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RESEARCH ARTICLE

A Qualitative Research on the Metaphors and Opinions of Graphic Design Department Students Regarding the Concept of Artificial Intelligence

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What is already known on this topic?

- *When the literature is reviewed, it is seen that artificial intelligence and metaphorical approaches developed toward this concept are discussed in different disciplines; however, it draws attention that studies containing the perception of artificial intelligence specifically in graphic design are virtually non-existent or extremely limited. This study aims to fill this gap in the literature by describing the mental schemas of graphic design department students regarding the concept of artificial intelligence through metaphors.*
- *It will also serve as a guide in revealing students' knowledge levels and perspectives on artificial intelligence technologies and in the process of integrating technology into the field of design.*
- *It is anticipated that the findings obtained from the study will contribute to evaluating the contributions of artificial intelligence to professional application fields and constitute a source for future academic projects and curriculum development processes.*

What this study adds on this topic?

- *Metaphors are used as a fundamental tool that helps students understand abstract concepts.*
- *Artificial intelligence is seen as a subject that can affect people's personal and professional development both positively and negatively in all areas of life.*

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Abstract

In today's world, where technology is developing at a dizzying speed, the present study aims to determine the approaches of future graphic designers toward the concept of artificial intelligence. A content analysis on the qualitative research method has been employed. The study group is selected using convenience sampling, a purposive sampling method. A total of 102 students (61 females, 41 males) participated in the research. In order to identify the students' metaphors regarding the concept of artificial intelligence, they are asked to complete the sentence: "Artificial intelligence is like…., because…," and a semi-structured interview form has been utilized as a qualitative data collection tool. In this analysis, the collected data are subjected to coding and sorting processes and categorized according to the emerging themes. During this stage, the data collected from participants are examined in detail through a semi-structured metaphor form. The most frequently produced metaphors by the students have been library, brain, and mirror. Female students most frequently have produced the metaphors of brain, mirror, library, and teacher, whereas male students have most frequently produced library, brain, and mirror metaphors. The metaphors obtained are divided into 12 conceptual categories. Among those categories, those with the most metaphors were "Information/Capacity" and "Negative Innovation-Risk/Danger." Regarding the positive outcomes that artificial intelligence applications might create in the professional field in the future, 27 students believed it would be a "helper" and 22 students believed it would have a positive impact on the development of the field. As for findings regarding negative outcomes, the students mostly have expressed the concern that artificial intelligence would replace the designer that is themselves.

Keywords: Artificial intelligence, designer, graphic design, metaphor, technology

Introduction

With evolving technology, artificial intelligence (AI)-supported applications ranging from calculators that facilitate the tasks in both professional and daily lives to smartphones, tablets, and computers are widely used by everyone. The technologies used have now become a part of everybody's lives and are indispensable. Developments in the information world, from YouTube recommendation algorithms that everyone have been using for a long time without realizing it, to voice-activated devices like Siri, and from navigation tools like Google Maps to facial recognition systems, have emerged with AI.

In general terms, AI is a new technology that produces various outputs by imitating and processing human behavior. This technology includes processes such as machine learning and then obtaining results by imitating human behaviors (Gondal, 2018; cited in: Albayrak & Kılıç, 2025; Şen, 2022; Kocaman, 2021).

The intersection of art and AI dates back to earlier times. With the invention of the camera, the birth of cinema, and the rise of digital art, art began to transition into a different phase. This interaction with AI began to go even further. In the last quarter of the 20th century, in parallel with developments in computer technology, AI began to influence the art world. Graphics, paintings, and interactive installations began to be created in digital environments. By the 21st century, with the development of machine learning and deep learning technology, the impact of AI on art increased even further. Today, AI-based artworks and the use of algorithms and datasets have begun to affect many fields of art, not just visual and auditory arts (Yüksel & Yüksel, 2024; Atalay, 2023).

The impact of AI on the production of art has become a topic discussed by everyone from artists and critics to technology experts and thinkers. Artificial Intelligence offers alternatives to the way and process of artists' creation. Artificial intelligence has also initiated discussions regarding the definition of art. Some argue that AI is just a tool and that what adds value to an artwork is human creativity, emotional connection,

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and experience. Others suggest that AI should be accepted as a creative entity, possessing the ability to learn and make independent decisions through algorithms, thereby allowing it to produce original artworks (Yüksel & Yüksel, 2024: 263–264).

Although the rapid development of AI represents significant progress for humanity, it has also brought concerns. Everyone shares a common worry: Can AI take away jobs? Today, AI tools are rapidly expanding in the design world, becoming helper components that offer a wide range of application opportunities to professionals. Artificial intelligence affects not only the production process and method but also the understanding of creativity and design. Technological advancements, particularly the development of deep learning and machine learning technologies, have been used in the field of graphic design since 2010 to improve performance and functionality by providing image creation, color, layout, and design suggestions.

The Impact of Artificial Intelligence on Graphic Design

Along with evolving technology, people's level of appreciation and aesthetic understanding is also changing. As in every field, the field of graphic design must follow technological developments and develop creative thinking and formal language for aesthetics. Graphic design, which is communication-based, should present the message with correct expressions and aesthetic concern while transferring information.

While designs in the field of graphic design were drawn by hand in 1980 and before, developments in computer technology in the 1990s started computer-based designs. Artificial intelligence applications immediately became popular and started to be used in the field of graphic design, which is intertwined with technological developments. With the development of image processing software, softwares developed by Adobe Systems, Macromedia, and Corel companies began to be used in the design field in the 1980s. Today, programs developed by Adobe Systems dominate the market. In 1987, Adobe Systems introduced Adobe Illustrator, and in 1988, the Photoshop software developed by the Thomas & John Knoll brothers was sold to Adobe and licensed. In 2005, Adobe Systems acquired Macromedia. Starting from 2022 and continuing into the present day, Adobe continues to develop programs such as InDesign, After Effects, and Premiere. These programs have become indispensable tools for designers.

