

RESEARCH ARTICLE

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Exploring gifted students' views on the effects of artificial intelligence through Taba's data interpretation technique

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Highlights:

- Gifted students identified both potential benefits and risks of artificial intelligence in education.
- Information-seeking questions posed by the students constituted the majority.
- Students reported high satisfaction with the AI-supported Taba activity.
- Structured AI use can provide opportunities for inquiry without replacing students' initial thinking.

Abstract

This study examined gifted students' views on the effects of artificial intelligence within Taba's Data Interpretation Technique. The study also identified the types of questions students posed to AI during this process. The study employed an exploratory single-case design. The study included 27 middle school students enrolled in an after-school gifted education program in Türkiye. During a lesson structured around Taba's Data Interpretation Technique, the students discussed the major effects of artificial intelligence and, in the final stages of the technique, asked ChatGPT questions to support and extend their reasoning. The data were analyzed using content analysis. The findings indicated that the gifted students generally evaluated artificial intelligence positively, emphasizing benefits such as increased efficiency, objectivity, and access to information. However, they also identified potential adverse effects, including reduced motivation and excessive dependence on AI. The questions addressed to ChatGPT predominantly consisted of information-seeking questions, including "why," and "how" questions. Students used ChatGPT to seek explanations and information related to the educational effects they selected. The findings show how ChatGPT can be integrated into a structured instructional process that gives gifted students opportunities to engage in inquiry and reflective thinking. The study thereby contributes a practice-based example to the emerging literature on artificial intelligence in gifted education.

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1. Introduction

Artificial intelligence (AI) refers to computational systems that can perform tasks that typically require human cognitive abilities, including reasoning, learning, language processing, decision-making, and problem-solving. Recent advances in generative AI, particularly large language models (LLMs) such as ChatGPT, have expanded these capabilities by enabling natural language interaction and adaptive support for complex cognitive tasks (Nah et al., 2023; Holmes et al., 2019). In educational contexts, AI is increasingly used to personalize learning, provide formative feedback, support assessment, and facilitate inquiry-based learning (Holmes et al., 2019; Hussain et al., 2024). Gifted students are learners who demonstrate exceptional abilities or potential in one or more domains and therefore require educational experiences that extend beyond the regular curriculum. Gifted education programs are specifically designed to provide differentiated instruction, enrichment opportunities, and cognitively challenging learning experiences that address these advanced educational needs (Gagné, 2021). Throughout this paper, the term gifted is used consistently, although some cited studies use the broader expression gifted and talented; the latter is retained only when reporting the original authors' terminology.

This study examines the effects of AI in education, particularly for gifted students, through Hilda Taba's Data Interpretation Technique (Taba, 1966). This structured inductive technique provides students with opportunities to draw logical inferences from data, reach conclusions, and formulate generalizations. I selected it because it supports cognitive exploration and enables students to examine the potential short- and long-term effects of AI in education through a systematic process. By guiding learners from evidence to inference and ultimately to generalization, the technique creates opportunities for analytical reasoning and reflective thinking without presuming measurable improvement in these skills (Schiever, 1991; Taba, 1966). This study integrates Taba's Data Interpretation Technique with generative AI to provide gifted students with opportunities to engage in inquiry-oriented reasoning. Unlike studies that primarily treat ChatGPT as an information-retrieval or productivity tool, the present study positions it as an additional cognitive resource that students can consult while asking questions, seeking evidence, and reflecting on their initial ideas within a structured instructional process. Accordingly, the study examines gifted students' views on the effects of AI, the types of questions they posed to ChatGPT, and their satisfaction with the activity.

1.1. Using AI in the Education of Gifted Students

AI is increasingly used in education to personalize learning, provide immediate and adaptive feedback, monitor student progress, and support interactive learning experiences (Holmes et al., 2019; Kaswan et al., 2024; Shah, 2023). These capabilities enable teachers to adapt instruction to individual needs and promote more active engagement in the learning process (Ayeni et al., 2024; Harry & Sayudin, 2023).

AI may be particularly valuable in gifted education because gifted learners often learn quickly, show intellectual curiosity, and prefer complex, open-ended problems. They therefore require differentiated learning experiences that foster inquiry, abstraction, critical thinking, creativity, and complex problem-solving (Gagné, 2021). AI can meet these needs by providing personalized, adaptive learning pathways, cognitively challenging tasks, and enrichment activities tailored to students' abilities, interests, and learning pace (Aydın & Yurdugül, 2024; Siegle, 2023). It can also support creative writing, research, collaboration, and written expression while increasing students' engagement in learning (Abu Owda et al., 2023; Al-Otaibi et al., 2023; Siegle, 2023; Sugiarti et al., 2024). However, educators should integrate generative AI through pedagogically structured, ethically responsible practices that require learners to remain actively involved in interpreting and evaluating generated information (Yılmaz-Bursa, 2025). This approach matters given gifted students' concerns about AI's potential risks and their emphasis on education for its responsible use (Görgülü & Törün, 2025).

