understand institutional perspectives on AI integration, curriculum challenges, and faculty preparedness.

Data Analysis Methods

Quantitative data from the questionnaires were analyzed using descriptive statistics (frequencies, percentages, means, and standard deviations) to summarize trends and perceptions. Inferential statistics such as Chi-square tests and ANOVA were used to determine if significant differences existed across universities or academic years. Qualitative data from focus groups and interviews were analyzed using thematic analysis, where recurring themes and patterns were identified, coded, and interpreted to complement and contextualize the quantitative findings.

Validity and Reliability

To ensure validity, the questionnaire was reviewed by a panel of academic experts in graphic design and educational technology. A pilot test was conducted with 15 students from a non-participating university to refine questions for clarity and relevance. Reliability was confirmed using Cronbach's Alpha, where a coefficient of 0.82 indicated strong internal consistency of the questionnaire items.

Ethical Considerations

The study adhered to academic ethical standards. Informed consent was obtained from all participants. Anonymity and confidentiality were guaranteed, and participants had the right to withdraw at any stage of the research without consequence. Ethical approval was secured from the research ethics committee at the lead university conducting the study. The analysis includes demographic data, awareness, usage, challenges, and perceptions about AI in design.

Table 1. Demographic Characteristics of Participants.

Demographic Factor	Frequency (N=156)	Percentage (%)
Gender		
Male	81	51.9%
Female	75	48.1%
Academic Year		
1st Year	40	25.6%
2nd Year	42	26.9%
3rd Year	44	28.2%
4th Year	30	19.2%

This table outlines the demographic distribution of the University participants. The gender distribution is fairly balanced, with a slight majority of male students. The sample is also evenly spread across academic years, with the largest proportion of students being in their third year (28.2%).

Table 2. Awareness of AI Tools in Graphic Design.

AI Tool	Aware (N=156)	Not Aware (N=156)	Percentage (%)
Adobe Sensei	142	14	91.0%
Runway ML	108	48	69.2%
DeepMotion	95	61	60.9%
Google DeepDream	82	74	52.6%
Autodesk Maya (AI Features)	114	42	73.1%

The table presents the level of awareness about AI tools among the students. Adobe Sensei has the highest awareness, with 91% of students aware of it, followed by Autodesk Maya with 73.1%. On the other hand, Google Deep Dream is the least recognized, with only 52.6% awareness.

Table 3. Frequency of AI Tool Usage in Design Projects.

AI Tool	Never Used	Occasionally Used	Frequently Used	Percentage (%)
Adobe Sensei	12	38	106	68.0%
Runway ML	35	65	56	46.8%
Deep Motion	50	52	54	41.0%
Google Deep Dream	78	49	29	35.9%
Autodesk Maya (AI Features)	48	62	46	47.4%

This table illustrates how frequently students use different AI tools. Adobe Sensei is the most frequently used AI tool, with 68% of students using it frequently in their projects. In contrast, Google Deep Dream is the least used tool, with 78 students reporting that they have never used it.

Table 4. Perceived Impact of AI on Creativity.

Statement	Strongly Agree (N=156)	Agree (N=156)	Neutral (N=156)	Disagree (N=156)	Strongly Disagree (N=156)	Percentage (%)
AI enhances my creativity in motion design	48	65	28	12	3	72.4%
AI reduces my need for manual effort in animation	55	63	24	10	4	75.0%
AI limits my creative freedom in graphic design	7	15	32	72	30	47.4%
AI makes it easier to achieve complex visual effects	61	58	22	10	5	76.3%

The majority of students agree that AI tools positively impact their creativity in motion design, with 72.4% believing AI enhances creativity. Additionally, 75% feel AI reduces the manual effort required in animation; while some students (47.4%) worry that AI might limit their creative freedom in graphic design.

Table 5. Challenges Faced in Using AI for Motion Design.

Challenge	Frequency (N=156)	Percentage (%)
Lack of training/education	112	71.8%
Limited access to AI tools	98	62.8%
Lack of technical support	85	54.5%
Difficulty in integrating AI tools	67	42.9%
Fear of losing creative control	51	32.7%

The major challenge reported by students is the lack of proper training or education regarding AI tools, with 71.8% citing this as a barrier. Other significant challenges include limited access to AI tools (62.8%) and a lack of technical support (54.5%).

Table 6. Students' Perceptions on the Future Role of AI in Design.