With the development of AI, these image processing programs have also begun to evolve. For investors, lowering costs, increasing productivity thanks to AI, and eliminating the need for a designer have increased interest in AI. For example, in 2017, the Italian food company Ferrero utilized AI's image deciphering, generating, and printing features to produce seven million different jar designs for Nutella chocolate cream, which were sold out within 30 days (Ergün et al., 2022: 392). Through algorithms, Ferrero obtained Nutella labels that were distinct from each other, highly diverse, and more creative (Deveci, 2022: 131). Another example is the sneaker shoe models produced by Niels Garve using AI. Designs produced by AI under the curation of designers will soon become a technically indispensable, perhaps even ordinary situation. Especially in the near future, it is anticipated that AI will successfully perform complex tasks with its critical thinking ability. At the same time, it can be perceived as a threat due to the idea that it might replace designers. The use of AI in the design process has sparked debates about ethical issues, namely the originality of the design and who owns the copyright (Stahl & Eke, 2024; Perkins, 2023; Özdal, 2023). Although AI contributes technically to design processes, it does not yet possess an aesthetic perspective or concern (Albayrak & Kılıç, 2025: 9).

In a process where these discussions are taking place, a metaphor study was conducted to determine the approaches of future graphic designers toward AI, which shows rapid development. Metaphor is defined as a form of expressing a concept or situation with another concept or situation depending on the symbolic use of language (cited in: Bozdağ, 2025: 310). Metaphors are not just figures of speech; they help in understanding individuals' thought structures, emotional states, and how they perceive and make sense of the external world (Konstantinidis, 2025: 2). Metaphor has an important place in discovering attitudes, beliefs, and conceptual ideas that cannot be revealed by other research methods (cited in: Eriçok et al., 2024: 609–610). Metaphors concretize abstract concepts (Vallis et al., 2025), strengthen communication by reducing complex thoughts to simple terms, making it a popular research topic across different disciplines (Erdoğan & Bozkurt, 2023; Roe et al., 2025).

In this study, the metaphors of graphic design department students regarding the concept of AI and their opinions on its applications were examined, and answers to the following questions were sought for this purpose:

- Q1. What are the metaphors produced by graphic design department students regarding the use of AI?
- Q2. Under which themes are the metaphors produced by graphic design department students regarding the use of AI categorized?
- Q3. What are the opinions of graphic design department students regarding the impact of AI applications on their professional fields?

Methods

Research Model

This study adopted the content analysis technique, shaped within the framework of qualitative research methodology. Content analysis involves a process that allows for the discovery of hidden meanings and realities by examining the obtained data in depth. With this method, closely related data are systematically organized under specific concepts and tracks—namely, themes—and reported in a language that the reader can understand (Yıldırım & Şimşek, 2011: 227).

Study Group

While determining the sample of the study, "convenience sampling," one of the purposive sampling methods, was preferred. This approach provides the advantages of speed, practicality, and easy accessibility for the researcher while forming the study group (Yıldırım & Şimşek, 2011: 113).

The participants in the research consist of students studying in the graphic design department at the state university where the researcher is employed. Information regarding the study group, which covers a wide range of grade levels from the first year to the master's degree level, is presented in Table 1.

Data Analysis

Content analysis, one of the qualitative research methods, was used in the analysis of the data obtained from the research. Content analysis

Table 1.
Information Regarding the Study Group

		Frequency (*f*)	Percentage (%)
Gender	Female	61	59.8
	Male	41	40.2
Grade level	1st Grade	23	22.55
	2nd Grade	25	24.51
	3rd Grade	18	17.65
	4th Grade	22	21.67
	Master's degree	14	13.73

As seen in in the table, 59.8% of the study group consists of females, and 40.2% consists of males.

can be defined as a systematic, reproducible technique in which some words in a text are summarized into smaller content categories with encodings made according to certain rules. It is a technique that provides objective and systematic recognition of certain characteristics of a message. Content analysis is used to determine the presence of certain words or concepts in a text or set of texts (Büyüköztürk et al., 2011: 269). For this purpose, the collected data must first be conceptualized, then rationally organized according to the emerging concepts, and themes explaining the data should be identified accordingly (Yıldırım & Şimşek, 2011: 227).

The metaphors and responses obtained from the students about graphic design questions were analyzed in five stages. These are data coding, category creation, organizing the data according to codes and categories, ensuring validity and reliability, and interpreting the data.

In the data coding stage, the metaphors produced by the students were listed in alphabetical order and a list was created. While preparing the list, the documents belonging to candidates who did not clearly define the specific metaphor in the questionnaire form and did not fill in expressions starting with "because" or any part of the form were comprehensively examined. Then, a list of sample metaphors was created to validate the data analysis process and to use as a source to gather metaphors under a specific category. Long statements used by students were examined and significant aspects were taken into account. Encodings were used to indicate which metaphor images belonged to which student (participant).

In the second stage, during the creation of categories, the metaphors produced by the students were examined in terms of their common characteristics, and their relationships were analyzed. In the third stage, data were organized according to codes and categories, and after coding was done in detail, categories that could bring related codes together were determined. In the fourth stage, after validity and reliability studies were completed, expert opinions were obtained to confirm whether the metaphors presented under the eight conceptual categories developed in the study represented the conceptual categories to which they belonged. For this purpose, two faculty members working at the same university were assigned. In the fifth stage, metaphor categories were tabulated and interpreted along with information on the frequency of use of these metaphors and categories by gender. The opinions of the graphic design department students about the positive and negative future outcomes that AI applications might create in the professional field were also examined, and codes and themes were created. Consequently, the data were interpreted based on these findings.

