

A Study on Logo Design Using Artificial Intelligence Logo Maker Web Service (Focusing on the type of idea)

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Abstract

Logo design plays a crucial role in brand marketing as an effective communication symbol that represents the identity of various products or services. The creative work of simplifying these symbolic meanings has traditionally been a specialized area reserved for designers, requiring unique artistic skills. However, with the advancement of artificial intelligence technology, it is anticipated that even the field of logo design could partially replace the role of designers, leading to changes in design methods and processes. Notably, AI Logo Maker Web tools provide automated solutions that allow users to easily and quickly create logos. With easier accessibility, convenience, and high efficiency compared to human designers, their use has been expanding, and related research has been progressing. However, specific studies comparing the AI's creativity in the idea generation phase with that of human designers have yet to be thoroughly conducted.

This study aims to explore the collaborative potential by analyzing and comparing the types of idea generation (combination, similarity, expansion) in logo design sketches by professional designers versus AI Logo Maker-generated logos through word frequency analysis based on in-depth interviews. The results indicate that the total number of idea-related words used was 343 for designer sketches and 311 for AI Logo Maker outputs, with the AI using fewer words overall compared to the designers. Designers used more words in combination and similarity categories, while the AI excelled in expansion.

The AI demonstrated remarkable performance in expansion, suggesting that AI Logo Maker Web services should be used in a complementary manner rather than as a replacement for designers. AI can provide rapid results by suggesting highly expansive ideas, while designers can refine these ideas to align with the concept. To better reflect the intuitive and creative workflows of users, AI needs to develop flexible and customizable interfaces that cater to varying levels of user expertise. Additionally, the AI's customization features should be enhanced through collaborative efforts with professional designers.

This research specifically presents a direction for collaboration between designers and AI by comparing their idea generation types. At the same time, it proposes important insights into the value of artificial intelligence technology and human designers within the design industry.

Keywords: AI Design, Logo Design, Artificial intelligence, Idea Generation Type, Idea Sketch

1. Introduction

Artificial intelligence (AI) technology is being applied across various fields, leading to transformations in workflows and processes. Even in traditional arts and design, where human inspiration and creativity are fundamental, AI is making an impact. As database error processing and learning capabilities improve at a rapid

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pace, it is anticipated that AI will be able to take on part of the role of designers soon. Logo design, as a visual element that represents the identity of products or services, plays an important role as an effective communication symbol, conveying quality, value, personality, and concept to potential consumers and the public. This complex process of visual simplification and symbolism used to be a specialized area restricted to designers with creative expertise. However, with the advent of advanced AI technologies, design methods and processes are becoming increasingly accessible to the public.

AI Logo Maker Web tools provide efficient solutions, offering various design options and automated recommendations that make it easier for anyone to generate a final product. Despite the growing use of these tools, there has been limited verification of whether they can fully replace the ideas generated by traditional human designers. Therefore, this study aims to explore the potential value of AI in collaboration with designers by comparing the idea generation stages specifically the idea sketches created by professional designers and the logo design of AI Logo Maker Web through interviews and in-depth analysis.

2. Research Methods

To explore the idea types generated by professional designers and AI Logo Maker, an in-depth interview was conducted to analyze and compare word frequencies.

1. Conduct a literature review to understand artificial intelligence and design.
2. Assess the current state of AI Logo Maker Web services and identify representative cases.
3. Split the logo design task into two groups: one using idea sketches and the other using AI Logo Maker.
4. Conduct in-depth interviews where participants reflect on their experiences with both idea sketches and AI Logo Maker logo design processes.
5. Perform coding analysis on the word frequency from each interview, comparing the counts to draw conclusions regarding the types of idea generation.

Research Question 1. For search goods, did idea sketches or AI Logo Maker perform better in idea generation (combination, similarity, expansion)?

Research Question 2. For experience goods, did idea sketches or AI Logo Maker perform better in idea generation (combination, similarity, expansion)?

Research Question 3. For credence goods, did idea sketches or AI Logo Maker perform better in idea generation (combination, similarity, expansion)?

