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Perspectives of Undergraduate and Graduate Students on Utilizing ChatGPT: Analyzing Its Role in Question Preparation

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***Abstract**: Artificial intelligence (AI) is increasingly integrated into daily life across various sectors such as banking, healthcare, tourism, and education. This research aims to investigate science teacher candidates' opinions on using ChatGPT in education and their approaches to preparing questions with this artificial intelligence tool. Specifically, it aims to elucidate the role of ChatGPT in question preparation processes and its potential applications in education. A case study methodology was employed, focusing on 17 fourth-year science teacher candidates and 6 graduate students in a science education master's program during the fall semester of 2023-2024. Data were collected using an interview form and images of participants' conversations with ChatGPT. Content analysis of the data reveals that most participants intend to use ChatGPT in their teaching process for research and question creation. Participants provided specific details in their prompts to ChatGPT, including grade level, unit, subject area, learning outcomes, question type, number, and difficulty level. This study highlights the potential of ChatGPT to enhance educational practices and support teachers in personalizing learning experiences.*

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Introduction

THE RAPID integration of advancing technology in our daily lives is evident in many fields such as health, banking, industry, logistics, and education (Tekin, 2023; Yalçın-Çelik & Çoban, 2023). The increasing digitalization with advancing technology has increased the value of artificial intelligence studies (Yalçın-Çelik & Çoban, 2023; Cooper, 2023). Artificial intelligence technologies are technologies that mimic human intelligence, possessing abilities such as thinking, reasoning, analyzing, and concluding, similar to human intelligence (Cooper, 2023; Aktay et al., 2023). These technologies, along with artificial neural networks and machine learning, with the help of computers and algorithms to process information, learn, generalize, problem-solve, and process language, can perform many human cognitive skills (Cooper, 2023).

Today, as in many fields, the use of artificial intelligence technologies is increasingly intensifying in the field of education (Tekin, 2023; Aktay et al., 2023). Artificial intelligence in educational areas is being utilized in many educational processes such as tracing educational steps towards everywhere-accessibility in the field of education. Artificial intelligence provides speed and convenience in analyzing, evaluating, and providing feedback on learning outcomes for teachers and students; by offering personalized educational programs tailored to individual needs, it enables students to progress at their own learning pace, ensures that students who are unable to attend formal education for any reason have access to an educational environment 24/7, prevents interruptions in their educational lives, and increases efficiency in the education process by enabling them to receive additional support in areas where they struggle (Yalçın-Çelik & Çoban, 2023; Mogavi et al., 2024). The utilization of artificial intelligence in the educational area is expanding from web-based content to online smart learning systems and chatbots which are getting more popular today (Aktay et al., 2023). A chatbot, which is a tool for conversation, is defined as an artificial intelligence program that is used to answer questions from users via text-based dialogue with the user (Meço & Coştu, 2022).

When the literature is inspected, it is obvious that several studies on artificial intelligence and chatbots in education have also been beginning to increase recently, as well as in all other areas (Mogavi et al., 2024; Tekin, 2023; Yalçın-Çelik & Çoban, 2023; Cooper, 2023; Doğru, 2023; Aktay et al., 2023; Darayseh, 2023; Meço & Coştu, 2022; Wu & Yang, 2022; Chai et al., 2021). ChatGPT is seen as one of the chatbot technologies that has become more and more widespread. ChatGPT, an abbreviation for Chat Generative Pre-trained Transformer, is an advanced chatbot technology that is developed and trained using a massive-scale word database and is capable of producing coherent and context-oriented answers to miscellaneous questions

of humans with the help of Natural Language Processing (NLP) algorithms (Mogavi et al., 2024). Artificial intelligence applications, such as ChatGPT, which include massive-scale language models themselves depend on prompt engineering which is a systematic approach designed to provide effective communication (Heston & Khun, 2023).