Data Collection Tools and Data Collection

In the research, an interview and metaphor form was used to reveal students' perceptions toward the phenomenon of AI and their thoughts on its applications. Data collection tools reached their final form by being revised in line with expert opinions.

In the research, the start date for data collection was January 12, 2026, and the end date was January 24, 2026.

Artificial Intelligence Metaphor Form

In order to determine the metaphors developed by the participants regarding the concept of AI, a fill-in-the-blank form containing the statement "Artificial intelligence is like… because…" was presented to the participants. In the introductory part of the form, a sample metaphor definition and sentence were shared to guide the students. Students were asked to liken AI to an object or a living being of their choice and to explain the underlying reason for this comparison after the conjunction "because."

Semi-Structured Interview Form

A semi-structured interview form was preferred as a part of the qualitative data collection process. While this method provides a framework with predetermined questions, it also offers flexibility to obtain in-depth information on the researched topic (Büyüköztürk et al., 2011: 163). In preparing the questions, care was taken to ensure the simplicity of the language, to avoid leading expressions, and to focus each question on a single dimension (Yıldırım & Şimşek, 2011: 128). Questions that passed expert review were provided in written format, taking into account the course workload of the students.

Limitations

1. Convenience sampling was preferred in the study. Since this method is not probability-based, the generalization of the findings to graphic design department students in different institutions and regions is limited. Keeping the research limited to a single university also narrows its representative power; however, since the purpose of the research is not to make statistical generalizations but to develop an in-depth qualitative understanding, this situation does not damage the validity of the study. As a matter of fact, purposive and convenience sampling methods are widely accepted in qualitative research and facilitate focusing on the research question.
2. The metaphor form and semi-structured interview form were applied to the participants in writing. In an oral interview environment, the researcher has the opportunity to ask in-depth questions and instantly explicate the participant's expressions. Although the written application provided a standardized and systematic data collection process, it may have partially restricted the participants from fully reflecting their thoughts.
3. Research data were collected in a specific period and cross-sectionally. Longitudinal studies are thought to offer the opportunity to monitor changes in graphic design students' attitudes and perceptions over time.

Ethics Committee Declaration

This study was found ethically appropriate by İnönü University Social and Human Sciences Scientific Research Ethics Committee (Date: December 18, 2025, Session Number: 24, Decision Number: 4). All participants participating in the study were informed about the purpose and scope of the research before the study, and their consent was obtained through the 'Informed Consent Form'.

Artificial Intelligence Use Statement

The author did not utilize any AI tools for the research, authorship, and publication of this article.

Findings and Interpretations

According to the findings obtained within the scope of Q1, as seen in Table 2, graphic design department students produced 69 metaphors regarding the concept of AI. It was determined that the most frequently produced metaphors by the students were Library (f=10), Brain (f=9), Mirror (f=5), Teacher (f=4), Robot (f=3), Book (f=3), Scholar (f=2), Friend (f=2), Assistant (f=2), Helper (f=2), Dictionary (f=2), and Space (f=2).

As seen in Table 3, the 61 female students participating in the research produced 41 distinct metaphors. It was observed that the metaphors created by female students regarding AI were mostly grouped into the categories of brain (6), mirror (4), library (4), teacher (4), robot (2), helper (2), dictionary (2), space (2), book (2), and assistant (2) in order of frequency. The 41 male students participating in the study generated a total of 32 metaphors. It can be stated that the metaphors created by male students regarding AI were mostly grouped into the categories of library (6), brain (3), and scholar (2), respectively.

Table 2.
Findings on Metaphors Produced by Graphic Design Students Regarding the Concept of Artificial Intelligence

Metaphor	Frequency	Metaphor	Frequency	Metaphor	Frequency (*f*)
Octopus	1	Emotionless parent	1	Genie in a lamp	1
Animation	1	World	1	Drain opener	1
My mother	1	Handbag	1	Blessing	1
Encyclopedia	1	Household item	1	Scalpel	1
Friend	2	Ship	1	Ocean	1
Elevator	1	Sun	1	Forest	1
Assistant	2	Diary	1	Student	1
Love	1	Pool	1	Teacher	4
Fire	1	Center of life	1	Compass	1
Mirror	5	Freeloading	1	Robot	3
Memory	1	Thief	1	Wind	1
Brain	9	Servant	1	Right hand	1
Scholar	2	Wrench	1	Dictionary	2
Science	1	Human mind	1	Taxi	1
Spoiled food	1	Rope	1	Stone	1
Magical sphere	1	Black hole	1	Laziness	1
Stolen	1	Dark room	1	Space	2
Child	1	Book	3	Helper	2
Rotten walnut	1	Writing code	1	Cooking robot	1
Consultant	1	Copycat	1	Way / Road	1
Iron	1	Savior	1	Journey	1
Sea	1	Well	1	Guiding force	1
Doctor	1	Library	10		

Findings on Categories of Metaphors Produced by Graphic Design Department Students Regarding the Concept of Artificial Intelligence

The metaphors produced by graphic design department students regarding the concept of AI were categorized by examining the explanations provided in the "Because..." section. Twelve categories were initially conceptualized, resulting in eight main conceptual categories: problem solving, facilitating convenience, learning/development, humanity/imitation, knowledge/capacity, breadth/infinity, surprising/interesting, and negative innovation-risk/danger. The metaphors belonging to each category are presented in Table 4 along with their frequencies.

