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# Determining the Metaphorical Perceptions of German Teacher Candidates Regarding the Concept of Artificial Intelligence

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**Abstract**

Considering the importance of individualised learning, artificial intelligence tools can effectively create an environment where students can learn by using them both in lessons and on their own, and enable students to learn a foreign language more effectively and permanently. The aim of this study is to examine the thinking worlds and thought patterns of prospective German teachers about the role of artificial intelligence in language teaching and learning and their views on the concept of artificial intelligence. The starting point of this study is the question of which metaphors prospective teachers use when talking about the concept of artificial intelligence. The questions of the study are as follows: 1. with which metaphors do pre-service German teachers express artificial intelligence? 2. How do pre-service German teachers define their metaphors related to the concept of artificial intelligence? 3. Under which conceptual categories are these metaphors categorised in terms of common characteristics? The participants of the study consisted of 1st, 2nd, 3rd and 4th year prospective teachers studying at the Department of German Language Teaching, Faculty of Education, Faculty of Foreign Languages Education, Trakya University. The data were collected by qualitative data analysis method. Firstly, Student Information Form was given to the students and what is metaphor was explained by giving examples of metaphor. Then, the students filled out an opinion form consisting of semi-structured questions. This form consists of two parts, in which short demographic information about the students is asked and the open-ended question 'artificial intelligence is like ...., because...' is asked. Metaphor analysis technique was used to analyse the data. The data obtained were interpreted by categorising the metaphors used by the prospective German teachers.

**Keywords:** German Teacher Candidates, Artificial Intelligence, Metaphor, Perception

## Almanca Öğretmen Adaylarının Yapay Zekâ Kavramına İlişkin Metaforik Algılarının Belirlenmesi

**Özet (Türkçe)**

Bireyselleştirilmiş öğrenmenin önemi düşünüldüğünde yapay zekâ araçları etkili bir şekilde gerek derslerde gerek öğrencilerin kendi başlarına kullanarak öğrenebilecekleri bir ortam oluşturulabilir ve öğrencilerin yabancı dili daha etkili ve kalıcı bir şekilde öğrenmelerine olanak sağlayabilir. Çalışmanın amacı, Almanca öğretmen adaylarının, yapay zekânın dil eğitimi ve öğrenimindeki rolüne ilişkin düşünme dünyalarını ve düşünce kalıplarını, yapay zekâ kavramına yönelik görüşlerini incelemektir. Bu çalışmanın çıkış noktası, öğretmen adaylarının yapay zekâ kavramından bahsederken hangi metaforları kullandıkları sorusudur. Çalışmanın soruları ise şu şekildedir: 1. Almanca öğretmen adayları, yapay zekâyı hangi metaforlarla ifade ediyorlar? 2. Almanca öğretmen adayları, yapay zekâ kavramına ilişkin metaforlarını nasıl tanımlamaktadır? 3. Belirtilen metaforlar ortak özellik bakımından hangi kavramsal kategoriler altında toplanmaktadır? Çalışmanın katılımcılarını Trakya Üniversitesi Eğitim Fakültesi Yabancı Diller Eğitimi Bölümü Almanca Öğretmenliği bölümünde öğrenim gören 1., 2., 3. ve 4. sınıf Öğretmen Adayları oluşturmaktadır. Çalışmada veriler nitel veri analiz yöntemiyle toplanmıştır. Öncelikle Öğrencilere Öğrenci Bilgilendirme Formu verilerek metafor nedir? metafor örnekleri verilerek açıklanmıştır. Daha sonra öğrenciler yarı yapılandırılmış sorudan oluşan görüş belirtme formunu doldurmuşlardır. Bu form, öğrenciler hakkında kısa demografik bilgilerin sorulduğu ve "yapay zekâ gibidir, çünkü..." açık uçlu sorunun sorulduğu iki bölümden oluşmaktadır. Verilerin analizinde metafor analizi tekniği kullanılmıştır. Elde edilen veriler Almanca Öğretmen adaylarının kullandıkları metaforların kategorize edilmesiyle yorumlanmıştır.

**Anahtar Kelimeler:** Almanca Öğretmen Adayları, Yapay Zekâ, Metafor, Algı



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## Introduction

Although artificial intelligence has been the subject of research for many years, it began to be heard more frequently in both daily life and education with the public release of the free version of the AI tool ChatGPT in November 2022 (Hu 2023; Fırat 2023). Consequently, new AI-supported tools that can be used for various purposes in many fields have emerged. Especially the use of AI in foreign language education and learning has been the subject of numerous studies, and research on this topic continues (Haristiani 2019; Zuraina 2020; Hartmann 2021; Guo & Wang 2023; Hockly 2023; Liu 2023). AI-supported tools provide a communicative environment by responding to user commands in a human-like manner and fulfilling tasks, catering to users' needs in almost every subject (Lim et al. 2023; Moorhouse 2024; Karataş et al. 2024). Utilizing these AI tools in language education has become inevitable due to their many innovative features. Initially, language educators approached the use of AI tools in language teaching cautiously, with concerns about validity and reliability (Yeo 2023; Moorhouse 2024). Additionally, issues such as promoting excessive use leading to plagiarism, a decline in critical thinking and writing skills, inappropriate referencing in generated texts, insufficient deep discussion, and context consideration lowering the quality of education were noted (Dunnigan et al. 2023; Mizumoto 2023; Chan 2023; Kumar 2023; Warschauer et al. 2023). However, over time, studies have focused on the potential pedagogical benefits of AI in language education and how teachers and students can effectively utilize various AI-supported technologies (Hockly 2023; Bao & Li 2023; Algaraady & Mahyoob 2023; Moorhouse 2024; Karataş et al. 2024). Students can benefit from AI tools in numerous aspects such as writing texts, analyzing texts, pronunciation exercises, speech patterns, grammar rules, personalized study programs, effective and in-depth research, self-study support, and creating a personalized learning environment (Knaus 2023; Yılmaz & Yılmaz 2023; Guo & Wang 2023; de Vicente Yagüe Jara et al. 2023). However, for students to effectively utilize AI tools, they must also possess the ability to write appropriate and purpose-focused prompts. The accuracy of instructions in prompts determines the quality of the outputs students will receive, allowing them to maximize their benefit from the AI tool. Considering the emergence of prompt engineering, training on prompt creation could be provided to students (Lee et al. 2023; Akol Göktaş 2024; Şentürk 2023; Karataş et al. 2024). Furthermore, it is crucial for students to know how to use AI tools effectively and efficiently, understand these tools, and have perceptions of the AI concept. This study conducted a metaphor study to determine students' perceptions of the AI concept.