Prompt engineering states a skill set that is used for applying certain rules over massive-scale language models, automatizing processes, and making obtained outputs provide certain qualifications (White et al., 2023). Heston and Khun (2023) mention prompt engineering in medical education in their studies. According to Heston and Khun (2023), prompt engineering is defined as including designing needed input for a model to produce the desired output. It is witnessed that this way, in the medical education field, realistic patient scenarios can be created and more effective results can be obtained in explaining medical concepts. Also in that study, it is emphasized that prompt engineering has a crucial role in the optimization of effective interaction with massive-scale language models and outputs (Heston & Khun, 2023). Henrickson and Meroño Peñuela (2023) mention polarized controversies on improvements in Natural Language Generation (NLG) and social effects of technologic developments, especially as ChatGPT, in their studies. According to Henrickson and Meroño Peñuela (2023), prompt engineering is defined as a technique that ensures the direction of the natural language generation system's output by setting inputs that the user gives into the system. Additionally, in their study, they state that prompt engineering has significant importance for artificial intelligence technologies and as artificial intelligence is not unbiased, it is influenced by human interactions (Henrickson & Meroño Peñuela, 2023). Lee et al. (2023) remark on the effects of prompt engineering in English education and also investigate prompt engineering usage in the development of Automatic Question Generation (AQG) systems, in their study. According to Lee et al. (2023), prompt engineering is described as utilizing certain instructions to help a language model yield requested results. In their study, they also declare that thanks to prompt engineering techniques, the validation and reliability of the questions are increased (Lee et al., 2023).

With the assistance of prompt usage in the educational field, Automatic Question Generation (AQG) systems ensure obtaining more effective desired results through language models such as ChatGPT. By using effective and appropriate prompt usage in language models, students' comprehension levels of taught topics can be evaluated, questions for teachers to ask students can be generated, and also the quality of those questions may be interpreted. Additionally, teachers can be given opportunities to develop different lecture materials (Lee et al., 2023). Taking these advantages into account, it is clear that the usage of language models in

education may increase the quality of education, integration of current technologies into the education field, and thus functionality of education.

In education and many other fields, language models provide opportunities like easing people's lives, reducing their workloads, and assisting rapid and simple access to information. Some leading technological development examples in this field may be ChatGPT which is created by OpenAI, or Bard.ai and Gemini developed by Google Inc. Among the aforementioned language models, Turkey's national language model MAIN GPT, which is developed by Havelsan Inc. The model which has its name as an abbreviation of the words "Multifunctional Artificial Intelligence Network" is a language model that is trained by Turkish content exclusively (Havelsan, 2023). It is predicted that this national language model will be able to analyze resources written in the native Turkish language and upon those analyses yield more fulfilling answers in the native Turkish language compared to counterpart models that are trained in foreign languages when released publicly. It will contribute to the students who are creating content in their native language and also allow teachers who are preparing educational materials to utilize the Turkish language's richness maximally.

This study aims to determine undergraduate and postgraduate students' opinions about ChatGPT itself and its usage in the educational field, also prompt structures they use when they are generating questions through ChatGPT.

Method

Research Model

As the research model, a case study, which is one of the qualitative research methods, was preferred. The result of the case study is important for revealing the problem situation with a holistic approach without making a generalization and providing ideas for future research (Yıldırım & Şimşek, 2021).

Research Group

The research was conducted with 17 science teacher candidates in the 4th grade of the science education undergraduate program of a state university's faculty of education in the Central Anatolia Region and 6 master's students studying in the graduate program during the fall semester of the 2023-2024 academic year. The participants of the research were selected using the convenience sampling method. The demographic information of the participants (age, gender, grade level) is included in **Table 1**.

Table 1. Demographic Information of the Participants.

Code names of the Participants	Gender	Age (yr)	Grade Level
KL1	Male	22	4th Grade
KL2	Male	23	4th Grade
KL3	Female	21	4th Grade
KL4	Female	22	4th Grade
KL5	Female	21	4th Grade
KL6	Female	22	4th Grade
KL7	Female	21	4th Grade
KL8	Female	22	4th Grade
KL9	Female	23	4th Grade
KL10	Female	22	4th Grade
KL11	Male	21	4th Grade
KL12	Female	21	4th Grade
KL13	Female	22	4th Grade
KL14	Female	22	4th Grade
KL15	Female	21	4th Grade
KL16	Female	21	4th Grade
KL17	Female	23	4th Grade
KY1	Female	23	Postgraduate
KY2	Female	25	Postgraduate
KY3	Female	30	Postgraduate
KY4	Female	32	Postgraduate
KY5	Female	24	Postgraduate
KY6	Female	25	Postgraduate