Table 3.
Metaphors Created by the Study Group and Frequency Distribution by Gender

Metaphor	Gender		Metaphor	Gender		Metaphor	Gender	
	F	M		F	M		F	M
Mirror	4	1	Doctor		1	Dictionary	2	
Scholar		2	Rope		1	Guiding force	1	
Rotten walnut		1	Genie in a lamp		1	Copycat	1	
Friend		2	Taxi		1	Space	2	
Blessing		1	Freeloading		1	Spoiled food	1	
Encyclopedia		1	Robot	2	1	Memory	1	
Library	4	6	Fire		1	Journey	1	
Brain	6	3	World		1	Black hole	1	
Stone		1	Iron		1	Savior	1	
Elevator		1	Assistant	2		Dark room	1	
Handbag		1	Servant	1		Forest	1	
Ship		1	Thief	1		Household item	1	
Diary		1	Writing code	1		Compass	1	
Scalpel		1	Way / road	1		Center of life	1	
Drain opener		1	Emotionless parent	1		Right hand	1	
Book	2	1	Stolen	1		My mother	1	
Magical sphere		1	Sun	1		Student	1	
Well		1	Sea	1		Child	1	
Consultant		1	Ocean	1		Wind	1	
Pool		1	Teacher	4		Cooking robot	1	
Wrench		1	Laziness	1		Animation	1	
Octopus		1	Helper	2		Science	1	
Love		1	Human mind	1				

According to the findings obtained within the scope of Q2, when Table 4 is examined, the eight conceptual categories formed are as follows: "Facilitating convenience" (32%), "Knowledge/Capacity" (22%), "Negative innovation—Risk/danger" (15%), "Learning / Development" (12%), "Breadth / Infinity" (10%), "Humanity/Imitation" and "Problem solving" (4%), and "Surprising/Interesting" (1%).

Some qualitative examples regarding the metaphor expressions of graphic design department students about AI are as follows:

Category 1 (Problem Solving)

S84: "Artificial intelligence is like a doctor. Because it offers you a solution on any subject you want."

S54: "Artificial intelligence is like a drain opener. Because it can open our blocked minds in one go."

Category 2 (Facilitating Convenience)

S68: "Artificial intelligence is like a brain. Because by learning data, it facilitates the work that people do."

S31: "Artificial intelligence is like a helper. Because it works in daily life just like in lessons, and facilitates most things."

Category 3 (Learning/ Development)

S4: "Artificial intelligence is like a friend. Because we both develop by receiving information from each other."

S40: "Artificial intelligence is like a brain. Because it can learn, think, and make decisions."

Category 4 (Humanity/ Imitation)

S77: "Artificial intelligence is like a robot. Because it can think like humans."

Table 4.
Distribution of Metaphors According to Conceptual Categories

Category	Metaphors Included	*f*	%
Problem solving	Doctor (1), Drain opener (1), Friend (1), Household item (1)	4	4
Facilitating convenience	Assistant (2), Animation (1), Encyclopedia (1), Scholar (1), Mirror (1), Octopus (1), Brain (3), Magical sphere (1), Consultant (1), Center of life (1), Servant (1), Rope (1), Well (1), Library (1), Blessing (1), Wrench (1), Forest (1), Student (1), Teacher (3), Compass (1), Robot (2), Right hand (1), Dictionary (1), Helper (2), Road/Way (1), Journey (1), Guiding force (1)	33	32
Learning / development	Friend (1), Love (1), Fire (1), Mirror (2), Brain (1), Child (1), World (1), Writing code (1), Scalpel (1), Wind (1), Cooking robot (1)	12	12
Humanity / imitation	Mirror (1), Brain (1), Human mind (1), Robot (1)	4	4
Knowledge / capacity	Memory (1), Brain (3), Scholar (1), Sun (1), Diary (1), Pool (1), Book (3), Savior (1), Library (8), Teacher (1), Dictionary (1)	22	22
Breadth / infinity	My mother (1), Brain (1), Science (1), Ship (1), Handbag (1), Sea (1), Genie in a lamp (1), Ocean (1), Space (2)	10	10
Surprising / interesting	Black hole (1)	1	1
Negative innovation—risk / danger	Elevator (1), Mirror (1), Spoiled food (1), Stolen (1), Rotten walnut (1), Iron (1), Emotionless parent (1), Freeloading (1), Thief (1), Dark Room (1), Copycat (1), Library (1), Taxi (1), Stone (1), Laziness (1)	15	15
	Total	102	100

S70: "Artificial intelligence is like a brain. Because it can think like a human and be creative."

Category 5 (Knowledge/ Capacity)

S2: "Artificial intelligence is like a scholar. Because it adds knowledge to us and has an instructive audience."

S46: "Artificial intelligence is like a brain. Because it can use information and features relentlessly without getting tired."

Category 6 (Breadth/ Infinity)

S49: "Artificial intelligence is like a ship. Because it is a tool that helps us navigate through endless information."

S61: "Artificial intelligence is like space. Because we can find infinite answers."

Category 7 (Surprising / Interesting)

S60: "Artificial intelligence is like a black hole. Because the more you use it, the more it attracts your curiosity, and you want to use it more."

Category 8 (Negative Innovation—Risk/ Danger)

S100: "Artificial intelligence is like iron. Because it can turn into a tool in the right hand and a weapon in the wrong hand."

S63: "Artificial intelligence is like a dark room. Because it dulls thoughts and ideas, imprisons oneself into it, and restricts the world of imagination."