Metaphors are present not only in our daily language but also in our thoughts and actions. They influence not only our way of speaking but also our thoughts and actions. Our mental processes are largely structured metaphorically. Through the systematic analysis of metaphors, ideas about phenomena in the world can be reconstructed (Martinez et. al. 2001; Gillis & Johnson 2002; Ben-Peretz Mendelson & Kron 2003; Borg 2003; Nikitina & Furuoka 2008; Lehmann 2012; Çetin Köroğlu & Ekici 2016; Asmalı & Çelik 2017). The metaphors we use to describe abstract realities not only reflect the concepts and ideas behind them but also represent our perception of our surroundings. Metaphors, besides influencing our way of speaking, also impact our thoughts and actions. They are part of an experiential understanding theory that addresses processes of understanding the world through the analysis of ideas (Seferoğlu et. al. 2009; Wan et. al. 2011; Yeşilbursa 2012). Through the systematic analysis of metaphors, ideas about phenomena in the world can be reconstructed. Metaphors can be used in two ways: first, as a cognitive tool, and second, as a tool supporting communication and thinking. In the first application area, it is assumed that referring to something concrete, already known or understood, provides easier access to or better understanding of a new situation or task (Quale 2002; Ebner & Lehmann 2012; Inceçay 2015; Karabay 2016). Additionally, metaphors are used

to reflect argumentative figures and preferences (Saban Kocbeker & Saban 2007). This can form a basis for discourse, information exchange, and thinking about a specific phenomenon. The clear expression of one's own ideas can be seen as an initial step in initiating conceptual change processes and thus supporting one's own or others' development (see Amin 2009). In this regard, it makes sense to define metaphors, identify control functions, and examine their relationships with other structures. Developments in the field of artificial intelligence have also influenced scientific studies, leading to the emergence of new problem situations and research questions. Therefore, this study uses metaphors as a research tool to gain insights into the metaphorical perceptions of German teacher candidates regarding the concept of artificial intelligence.

## Literature Review

A series of studies have investigated students' metaphors regarding artificial intelligence (Demir and Güraksın 2022; Aydın et al. 2022; Tartuk 2023; Lim 2024). In their study, Demir and Güraksın (2022) identified 11 metaphor categories related to artificial intelligence among middle school students: intelligent brain, nature, security, humanist, good and evil dichotomy, service, object, technology, life, and time. These findings indicate that participants generally used positive metaphors when defining artificial intelligence, showing positive perceptions of AI. In his study, Tartuk (2023) found that middle school students generally perceived AI as a human-like entity, a brain, or a robot. Young children aged 6-10 tended to compare AI to both animate and inanimate objects, reflecting a wide range of perceptions. Additionally, computer-assisted animations were found to deepen students' understanding of AI, helping them provide more meaningful reasons for their metaphors (Aydın et al. 2022). In their study, Erdoğan and Bozkurt (2023) found that physics teacher candidates produced metaphors such as human brain, universe, space, library, machine, and robot for AI. In his study, Lim (2024) found that early childhood teacher candidates' understanding of AI education could play a significant role in shaping future AI education for young children. Lim (2024) revealed that teacher candidates used positive metaphors such as 'opportunity for play and experience,' 'foundations of the future,' 'innovation and change,' 'conscious change,' and 'variety of opportunities' for AI. These studies show that positive perceptions of artificial intelligence are prevalent. Nevertheless, there is also a need to investigate the metaphors German teacher candidates use for artificial intelligence. This study aims to fill this gap by investigating the metaphors German teacher candidates use for the concept of artificial intelligence.

## Method

### *Purpose and Significance of the Research*

The aim of this study is to determine the metaphorical perceptions of German teacher candidates studying at the undergraduate level at Trakya University regarding the concept of artificial intelligence, and to understand their thought patterns about the role of AI in language education and learning by using metaphors. This includes exploring the potential impacts of AI on language education as perceived by these candidates. The starting point of this study is the question of which metaphors German teacher candidates use when discussing AI. Metaphorical thinking is the ability to establish connections between two different things by considering their similarities. Metaphors allow for the understanding and visualization of abstract concepts by pointing to similarities in the real world. The word "metaphor," named as "mecaz" by the Turkish Language Association (TDK), means explaining and interpreting a concept in another way (Lakoff & Johnson, 1998, 4; TDK, 2018). Metaphors use a word in a figurative sense, different from its known literal meaning through analogy (Köroğlu et al., 2018, 117). Metaphors

allow us to express our experiences, perspectives on events, and thoughts by making them visual and concrete. Therefore, this study is significant in understanding the metaphorical perceptions of German teacher candidates at Trakya University towards artificial intelligence. Considering the use of AI in German language education as a foreign language, it can be hypothesized that the metaphors used by German teacher candidates to describe AI reflect their ideas about the use of AI in the process of teaching and learning languages. Thus, determining how German teacher candidates perceive AI will contribute to understanding their ideas, feelings, or prejudices about the use of AI in foreign language education. This, in turn, can help identify how AI can be used more effectively in language education and its positive or negative aspects on students.