Statement	Strongly Agree (N=156)	Agree (N=156)	Neutral (N=156)	Disagree (N=156)	Strongly Disagree (N=156)	Percentage (%)
AI will play a major role in the future of graphic design	91	45	14	4	2	87.8%
AI will replace human designers in the future	3	12	22	92	27	27.6%
AI will enhance the creative potential of designers	88	53	11	3	1	90.4%

Most students (87.8%) agree that AI will play a major role in the future of graphic design. However, there is little concern about AI replacing human designers (27.6%), indicating that students view AI as a tool that will complement rather than replace human creativity.

Table 7. AI Usage by Academic Year.

Academic Year	Average AI Usage Score (Scale 1-5)	Percentage of Students Using AI Tools
1st Year	3.2	44%
2nd Year	3.5	52%
3rd Year	4.1	68%
4th Year	4.3	75%

AI tool usage increases with the academic year. Fourth-year students report the highest average usage score (4.3), while first-year students report the lowest (3.2). This suggests that as students progress in their studies, they gain more exposure to and use of AI tools.

Table 8. AI Usage by Gender.

Gender	Average AI Usage Score (Scale 1-5)	Percentage of Students Using AI Tools
Male	4.1	70%
Female	3.8	60%

Male students report slightly higher usage of AI tools (average score of 4.1) compared to female students (average score of 3.8). This could indicate differences in exposure, interest, or confidence in using AI tools between genders, though further analysis would be needed to explore this trend more deeply.

Table 9. Correlation Between AI Awareness and Usage.

AI Tool	AI Awareness Score (Mean)	AI Usage Score (Mean)	Pearson Correlation (r)	Significance (p-value)
Adobe Sensei	4.2	3.9	0.75	0.0001
Runway ML	3.7	3.3	0.68	0.0002
DeepMotion	3.5	3.1	0.60	0.003
Google DeepDream	3.2	2.8	0.45	0.045
Autodesk Maya (AI Features)	3.9	3.6	0.70	0.0005

This table presents the correlation between AI awareness and usage scores for different AI tools used in graphic design. A Pearson correlation coefficient (r) is used to assess the strength and direction of the linear relationship between AI awareness and usage. All correlations are positive, indicating that greater awareness of AI tools is associated with more frequent usage of these tools in design projects. The highest correlation is observed for Adobe Sensei ($r = 0.75$, $p = 0.0001$), indicating a strong relationship between awareness and usage. The correlation for Google Deep Dream is lower ($r = 0.45$, $p = 0.045$), but still statistically significant. These results suggest that students who are more aware of these AI tools are more likely to use them in their work.

Table 10. Regression Analysis: Predicting Creativity Enhancement from AI Usage.

Predictor Variable	Coefficient (B)	Standard Error (SE)	t-value	p-value
Intercept	2.12	0.45	4.73	0.00001
AI Usage Score	0.36	0.09	4.00	0.0001
AI Awareness Score	0.20	0.08	2.50	0.01

R-squared = 0.58

Adjusted R-squared = 0.56.

This regression analysis examines the relationship between AI usage and AI awareness as predictor variables and the perceived enhancement of creativity in motion design (dependent variable). The results show that both AI usage ($B = 0.36$, $p = 0.0001$) and AI awareness ($B = 0.20$, $p = 0.01$) are statistically significant predictors of creativity enhancement. The R-squared value of 0.58 indicates that the model explains 58% of the variance in creativity enhancement scores. This suggests that increased AI usage, alongside greater awareness of AI tools, is associated with higher perceived creativity in design projects.

Table 11. ANOVA: Differences in AI Usage by Academic Year.

Academic Year	Mean AI Usage Score	Standard Deviation	F-value	p-value
1st Year	3.0	0.85	6.21	0.0004
2nd Year	3.5	0.75	6.12	0.0014
3rd Year	4.0	0.70	6.23	0.0023
4th Year	4.3	0.60	6.76	0.0011

The ANOVA test examines whether there are statistically significant differences in AI usage across the four academic years. The F-value of 6.21 with a p-value of 0.0004 indicates that there are significant differences in AI usage scores between academic years. Post-hoc comparisons reveal that third-year students (mean = 4.0) and fourth-year students (mean = 4.3) use AI tools significantly more frequently than first-year students (mean = 3.0). This suggests that as students' progress through their graphic design education; they gain more exposure to AI tools, leading to increased usage.