According to the findings obtained within the scope of Q3, as seen in Table 5, there are two codes under the theme of Professional Challenge: Replacing the designer (23) and Increase in unemployment rates (15). Regarding the code of replacing the designer, students coded S34, S19, S45, S27, S94, S79, S54, S75, S10, S51, S20, S55, S50, S41, S47, S8, S87, S37, S88, S17, S3, S32, and S43 stated that AI could replace the designer. Some of the opinions regarding these students are as follows:

"S39: Because it has less cost, they turn to artificial intelligence instead of a designer." "S50: Artificial intelligence can also do the designs we will make, so it is dangerous for us." "S47: With the developing artificial intelligence, even people who do not know how to design have started making designs. Therefore, the path for graphic designers like us is closing a bit more."

Regarding the code of increase in unemployment rates, students coded S95, S6, S71, S101, S33, S39, S21, S56, S46, S48, S86, S58, S11, S84, and S77 experience anxiety that the use of AI in every field will cause an increase in the unemployment rate in the future. A few of the students' expressions are as follows:

"S95: When machines start doing the work, people might lose their jobs." "S6: It could decrease employment opportunities."

Under the theme of Quality Constraint, a single code was formed: Unoriginal works (21). Students coded with S92, S59, S73, S62, S49, S93, S18, S44, S97, S28, S81, S83, S52, S65, S61, S78, S31, S7, S12, S66, and S102 agree on the opinion that the quality of designs produced with AI is low. Some of these opinions are listed below:

"S92: It can reduce originality and lead to everyone producing similar works." "S44: Studies not being differentiated, not being correct, and a simple perspective."

Under the theme of Developmental Inhibitors, two codes were formed: Dependency (3) and Decline in cognitive skills, Laziness (22).

Table 5.
Findings on Students' Opinions on Future Negative Outcomes of Artificial Intelligence Applications for the Professional Field

Theme	Code	Students	*f*
Professional Challenge	Replacing the designer	S34, S19, S45, S27, S94, S79, S54, S75, S10, S51, S20, S55, S50, S41, S47, S8, S87, S37, S88, S17, S3, S32, S43	23
	Increase in unemployment rates	S95, S6, S71, S101, S33, S39, S21, S56, S46, S48, S86, S58, S11, S84, S77	15
Quality Constraint	Unoriginal works	S92, S59, S73, S62, S49, S93, S18, S44, S97, S28, S81, S83, S52, S65, S61, S78, S31, S7, S12, S66, S102	21
Developmental Inhibitors	Dependency	S72, S29, S60	3
	Decline in cognitive skills and laziness	S96, S35, S69, S16, S67, S82, S91, S26, S64, S57, S30, S42, S23, S98, S36, S22, S68, S1, S63, S70, S25, S38	22
Scientific Research Problems	Plagiarism / theft	S14, S13, S100	3

Regarding the code of dependency, students coded with S72, S29, and S60 stated that dealing excessively with AI makes a person dependent. These expressions are listed below:

"S72: The fact that some designers become completely dependent on AI can cause originality to decrease." "S29: Dependency."

Under the code of Decline in cognitive skills, Laziness (22), students coded as S96, S35, S69, S16, S67, S82, S91, S26, S64, S57, S30, S42, S23, S98, S36, S22, S68, S1, S63, S70, S25, and S38 think that the use of AI will cause laziness and a decline in thinking skills. Some of the opinions regarding these students are as follows:

"S96: It both prevents development and accustoms them to laziness." "S91: To artificialize people, to make them lazy."

Another theme seen in Table 5 is Scientific Research Problems. Under this theme, a single code was produced as plagiarism / theft (3). Students coded with numbers S14, S13, and S100 carry the concern that AI applications will also bring along plagiarism problems in their professional fields. The expressions of the students on this subject are listed below:

"S100: Using artists' works unethically and without permission leads to the violation of copyrights. Since it does not recognize any ethical obstacle before it, the development of AI accelerates rapidly thanks to unlimited resource access." "S13: The same works could be stolen."

In the research, in response to the question "what kind of negative results can AI applications cause in your professional field," 15 students (14.7%) coded as S80, S24, S09, S02, S76, S89, S90, S15, S85, S05, S74, S99, S40, S04, and S53 used positive expressions indicating that AI would not have negative effects. For example:

"S90: I do not think it will have a negative outcome. I think better work can be done by using it." "S85: I do not think there will be a negative result; on the contrary, it makes my work even easier."

Table 6 contains the findings regarding the opinions of graphic design department students on the positive results that AI applications might create in their professional field in the future. Four themes were formed. Under the theme of Speed, the frequency of the code "acceleration of workflows/processes" is 21; under the theme of Convenience, the frequency in the code "access to information" is 17; under the theme of helper, the frequency in the code "exchange of ideas" is 15, and in the code "growth within the field" the frequency is 27; and 22 people are of the opinion that AI will not have a positive impact on their professions in the future.

Students participating in the research stated that AI is effective in accelerating the process in the application area of their profession. Some of these statements are:

"S92: It accelerates my visual communication process, gives inspiration in ideation, and increases design quality." "S99: It makes simple but time-consuming applications such as changing colors in visuals or deleting backgrounds faster. Artificial intelligence is a tool for us."

A total of 22 students participating in the research do not think that AI applications will have a positive outcome regarding their professional fields:

"S16: It can help in some professions, but it does not contribute to design or things that humans can do." "S15: No, because designing is my duty."

Graphic design department students stated that AI would provide convenience in accessing information in their research:

"S34: Yes, because we can easily access the information we want to obtain." "S51: Yes, it contributes to access to information."

Students mostly think that AI will help them grow within their field:

"S24: It helps me learn in detail what I want to learn in my field and what I do not know." "S82: Yes, it can develop me from the very beginning to mastering my profession."

The second code formed under the theme of helper is the exchange of ideas code. Fifteen students from the graphic design department stated that AI would be useful in exchanging ideas. For example:

"S18: It can have contributions in terms of presenting ideas with a different perspective and point of view." "S63: It contributes to getting ideas."

