

Integrating AI image generation into the designer's creative process for mascot creation

ABSTRACT

AI-generated image tools are an innovation that can significantly impact the design process by increasing productivity and generating a wide range of complex design exploration results. Although AI-generated image tools have many advantages and diverse features, research is still needed to assess the suitability of the images produced in the ideation process carried out by designers. The purpose of this study is to compare and assess the influence of the ideation process carried out by student designers in a mascot creation project with and without the use of AI-generated image tools. The method for this study is an experimental design by compares the ideation process using AI-generated images with the ideation process without using AI-generated images. The design analysis of the final design was conducted by expert designers using a blind review technique. The results of this study do not yet show that the use of AI in the ideation process is superior to conventional methods, but it is known that AI-generated images tools can be a reference and a competent choice of ideation media to use. This research has implications for the method of extracting ideas in the mascot design process and also provides evidence that the use of AI in the ideation process should not be feared or avoided.

KEY WORDS

artificial intelligence, creative strategy, graphic design, character design, conceptual design

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Introduction

The launch of Society 5.0 on January 21, 2019, focused on the use of technology and information to solve social problems and improve the quality of life, one of which is through the help of Artificial Intelligence (AI) (Roblek, Meško & Podbregar, 2021). The integration of AI into the design field has garnered significant attention, greatly transformed traditional practices and pushed toward new creative paradigms. Despite its speed and risks, AI in the design field is currently widely used.

The effectiveness of AI has also opened up opportunities to create a more inclusive design process for everyone by creating creative content more easily and instantly (Satrinia, Firman & Fitriati, 2023). However, the ease of AI in creating designs carries the potential to reduce

designers' creativity in generating ideas. There is considerable resistance to the use of AI in the design context. The other side, AI image generative tools offer various alternatives for design and the development of ideas to be processed into various design explorations (Ardhianto & Nababan, 2023). The use of AI tools can influence the design process by increasing productivity (Thomson, Thomas & Matrich, 2024).

Generative deep learning can also influence the cognitive thinking of their users through diverse input processes, which can ultimately impact the resulting designs.

In visual communication design (VCD), AI-image generative devices can create a wide variety of engaging visuals, including photos, logos, cartoons, comics, audiovisuals, and mascots.

The superiority and speed of AI in processing text commands into visuals are increasingly questioning the design education and the design profession. However, AI technology still needs supervision and even further development with existing design techniques (Longhurst, 2024). The Indonesian Visual Communication Design Professional Association (AIDIA) believes that designers in the current AI era need to focus on creating value through problem-solving. This shift addresses doubts about the future of designers, who have shifted from focusing on visual creation to value creation (Zafar, 2024). This value creation process requires training in designers' critical thinking and empathy for problems that generate ideas through the ideation process.

Currently, there is little research on the use of AI-image generative in visual communication design case studies. According to Fareed, Bou Nassif & Nofal (2024), further research is needed to assess the suitability of the generated images, taking into account the knowledge and critical thinking of users (Fareed, Bou Nassif & Nofal, 2024). Striking a balance between human thinking and AI capabilities is crucial.

This research conducts a comparative study focusing on the ideation process using non-AI reference media and using AI image generative tools. The aim of this study to examine how the ideation process using AI image generative tools can influence the suitability of the design work obtained from the given brief. Therefore, the results of this study acknowledge the need for an ideation process that utilizes the features of AI image generative tools effectively and positively. This points back to the importance of using AI to help improve human life and professions by combining human intelligence and technology to enhance the creative process.

Theoretical basis

Design Thinking in Education: Perspectives, Opportunities and Challenges

Design thinking is an approach and mindset process that is done collaboratively to find and design a solution to big problems in various aspects. According to Panke (2019) complex problems have unlimited scope of complexity and are impossible to solve completely. With this, design thinking aims to go beyond the limits of existing problem challenges (Panke, 2019).

The process of design thinking in education is to make the students think and work like an expert designer (Ferguson et al., 2017; Sharples et al., 2016). The process can be applied to creates an innovative product according to the people's needs.