One AI tool with potential applications in gifted education is ChatGPT, which can provide additional resources, feedback, and challenging questions within differentiated learning activities (Siegle, 2023). Its particular strength lies in enabling learners to engage in iterative dialogue, consider alternative perspectives, receive immediate feedback, and refine their ideas. Thus, ChatGPT can support active knowledge construction rather than functioning merely as a source of information (Harry & Sayudin, 2023; Rudolph et al., 2023). These features may be relevant to gifted education, where learners need opportunities to engage with complex, open-ended inquiries. Research on AI use in gifted education remains limited (Görgülü & Törün, 2025; Siegle, 2023). To the best of our knowledge, empirical research on integrating AI into differentiated instructional techniques remains scarce. Given this limited evidence

base, the present study integrates ChatGPT into Hilda Taba's Data Interpretation Technique and examines gifted students' views, question-asking practices, and satisfaction within a structured, AI-supported activity.

1.2. A Differentiated Instructional Technique for Gifted Students: Hilda Taba's Data Interpretation Technique

Within structured reasoning approaches, Hilda Taba's Data Interpretation Technique offers a particularly relevant framework for structuring inquiry-oriented reasoning among gifted learners (Maker & Schiever, 2010). Gifted individuals often display developmental characteristics that are more advanced than, and qualitatively different from, those of their peers, creating distinct educational needs. As a result, educators must use varied methods and techniques to fully nurture gifted students' potential (Nicholas et al., 2024). One relevant instructional approach is Hilda Taba's set of teaching techniques (Taba, 1966), which provides structured opportunities for analytical inquiry. This set comprises four techniques, including Taba's Data Interpretation Technique. Like the other Taba techniques, it is intended to develop analytical thinking. With this technique, students make inferences about the short- and long-term cause-and-effect relationships of a situation or event. Students focus on causes or effects, depending on the activity's purpose. They must also draw conclusions, support their inferences, and make generalizations about the relationships (Schiever, 1991). The technique consists of five steps: listing the data; identifying the effects of the listed data in line with the purpose of the activity; discussing and supporting the further consequences of the selected effects; selecting the most important effect; and formulating generalizations about the topic (Schiever, 1991; Taba, 1966). Taba's Data Interpretation Technique provides students with opportunities for cognitive exploration through a series of focused questions and engages them in processes associated with critical and analytical thinking (Taba, 1966).

Empirical research on Taba's techniques remains limited. Hall and Myers (1977) reported that a one-year in-service education program incorporating these techniques led to positive changes in teachers' perceptions of their classroom performance. Hanninen (1989) found that Taba's techniques improved elementary and middle school students' fluency and flexibility skills, although their effects on critical thinking behaviors remained limited. In gifted education, Demirel-Dingeç et al. (2023) examined graduate students' views on Taba's techniques. The participants indicated that the Data Interpretation Technique, in particular, could support analytical and creative thinking, inductive reasoning, and enjoyable learning experiences. These findings suggest that the Data Interpretation Technique can serve as a structured differentiation tool to help gifted students establish cause-and-effect relationships, draw inferences, and develop generalizations. Integrating ChatGPT into this process may offer an additional information resource that students can consult while examining evidence and formulating generalizations.

This study integrates ChatGPT with Hilda Taba's Data Interpretation Technique to examine gifted students' views and question-asking practices within a structured AI-supported instructional activity. The study aimed to identify gifted students' views on the effects of artificial intelligence through Taba's Data Interpretation Technique, examine the types of questions they pose to ChatGPT during this process, and determine their satisfaction with the activity. Accordingly, the study addresses the following research questions:

- How do gifted students evaluate the effects of artificial intelligence within the context of Taba's Data Interpretation Technique?
- What types of questions do gifted students pose to ChatGPT within the framework of Taba's Data Interpretation Technique?
- How satisfied are gifted students with the activity?

This study contributes to the literature by illustrating how ChatGPT can be used not merely as a source of information but as an additional cognitive resource within a structured reasoning process. It also extends the limited empirical knowledge base on AI-supported gifted education by providing a practice-based example of how generative AI can be integrated with a differentiated instructional technique for gifted students.

2. Method

2.1. Research Design

This study employed an exploratory single-case study design to examine gifted students' views on the effects of artificial intelligence, the types of questions they posed to ChatGPT, and their satisfaction with a structured AI-supported instructional activity (Yin, 2018). Exploratory case studies allow researchers to examine contemporary, insufficiently understood phenomena in depth within a specific context (Merriam,

2009; Yin, 2018). This study examined a group of gifted students participating in a structured instructional activity in which ChatGPT was integrated into Hilda Taba's Data Interpretation Technique.

2.2. Defining the Case and Its Boundaries

The case was defined as gifted students' interactions with ChatGPT and their reasoning about the effects of artificial intelligence during a structured activity in an after-school, university-based gifted education program in Türkiye. The study was limited to a two-week implementation during the fall semester of the 2023-2024 academic year. The study group consisted of 27 gifted middle school students enrolled in a university-based after-school program. These boundaries are consistent with the fundamental principles of case study research (Creswell & Poth, 2018; Stake, 1995).