3. Artificial Intelligence and Design

3-1. AI-Based Logo Maker Web Services

The fields of artificial intelligence can be divided into machine learning and deep learning, distinguished by learning methods and implementation complexity. Machine learning typically involves manually selecting features and creating models to solve problems, allowing for rapid application to relatively simple issues. In contrast, deep learning mimics the way the human brain processes information, enabling self-learning, which requires large volumes of data and high-performance computing power [1]. In terms of application areas, machine learning is widely used for tasks like data mining, recommendation systems, and fraud detection, focusing on identification rather than accuracy [2].

Deep learning models use neural networks that can predict and evaluate accuracy autonomously, making it possible to partially replace human functions. However, with machine learning, as new data is introduced, certain tasks may become more proficient, but human intervention is still required. Various design solutions based on AI technology use terms like AI-Powered Design, AI-Generated Design, and AI-Driven Design interchangeably. Moreover, generative design and algorithm design refer to image creation based on deep learning, utilizing deep neural network structures. [3]. In this context, As shown in Figure 1 AI Logo Maker Web are broadly referred to as AI-Powered Design because they are based on machine learning.

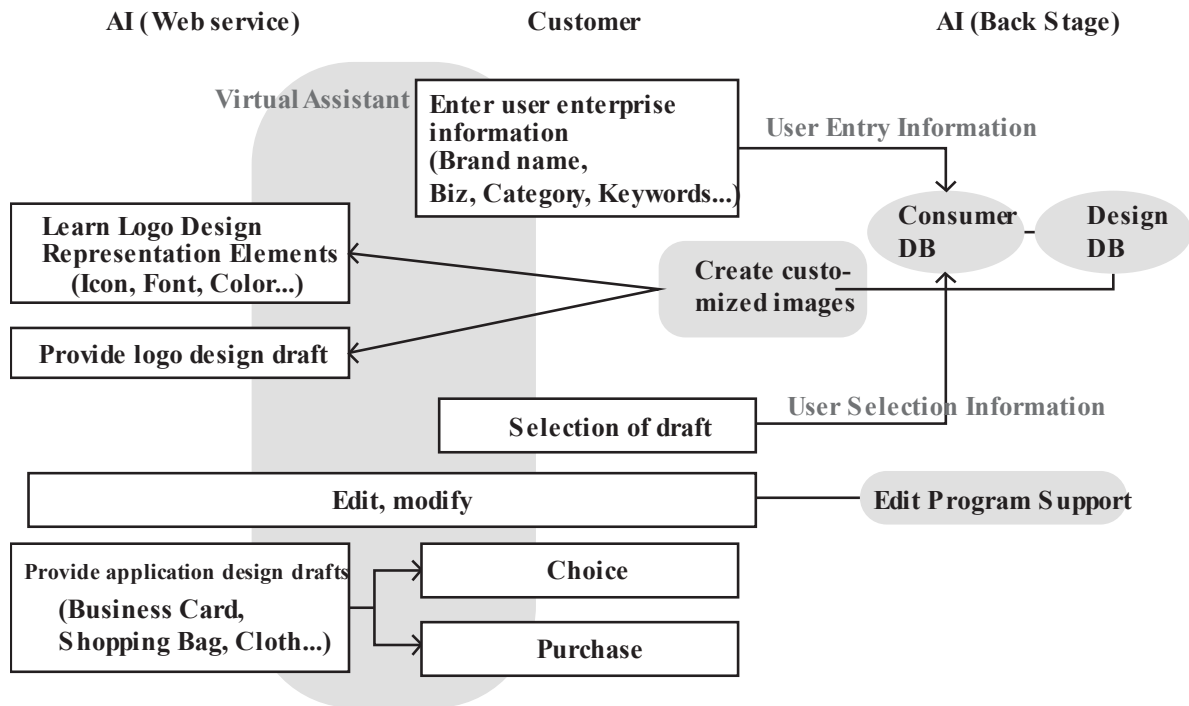


Figure 1. Logo design process of AI-based logo Maker tool

As shown in Table 1 AI Logo Maker websites can be classified into international and domestic services. Internationally, services like Wix Logo Maker, Logo, Pony, Hatchful, Design With AI, Tailorbrands, and Brandmark are prominent, while domestic services include Vivivik, Designs, and Logomaster. Although the logo creation processes vary slightly across these sites, they generally follow the steps: Brand Name → Industry Selection → Logo Style → Icon Selection → Logo Creation. Additionally, elements such as Slogan, Style, Mood, Color, and Symbol Selection are included as part of the process, depending on the specific website. Among these, "Wix Logo Maker," established in New York in 2014, has been selected for this study due to its extensive user experience and data accumulation. Currently, all AI Logo Maker Web services operate using machine learning.