Furthermore, design thinking process develop a deep interest and understanding of the people we're designing by developing our empathy, and the five phase of design thinking according to Standford Design Schools are empathise with users, define the problems and needs, ideate the challenges, prototyping the solutions, and test the solutions (Razzouk & Shute, 2012; Sreenivasan & Suresh, 2024). This research encourages the VCD students to think deeply about understanding their behaviour, needs, and represent it through the mascot they created, practicing the design thinking process to make a more effective work like an expert designer.

A Design Ideation Method for Novice Designers

Ideation is one of design thinking process stages. According to Kim (2020), ideation is an important step in the design thinking process (Kim, 2020). Ideation processes the design brief to be re-generated into various designs as problem solutions (Cheng, 2023). The importance of understanding ideation fundamental and capabilities is developing design environments, which will enable a more complex design form.

The process of ideation is used to guide designers to think effectively in order to create a creative outcome according to the brief or specific criteria (Cheng, 2015). In the industrial design engineering, ideation is described as a set activity of creation and development of directed ideas (Gonçalves & Cash, 2021). The success rate of the designer's ideation process in this research is determined by how they manage to visualize the creative process of their work.

The Potential of AI in Creativity Creating a Design

Artificial Intelligence is able to explore more deeply everything in the creative world of design, including creating art in the form of paintings, 3D images, and even an influencer. AI helps designers to create new and interactive design explorations, and make the work process efficient. The effectiveness generated by AI has also opened up opportunities to make to make a more inclusive design process for everyone with an easier and instant creation of creative content (Satrinia, Firman & Fitriati, 2023).

Kim & Maher (2023) research shows that AI inspiration design process can produced more novelty, variety, and quantity which can influenced and improved the pattern of designer's ideation process (Kim & Maher, 2023). The collaboration of human and AI is a dynamic process since AI can adapt to user feedback, behaviours, preferences and needs, this will allow AI to improve their performance and match with the user expectations (Usmani, Happonen & Watada, 2023).

It is important to gain a better understanding of AI potential and its dynamic process with designers, and how effective it is compared with other conventional media in this research.

Realizing Society 5.0 Through the Utilization of Artificial Intelligence Technology

Society 5.0 represents a transformative vision of future society characterized by the integration of digital technologies such as AI, the Internet of Things (IoT), and big data with social systems. Society 5.0 emphasizes inclusivity and adaptability to preemptively address societal challenges through advanced technological solutions, in line with the emphasis on human-centered design in AI development, as highlighted in recent discussions on ethical principles and practical strategies in AI governance (Sigfrids et al., 2023).

The rapid development of technology opens up the possibility for society to keep up with the flow of advancement. The start of society 5.0 in 2019 by the Japanese government which is based on the use of technology and information, Society 5.0 is here to solve social problems and improve the quality of people's work, one of which is with the help of the use of AI (Choudhry et al., 2024).

The advancement of AI in society 5.0 benefits in improving the manufacturing world and increasing business efficiency, but also aims to develop renewable energy so it may benefit in sustainability as well (Adel, 2022).

With this, the industry is improving effectively through the perfection of machine work and human workers. Society 5.0 is important aspect of improving the futures of many industries, and designers may contribute by the use of its information and technologies, making it easier to focus on improving their creativity by the effectiveness of smart technologies and machines.

Method

In this study, we used experimental research through observation and testing of 34 VCD students, giving them the same task. The students were randomly divided into two groups of 17 students each (group A and group B). Group A completed the task using AI, while Group B completed the task using other reference media without AI.

Participants and Task

Students in 2 groups were asked to create a non-human mascot to represent Soegijapranata Catholic University (SCU) VCD program. The characters created are prohibited from using stationery or painting properties with the intention of showing difference between

VCD and fine arts study program. The character must also be considered in order to be a Virtual YouTubers (VTubers) that can be used as a visual asset for digital purposes (Hermawan et al., 2024). VTubers are virtual personas that employ real-time motion capture and AI to animate characters and engage audiences through live-streaming platforms and utilize 3D or 2D models to create content, reflecting both individual identity construction and broader cultural expressions (Yuan, 2025).

Procedure and Work Scheme

Students were given a piece of paper and a total of one hour to create a character as in the brief. In the process, both groups were assigned to two different locations. Each group was allowed to use any reference media. Observations were also made by checking the progress time of the work every twenty minutes to determine the stages completed by each student.