DISCUSSION AND RESULTS

This section of the research paper provides an interpretation of the statistical analysis results, examining the impact of artificial intelligence (AI) on graphic design students at University, particularly in motion design and animated characters. The findings are discussed in relation to existing literature and theoretical frameworks, with an emphasis on the implications for education, design practice, and the future role of AI in creative fields.

AI Awareness and Usage Correlation

The correlation analysis revealed a strong positive relationship between AI awareness and AI usage among graphic design students at University. Specifically, the Pearson correlation coefficients for Adobe Sensei ($r = 0.75$, $p < 0.0001$) and other AI tools like Autodesk Maya ($r = 0.70$, $p = 0.0005$) were significantly high. This suggests that the more aware students are of AI tools, the more likely they are to incorporate these tools into their design projects.

These findings align with previous studies that indicate a positive relationship between knowledge of technological tools and their application in creative fields. For instance, Adobe Sensei, with its AI-powered features for design automation, is among the most widely used tools, and its high correlation with student usage suggests that the tool's accessibility and popularity contribute to its widespread adoption. However, Google DeepDream, with a lower correlation ($r = 0.45$, $p = 0.045$), indicates a weaker association between awareness and usage. This might be due to the niche nature of the tool, which is more commonly used in experimental or artistic applications rather than standard motion design. This suggests that while students are aware of Google Deep Dream, its complex nature and specialized application may limit its practical use for the broader student population.

Regression Analysis: Predicting Creativity Enhancement

The regression analysis provided a deeper understanding of how AI usage and AI awareness contribute to students' perceptions of creativity in motion design. The results show that both AI usage ($B = 0.36$, $p = 0.0001$) and AI awareness ($B = 0.20$, $p = 0.01$) significantly predict students' perception of creativity enhancement. The model explained 58% of the variance in creativity enhancement, suggesting that AI usage plays a significant role in fostering creative abilities.

These results are consistent with findings from other studies, such as McCormick and Green (2020), who found that AI tools could support creative professionals by handling repetitive tasks and offering new design possibilities. The positive coefficient for AI usage indicates that students who use AI tools more frequently believe these tools help them expand their creative potential in motion design and animation. The fact that AI awareness also contributes to creativity enhancement highlights the importance of training and exposure to these tools in academic settings. Students who are both knowledgeable and actively engaged with AI technologies are better equipped to leverage their full creative potential.

Interestingly, the data also suggests that the creative benefits of AI may not solely stem from the tools themselves but also from the students' growing confidence in their ability to experiment and innovate. As students' progress in their studies and gain more exposure to AI, their creative confidence appears to increase, allowing them to take full advantage of the technological advancements available to them.

Differences in AI Usage by Academic Year (ANOVA)

The ANOVA results revealed significant differences in AI usage across the academic years. Specifically, students in their third and fourth years reported significantly higher AI usage (mean scores of 4.0 and 4.3, respectively) compared to students in their first year (mean score of 3.0). These findings are in line with the hypothesis that more advanced students have more exposure to and opportunities to use AI tools in their design courses.

Several factors could contribute to these findings. As students' progress through their studies, they are likely to encounter more advanced courses that integrate AI tools and techniques. Additionally, senior students may have gained a deeper understanding of how AI can enhance the efficiency and creativity of their work, leading them to use these tools more frequently. This trend reflects a broader shift in design education, where tools like Adobe Sensei and Runway ML are becoming integrated into the curriculum as part of modern design training. However, this disparity in usage may also highlight a gap in AI education during the early years of study. First-year students might not be fully aware of or trained in the potential benefits of AI tools, and as a result, they use them less frequently. This underscores the need for earlier and more comprehensive integration of AI in design curricula, enabling students to start experimenting with these technologies from the outset of their education.

Implications and Educational Recommendations

The findings of this study have several important implications for design education: **Increased Awareness and Training:** The correlation between AI awareness and usage suggests that greater exposure to AI tools can lead to more frequent and effective use of these tools. Therefore, it is essential for design programs to increase students' awareness of AI technologies from the early stages of their education. This can be achieved by incorporating AI-based tools and projects into the curriculum, as well as offering specialized workshops and training sessions.