Table 1. Current Situation of AI-Based Logo Maker Web Services

Category	Business Name	Logo Making Process	Type of Artificial Intelligence
Domestic Services	Vivivik	Brand Name → Industry Selection → Logo Style (emphasize design, industry, or brand name) → Preferred Style Selection (curved, rounded, straight, angular) → Logo Creation	Machine Learning
	Designs	Brand Name → Industry Selection → Logo Style (Icon, Initial, Name) → Slogan → Preferred Style Selection (5 options) → Color Selection (using provided color imagery) → Icon Selection → Logo Creation (select from 5 options) → Edit	
	Logo master	Brand Name → Industry Size → Logo Style → Color Selection → Icon Selection → Logo Creation	
International Services	Logo Pony	Brand Name → Brand Size (individual, business) → Color Selection → Slogan Setting → Logo Creation → Design Edit	
	Hatchful	Business Type → Visual Style Selection → Company Name and Slogan → Application Selection → Logo Creation	
	Design with AI	Brand Name → Industry Selection → Logo Creation (AI-based recommended editing provided)	
	Tailorbrands	Brand Name → Application → Industry Selection → Logo Type → Logo Style (3 options) → Logo Creation	
	Looka	Brand Name → Industry Selection → Style Selection → Color Selection → Symbol Selection → Logo Creation → Logo Selection and Edit	
	Wix logo maker	Brand Name → Industry Selection → Mood Selection (keywords) → Design Style Selection (logo image) → Application Usage Range Selection → Logo Creation	
	brandmark	Brand Name → Keyword → Color Selection → Logo Creation	

3-2. Previous Studies on AI-Based Design

Yeon Myung-heum and Jung Eui-tae (2019) proposed that AI logo creation platform services lack the initial stages necessary for deriving and analyzing critical brand essences, which are essential in the traditional logo design process. They suggested further research to address this gap [4]. In a follow-up study conducted in 2023, they indicated that it is difficult to distinguish between AI-generated logo designs and those made by human designers. Moreover, it was found that general expectations for AI-based design outcomes remain low. They also suggested that, in the near future, human designers will likely delegate tasks that were previously assigned to junior designers to AI design tools, allowing them to focus on more creative, strategic tasks and decision-making roles [5]. As shown in Figure 2 Ryu Joon-sang and Oh Byung-geun (2023) proposed improvements to the existing AI Logo Maker Web service from a functional perspective, including features such as 'more detailed industry settings,' 'AI implementing user sketches,' and 'more diverse color and font settings' [6]. They suggested enhancing the AI-based logo Maker Web process. They also recommended follow-up research to compare AI-based brand design with human designer outcomes to assess the current quality of AI-based design and to identify further studies needed to improve that quality.