There was no time limit for the ideation process and design work as long as everything could be completed within one hour. This was done to observe the ideation time process, including the characteristics and details of each participant's work. The result of the design ideation process was done by drawing a final sketch of the character that had been made on the paper given. At the end, participants must draw the final sketch of the character on the given paper, as a result of the design ideation process that have been done.

Data Analysis

To test the comparative study in this research, the author uses a qualitative method with data reduction to process the results of the design comparison study that has been conducted with participants. Data reduction is a process of summarizing, selecting key things and focusing on important things and then looking for themes and patterns (Mezmir, 2020). The data reduction process was carried out with the assistance of a design expert, namely Mrs. Agnes Indah Suciani Kristanti, as a lecturer in charge of the Semantic Design Studio course at the Soegijapranata Catholic University and has experience teaching topics relevant to this research since 2016. The expert analyzed and assessed using a blind review technique, so the expert did not know the identity of the designer.

Furhtermore, the expert will analyse which work are the best in implementing the brief that has been given to students. This is important to determine the character chosen by each student, along with its meaning, and to identify which best aligns with the image of SCU's VCD program. The analysis process with the expert is conducted through a blind review, in which the author does not tell the expert the differences between Group A and Group B whether they used AI or not. The following is the data reduction process carried out by the author.

Results

In this study, participants were free to use their own preferred reference media to design their mascots. Table 1 is a summary of the media used by each student. By observing the time and process carried out by each student ideation process. The researcher made a scheme of the process carried out by each participant by writing the behaviour code in table 2 and dividing the three stages of work, Pre-Process, Mid-Process, and Post-Process into figure 1 and figure 2. Pre-Process is carried out in the first 20 minutes of the participants process, the next 20 minutes are categorized as Mid-Process, and the last 20 minutes of are cate-

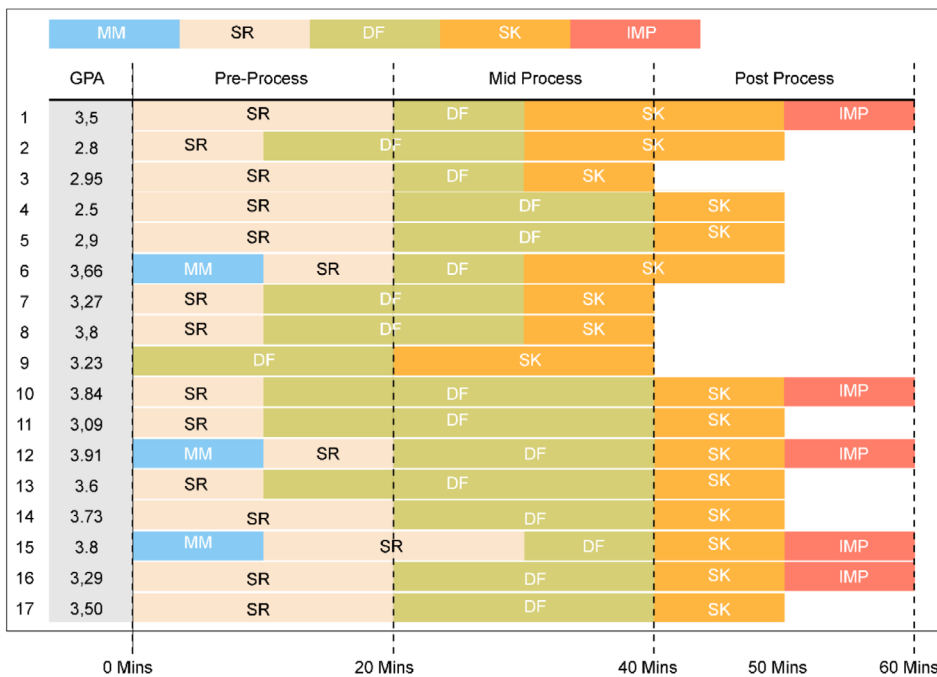
gorized as post-process. Each students experienced different times and ideation process at each stage.

The expert was asked to select 15 out of 34 works first. the selected works are considered to have good semi-otic meaning to be used as a mascot for the SCU's VCD program, according to the brief with good visual as well. Refer to table 3, it showed that the selected works from group A are works belonging to participants with numbers 1, 6, 8, 12, 14, 15, 16, 17. while the selected works from group B are works belonging to participants with numbers 18, 25, 26, 29, 31, 32, 33. it can be observed that group A had 8 selected works, while group b had 7 selected works, making group a superior by one selected work.