2.3. Rationale for the Case Study Approach

The research questions are aligned with an exploratory case study approach, which seeks to uncover emerging themes, patterns of reasoning, and AI-use practices within a specific instructional context (Merriam, 2009; Yin, 2018). Rather than seeking statistical generalization, the study aimed to provide contextually grounded insights into how gifted students considered the educational effects of AI and used ChatGPT within a structured instructional activity (Flyvbjerg, 2006).

2.4. Researcher Positionality

Three researchers conducted this study, each with complementary areas of expertise. The first researcher has worked in gifted education since 2014 and designed and implemented the activity used in the study. Her familiarity with the research context facilitated the implementation of the activity and supported a detailed understanding of the instructional process, while also requiring explicit attention to potential researcher bias. To minimize potential bias, the researchers systematically applied Taba's Data Interpretation Technique, grounding interpretations in student-generated data. The second researcher works in curriculum and instruction and contributed to the research design and data analysis through expertise in qualitative research, instructional methods, and curriculum development. The third researcher works in distance education and artificial intelligence in education and contributed to interpreting students' interactions with ChatGPT and evaluating the findings within the broader context of AI-supported education. Throughout the study, the researchers engaged in regular reflection and peer debriefing to limit the influence of personal and disciplinary assumptions on data interpretation.

2.5. Participants

The study included 12 sixth-grade and 15 seventh-grade gifted students enrolled in a university-based after-school program. The program uses a sample-based, multi-stage identification process consisting of student self-nomination, ability and scientific creativity tests, and combined scores from these assessments. Students who meet the identification criteria and rank within the available admission quota are admitted to the program, where they receive instruction in homogeneous groups with gifted peers. Participants were included in the study based on their identification as gifted and their voluntary participation (Patton, 2015).

2.6. Data Collection Procedure and Instruments

In this study, Taba's Data Interpretation Technique was used to examine the effects of AI in education with gifted students. The activity was conducted separately with the sixth- and seventh-grade groups over two weekly sessions during the fall semester of the 2023-2024 academic year. During the first session, students completed the first three stages through whole-class discussions, and the teacher recorded their ideas, inferences, and cause-and-effect relationships on the board. In the fourth stage, completed individually at home over the following week, students selected the educational effect they considered most important, explained their reasons, and used ChatGPT to support their individual work. They recorded both their responses and the questions they posed to ChatGPT on the worksheet. During the second session, students shared their individual work and completed the fifth stage by formulating class-level generalizations. At the end of this session, they also recorded their satisfaction with the activity on the worksheets. Figure 1 presents the stages of the activity.