### *Research Question*

Which metaphors do German teacher candidates use to express artificial intelligence?

### *Methodology*

This study, aiming to determine the metaphorical perceptions of German teacher candidates towards the concept of artificial intelligence, is descriptive in nature and has analyzed the data using qualitative research methods. The qualitative research method allows for deeper investigation and exploration based on the responses of the participants and is based on a postmodernist paradigm. It delves into the experiences and perceptions of students to thoroughly examine the topic under investigation (Merriam, 2009; de Costa et al., 2017; Yıldırım & Şimşek, 2021). In this context, the use of metaphors is seen as an important tool in understanding how participants perceive artificial intelligence. According to Bal (2016) and Morgan (1986), one of the purposes of using metaphors is to describe a situation. When used for this purpose, metaphors depict an event, situation, and phenomenon as they are. Using metaphors to understand and explain a new phenomenon facilitates the learning of information (Alpaslan & Kutanis, 2007). This study is a metaphor analysis aimed at identifying the perceptions of German teacher candidates towards artificial intelligence. Moreover, the data for this study were collected at a single point in time to explore the metaphorical perceptions of German teacher candidates.

### *Participants*

The participants of the study consist of all undergraduate students, a total of 107 individuals, studying in the German Language Teaching Department at Trakya University during the 2023-2024 academic year, including 1st, 2nd, 3rd, and 4th-year students. When selecting the participants, the purposive sampling method was chosen, which allows for an in-depth examination of cases considered to have extensive knowledge (Büyüköztürk et al., 2016). Among the purposive sampling methods, participants were determined through easily accessible case sampling, which offers speed and convenience (Patton, 2014; Yıldırım & Şimşek, 2021). All participants were informed about the study, and it was explained that participation was based on voluntariness. The following visuals provide the demographic information of the participants.

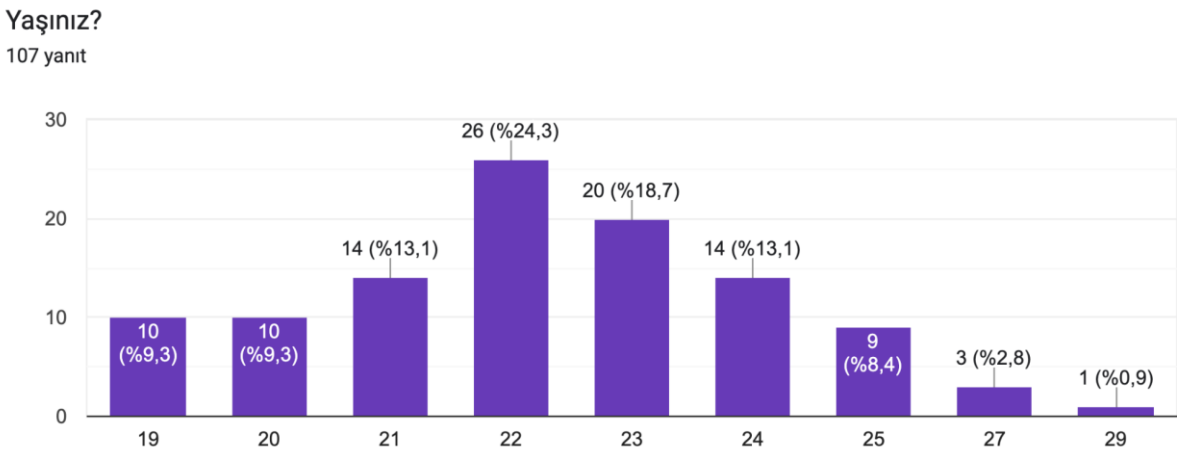


**Figure 1.** Age of Participants

When examining Visual 1, it is seen that a total of 107 German teacher candidates participated in the study. The ages of the participants range from 19 to 29, with the most common age being 22.

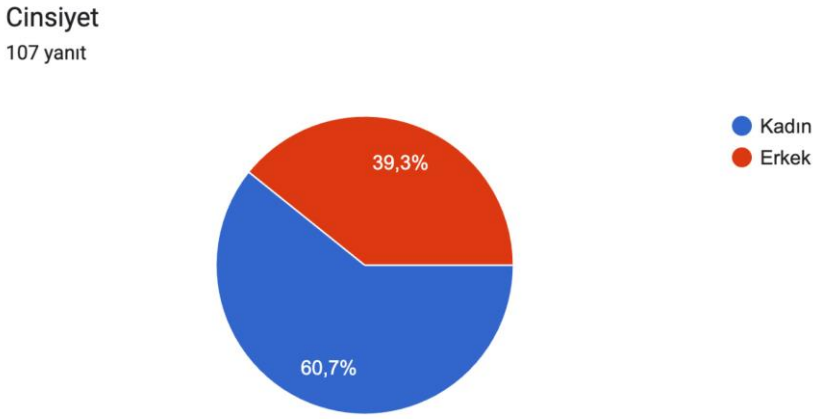


**Figure 2.** Gender of Participants

When examining the gender distribution of the participants in the study, it is observed that 60.7% of the participants are female (blue color in the graph) and 39.3% are male (red color in the graph). These results indicate that there is a numerical majority of female participants in terms of gender representation in the study.