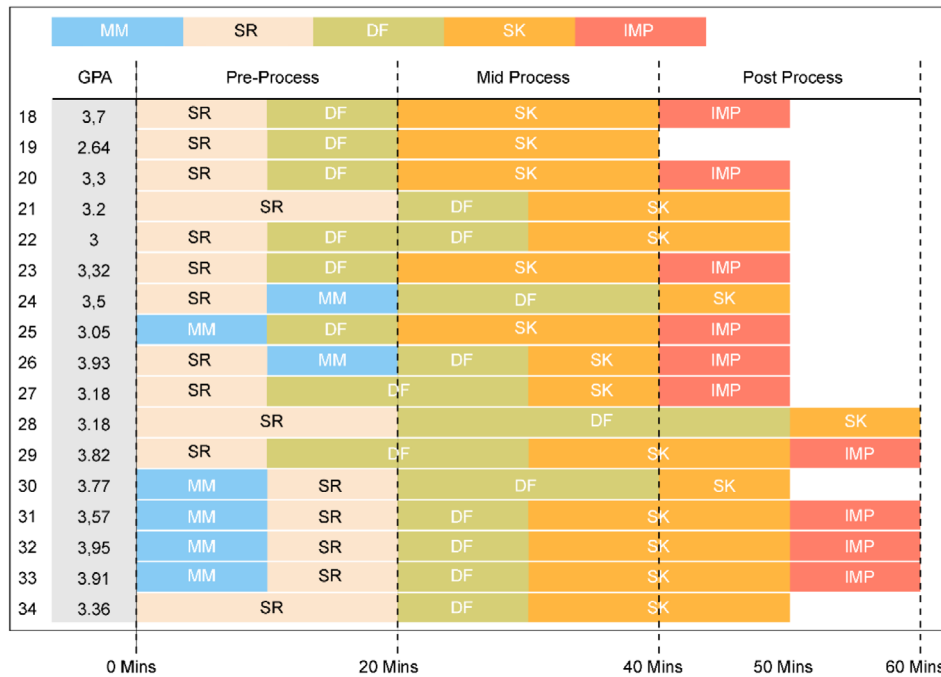
Table 1

Participants Ideation Process

GROUP A – AI GENERATIVE IMAGE TOOL IDEATION					GROUP B – NON AI IDEATION					
NO.	GPA	MEDIA				NO.	GPA	MEDIA		
		Bing AI	Copilot	Leonardo AI	ChatGPT			Pinterest	Google	Instagram
1	3,5	✓	✓			18	3,7	✓		
2	2,8					19	2,64	✓		
3	2,95		✓			20	3,3	✓		
4	2,5		✓			21	3,2	✓		
5	2,9	✓				22	3	✓		
6	3,66			✓		23	3,32	✓	✓	
7	3,27			✓		24	3,5	✓	✓	
8	3,8			✓		25	3,05	✓	✓	
9	3,23			✓		26	3,93	✓	✓	
10	3,84	✓	✓	✓		27	3,18	✓		
11	3,09			✓		28	3,18	✓		
12	3,91	✓			✓	29	3,82		✓	
13	3,6			✓		30	3,77			
14	3,73	✓			✓	31	3,57	✓	✓	✓
15	3,8	✓			✓	32	3,95	✓	✓	
16	3,29	✓			✓	33	3,91	✓	✓	✓
17	3,50	✓			✓	34	3,36	✓		
Total		8	4	7	5	Total	16	9	2	



» **Figure 1:** Behaviour Code of Group A



» **Figure 2:** Behaviour Code of Group B

Table 2

Code and Definitions

Behaviour Code	Description
MM (Mind Map)	Brainstorming process by creating a series of information images
SR (Search)	The process of searching for references to gather the information needed
DF (Define)	Building an understanding and desire from the information that has been collected
SK (Sketch)	The process of making the final drawing based on the understanding and desire
IMP (Improve)	Adding or correcting details to complete the sketch

Working Scheme

Based on the analysis of the participants workflow in Figure 1 and Figure 2, it can be observed that Group A spent more time on the search and define process compared to Group B, which focused more on the sketching and design improvisation process.