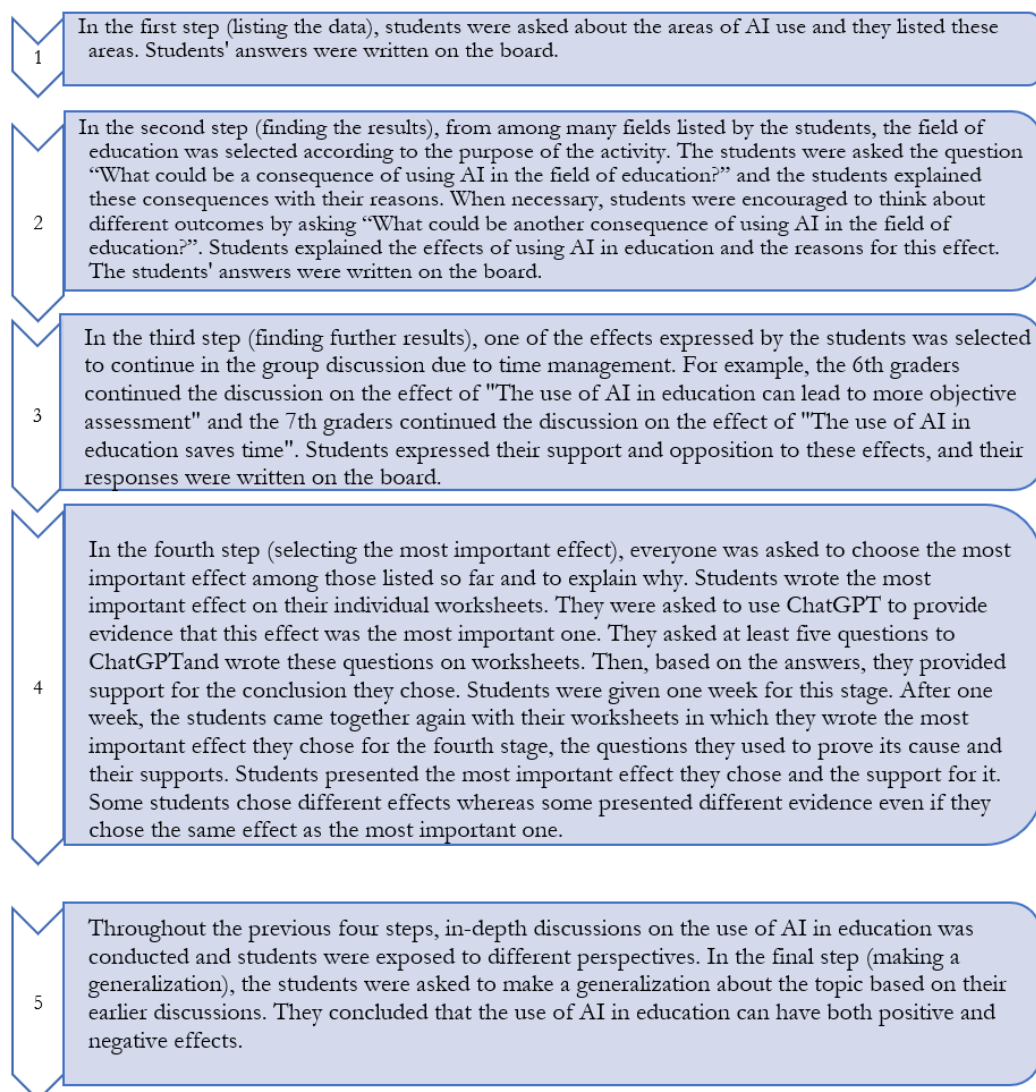


Figure 1. Steps of Hilda Taba's Data Interpretation Technique

During the group classroom activity, students wrote their answers on the board, which were then photographed. The photographed board records and individual worksheets were analyzed as complementary data sources. The board records were coded to identify the educational effects of AI and the cause-and-effect relationships collectively generated during the first three stages. The individual worksheets were analyzed to identify the educational effects each student selected as most important, classify the questions posed to ChatGPT, and examine students' views on their satisfaction with the activity. The category frequencies reported in Tables 1 and 2 were calculated from students' individual selections rather than from the collectively generated board records. Satisfaction responses were summarized descriptively using frequencies. On the worksheet, students also indicated their satisfaction with the activity in which they used ChatGPT to examine the effects of artificial intelligence, reporting how much they liked the activity and found it useful by selecting one of four response options: "not at all," "partly," "moderately," or "very much." The researchers prepared this form and finalized it based on feedback from one expert in gifted education and one language expert. The gifted education specialist holds a master's degree and a doctorate in gifted education, is an associate professor, and has worked with gifted children, educators, and families in the field. The language specialist holds a master's degree and a doctorate in Turkish language and literature, has taught in this field at the secondary school level for more than 10 years, and also teaches courses related to her field at a university. The final version of the form opened with an explanation of how to use ChatGPT, then presented three sections in which students recorded the effect they considered most important, the questions they posed to ChatGPT to support that choice, and whether they liked the activity and found it useful. This study collected data through this form, and students

submitted completed forms to the first author, who conducted the implementation, at the following weekly session. Because digital devices were not available during the program sessions, students completed the ChatGPT component at home over the following week. Each student was instructed to pose at least five questions about the educational effect they had selected and record them on the individual worksheet. Students submitted the completed worksheets to the first author at the following weekly session.

2.7. Data Analysis

The researchers analyzed the qualitative data using content analysis. The researchers conducted the coding process iteratively through repeated comparison and discussion. Initially, the researchers independently reviewed and coded the data. The researchers identified differences in category definitions and code assignments through comparison and discussed them until they reached consensus. An expert in gifted education then reviewed the coding categories, and the researchers refined them based on the expert's feedback. The researchers analyzed individual worksheet data using qualitative content analysis. Students' selected effects of AI were coded inductively, whereas their questions to ChatGPT were classified deductively using Uzun's (2006) taxonomy. The photographed board records were reviewed separately to document and describe the collective stages of the activity; they were not combined with the individual worksheet data in the category frequencies.

To examine students' interactions with ChatGPT, the questions recorded on the individual worksheets were classified according to Uzun's (2006) taxonomy of Turkish question sentences. Uzun distinguishes three main question types: yes-no questions, what questions, and melodic questions. Yes-no questions generally seek confirmation or disconfirmation; for example, "Did Alice take the children to the garden?" What questions constitute a broader category and include questions formed with expressions such as "what," "why," "how," "where," "for what reason," and similar interrogative forms; for example, "Why did Alice take the children to the garden?" Thus, in this study, questions formed with or functioning as "what," "why," "how," "for what reason," and related expressions were classified under Uzun's original category of what questions. Melodic questions are produced primarily through intonation and are typically context-dependent, often expressing confirmation or surprise; for instance, in response to a sound from another room, the utterance "Alice?" may function as a melodic question (Uzun, 2006, pp. 21-30). The written data contained no melodic questions.

The trustworthiness of the analysis was addressed in accordance with Lincoln and Guba's (1985) criteria of credibility, dependability, confirmability, and transferability. Credibility was supported through repeated engagement with the data, independent coding by multiple researchers, peer debriefing, external expert review, and the inclusion of direct participant quotations in the findings (Creswell, 2008; Creswell & Miller, 2000). The study strengthened dependability and confirmability by documenting coding decisions, category development, and revisions throughout the analysis. Transferability was supported through detailed descriptions of the research context, participants, instructional process, and data collection procedures, enabling readers to assess the findings' applicability to comparable educational settings.