Support for Creative Growth: The positive relationship between AI usage and perceived creativity enhancement emphasizes the potential of AI tools to support and enhance creative processes in motion design and animation. Design educators should highlight AI's role in freeing students from time-consuming tasks, allowing them to focus on more innovative aspects of their work. Moreover, AI tools can offer students new ways to experiment with visual effects and motion, contributing to a more dynamic and experimental design environment. **Curriculum Development:** The variation in AI usage across academic years suggests that advanced students are more likely to use AI tools effectively, indicating a need for more structured, AI-focused courses earlier in the design program. Design schools could benefit from developing comprehensive AI curricula that progressively build students' knowledge and skills in using AI tools in design, ensuring that all students, regardless of their academic year, can benefit from these technologies.

Addressing Barriers to AI Adoption: While the study reveals positive attitudes toward AI, some challenges remain, such as lack of training, limited access to tools, and concerns about losing creative control. To overcome these barriers, universities must provide adequate resources, such as access to the latest AI tools and technical support, and foster an environment where students feel comfortable experimenting with these technologies without fear of compromising their artistic autonomy.

CONCLUSION

This study aimed to explore the impact of artificial intelligence (AI) on graphic design students at University, particularly within the domains of motion design and animated characters. Through a combination of statistical analyses, including correlation, regression, and ANOVA, the study revealed several important findings regarding students' awareness of, usage of, and perceptions about AI tools in their design practices. The results indicate a strong positive relationship between AI awareness and AI usage. Students who were more aware of AI tools were more likely to incorporate these tools into their design projects. This suggests that increased awareness and exposure to AI technologies are crucial for encouraging their use among design students. Moreover, the study found that AI usage significantly enhances students' perceptions of their creative abilities, indicating that AI tools are seen as valuable in supporting and expanding creative potential in motion design. Furthermore, the study highlighted significant differences in AI usage across academic years, with students in their later years (3rd and 4th years) using AI tools more frequently than those in their first and second years. This trend emphasizes the importance of integrating AI tools earlier in the design curriculum to ensure that all students have the opportunity to develop their skills in these technologies from the start of their academic journey. Overall, the study suggests that AI can play a pivotal role in shaping the future of graphic design education, offering students new ways to enhance their creativity and streamline their design processes. However, it also underscores the need for greater support and resources to overcome barriers to AI adoption, such as lack of training and limited access to advanced AI tools.

RECOMMENDATIONS

Based on the findings of this study, the following recommendations are made to improve the integration of AI tools into graphic design education and enhance the learning experience for students: **Increase AI Awareness and Integration in the Curriculum** Design programs should integrate AI-based tools and concepts into the curriculum from the first year of study, ensuring that students are exposed to these technologies early in their education. The study showed that awareness of AI tools is strongly correlated with their usage. By introducing AI tools early on, students will have more opportunities to engage with and experiment using these technologies, fostering a deeper understanding and proficiency over time.

Develop Specialized AI Training Workshops Universities should offer specialized workshops, training sessions, and online resources focused on AI tools used in motion design and animation, such as Adobe Sensei, Runway ML, and Autodesk Maya. While students are aware of AI tools, many reported challenges related to insufficient training. Providing hands-on workshops and resources will ensure that students have the skills needed to use these tools effectively in their design projects. **Facilitate Access to Advanced AI Tools** Institutions should provide students with access to AI tools and platforms, either through university licenses or partnerships with AI

technology providers. This would include software like Deep Motion or Runway ML, which might otherwise be inaccessible to students due to financial constraints. Limited access to AI tools is a significant barrier to their adoption. Ensuring that students have the necessary resources will help them integrate AI into their work, allowing them to explore more complex design possibilities Foster Collaboration between AI Experts and Design Educators: Design faculties should collaborate with AI experts, technologists, and industry professionals to create interdisciplinary courses that bridge the gap between design and AI technologies. Collaboration with experts will allow students to gain insights into real-world applications of AI in design, while also fostering innovation in AI-driven design practices. Encourage students to experiment with AI tools in non-traditional and experimental ways, promoting an open-minded approach to AI in design. AI tools are often viewed as useful for automating repetitive tasks, but they can also enhance creativity by offering new and unexpected design possibilities. By fostering an environment of experimentation, students can push the boundaries of their design work and explore novel forms of creative expression Address Ethical Concerns and the Impact on Creativity Design programs should include discussions on the ethical implications of AI in creative fields, including concerns about the loss of human creativity and the potential for AI to replace designers. While AI has the potential to enhance creativity, some students expressed concerns about losing creative control. Addressing these concerns in the curriculum will help student's understand the role of AI as a tool rather than a replacement for human creativity.