It was also found that the define process in Group A differed from that of Group B. Group A performed the define process by repeatedly generating images until they found an alternative visualization that suited their needs before proceed to the sketching process.

In contrast, Group B conducted the define process by deeply researching the selected character type, followed by making rough sketches before developing the final sketch.

Reviewing the workflow of the 15 selected works, it was found that 8 out of 15 students used mind mapping during the pre-process stage. Additionally, 11 out of 15 students made improvisations to their work to make it more refined and aligned with their objectives. The workflow of the 15 selected works is presented in Figure 3.


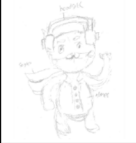






It can be observed in Figure 2 that Group B spent more time on the sketching process. Then based on the analysis of 34 sheets of collected design work, it was found that none of the participants in Group A created rough sketches or on the provided paper. In contrast, in Group B, 8 out of 17 students did the sketching, problem solving and mind map process on the paper sheet given. Table 4 presents the findings related to Group B's sketching process.

References Media

It was found in Group A, that 8 students used Bing AI, 4 students used Copilot, 7 students used Leonardo AI, 5 students used ChatGPT, and 1 student used Meshy AI. This indicates that Bing AI is the most frequently used tool, with 8 users. Meanwhile, in the ideation process conducted by Group B, 16 out of 17 students used Pinterest, 9 students used Google Images, and 2 students used Instagram. This shows that Pinterest is the most preferred reference platform for the ideation process, with 16 students using it.

Table 4

Group B findings in sketching process

Participants Number							
18	21	25	29	30	31	32	33
							

Discussions

Based on the research on the working process and the final works, the author with the expert, conducted a re-evaluation of the existing data and performed data reduction.

Best Work

From 15 selected works deemed suitable by the expert, further data reduction was carried out by selecting the 3 best works that are considered the most suitable as SCU's VCD mascot.

These selections were based on good visual, alignment with the brief, and creative meanings.

As a result, the works of participants numbered 6 and 12 from Group A, and participant number 33 from Group B were selected. This again makes Group A superior by one selected best work.

1. Participant Number 6 (Figure 4)



» **Figure 4:** Participant's Work Number 6

The selected mascot, a koala character is illustrated with a body that is splashed with colour, the character wears a beret hat, smiles while holding the university's alma mater jacket. This koala was chosen as it symbolizes SCU's VCD students, who can adapt to any situation with ease. Holding the alma mater jacket can also represent students' readiness to face challenges.

Koalas are known for their lazy nature and long sleeping hours, becoming active from dusk to night, and even at dawn. This fact is quite similar to the habits of many VCD students who tend to prefer to do assignments and activities late at night, and often staying up until dawn. Wearing a hat is a common thing for VCD students, but a beret hat is reflecting students' personality and desire to be unique and eccentric, especially with paint spill ornaments on the character's body as a symbol of creativity.

2. Participant Number 12 (Figure 5)



» **Figure 5:** Participant's Work Number 12

The chosen mascot, represented by a chibi wolf character, smiling while clenching his hands, symbolizing perseverance. Based on the information added by participants, this character is interpreted as a brave and tough character. A detail shows that the tail on this character is also splashed with colour.

The wolf is a representative of students who tend to be more active at night and have a habit of gathering with their packs. Wolf is considered as a wise leader in the packs, good adaptation skill and problem solving. Wolf are suitable characters to portray a brave nature that willing to face challenges.

With a splash of colour on its tail, this can give the impression that the wolf mascot is a character who is willing to accept creative challenges.

3. Participant Number 33 (Figure 6)



» **Figure 6:** Participant's Work Number 33

The chosen mascot is a cloud character. The mascot is portrayed with a smiling, wearing glasses, and splashed with color. Based on the information written by the participants, the cloud symbolizes freedom in creativity, with details of color splashes on the face. The character is also described as having a sleek body, modern clothing, and wearing a VR headset, which shows that SCU's VCD program embraces learning and innovation in art, design, and technology. This character is considered suitable to illustrate SCU's VCD positive, cheerful, free spirit, and technology literacy in creativity. The use of VR shows advancements in technology and knowledge.