Discussion

According to the findings obtained, graphic design department students produced 69 metaphors regarding the concept of AI. The most frequent metaphors produced by the students are listed as Library, Brain, Mirror, Teacher, Robot, Book, Scholar, Friend, Assistant, Helper, Dictionary, and Space. One of the studies similar to these results obtained in the literature review shows similarity with the study of Bozdağ (2025) regarding the metaphors most developed by Generation Z youth toward the concept of "Artificial Intelligence." According to that study, similarly, robot, brain, and helper metaphors were produced the most. In the research of Balıkçı et al. (2024), it was concluded that teachers used technological terms such as "Robot," "Assistant," "Machine," and "Computer" when defining AI, and teachers perceived AI as a programmable and automatically functioning entity. Erdoğan & Bozkurt (2023) in their study with pre-service physics teachers, and Eriçok et al. (2024) in their study with pre-service teachers, reached the same results and determined the most produced metaphors as brain,

Table 6.
Findings on Students' Opinions on Future Positive Outcomes of Artificial Intelligence Applications for the Professional Field

Theme	Code	Students	*f*
Speed	Acceleration of the process	S65, S29, S76, S99, S72, S91, S57, S92, S71, S86, S89, S6, S101, S4, S27, S93, S83, S47, S88, S12, S46	21
Convenience	Access to information	S51, S7, S97, S50, S100, S64, S48, S55, S80, S54, S11, S34, S25, S23, S53, S5, S17	17
Helper	Exchange of ideas	S18, S56, S84, S45, S58, S63, S60, S69, S52, S90, S49, S66, S74, S22, S79	15
	Growth within the field	S43, S3, S61, S73, S59, S30, S82, S38, S9, S40, S96, S67, S28, S95, S94, S36, S75, S77, S78, S98, S85, S24, S31, S81, S2, S20, S102	27
Negative		S62, S1, S26, S16, S35, S13, S32, S41, S68, S15, S70, S14, S37, S87, S8, S39, S33, S21, S10, S19, S44, S42	22

space, robot, and library. Güzelgörür & Sever (2025) saw in their study that the metaphors of smart robot and human brain were used the most by students. Tartuk (2023) determined as a result of the research that middle school students developed 51 different metaphors about the concept of artificial intelligence. It was found that these metaphors developed by the students were diverse and creative. It was concluded that the most frequently used metaphors were human (10), brain (8), robot (4), technology (3), and scientist (3).

Graphic design department students' definition of AI with metaphors such as "brain," "library," "book," and "dictionary" draws attention to its role in accessing information. While they see AI as a powerful tool supporting instructional processes with metaphors such as "teacher" and "scholar," they point out its supportive role in homework and daily work with "robot" and "helper" metaphors, and that AI is perceived as a wide area to be explored with the "space" metaphor. In the research conducted by Jin and colleagues (2025), metaphor analysis of the perceptions of international students from 277 master's students studying in the UK from a total of 14 countries and regions determined an initial set of 53 metaphors that researchers divided into four categories such as high heels, compass, Spider-Man, and drugs (cited in: Walton & Cormier, 2025: 2). Participants' academic disciplines influenced their perceptions of GenAI, but overall, the results concluded that most viewed it as transformative, meaning more than just a writing tool (Jin et al., 2025: 1). Saçan et al. (2022) produced 12 metaphors gathered under 97 animate main themes and 38 inanimate main themes in their research. In the animate main theme, the Robot sub-theme constituted the highest rate of 41.24%, and the Child sub-theme constituted the lowest frequency of 2.06%. In the inanimate main theme, the Processes Information sub-theme was repeated most frequently with a rate of 52.63%. The lowest frequency was formed by the Game and Book sub-themes with 2.63% (p: 282).

The 61 female students participating in the research produced 41 different metaphors. It was observed that the metaphors created by female students regarding AI were mostly grouped into brain, mirror, library, teacher, robot, helper, dictionary, space, book, and assistant categories, respectively. When the prominent metaphors in female students are examined, female students positioned AI more as a helper and supporter. This situation can be explained by the earlier acquisition of gender roles in girls. Metaphors such as "dictionary" and "book" show that female students internalize AI as an information access tool and are more positive toward these tools for educational purposes. The 41 male students participating in the study produced a total of 32 metaphors. It can be stated that the metaphors created by male students regarding AI were mostly grouped into library, brain, and scholar, respectively. Male students defined AI more as intellectual capacity and a storage system. This overlaps with the tendency of males to approach technology functionally/instrumentally. Metaphors like "brain" and "scholar" suggest that male students associate the emphasis on authority and expertise with power and status.

The metaphors produced by graphic design department students regarding the concept of "Artificial Intelligence" were divided into eight conceptual categories according to the meaning characteristics they carry. It is seen that these are in the form of "knowledge/capacity," "negative innovation," "breadth/infinity," "facilitating convenience," "learning/development," "humanity/imitation," "problem solving," and "surprising/interesting."

Among the categories, the category with the highest number of metaphors is the "facilitating convenience" category. In this category, graphic design department students produced a total of 33 metaphors. It was determined that AI is perceived as a concept that facilitates work, accelerates it, and saves time. The metaphor explanations under this category in this study show similarity with the metaphor explanations in the study of Vatansever (2024). Furthermore, it carries a parallelism with the result obtained by Kılıç (2025) in his category titled "AI as a useful and supportive requirement." Kılıç stated that AI's answering questions in a short time and offering alternative content are effective.

The second category with the most metaphors produced in the study belongs to "knowledge/capacity" with 22 metaphors. Graphic design department students' metaphors in these categories show that they have a general awareness of the characteristics of AI. Erdoğan & Bozkurt (2023), when they examined the metaphors formed by the participants in their study, reached the same categories and stated that the participants emphasized the information processing and storage capabilities of AI. The intense need of the graphic design field for visual and conceptual information may have been a decisive factor in students positioning AI within this framework.