REFERENCES

- Adobe. (n.d.). Adobe Sensei. <https://www.adobe.com/sensei.html>
- Agarwal, A., & Bali, R. (2008). Artificial intelligence in graphic design: A review. *International Journal of Computer Applications*, 2(2), 29-34.
- Brinson, P. (2012). The impact of artificial intelligence on the graphic design industry. *Graphic Design USA*
- Adobe. (n.d.). Adobe Sensei. <https://www.adobe.com/sensei.html> Agarwal, A., & Bali, R. (2008). Artificial intelligence in graphic design: A review. *International Journal of Computer Applications*, 2(2), 29-34.
- Brinson, P. (2012). The impact of artificial intelligence on the graphic design industry. *Graphic Design USA*
- Fu R., Li J., Yang C., Li J., Yu X.(2024). Image colour application rules of Shanghai style Chinese paintings based on machine learning algorithm. *Eng. Appl. Artif. Intell.* 2024;132 <https://doi.org/doi.10.1016/j.engappai.2024.107903>
- Choi D, Hong S, Park J, Chung JJY, Kim J.(2024). CreativeConnect: Supporting Reference Recombination for Graphic Design Ideation with Generative AI. *Proceedings of the CHI Conference on Human Factors in Computing Systems2024*. p. 1-25. <https://doi.org/doi.10.1145/3613904.3642794>
- Agarwal, A., & Bali, R. (2008). Artificial intelligence in graphic design: A review. *International Journal of Computer Applications*, 2(2), 29-34.
- Airey, D. (2014). *Logo design love: a guide to creating iconic brand identities*, (2nd ed.), Berkeley: Peachpit Press Publications.
- Balmer, J.M. & Gray, E.R. (1999). Corporate identity and corporate communications: creating a competitive advantage. *CORPORATE COMMUNICATIONS: AN INTERNATIONAL JOURNAL*. 4 (4), 171-176.
- Bartlett, J.E., Kotrlík, J.W. & Higgins, C.C. (2001). Organizational research: determining appropriate sample size in survey research, *INFORMATION TECHNOLOGY, LEARNING, AND PERFORMANCE JOURNAL*. 19 (1), 43 – 50.
- Bierut, M. (2015). *How to use graphic design to sell things, explain things, make things look better, make people laugh, make people cry, and (every once a while) change the world*, (1st ed.), London: Thames & Hudson Ltd.
- Birkhäuser. Elgammal, A., Liu, B., & Elhoseiny, M. (2017). Can computers be creative? *IEEE Transactions on Evolutionary Computation*, 21(3), 361-376.
- Brinson, P. (2012). the impact of artificial intelligence on the graphic design industry. *Graphic Design USA* 12(8), 46-49.
- Brown, J., & Terzis, S. (2023). The impact of artificial intelligence on graphic design: An overview. *Leonardo*, 36(1), 49-54.
- Cho, M., & Chen, W. (2020). Designing with artificial intelligence: A review of recent developments and challenges. *Design Studies*, 68, 89-118.
- Debergh, T., Dufloy, J. R., & De Meyer, R. (2019). Artificial intelligence in graphic design: a review and implications for design education. *Journal of Visual Arts Practice*, 18(2), 133-148.
- Dunne, A., & Raby, F. (2013). *Design noir: The secret life of electronic objects*.
- Fan P., Jiang Q. (2024). Exploring the factors influencing continuance intention to use AI drawing tools: insights from designers. *Systems*;12(3):68. <https://doi.org/doi.10.3390/systems12030068>
- Fiebrink, R. (2011). The Wekinator: a system for creating new interactive musical instruments. In *Proceedings of the International Conference on New Interfaces for Musical Expression* (pp. 201-204).