2.8. Ethical Considerations

The institution where the study was conducted approved the ethics application on 18 October 2023. The researchers obtained informed consent from participants and their families, and participation was voluntary. The study did not use participants' real names. All student data were anonymized and securely stored: digital files were encrypted on a password-protected computer, and physical documents were kept in a locked office accessible only to the research team.

3. Results

This section presents findings on students' views of AI's educational effects, the types of questions they posed to ChatGPT, and their satisfaction with the activity. The findings are organized according to the three research questions guiding the study. Each subsection presents the evidence relating to one research question; interpretation is reserved for the Discussion.

3.1. Results on the Effects of Using AI in Education

During the group stages of Taba's Data Interpretation Technique, the sixth- and seventh-grade students identified uses of AI, discussed its possible educational effects, and considered the further consequences of these effects. The students organized their collective responses as concept maps on the classroom board. These concept maps documented the development of the group discussions and the

cause-and-effect relationships established by the students. The sixth-grade students' concept map is presented in Figure 2.

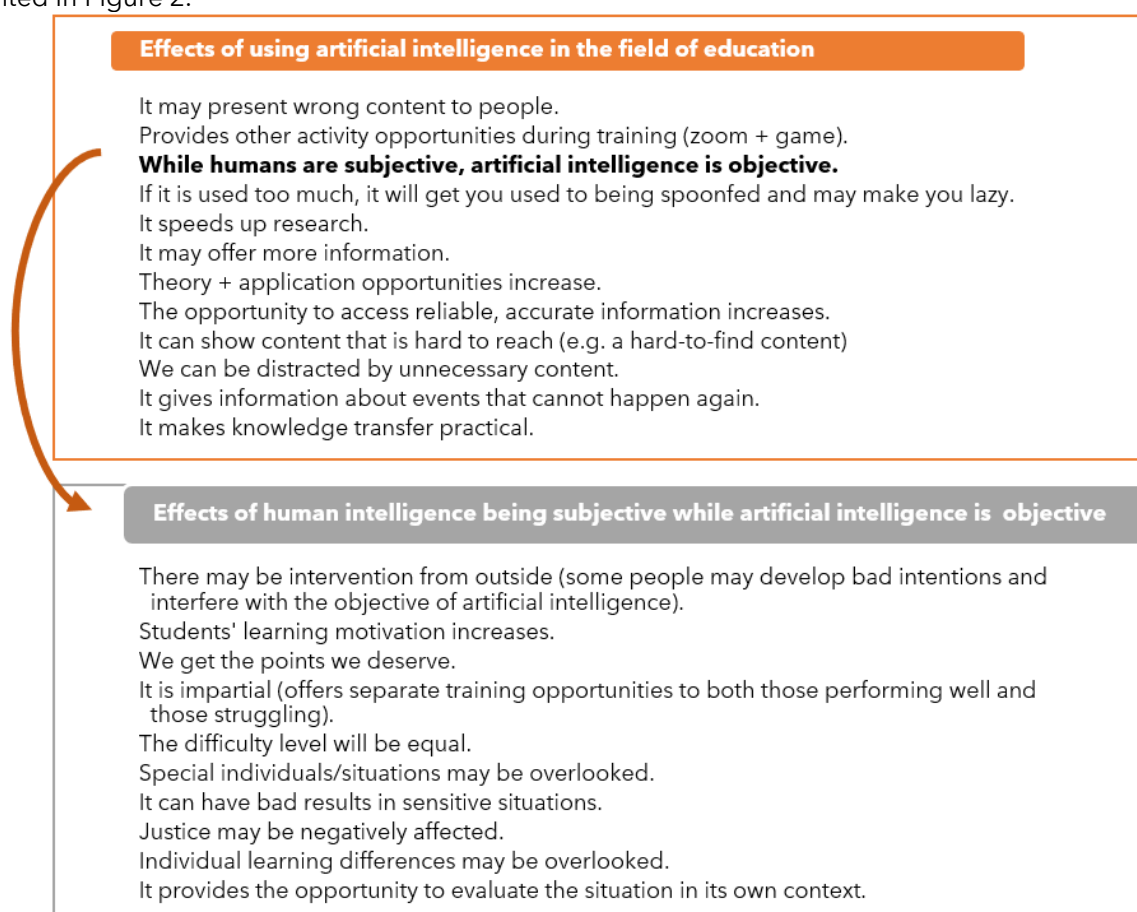


Figure 2. Effects of Using AI in Education According to Sixth-Grade Students

As shown in Figure 2, the sixth-grade students considered both positive and negative educational effects of AI during the group discussion. The group selected the statement "While humans are subjective, AI is objective" for further discussion. In examining its possible consequences, the students suggested that AI might produce fairer judgments in some situations but might be less capable than humans of making context-sensitive judgments. The effects individually selected by the sixth-grade students were analyzed inductively and grouped into seven categories. Initial descriptive codes were compared and consolidated according to conceptual similarity. Table 1 presents the resulting categories and the number of students represented in each category.