The Negative Innovation - Risk/Danger category is the third highest category with 15 metaphors. According to the metaphors produced, graphic design department students draw attention to its potential dangers and reflect their concerns, besides its benefits in obtaining information. It was seen that the students' awareness on this subject is high. Studies supporting these data obtained in the literature review were encountered. Erdoğan & Bozkurt (2023), Ağmaz & Ergüleç (2024), Gölbaşı & Okul (2024), and Turan (2024) drew attention to this danger with the metaphors they obtained in their studies. Altuntaş & Karabay (2024), when they examined the metaphors reflecting the thoughts of university students and academics regarding AI, determined that they thought "some of the produced metaphors had mysterious and frightening aspects of AI that needed to be explored." The results of the study conducted by Bozdağ (2025) with Generation Z also support the findings this study obtained. The research of Kılıç (2025) carries parallelism with the findings. Kılıç also concluded in his research that AI was seen as a harmful and worrying technology at the second highest rate. Meylani (2024) stated in his research that the use of AI brought ethical problems along with it. However, Hoşgör et al. (2023) concluded that nearly half of the healthcare professionals participating in their research used expressions indicating that AI made them curious and that it should be included more in their lives. In the study titled "Primary School Students' Perceptions of Artificial Intelligence: Metaphor and Drawing Analysis" by Kalemkuş & Kalemkuş (2025), it was determined that students had perceptions that bad things would happen if AI was used by malicious people, that it was produced to harm people, and that it affected or damaged the mind. Therefore, it can be said that some students emphasized the possible dangers and some disadvantages of AI. Based on this, it can be said that the malicious use of AI is taken into account by students and creates anxiety in them.

One of the categories emerging when the produced metaphors are examined is the "learning/development" category with 12 metaphors. The metaphors of female students were generally effective in determining this category. Female students see AI as a tool open to development by adding human-like features. According to the metaphors obtained in the studies of Erdoğan & Bozkurt (2023), the learning/development category was formed (p: 156). As Erdoğan & Bozkurt stated, pre-service teachers brought the learning ability and development of AI to the fore. They concluded that the fact that they did not include technical issues such as machine learning and deep learning about the learning of AI in their expressions meant they did not have detailed information on this subject. In this study, graphic design department students similarly did not mention technical information.

Regarding the breadth/infinity category, it was seen that metaphors such as "sea," "ocean," "space," and "brain" pointed to the continuously developing and limitless capabilities of AI. The metaphors produced by

the students may reflect their perceptions of the endless content generation and creative potential offered by technology. Students, who are in search of different ideas and inspiration in the design process, evaluated the production capacity of AI as boundaryless, and at the same time, they may have perceived it as an area that has not yet been fully understood and is waiting to be discovered. These data obtained carry parallelism with the data obtained in the studies of Erdoğan & Bozkurt (2023), Vatansever (2024), and Turan (2024). As Turan stated, the reason for this may be that AI is spread over a very wide area of use and its boundaries are not yet fully known. Erdoğan & Bozkurt state that AI is a continuously developing capability.

When the metaphors produced in the problem-solving category are examined, it shows that especially male students perceive AI as a concept that solves problems. Vatansever (2024) determined it as the category with the second highest number of metaphors in his research (p: 100). According to the findings he obtained, it was determined that AI was perceived as a concept that solves complex problems and issues. Altuntaş & Karabay (2024) determined in their study that under the main theme of "Knowledge and Solution," the sub-theme of "Solution/result" and six metaphors under it were produced (p: 41). It shows that students perceive technology as a tool that offers practical solutions to the problems they encounter in life. Students, who frequently encounter technical and creativity-related problems in the graphic design process, may have experienced AI as a resource that produces fast and functional solutions, which they apply to when they need it, just like a doctor.

One of the categories produced the least in the study is "Humanity/imitation." When the metaphors in this category and the "Learning/development" category are examined, Graphic design department students attributed learning, growing, developing, namely human qualities, to AI. The research of Erdoğan & Bozkurt (2023) and Turan (2024) supports these findings.

The category with the fewest metaphors produced is the "surprising/interesting" category with one metaphor. With the "black hole" metaphor formed, it emphasizes the undiscovered and interesting aspects of AI and the uncertainty of where these developments in technology will lead. The result of the study shows parallelism with the data obtained in the study of Erdoğan & Bozkurt (2023).

When graphic design department students were asked about their thoughts on what the negative future consequences of AI applications on the professional field could be, there are two codes under the theme of Professional Challenge: Replacing the designer (23) and Increase in unemployment rates (15). Students experience anxiety that AI may replace the designer and cause an increase in the unemployment rate in the future. Under the theme of Quality Constraint, a single code was formed: Unoriginal works (21). Students agree on the opinion that the quality of designs produced with AI is low. Under the theme of Developmental Inhibitors, two codes were formed: Dependency (3) and Decline in cognitive skills, Laziness (22). Students think that dealing excessively with AI makes a person dependent and will cause laziness and a decline in thinking skills. Another concern is on Scientific Research Problems. Under this theme, a single code was produced as plagiarism / theft (3). Students carry the concern that AI applications will also bring along plagiarism problems in their professional fields. An interesting result obtained in the research is that 15 students (14.7%) used positive statements indicating that AI would not have negative effects.