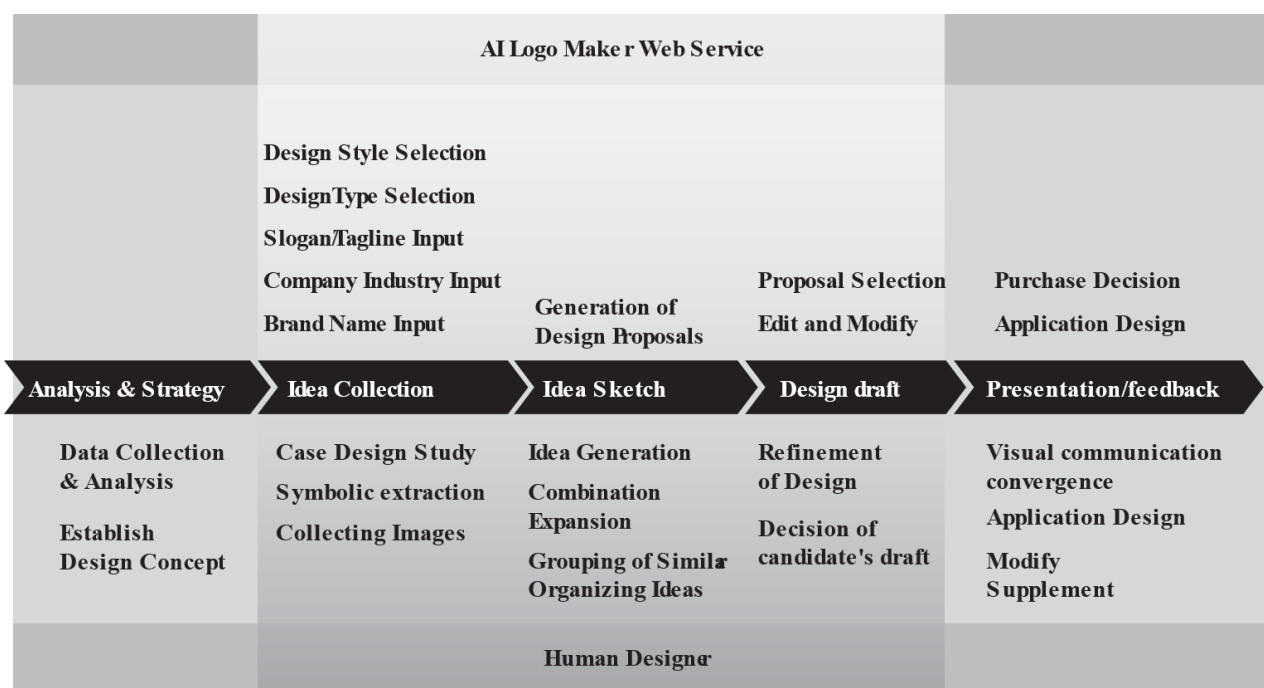


Figure 2. AI vs Designer's Logo Design Visualization Process

3-3. Characteristics of Logo Design by Product Type

Research on product types has been conducted in various forms. As shown in Figure 3 Zeithaml (1981) stated that in studies on product type classification, the ease of evaluating product quality can be represented on a continuum, ranging from easy to difficult [8]. These product types are categorized into three groups: first, search products, which are tangible; second, experience products, which are a hybrid between tangible and intangible goods; and third, credence products, which are services and thus intangible.

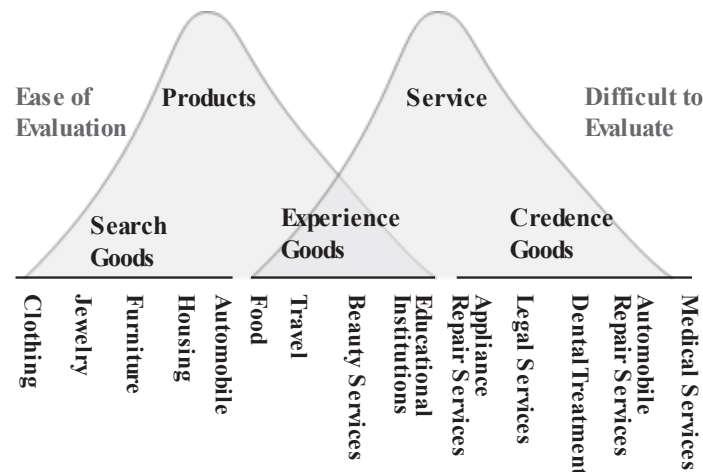


Figure 3. Product Classification by Quality Evaluation

As shown in Table 2 Kim Hae-ryong and Lee Ki-dong (2005) conducted a study on the visual characteristics of logos and brand concepts based on the characteristics of these three product types. They found significant differences in the characteristics of logo designs depending on the type of product. Furthermore, they suggested that in order to design an effective brand or logo, it is crucial to first understand the nature of the product or service and align it with the logo's characteristics. This provides a foundation for designing more effective and diverse logos [9]. Based on this understanding, the study selected these three product types to determine whether AI can effectively test and handle the variations in logo design across different categories. Based on this understanding, it is believed that testing various types of logo designs using AI would be feasible, and thus, the study has selected these three product types as the scope of the research.