Working Process Factor

It was found that 8 out of 15 students whose work was selected used the mind mapping process during the pre-process stage. Additionally, 11 out of 15 students made improvements to make it more suitable.

In contrast, among the 19 students whose work was not selected, only 2 students applied the mind mapping process, and only 4 out of 19 made improvements to their designs.

This indicates that mind map process and improvisation help the students' thinking process to be more thoughtful in determining what kind of work they will create in order to become a good and appropriate work (Jones & Morrison, 2021). The use of mind mapping methods can help the users to improve their critical thinking skills in processing creativity because mind mapping helps users in categorizing and organizing visual information and creativity, which will be useful in the process of solving existing problems (Chiu & Hwang, 2024).

High Achievement Factor

Among the 15 students with selected works, it was found that 13 of the 15 students have high achievement in their academic performance.

The form of high achievement is known through their Grade Point Average (GPA) being above 3.5, with the overall average GPA of students with selected works being 3.67. Additionally, two students with the best selected works have excellent high achievement by achieving a GPA of 3.91. Meanwhile, 2 out of the 13 students with selected works had mid-level academic achievement, with GPAs of 3.29 and 3.05.

The author also conducted an analysis of students whose work was not selected. It was found that the average GPA of this group is 3.19, indicating a mid-level academic achievement. It can be concluded that students with selected works have a good academic achievement (Purnomo & Chen, 2025). GPA is one of the factors that support students in the design thinking process of creating more refined and high-quality work (Povinelli, 2023).

Reference Media Factor

In Group A, Bing AI was found to be the most widely used AI generative image engine by students, likely due to its features and output quality. Meanwhile, in Group B, the majority of students used Pinterest for their ideation process, with 16 out of 17 students using this platform during the search and definition process. This finding suggests that many students consider Pinterest their preferred reference platform due to its efficient features and immediate visual image references (Scolere, 2023).

The integration of AI into the creative process, particularly in mascot design ideation, represents a significant evolution in design, particularly in terms of timeliness and big data (Ardhianto, Santosa & Pusparani, 2023). However, AI ideation methods require prompting skills with good language structure, good visual taste for supervise the result from the AI, and need basic skill in computing and internet access. The emergence of generative AI technology allows designers to explore a wide range of artistic possibilities (Xiao, 2025).

Generative AI fosters a collaborative dynamic that combines human ingenuity with computational capabilities, empowering designers to see visual data that might not have initially emerged during manual ideation. Therefore, AI is more of an idea-stimulating tool, as the majority of output is derived from data the machine has stored and trained.

While traditional ideation methods typically rely on human creativity and intuition, these are actually key to generating creative ideas. Humans can combine information and context into visual ideas because of their intuition and aesthetic experience. However, they cannot generate images as quickly as AI. This trend aligns with the increasing use of AI in various creative fields and underscores the importance of understanding AI tools as an enhancement to human creativity, not a replacement.

Conclusions

Through a series of data reduction processes conducted to curate the best works, it was found that Groups A and B differed only in one selected design and the best work. This slight difference does not indicate that the use of AI in the ideation process is superior to other conventional media. However, it does indicate that AI-generated image tools can be a competent reference and ideation tool.

This study also revealed that students whose works were selected had high academic achievement. This is a supporting factor in how high-achieving students are able to think more critically to produce work that meets the brief. These high-achieving students often engage in the ideation process using mind maps and improvisation, which can help users think more critically in determining the suitability of the work. This occurs because these processes help designers organize visual information and context more effectively. Critical thinking is a crucial aspect of ideation that can influence the suitability of the work.

Future works

The ideation process, with or without the use of AI generative tools, must always be approached with critical thinking in processing information. Furthermore, while AI is only a tool, visual sense derived from aesthetic experience is crucial in visual design and the determination of which visuals will be published.

One method of organizing visual information during the ideation process is through the use of mind maps. While AI can produce high-quality results, its effectiveness can be further optimized by incorporating the user's critical thinking processes.

A recommendation for future research is to focus on how AI generative tools can produce more innovative visual work (Alayrac et al., 2022), taking into account the complexities of various design styles and current trends. This approach could increase the acceptance of AI in everyday life and society.

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