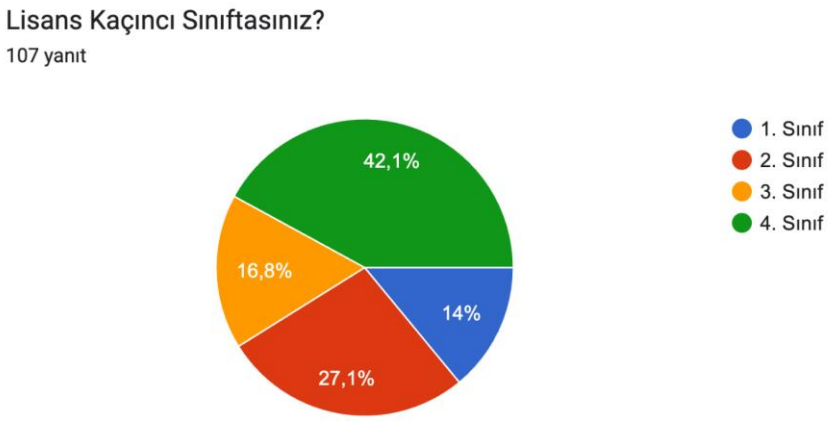


**Figure 3.** Grade Level of Participants[3]

When examining the distribution of participants by their undergraduate grade levels, it is observed that the majority (42.1%) are 4th-year students. This is followed by 2nd-year students at 27.1%, 3rd-year students at 16.8%, and 1st-year students at 14%. In this regard, it can be said that there is a heterogeneous distribution of participants across all grade levels.

### *Data Collection Tool*

The data collection tool used in the study was a survey form created with Google Forms, consisting of open-ended questions, which are particularly preferred in metaphor studies. This form consists of two sections. The first section includes questions aimed at determining the demographic characteristics of the participants, such as gender and age. In the second section, participants are asked to complete the sentence “Artificial intelligence is like .... because…”. In this template, the word "like" indicates the direction of the analogy, while the conjunction "because" aims to explain the reason or justification for the analogy (Elkatmış, 2023). Additionally, students were asked whether they had used any artificial intelligence tools before, and if so, which AI tools they had used in the second section. This is because it is thought that having used or not used AI tools could influence the students' metaphorical perceptions of AI. Before collecting the data, an explanation of what a metaphor is and how it is used was provided to the students with examples. Subsequently, during class hours, students were asked to fill out the form and complete the sentence. They were specifically asked to use a single word that evokes the concept of artificial intelligence when creating the metaphor sentence related to AI. The forms filled out by the German teacher candidates constitute the data set for this research.

### *Data Analysis*

A total of 107 students participated in the study during the application phase. When examining their responses, the answers of 100 students who were able to use metaphors and correctly explain the reasons were analyzed. Seven students either could not construct a metaphorical sentence, left their sentences incomplete, or did not provide an answer. Additionally, a few students used more than one metaphor and constructed reason sentences. These metaphors were also included in the analysis. The data analysis utilized Braun and Clarke's (2006) metaphor

[3] In this item of the questionnaire there is the question: what year of the bachelor's degree are you in?

analysis technique and the artificial intelligence tool ChatGPT. The thematic content analysis followed five stages:

- The answers were read multiple times to familiarize the researchers with the data.
- Each researcher independently coded the themes.
- The codes were categorized into identified themes and sub-themes.
- Similarities and differences between the coding done by the two researchers were determined.
- Finally, the results obtained were compared with the analyses conducted by ChatGPT and compiled into a report. The results obtained through thematic content analysis were interpreted by categorizing the metaphors used.

***Validity and Reliability***

*a. Participant Information and Survey Implementation*

- Before administering the survey form, participants were provided with a Participant Information Form and were verbally informed about what a metaphor is and examples of metaphors.
- Before completing the survey, participants were provided with a suitable environment and sufficient time. This allowed participants to express their thoughts comfortably and ensured accurate data collection.

*b. Data Analysis and Examination of Conceptual Categories*

- Use of ChatGPT: To enhance the reliability of the study, the artificial intelligence tool ChatGPT was used to categorize metaphors into conceptual categories during the data analysis. ChatGPT analyzed the collected data and created specific themes and sub-themes.
- Human Review: The conceptual categories created by ChatGPT were re-examined and compared by two independent researchers using the MaxQDA program. During this comparison process, the researchers assessed the accuracy and consistency of ChatGPT's classifications.
- Agreement of Opinions: As a result of the comparison conducted by the researchers, it was observed that the opinions were largely in agreement. This level of agreement is an important finding that supports the reliability and validity of the study.

*c. Evaluation of Results*

- Consistency: The verification of the analyses conducted by ChatGPT by human researchers increased the consistency and reliability of the data. This process combined ChatGPT's analytical skills with human oversight to provide more reliable and valid results.

*d. Reliability and Validity Rate*

- Agreement Rate: The comparison between the researchers' analyses and ChatGPT's analyses determined that there was a high level of agreement. This high agreement rate indicates that the study is both reliable and valid.