Table 2. Comparison of Product Types by Inherent Characteristics

Category	Tangibility	Product Type	Brand Concept
Intrinsic characteristics	Tangible	Search Goods	High determinability, low ambiguity
	Semi-Tangible	Experience Goods	High determinability, high ambiguity
	Intangible	Credence Goods	Low determinability, high ambiguity

3-4. Idea Generation and Logo Design

The logo design process emphasizes the importance of collecting idea sources and establishing design types (typography, images, logotypes, symbol logo combinations, characters) based on idea sketches, while considering the brand design concept [12]. Ideas play a crucial role in logo design, which serves as an expressive symbol for building a brand.

In the 2009 book *"Idea Generation Methods"* by Shin Gang-Gyun, methods of idea generation were proposed as follows:

1. Hypothesizing
2. Simple association
3. Extending stimulation to distant areas
4. Finding similarities [13].

These methods were redefined in Park Mun-Soo's 2013 study on idea generation types for award-winning advertisements, resulting in the categories: hypothesizing, combining, processing, finding similarities, and redefining into reality [14]. Based on this, the idea generation types and concepts suitable for idea sketches and AI Logo Makers have been reorganized as shown in the table 3.

Table 3. Types and Concepts of Ideas

Idea Generation Type	Concept
Mixing	An idea generation method that aims to solve problems by combining two related words or forms.
Similarity	An idea generation method that aims to solve problems using similar shapes and words based on existing characteristics and associations.
Expansion	An idea generation method involving simulations of "What if..." scenarios to create new possibilities.

4. Research Plan

To investigate the idea generation processes of AI Logo Makers and human designers, six professional designers with varying levels of experience were selected and divided into two groups. Each group was tasked with designing logos using either hand-drawn idea sketches or the Wix Logo Maker.

As shown in Table 4 the process was as follows:

- (1) Each designer was provided with three product-specific logo design briefs.
- (2) Group A worked on hand-drawn idea sketches, while Group B used the Wix Logo Maker Web platform to create their designs.
- (3) After completing the tasks, an in-depth interview was conducted with each participant.
- (4) The designers were asked to recall their experiences by reviewing the results of the hand-drawn sketches and AI-generated logo designs.

Table 4. Designer In-depth interview overview

Category	Details				
Goal	To compare the idea generation types (Combination, Similarity, Expansion) between designer's idea sketches and AI Logo Maker's logo designs.				
period	September-November 2024				
Location	"A space equipped with idea sketches and an internet-connected computer system, featuring a two-person table and chairs with voice and video recording devices, isolated from the outside."				
Preparation Items	Paper, pencil, eraser, color chart, geometric ruler / monitor, PC, keyboard, mouse				
Method	1:1 Face-to-Face Interview				
Procedure	Experiment Explanation > Provide Design Guidelines by Product Type > Group A Idea Sketching > Group B AI Logo Maker Web Usage Instructions and AI Logo Maker Logo Design > In-depth Interview				
Overviewee (Designer)	Group	Designer	Professional Experience	Gender	Design Field
	A	L	10 years	여성	Visual, Brand, Editorial, Graphic Design
		J	8 years	여성	Visual, Brand, UX/UI Design
		L	5 years	여성	Visual, Packaging, Advertising Design

	B	P	10 years	여성	Visual, Advertising Design
		K	9 years	남성	Visual, Motion Graphic Design
		K	4 years	여성	Visual, Brand, Editorial Design

This research approach, grounded in practical application, aimed to elicit direct Story from designers who experienced AI tools firsthand. It was considered the most effective way to achieve the study's objectives. Additionally, As shown in Table 5 to minimize discrepancies in idea generation due to differing logo characteristics across industries, product-specific design briefs were developed as standardized criteria. Activities beyond the hand-drawn sketches and AI Logo Maker usage were controlled to ensure consistency.