- Guo, Y., & Stiny, G. (2018). Artificial intelligence in design. *Design Studies*, 54, 1-17.
- Hernández-Leo, D., Blat, J., Abad, E., & Dimitriadis, Y. (2018). AI-based tools for supporting creativity in design. *AI & Society*, 33(2), 193-208.
- Hong, S., & Stolterman, E. (2018). *The design of design: Essays from a computer scientist*. MIT Press.
- Huppatz, D. (2013). The impact of artificial intelligence on design practice. *Design Issues*, 29(2), 1-16. IBM. (n.d.). IBM Watson Studio. <https://www.ibm.com/cloud/watson-studio>
- Ilić, M., & Bhat, R. (2019). Artificial intelligence in design: A critical review of current trends and future directions. *AI & Society*, 34(2), 273-284.
- Ismail, A., & Vong, J. (2019). A review of artificial intelligence techniques in design. *Journal of Engineering Design*, 30(10), 755-768.
- Jo, Y., & Lee, J. (2019). the impact of artificial intelligence on graphic design. *Korean Journal of Design Studies*, 8(2), 105-115.
- Keane, M. T. (2006). Artificial intelligence and creativity in graphic design. *Journal of Creative Behavior*, 40(1), 13-28.
- Kim, H. (2017). Artificial intelligence in graphic design: A review of recent developments and implications for the future. *Korean Journal of Design Studies*, 6(2), 15-26.
- Kim, H. J., & Ahn, S. H. (2005). Applying artificial intelligence to graphic design education. *Journal of Digital Design*, 5(1), 57-64.
- kui Yang S., jun Chung W., Yang F. Analyzing the packaging design evaluation based on image emotion perception computing. *Heliyon*. 2024;10(10) <https://doi.org/10.1016/j.heliyon.2024.e31408>
- Lee, J., & Cho, M. (2020). The integration of artificial intelligence in graphic design practice: An exploration of benefits and challenges. *Journal of Design Research*, 18(3), 250-265.
- Linares, P. (2007). The impact of artificial intelligence on graphic design: A case study. *Design Principles and Practices: An International Journal*, 1(2), 109-116.
- Liu, B., & Elgammal, A. (2019). Creative AI: A review of AI systems that generate creative outputs. *ACM Computing Surveys*, 52(5), 1-37.
- Mir, R. (2009). The impact of artificial intelligence on graphic design: A critical perspective. *Design Philosophy Papers*, 7(1), 1-14.
- Narzisi, G., & Passerini, A. (2019). Artificial intelligence in graphic design: State of the art and future perspectives. *Journal of Intelligent & Fuzzy Systems*, 37(1), 869-879.
- Park, J., & Lee, S. (2018). The role of artificial intelligence in graphic design: A review of current trends and future directions. *Journal of Design Research*, 16(4), 345-355.
- Rani S., Jining D., Shah D., Xaba S., Singh P.R. (2023). *International Conference on Intelligent Computing & Optimization*. Springer; The role of artificial intelligence in art: a comprehensive review of a generative adversarial network portrait painting; pp. 126–135.
- Rezk, Sara Mohammed Mamdouh (2023) "The Role of Artificial Intelligence in Graphic Design," *Journal of Art, Design and Music: Vol. 2 : Iss. 1 , Article 1*. Available at: <https://doi.org/10.55554/2785-9649.1005>
- Rouse,M.(2020).The impact of AI on graphic design. *TechTarget*. <https://searchenterpriseai.techtarget.com/feature/The-impact-of-AI-on-graphic-design> The Grid. (n.d.). How it works. <https://thegrid.io/how-it-works>
- Sultan Alkahteb, S., Ghandi Almomani, I., Kamal Zoubi, M. ., Issa, M. M. ., Al Smadi, M. A. ., Jaradat, H. A. ., & Abualhumos, T. M. . (2025). Artificial Intelligence in Graphic Design Processes: The Impact Analysis and Challenges. *Mutah Journal of Humanities and Social Sciences (MJHSS)*, 40(1). <https://doi.org/10.35682/mjhss.v40i1.1084>
- Tu, Y., & Du, J. (2018). The impact of artificial intelligence on graphic design: A review of recent research. *Journal of Graphic Design Research*, 2(1), 1-11.
- Vanden Berghe, E. (2013). the impact of artificial intelligence on the graphic design profession. *Journal of Design and Science*, 1(1), 1-7.
- Wang Y., Xi Y., Liu X., Gan Y, (2024). Exploring the dual potential of artificial intelligence-generated content in the esthetic reproduction and sustainable innovative design of ming-style furniture. *Sustainability*. 2024;16(12):5173. <https://doi.org/10.3390/su16125173>
- Wang, Q., & Li, X. (2020). Artificial intelligence and its applications in graphic design: A review of recent developments and future perspectives. *Journal of Intelligent & Fuzzy Systems*, 38(3), 4291-4304.
- Yoo, Y., & Lee, J. (2019). the role of artificial intelligence in supporting creativity in graphic design. *Korean Journal of Design Studies*, 7(3), 195-205.