Özdal (2023), who conducted research on these anxieties experienced by students, in his research titled "The legal dimension of AI-supported graphic design," determined that the use of AI in the graphic design process could have an impact on intellectual property law and copyrights and reached the conclusion that there were uncertainties regarding the originality and copyrights of graphic designs created with AI. Furthermore, he determined that it could lead to problems in personal data protection. He emphasized in his research that there is a need for more regulation in this area. The study conducted by Vatansever (2024) supports the findings of the current research by revealing the reservations of Computer Engineering and CEIT department students toward the use of AI. In the said study, it was emphasized that the inclusion of AI tools in educational processes could lead to a regression in students' thinking practices in the future and a kind of "mental laziness" due to effortless access to information. In addition, concerns were expressed in the research that these technologies could weaken students' desire to explore, negatively affect learning motivation, and trigger technology dependency, opening the role of educators to debate. One of the data obtained by Vatansever is that especially students expressed opinions that the risk of plagiarism in academic studies could increase. Akın et al. (2025) in their study titled "Transformation in Education: Teachers' Perspective on Artificial Intelligence" reached the conclusion that teachers carry the perception that the use of AI technologies in the education-teaching process can cause ease and laziness. Bozdağ (2025), on the other hand, reached the conclusion that while a large part of Generation Z youth see AI positively as an opportunity, there is a group that thinks there may be risks, even if at a low rate. In the study conducted by Fan et al. (2025) on "Educational impacts of generative AI on learning and performance of engineering students in China," it was concluded that there was anxiety about ethical concerns and data privacy in the use of generative AI, revealing that 35.14% and 22.97% of the participants evaluated ethical issues as "important" or "very important," respectively. However, 40.54% of the participants evaluated ethical issues as "of average importance," while only 1.36% ignored the importance of ethics.

Swanson (2019) also argues that with technological developments, the expansion of AI design applications increases the probability that the value of the graphic design field and the graphic designer against society will be less (cited in: Gürdal Pamuklu & Fındıkcı, 2023: 181). Öztürk (2024), on the other hand, makes a different defense. In his article titled "Artificial intelligence 'art'," while AI makes production based on existing data, humans can think outside the box and create completely new concepts with emotional intelligence, empathy, and complex social interactions. These features allow humans to create awareness. Some people are afraid of AI taking over the world. According to the research results of the article titled "The AI Effect" published in the July 2023 issue of the Journal of Experimental Social Psychology, it is stated that as people learn more about the advancements in AI, they evaluate human characteristics as more important for being human. In short, as AI becomes widespread and acquires more information, it may try to be more "human," and the importance it gives to being human may increase. Delil (2024) states in his research that there are concerns about the originality and aesthetic depth of designs produced by AI, but without humans, AI will remain a development that depends on certain trends and produces limited variations. In the future, the cooperation of human and AI will be important, and people who have trained themselves in their field can play a critical role in regulating the production of AI, evaluating the results, and enriching the design.

When graphic design department students were asked about their thoughts on the positive results that AI applications could create in the professional field in the future, four themes were created according to the findings obtained. Under the theme of Speed, the frequency of the code "acceleration of the process" is 21; under the theme of Convenience, the frequency in the code "access to information" is 17; under the theme of helper, the frequency in the code "exchange of

ideas" is 15, in the code 'growth within the field' the frequency is 27, and 22 people are of the opinion that AI will not have a positive impact on their professions in the future.

The study conducted by Vieriu & Petrea (2025) showed that a significant majority of students believe AI is useful in their academic activities. According to this, 80% of the students agree that the use of AI-based technologies improves their educational experience either by optimizing their study time or by providing fast access to personalized educational resources that facilitate their understanding of complex materials. In contrast, only 2.4% of the students thought that AI had no benefit to educational processes. Kum (2023) also measured the attitudes of graphic design department students toward AI in the province of Tokat and concluded that students exhibited a mostly positive attitude. Fan et al. (2025) showed that more than half of the participants reported that generative AI had a positive effect on their learning efficiency, entrepreneurship, and creativity, and nearly half believed that it improved their independent thinking. However, despite acknowledging the improvement in study efficiency, many felt that their actual academic performance was largely unchanged and expressed concerns about the accuracy and field-specific reliability of generative AI. Supporting the idea of students that AI will have positive results in their professional fields in the future, Kocaman (2021) and Özdal (2023) defend that designers should not experience anxiety and that AI will not be able to replace the graphic designer in the future. He stated that AI would serve as an assistant that solves design problems by reducing the workload of graphic designers and facilitating their work, and extra time could be left for the graphic designer to perform studies such as art direction, curatorship, and the like.

As a result, graphic design department students, who are intertwined with technology requiring lifelong learning as a necessity of their profession, believe with their answers that while AI can offer important opportunities on one hand, it can create risks for the future of their own professions and their own personal developments, even if at a lower rate, on the other hand.

Conclusion and Recommendations

In order to eliminate the anxieties felt by students in this field where personal development requiring labor and effort is important, courses focused on ethics and critical thinking should be added to educational programs about how AI applications can be used effectively and efficiently. In order for this research to gain value in the literature and to make a more explanatory generalization, the study group should be kept wider, and comparative examinations and observations should be made in different provinces or countries with a large sample group. This may allow for evaluating AI from a wider perspective. Workshops and seminars can be organized that position AI not just as a tool, but as a partner that can cooperate in design. The data obtained in this study will constitute a source for researchers who will work in the field.

Data Availability Statement: The data that support the findings of this study are available on request from the corresponding author.

Artificial Intelligence Usage Statement: For the English translation of the present article, an artificial intelligence program has been utilized.

Ethics Committee Approval: Ethics permission was obtained for this research from İnönü University Social and Human Sciences Scientific Research Ethics Committee (Date: December 18, 2025, Session Number: 24, Decision Number: 4).

Informed Consent: Written informed consent was obtained from participants who participated in this study.

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