Table 1. Most Important Educational Effects of AI Selected by Sixth-Grade Students

Category	Frequency (n)
Quick information retrieval	3
Facilitating research	2
Displaying hard-to-access content	2
Objectivity in educational assessment	2
Customizing instruction	1
Encouraging laziness	1
Inability to recognize human differences	1

As shown in Table 1, sixth-grade students most frequently selected quick information retrieval ($n = 3$). Two students selected facilitating research, providing access to otherwise difficult-to-access content,

and objectivity in educational assessment. One student selected each of the following: personalizing instruction, encouraging laziness, and AI's inability to recognize individual differences. Thus, the students identified both potential benefits and potential limitations of AI in education.

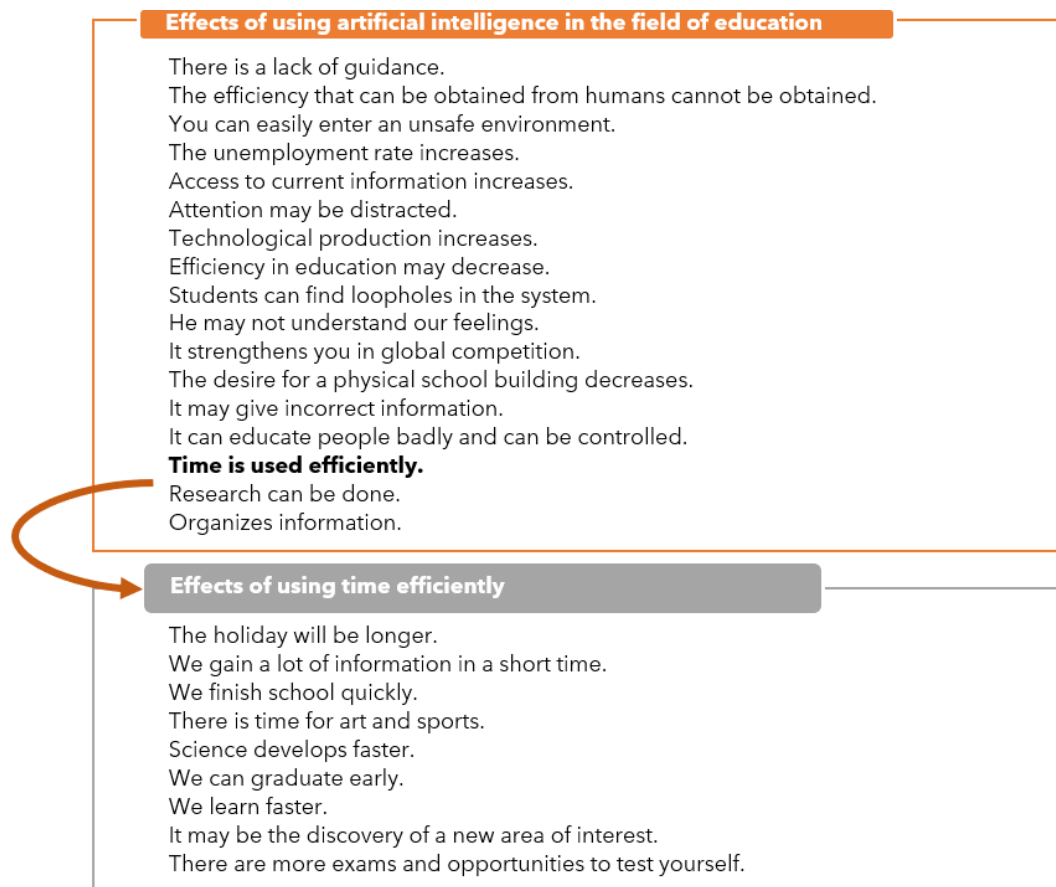


Figure 3. Effects of Using AI in Education According to Seventh-Grade Students

Figure 3 presents the educational effects of AI collectively identified by the seventh-grade students. The group selected "Time is used efficiently" for further discussion and considered how the time saved through AI use might be allocated to other activities. Following the group discussion, each student independently selected the effect that they considered most important. These individual responses were grouped into five categories, as presented in Table 2.

Table 2. Most Important Educational Effects of AI Selected by Seventh-Grade Students

Category	Frequency (<i>n</i>)
Saving time	7
Increasing the quality of education	4
Increasing the rate of unemployment	2
Accessing up-to-date information	1
Ability to perform mathematical operations	1

As shown in Table 2, saving time was the most frequently selected effect among the seventh-grade students ($n = 7$), followed by increasing the quality of education ($n = 4$) and increasing unemployment ($n = 2$). One student selected access to up-to-date information, and another selected the facilitation of mathematical operations.

3.2. Types of Questions Posed to ChatGPT

In the fourth stage of Taba's technique, each student independently selected the educational effect of AI that they considered most important and posed at least five questions to ChatGPT concerning that effect. Specifically, students completed the prompt, "In my opinion, this is the most important effect because ...," by drawing on the responses they received to the questions they posed to ChatGPT. Because digital devices were not available during the program sessions, students completed this task at home over the following week and recorded their questions on the individual worksheets. Although the researchers provided a brief user guide, students reported that they were already familiar with ChatGPT. The recorded questions were classified according to Uzun's (2006) taxonomy.