## Findings

The study investigated the metaphorical images of artificial intelligence among German language teacher candidates in the context of Trakya University. The findings obtained from the metaphor study, conducted with a total of 107 German language teacher candidates from the German Language Teaching undergraduate program, were organized and presented under four main headings:

### *Participants' Use of Artificial Intelligence Tools*

The participants' familiarity with the concept of artificial intelligence, their experience with using any artificial intelligence tools, or their lack of experience with such tools were considered, as these factors might affect their metaphorical perceptions. Participants were asked whether they had used any artificial intelligence tools to date.

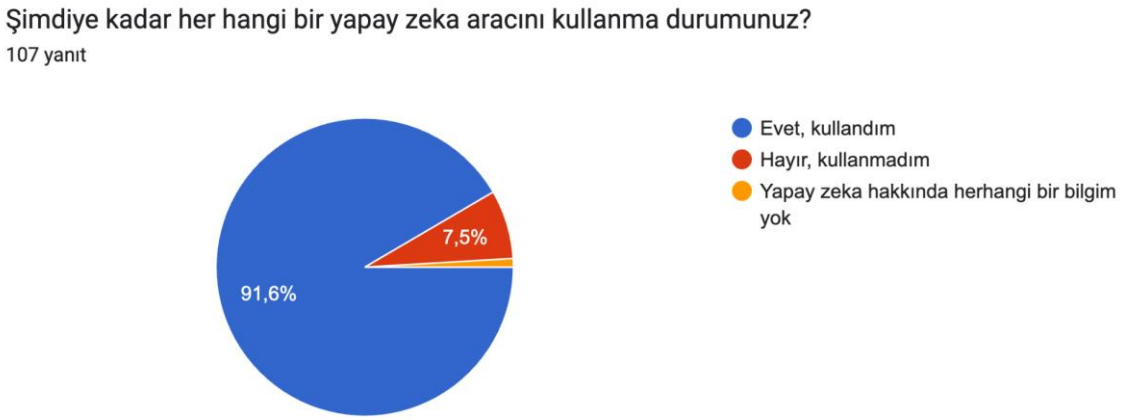


**Figure 4:** Participants' Use of Artificial Intelligence Tools[4]

As shown in Figure 4, the majority of participants (91.6%) have used artificial intelligence tools before. Only a small portion of participants (7.5%) have not had any experience with artificial intelligence tools. There are very few participants with no knowledge of artificial intelligence. This figure demonstrates that, in general, participants are familiar with and have experience using artificial intelligence tools.

### *Artificial Intelligence Tools Used by Participants*

Based on whether participants have used any artificial intelligence tools to date and the results obtained from those who answered "yes," the types of artificial intelligence tools used and their frequencies are shown below.

[4] This question of the survey is as follows: Have you ever used any artificial intelligence tool? The colors in the image and their graphic distribution mean the following. Blue means "yes, I have", red means "no, I haven't", and yellow means "I have no idea about AI".

**Table 1.** Frequency and Percentage Distribution of Used Artificial Intelligence Tools

| **Artificial Intelligence Tool** | **Frequency (n)** |
|---|---|
| ChatGPT | 90 |
| Bard | 20 |
| Snapchat AI | 8 |
| Bing AI | 7 |
| Siri | 4 |
| Dall-E | 4 |
| Midjourney | 4 |
| OpenAI | 3 |
| Zekai | 2 |
| Lumen5 | 2 |
| Co-Pilot | 2 |
| Hotpot.ai | 2 |
| Microsoft Bing | 2 |
| Sanal asistanlar | 1 |
| Claude Instant | 1 |
| Sage | 1 |
| Discord bot | 1 |
| Stockfish | 1 |
| Deeply | 1 |
| Grammarly | 1 |
| Alphazero | 1 |
| Invideo | 1 |
| GitHub Copilot | 1 |
| Character.ai | 1 |
| Canva AI | 1 |
| IBM Watson | 1 |
| PyTorch | 1 |
| Ludwig | 1 |

| | |
|---|---|
| PDFReader AI | 1 |
| Sora | 1 |

As seen in the table, the most frequently used artificial intelligence tool among participants is ChatGPT. The majority of participants (90 individuals) use this tool, indicating its widespread use and popularity. The second most frequently used tool is Gemini, with 20 participants reporting its use. Based on the table, it is understood that the use of artificial intelligence tools is widespread among German language teacher candidates, with ChatGPT being the most frequently used tool. It is followed by Gemini, Snapchat AI, and Siri. This suggests that artificial intelligence tools hold an important place in the education and daily lives of teacher candidates. The popularity of tools like ChatGPT and Gemini can be attributed to their functionality and accessibility.

### *Participants' Metaphorical Images of Artificial Intelligence*

The themes, sub-themes, and their percentages and frequencies related to the metaphors used by participants for artificial intelligence are shown in the table below. Initially, it was determined that 100 participants correctly used the "artificial intelligence is like .... because…" sentence structure. Additionally, sentences from participants who used multiple metaphors, such as "Artificial intelligence is like space because it contains endless information and answers. Artificial intelligence is like a tree because there are many different answers. Artificial intelligence is like a computer because we can access any information in seconds," were also included in the analysis. Sentences using "similar to" instead of "like," such as "Artificial intelligence is similar to space because it is unpredictable, its end is unobservable, and although it is full of beauty, its dark sides cannot be ignored," were included in the analysis. Additionally, responses like "Artificial intelligence is like lightning; it is fast but has a great impact" and "Artificial intelligence is like a god; you wish for something and it does it," where the metaphorical comparison was used without the "because" clause, were also included in the analysis. This resulted in a total of 108 metaphors being identified. Responses from 7 participants who could not construct a metaphorical sentence or used metaphor ineffectively are as follows:

"Artificial intelligence is useful because, while the internet gives us many similar results for what we are looking for, artificial intelligence provides us with that one exact answer."