Table 5. Logo Design Directions by Product Type

Type	Search Goods	Experience Goods	Credence Goods
Business Name	Funipets	BeauMe	Wailastic
Slogan	Life with pet	Love myself	Young & Healthy
Business Industry	Furniture Store	Hair Shop	Spine Orthopedics Clinic
Target	Males/females 20s to 30s	females 20s to 30s	Males 40s to 50s
Brand Story	Rest and life with pets	Every woman is beautiful	Elastic Waist Healthy Life
Logo Style	Symbol (Icon) + Text	Symbol (Icon) + Text	Symbol (Icon) + Text

The interview content was analyzed using language coding to extract vocabulary related to idea generation. Duplicate vocabulary was recorded only once, and similar terms were grouped into categories. The summarized results are presented as Show in the table 6.

Table 6. Key Vocabulary Frequency Related to Idea Generation Types

Product Type	Idea Generation Type	Used Words	Example Sentences
Search Goods	Mixing	Combine, Mix, Mixing, Merge	"Mixed text to create a new outcome." "Combined furniture and pet elements to create a warm image."
	Similarity	Similar, Existing, Reproduce, Close	"Selected a similar color palette." "Expressed the brand image of a furniture store in a similar form."
	Expansion	Expand, Transform, Add, New Attempt, Develop	"Expanded on an existing idea by using suggested options." "Added a new icon to the existing design."
Experience Goods	Mixing	Combine, Mix, Merge	"Combined symbols and backgrounds to create an elegant atmosphere." "Mixed images to strengthen the brand identity of a beauty salon."
	Similarity	Similar, Existing, Reproduce, Close	"Found and added a similar curved symbol." "Selected a text style similar to the imagined beauty salon logo."

	Expansion	Expand, Transform, Add, Develop, Diverse Attempts	"Transformed the suggested icon into a more luxurious style." "Expanded the shape of the symbol to express the unique image of the beauty salon."
Credence Goods	Mixing	Combine, Merge, Mix	"Merged simple lines with a hospital symbol to create a trustworthy design." "Combined a cross and circular icon to create a balanced logo."
	Similarity	Similar, Existing, Reproduce, Close	"Selected a color similar to that of an existing hospital logo." "Reproduced the trust image of the hospital using similar symbols."
	Expansion	Expand, Transform, Add, Develop, New Attempt	"Expanded the idea using the suggested icon to add a more professional look." "Expanded the color palette to develop a young and healthy image for the hospital."

The results of the vocabulary count by idea generation type for Group A's idea sketches and Group B's AI Logo Maker logo design are shown in the following Figure 4 and Table 7.