The sixth-grade students posed 67 questions in total: 14 yes-no questions (20.9%) and 53 information-seeking questions (79.1%). The seventh-grade students posed 81 questions: 30 yes-no questions (37.0%) and 51 information-seeking questions (63.0%). These information-seeking questions fall within Uzun's (2006) category of "what questions." Across both grade levels, 104 of the 148 questions (70.3%) were information-seeking questions, whereas 44 (29.7%) were yes-no questions. No intonation-based questions were identified. Examples of the questions students posed to ChatGPT are presented below; participants are identified as P1 to P27:

P1: If AI is used in education, how will students' willingness to learn be enhanced or diminished?

P8: How does the objectivity of AI contribute to education?

P12: Can AI be a better teacher than humans?

P15: Has there been an increase in students' abilities since AI came out?

P16: How does increased access to up-to-date information affect students' question-solving speed?

P18: Can AI identify a personalized learning style?

P21: How can AI save teachers' time?

P25: Can AI misinform?

P27: What AI tools can be used to monitor students' progress and provide frequent feedback?

Students in both grade levels predominantly used information-seeking questions to request explanations, reasons, examples, or possible consequences related to their selected effects. They also used yes-no questions to seek confirmation or examine whether a particular possibility was valid. One student added the instruction "Give a short answer" to all questions, suggesting an individual preference for concise responses.

3.3. Student Satisfaction with the Activity

Students' satisfaction with the activity was assessed using the original response categories of "not at all," "partly," "moderately," and "very much." Among the sixth-grade students, 11 indicated that they liked the activity "very much," while one selected "partly." Among the seventh-grade students, 14 selected "very much," while one selected "moderately." The same distribution was observed for perceived usefulness: 11 sixth-grade students selected "very much" and one selected "partly," whereas 14 seventh-grade students selected "very much" and one selected "moderately." No student selected "not at all" for either item. Overall, 25 of the 27 students selected "very much" for both liking the activity and finding it useful.

4. Discussion

In this study, gifted students examined the educational effects of AI through Taba's Data Interpretation Technique. The most frequently selected positive effects were saving time and gaining rapid access to information, while one student identified personalized instruction. Identifying personalization as a potential benefit aligns with Van der Vorst and Jellic (2019), who noted that AI systems can provide learning experiences tailored to students' preferences and learning needs. Similarly, students' views on efficiency and access to information align with findings that AI-supported chatbots can reduce wait times and provide rapid educational support (Wollny et al., 2021).

Students also identified potential adverse effects, including increased learner passivity and AI's limited ability to recognize contextual or individual differences. Their views concerning fairness were not uniform. Some perceived AI as potentially more consistent in assessment, whereas others noted that its outputs could be affected by biased data, system design, or misuse. These findings reflect students' expectations and concerns; the study did not assess whether AI-based evaluation is more objective or fairer than human evaluation. Wang (2021) similarly calls for caution when AI is used to inform educational decisions.

The students did not evaluate AI as entirely beneficial or entirely harmful; instead, they articulated both positive and negative possibilities. This balanced pattern is consistent with the literature indicating that gifted learners may engage readily with complex and open-ended issues (Olpak & Korkut, 2025). However, because critical thinking was not directly measured, the diversity of perspectives identified in the present study should not be interpreted as evidence of improvement in students' critical thinking skills. The structured sequence of Taba's technique may nevertheless have provided opportunities for students to consider multiple consequences and relationships.

Another finding concerned the types of questions students posed to ChatGPT. Information-seeking questions constituted 70.3% of all questions and included questions formed with expressions such as "what," "why," "how," and "for what reason." Yes-no questions constituted 29.7% of the questions and were generally used to seek confirmation concerning the effect selected by the student. No intonation-based questions were identified, which is unsurprising given that the data consisted of written questions. One student added the instruction "Give a short answer" to every question. Although this was an isolated observation, it suggests that this student preferred concise responses when consulting ChatGPT, and no broader conclusion can be drawn from a single participant's prompting practice. The predominance of information-seeking questions aligns with AI systems' ability to combine and present information from multiple sources (Rudolph et al., 2023). The explanatory questions show how students used the activity to explore the possible reasons and consequences of their selected effects. This study did not assess whether these questions reflected a stable characteristic such as intellectual curiosity. Within Taba's Data Interpretation activity, students may have used these questions to explore the underlying reasons for the effects they had selected and to obtain information relevant to their views.

Students also reported high levels of satisfaction with the activity. Twenty-five of the 27 students selected "very much" for both liking the activity and its perceived usefulness. No student selected "not at all." These results indicate a positive immediate response to the activity but should not be interpreted as evidence of learning gains or sustained engagement. Because research examining gifted students' experiences with AI-supported instructional activities remains limited, the findings provide preliminary insight into students' acceptance of this form of structured AI integration. This interpretation is compatible with suggestions that, when accompanied by appropriate pedagogical and ethical safeguards, AI may expand the range of learning opportunities available to gifted students (Al-Otaibi et al., 2023).