"Family is the most important source of teaching; we have the opportunity to learn many things from infancy based on what we see from them."

"Artificial intelligence is a tool that facilitates life and I frequently benefit from it in areas where I struggle."

"Artificial intelligence."

"ChatGPT is like a Gemini; it knows everything."

"."

"Artificial intelligence is a perfect thing; it helps us."

These sentences were not included in the analysis as they did not reflect metaphor usage, were definitions, were incomplete, or lacked a response.

**Table 2:** Percentage and Frequency Distribution of Metaphorical Themes of Artificial Intelligence

| Main theme | Subtheme (artificial intelligence is like ...) | Why Sentence (because) | Frequency |
|---|---|---|---|
| **Access to Information and Learning** | library<br>digital library<br>library<br>library<br>a library that we carry with us<br>a library with unlimited resources | because it has much more information than an encyclopedia series.<br>because it holds all the information.<br>because I can find all the information I need there.<br>because it contains information that we can access immediately in different fields.<br>because it can give us instant answers to everything we ask for, and it can show us in practical or tabular form what we are curious about.<br>because it has access to resources we didn't even know existed. | 6 |
| | encyclopedia<br>a talking encyclopedia<br>encyclopedia | because it delivers information in a sourced and clean way.<br>because no matter what you are looking for, it can research the answer from the sources it has and present it in front of you.<br>It can contain any information. | 3 |
| | student | because it evolves over time.<br>because it learns from the data, learns and improves.<br>because it has to answer every question and answer every answer. | 3 |
| | is like an infinite dictionary, | because it contains everything. | 2 |

| | | |
|---|---|---|
| artificial intelligence is like a dictionary, | because we can ask him anything you don't know. | |
| pool | Human creation is a brain serving humans. The information contained in artificial intelligence is actually the work of people for years. Information has accumulated and developed for years. As a result, in this internet age, this information is transferred to a system. We ask it what we want and it finds and gives us answers from the pool of information. Or when we want something done, we give it commands and it does it for us. The accuracy is debatable, but this is evolving every day. | 1 |
| a tidy warehouse | because you can access any information easily and in one place | 1 |
| bedside book | because he can always help you with anything. | 1 |
| intelligence cube | because without knowing the tricks, you cannot reach the result immediately. If you don't know how artificial intelligence works, you can't reach what you want immediately, but if you know the key points, you can use artificial intelligence as you want. | 1 |
| Wiki | artificial intelligence can detect all information or all words and phrases floating around the internet | 1 |

| | | |
|---|---|---|
| world | because in one word, it presents what we want instantly, in detail and in a clear way. if we don't like the answer, it presents different answers. it explains the subject, the lesson we want like a private teacher. | 1 |
| star | because it allows us to get millions of pieces of information and what we want with very little effort. We see information as if we are in a pool of information, like looking into space and seeing the stars, but it is artificial intelligence that facilitates our efforts to reach it. | 1 |
| game | because the more you learn and progress, the more knowledgeable you become and the more you master the subject. | 1 |
| Albert Einstein | because AI knows everything | 1 |
| rope | because as you pull the string, new information comes. | 1 |
| human | because it's always evolving.<br><br>because it collects all the information on the internet and gives it to us.<br><br>because like human beings think and invent and do things, AI finds and does things that benefit the whole world. | 3 |
| human thinking | because AI can solve complex problems, learn and make decisions. | 1 |

| | | | |
|---|---|---|---|
| | AI is like a baby that is just learning to speak. | because the perception of children in this period is open and susceptible to misdirection. | 1 |
| | our second brain<br><br>brain | It allows us to access information that we cannot think about with our own brains, or information that we can reach after a long effort.<br><br>AI could be the answer to what happens if we use more of our brains, because it contains a lot of information, even billions of pieces of information. | 2 |
| | brain | because it makes us understand everything.<br><br>It knows everything | 2 |
| | an expression that attempts to simulate the human-like learning and problem-solving capabilities of computer systems | because it informs topics such as data analysis, learning algorithms and automated decision-making. | 1 |
| | a child who grows and develops day by day | because every day, the branches and tools where artificial intelligence is used are increasing and becoming compatible with human life and making life easier. | 1 |
| | genius | because he knows everything. | 1 |
| **Support and Auxiliary Role/ Tool** | Swiss Army knife<br><br>pocket knife | It is a tool that helps us achieve results that are useful in every aspect of our daily lives, be it knowledge, activities or social goals.<br><br>because it can develop us in many different areas of knowledge and help us move in the direction we need. | 2 |

| | | |
|---|---|---|
| key | When we face a problem, if you use the right key to solve it, you can go through any door.<br><br>because new knowledge easily opens doors to new worlds. | 2 |
| a smart home robot<br><br>an intelligent robot | because it is always easy for me to have it at my fingertips and at my disposal for anything that comes to my mind.<br><br>because he can answer even the most extreme questions intelligently | 2 |
| assistant | because it can provide you with great convenience in necessary matters. | 1 |
| helpful friend | It helps me in difficult times and makes it easy to understand the homework. | 1 |
| Guide | because it helps its users with a wide range of information to reach their goals. | 1 |
| tool | because it helps people achieve goals that are difficult for them to achieve. | 1 |
| toolbox | you can use the tools inside to do whatever you want | 1 |
| pencil | because it brings to the forefront, in written form, knowledge in areas where human beings are incompetent. | 1 |