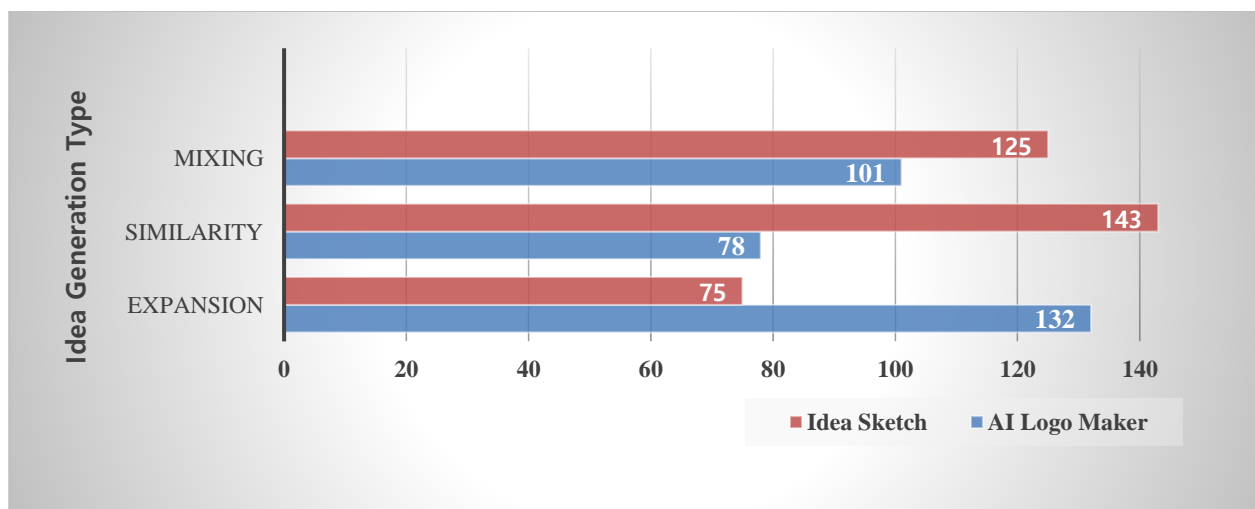


Figure 4. Word Total by Idea Generation Type

Table 7. Word Count Summary by Idea Generation Type

Group	Designer	Goods Type	Word Count Summary by Idea Generation Type		
			Mixing	Similarity	Expansion
A	K	Search	15	20	10
		Experience	14	18	9
		Credence	13	16	8
	J	Search	12	15	10
		Experience	16	20	7
		Credence	11	14	6
	L	Search	20	15	12
		Experience	14	15	8
		Credence	10	10	5
Idea Sketch Word Sum			125	143	75

B	P	Search	10	8	16
		Experience	12	9	15
		Credence	11	10	14
	K	Search	11	9	14
		Experience	10	8	13
		Credence	12	9	15
	L	Search	12	10	15
		Experience	13	7	16
		Credence	10	8	14
AI Logo Maker Word Sum			101	78	132
Total			326	221	207

5. Result

Comparison of Vocabulary Counts by Idea Generation Types

Mixing Type (Combination) :

Designer Idea Sketches: 125 words AI Logo Maker: 101 words

Designers demonstrated a higher tendency to use combinative ideas, creatively integrating different elements into new concepts. Examples of vocabulary included phrases like

Designer: "Tried combining text and shapes," "Drew several images, erased, and merged them together."

AI Logo Maker: "Liked that it combined color palettes," "Tried merging multiple shapes or combining two icons into one logo." However, negative feedback such as "The combinations are not detailed" was not included.

Similarity Type:

Designer Idea Sketches: 143 words AI Logo Maker: 78 words

Designers were more prominent in leveraging existing ideas through similarity and building upon them. Examples of vocabulary included

Designer: "Repeated drawing similar shapes while gradually improving," "Recalled previous experiences and sketched similar images," "Tried drawing something similar while thinking of an object."

AI Logo Maker: "There are many similar fonts," "Selected similar icons," "Search results grouped similar shapes together."

Expansion Type:

Designer Idea Sketches: 75 words AI Logo Maker: 132 words

AI Logo Maker showed a higher occurrence of vocabulary related to the expansion of ideas.

AI Logo Maker: "Provides various images for users to choose from," "Additional application designs can be viewed," "Recommended icons inspired new thoughts."

Designer: "Drew new images," "Expanded on the original idea to include more diverse elements."

This comparison reveals the nuanced differences between how human designers and AI tools approach idea generation, highlighting the strengths of each method in fostering creativity.

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6. Conclusion

The total vocabulary count related to idea generation was 343 for designer idea sketches and 311 for AI Logo Maker, indicating that AI slightly lagged behind human designers in the number of words. However, designer sketches showed greater emphasis on combination and similarity, while AI Logo Maker excelled in expansion. This suggests that designers are more adept at improving and combining existing ideas, while AI is advantageous in providing diverse expansions and quick data.

The Idea Sketch of designers stands out in combination and similarity, whereas AI's machine learning capabilities are prominent in expansion. Based on these findings, AI Logo Maker web services should be utilized not as a replacement for designers but as a complementary tool for collaboration. AI can offer rapid results with high levels of expansion, and designers can refine these results to align with conceptual ideas.

Designers should also leverage the automated outputs of AI to merge their creativity and intuition into unique ideas. To achieve this, enhancing designers' understanding of AI's mechanisms and design recommendation algorithms will be an essential skill.

At the same time, AI developers should aim to create more flexible, customizable user interfaces that better reflect the intuitive and creative workflows of users. Enhancing customization features in collaboration with professional designers is necessary to maximize AI's utility.

This study provides a concrete direction for collaboration between designers and AI by comparing their respective approaches to idea generation. It also offers significant insights into exploring the value of AI technology and human designers in the design industry, paving the way for future research into the optimal collaboration processes between AI and designers.

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