4.1. Implications for Theory and Practice

The study offers a practice-based illustration of how generative AI can be incorporated into gifted education through an established instructional framework. Taba's Data Interpretation Technique required students to identify and select an educational effect of AI before consulting ChatGPT. In this sequence, ChatGPT served as an additional information resource that students could use while examining their selected effects, rather than as the starting point for generating their initial ideas. From a practical perspective, teachers may use similar structured activities to require students to formulate an initial position, generate questions, consult AI-generated information, and subsequently reconsider or elaborate their ideas. However, teachers should also incorporate explicit verification procedures because the present activity did not systematically assess the accuracy of ChatGPT's responses. AI-supported activities should preserve students' responsibility for interpreting information and should not position generated responses as automatically reliable or authoritative.

4.2. Limitations and Directions for Future Research

This study has several limitations. Because students used ChatGPT at home, the researchers could not observe their interactions in real time or determine whether they received assistance while completing the task. The analysis relied on questions recorded on worksheets rather than complete ChatGPT conversation histories. Thus, the recorded questions may not represent every question students posed, and the study could not examine the full content or accuracy of ChatGPT's responses. The study also did not directly measure learning outcomes; the benefits students identified should therefore be interpreted as perceived or anticipated benefits rather than evidence of cognitive or academic improvement.

Future research could examine AI-supported learning across different educational settings and with larger, more diverse participant groups. Comparisons between gifted students and typically developing students could focus on their frequency of AI use, the questions they pose, and the benefits and challenges they experience. Laboratory-based studies incorporating screen recordings, think-aloud protocols, classroom observations, and systematic comparisons of students' initial and final responses could provide more precise evidence of how interaction with AI shapes reasoning. Longitudinal, experimental, and mixed-

method studies could also investigate whether the anticipated benefits translate into measurable improvements in higher-order thinking, creativity, and academic performance. Comparing different generative AI tools may further clarify whether the findings are specific to ChatGPT or applicable across AI systems.

5. Conclusion

This study indicates that Taba's Data Interpretation Technique provided a structured context in which gifted middle school students could consider both the potential benefits and risks of AI in education from multiple perspectives. Rather than merely expressing opinions about AI, students engaged directly with ChatGPT to explore the educational effects they had identified, seeking information, explanations, reasons, examples, and confirmation. In this respect, the activity allowed the researchers to examine students' views of AI alongside how they interacted with a generative AI tool within the same instructional process. The findings further suggest that students did not frame AI as either wholly beneficial or inherently problematic. They recognized potential advantages related to efficiency, access to information, objectivity, and personalization, while also identifying concerns such as inaccurate information, overdependence, learner passivity, and limited responsiveness to individual differences. Their questions primarily sought explanations, reasons, information, or confirmation concerning the effects they had selected. In addition, most participants reported that they liked the activity and considered it useful, suggesting that a structured approach combining guided interpretation with direct use of generative AI may offer an engaging and educationally relevant context for gifted learners. Overall, integrating Taba's Data Interpretation Technique with ChatGPT appears to provide a meaningful instructional setting in which gifted students can examine the educational implications of AI from different angles and participate through their own questions. However, because the study did not directly assess cognitive outcomes, these findings should not be interpreted as evidence that the activity improved reasoning, metacognition, or higher-order thinking skills.

Statement of Researchers

Researchers' contribution rate statement:

ŞDD: Conceptualization, methodology, investigation (implementation of Taba's Data Interpretation Technique and data collection), formal analysis, data curation, validation, resources, visualization, supervision, writing—original draft, and writing—review and editing. **S.U:** Methodology and writing—original draft (literature review and discussion). **HS:** Methodology and writing—review and editing (language editing).

Conflict statement:

The authors declare that they have no conflict of interest.

Data Availability Statement:

The data supporting this study's findings are available on request from the corresponding author. However, the data are not publicly available due to privacy or ethical restrictions.

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Ethical Considerations: This research was approved by the Anadolu University Ethics Committee's Social and Human Sciences Ethics Committee's decision, No. 633345, dated 31/10/2023.

Author Biographies

Şule Demirel Dengeç is an Associate Professor in the Division of Gifted Education at the Faculty of Education, Anadolu University. She completed both her master's and doctoral degrees in gifted education and was awarded the title of Associate Professor in the same field. Her research focuses on the characteristics, identification, and education of gifted individuals, as well as their character development and values education. Her scholarly interests also include the sociocultural dimensions of giftedness and the experiences and educational needs of families of gifted individuals. She serves as an editor and reviewer for academic journals and has undertaken roles as both principal investigator and researcher in various academic projects.

Serap Uğur is an Assistant Professor at the Faculty of Education, Anadolu University. She began her academic career as a lecturer in the university's Open Education Faculty in 2002. She earned her bachelor's and master's degrees in Computer Education and Instructional Technology at Anadolu University and completed her doctorate in distance education. Her research interests include e-learning, digital content, digital storytelling, animation, game-based learning, gamification, instructional design, intercultural and individual differences, human-computer interaction, artificial intelligence, technological singularity, and transhumanism. She conducts research and development activities and contributes to projects in these fields.

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