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| | telephone | because it is easily accessible and allows us to open up to the whole world, destroying borders. | 1 |
| | bridge | because it encompasses traditional education and computer-based education and is shaped accordingly, acting as a bridge to future generations. | 1 |
| | it's the perfect thing | help us | 1 |
| | Locksmith | because it opens the door that you cannot open | 1 |
| **Uncertainty and Infinity** | space | because it holds endless knowledge and answers.<br><br>It is unpredictable, its end is unobservable, it is full of beauty, but its dark sides cannot be ignored. It will bring great benefits, but also, of course, negativity.<br><br>It is the new generation's library, which has no limits and is filled with information day by day. | 3 |
| | sea<br><br>a vast sea | because it contains all kinds of information and can process it like a human being, if the right questions are asked.<br><br>because it knows everything | 2 |
| | a never-ending road | because as we move forward, we encounter endless information | 1 |
| | universe | because it encompasses everything in it | 1 |

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|---|---|---|---|
| | open world game | because as you use it, you discover different parts of it. | 1 |
| | clay crafting | the way you shape it, the feedback you get. | 1 |
| | flower | because the more you use it, the more it blooms like a flower. | 1 |
| **Power and Control** | deity<br>god | because it's believed that you can do anything.<br>you wish it to do something and it does it. | 2 |
| | philosopher's stone | because there is no limit to what AI can do. | 1 |
| | human shadow | because it does not exist, but it conveys everything. | 1 |
| | savior | because he knows everything we wonder. | 1 |
| **Danger and Uncertainty** | I see AI as a weapon, | Misuse can have very dangerous consequences, but it can also lead to good results. | 1 |
| | weapon | misuse can have very dangerous consequences. | 1 |
| | skynet | One day, as human beings have done for centuries in the natural process, they may turn to their own free will, question their creator, become independent and want to shape their environment accordingly. The consequences are unknown. | 1 |

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| | a country we sowed seeds in even though we knew we couldn't conquer it | because the intelligence that we create with the power of our own minds will one day become uncontrollable and we will find ourselves living in a universe in a very different dimension. | 1 |
| | puzzle | because if we place the puzzle pieces correctly, we can get a beautiful picture, but if we place them incorrectly, we will get nothing. If we use artificial intelligence for the right purpose, it can help us learn German in many ways, it can help us improve grammar, writing, vocabulary, but if we use it incorrectly, it can prevent us from learning German correctly. | 1 |
| **Transparency, Speed and Efficiency** | microwave<br><br>microwave oven | because instead of searching for information for a long time, we can access information in a short time thanks to artificial intelligence applications.<br><br>Instead of waiting for the minced meat you forgot in the freezer to thaw for hours, you can throw it in the microwave and it will thaw in 1 minute. But the harms are very high. We run the risk of cancer in the long run. Artificial intelligence also prepares the necessary information for us in seconds instead of doing long research. But it also has its drawbacks. In the long run, we lose our creativity.<br><br>because it makes it easier to take notes, just like the microwave makes it easier to cook. | 3 |
| | computer | because we can access any information we need in seconds. | 1 |

| | | | |
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| | car | At first, we were afraid of speed, today it is unthinkable to be without it.<br><br>because it allows us to get where we want to go and get information. | 2 |
| | Lightning | because it's fast, it's quick, but it has a big impact. | 1 |
| | tree | there are a wide range of answers. | 1 |
| | fast food restaurant | because in a short time you can get what you want, for better or worse. | 1 |
| | godsend | because it makes it easier for us to know about all kinds of things. | 1 |
| | robots | because we can get an immediate answer to our question. | 1 |
| | glass | because it offers us everything we want to see and know in the transparency of glass. | 1 |
| **Guidance and Counselling** | tutorial<br><br>the teacher who knows everything<br><br>teacher<br><br>guidance counselor | because it collects all the information on the internet and gives it to us.<br><br>because it provides us with information we don't know about everything.<br><br>because he can be a pioneer and add to our knowledge where our own knowledge is narrowing.<br><br>because I learn many things from him.<br><br>because I can consult him on what to do and how to do it. | 5 |

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| | guide | because it provides people with information and guidance.<br><br>because it guides its users by providing information and solutions through its guiding algorithms and learning capabilities. So far, it's the AI that's been answering. The point is that it helps people. We can think of it as a resource. It simplifies our lives. We can think of it like we can't breathe without it. | 2 |
| | sun | because not only does he enlighten us by giving us access to all knowledge, but he warms us by guiding us.<br><br>because with him we have access to all knowledge. | 2 |
| | a guiding helper | because it helps us where we get stuck. | 1 |
| | fire | can guide with its light, until it jumps somewhere. | 1 |
| | old gossiping aunts | because they know everything. | 1 |
| **Addiction and Habit** | chocolate | it's addictive and makes you happy. | 1 |
| | cigarette | because it's addictive. | 1 |
| | parasite | because it is entering more and more into our lives day by day. | 1 |

| | | | |
|---|---|---|---|
| | breathing | because we have become unable to live without it, we have become lazy and we use it to reach an easy conclusion without thinking, without researching everything we want the answer to. It's a great tool to use correctly, but it's also an indisputable fact that it makes us lazy. | 1 |
| **Emotional Impact** | love | the more you are exposed to it, the more it pushes you away. | 1 |
| | hope | because where there is AI, there is hope for the future. | 1 |
| | desirable | because when we express what we want correctly, we can find anything. | 1 |
| **Others** | mirror | reflects information to us | 1 |
| | rainbow after rain | because after the difficulties caused by the rain, a rainbow can make you forget those difficulties. Just like for centuries, artificial intelligence has made people forget the difficulties in medicine, education, transportation and so on. | 1 |
| | an indicator of human progress | because the more humanity develops, the more the limit of this indicator advances. | 1 |
| | future | because it interrupts the development of technology. | 1 |
| **Total** | | | **108** |

The German language teacher candidates were asked to express their perceptions of artificial intelligence through metaphors. The results were classified into several main themes, each highlighting different aspects of artificial intelligence. As shown in Table 2, these main themes are: "Access to Information and Learning," "Support and Assistive Role/Tool," "Unknown and Infinity," "Power and Control," "Danger and Uncertainty," "Transparency, Speed, and Efficiency," "Guidance and Direction," "Dependence and Habit," and "Emotional Impact."

Metaphors where the exact meaning intended by the teacher candidates was unclear were included under the main theme "Other."

The analysis provides a comprehensive understanding of the multifaceted role of artificial intelligence among German language teacher candidates. It is observed that the perceptions of teacher candidates about artificial intelligence are highly diverse and that they use various metaphors. The most frequently used metaphor is "library" (f=6). This metaphor suggests that artificial intelligence is used for accessing and acquiring information, and it is seen as a tool for learning. The other most frequently used metaphor is "teacher" (f=5). The metaphors "encyclopedia," "student," "space," and "microwave" follow this with a frequency of 3.

Overall, the metaphors provided by German language teacher candidates reflect a nuanced understanding of artificial intelligence that highlights its benefits, potential risks, and profound impact on information access, learning, and daily life. The diversity of metaphors indicates a balanced perspective that acknowledges both the positive and negative aspects of artificial intelligence. Thus, these findings are expected to provide valuable insights into how future educators and students perceive artificial intelligence and its role in education and society.

Based on the metaphorical images obtained from the participants, a word cloud has been created visually. The Free Word Cloudop application was used for the word cloud. The metaphors used by students regarding the concept of artificial intelligence were entered into the application as individual texts. Subsequently, the word cloud was automatically generated by the program.


**Figure 5:** Word Cloud of Participants' Metaphorical Images

Figure 5 presents the participants' metaphorical images in a colourful visual form. The most prominent words in the word cloud are "brain," "library," "world," "teacher," and "student." This indicates that students perceive artificial intelligence as a source of information similar to a brain or library and as a learning tool like a teacher or student. The words "assistant" and

"helper" are also frequently used, reinforcing the idea that students view artificial intelligence as a tool that can assist them.

The word cloud also includes some words suggesting that students see artificial intelligence as powerful and even potentially dangerous. For example, words like "god," "deity," and "universe" symbolize power. Overall, the word cloud demonstrates that students have a complex view of artificial intelligence. They see it as a powerful tool that can be used for both good and ill. They recognize its potential for learning and assistance but also express concerns about its power and potential negative aspects.

## Conclusion and Discussion

In this study, the metaphorical perceptions of artificial intelligence among German language teacher candidates at Trakya University were identified. A total of 107 voluntarily participating German teacher candidates were given a survey form, and it was found that 100 of them were able to use metaphors. The qualitative data obtained were analyzed and presented in the findings section.

From the qualitative data analysis of metaphorical perceptions, ten main themes were identified. These themes provide valuable insights into how future teachers perceive artificial intelligence and its various roles in education. The results indicate that German language teacher candidates perceive artificial intelligence in various ways, emphasizing its roles in accessing information, providing support, embodying power and control, and presenting both opportunities and risks. Metaphors such as "library," "Swiss army knife," "space," "encyclopedia," and "god" summarize a broad range of perceptions reflecting the complexity of artificial intelligence and its profound impact on learning, daily life, and society in general. The most prominent metaphors in the word cloud (see Figure 5) corroborate this information.

The use of a wide variety of metaphors suggests that teacher candidates have a broad understanding of artificial intelligence. However, it may also indicate some confusion related to the uncertainties brought about by the rapid introduction of artificial intelligence into our lives. The increasing use of artificial intelligence in education, the introduction of various AI tools, and their ongoing development raise concerns among both educators and students. Uncertainties about what artificial intelligence can do and its current relevance in education may have led to the use of diverse metaphors.

Metaphors can reflect individual perceptions and experiences in order to review personalised learning, develop personalised learning methods and give importance to personalised learning in foreign language teaching. In this way, the foreign language learning process can be made more personalised and creativity can be encouraged. In other words, the results of this study will contribute to the formation of possible artificial intelligence foreign language learning methods and strategies in the future.

These varied metaphorical perceptions underscore the need for comprehensive artificial intelligence education in teacher training programs. This highlights the importance of integrating comprehensive AI education into teacher training programs to equip future educators with the skills to use AI effectively and responsibly. Providing future teachers with a balanced understanding of AI's capabilities and limitations is crucial for fostering a conscious and critical approach to integrating AI into educational contexts. Therefore, it is essential to offer teacher candidates the opportunity to use AI technology as a tool in their own education

and professional development. Integrating AI into teacher training curricula and ensuring that teacher candidates are aware of both the benefits and potential risks of AI will enable future educators to use AI effectively and mitigate potential risks.

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