Implementation Process

The implementation consists of three weeks with two hours per week for both undergraduate and graduate students. A class was created on Google Classroom for monitoring the implementation process, and the weekly activities were uploaded to this platform. During the first week of the implementation process, the participants were informed about the definition of artificial intelligence, the application areas of artificial intelligence, the definition of ChatGPT, and the application areas of ChatGPT. They were also encouraged to conduct research using ChatGPT by selecting one of the environmental issues as a topic. They uploaded their research to the Google Classroom platform until the next class. In the second week, the research conducted by the participants in the previous week was discussed in the class.

Then, the participants worked on creating lesson plans and stories about environmental issues. The work was uploaded to the platform. In the

last week, the participants were informed about the definition of prompt engineering, the importance of prompt engineering, and its place in ChatGPT. Then, an activity of question generation using prompts was conducted and the participants were given an assignment to generate questions about an environmental issue they had chosen. The assignments were uploaded to the Google Classroom platform and reviewed.

Data Collecting Tools

In the research, the "Interview Form for ChatGPT and Its Use in Education" prepared by the researchers was used as the data collection tool and the data consisted of the conversations the participants had with ChatGPT-3.5. To enhance the credibility (validity) and consistency (reliability) of the qualitative research, several measures were taken. These include credibility (long-term engagement, depth-focused data collection, diversification, participant verification, expert review), transferability (detailed description, purposive sampling), consistency (consistency examination), and confirmability (confirmability examination) (Yıldırım & Şimşek, 2021). The semi-structured interview form prepared by the researchers is a questionnaire consisting of 10 open-ended questions aimed at determining participants' views on ChatGPT and its use in education. After initially creating the interview form, the researchers sought the opinions of two experts on ChatGPT and its application in education. Subsequently, the questions posed by the researchers were revised based on the experts' suggestions.

Collecting the Data

The data for the study was obtained through a semi-structured written interview form and screenshots of the conversations participants had with ChatGPT-3.5, after a 3-week implementation process.

Analysis of Data

The data collected in the study was analyzed using the content analysis method. In the content analysis method, categories and codes defined by the researcher are established. These categories and codes will contribute to other researchers in determining categories in line with similar results (Silverman, 2001). Firstly, for the analysis of the study, a code according to their grade levels was assigned to each participant who attended the study. Afterward, similar answers provided by the participants were grouped by the researchers under the same codes. The codes, which were examined based on their similarities and differences, were presented in table format to ease the analysis.

Table 2. Distribution of Participants According to Their Demographic Information.

Parameter		f	%
Gender	Male	3	13.1
	Female	20	86.9
Distribution of Ages	21	7	30.4
	22	7	30.4
	23	4	17.3
	24	1	4.4
	25	2	8.7
	30	1	4.4
	32	1	4.4
Grades	4th Grade (Undergraduate)	17	73.9
	Postgraduate	6	26.1

Table 3. Distributions According to First Resources of Information About ChatGPT.

Category	Code	Participant Code	f	%
First Resources of Information	Circle of Friends	KL1, KL3, KL7, KL11, KL13, KL16, KY 2	7	30.5
	Lectures	KL4, KL12, KL14	3	13.0
	Social Media	KL2, KL5, KL6, KL8, KL9, KL10, KL15, KY1, KY5	9	39.1
	Haven't Heard	KL17, KY3, KY4, KY6	4	17.4

Results

This chapter covers the presentation of findings obtained from participants' answers to the questionnaire in the form of a table and an examination of prompt structures they used while generating questions. Firstly, the demographic information of research participants is examined. In this context, the distribution of participants according to their demographic information is in **Table 2**.

Participants are asked, *"Have you ever heard of ChatGPT? If so, where have you heard? (Circle of friends, social media, etc.),*" and their answers to those questions are analyzed (**Table 3**). In **Table 3**, similar answers from the participants about where they first had been informed of ChatGPT were summed and examined.

Table 4. Distributions Upon Purposes of Usage of ChatGPT before the Research.

Category	Code	Participant Code	f	%
Purposes of Usage	Researching	KL4, KL8, KL15, KY1	4	17.4
	Chatting	KL10, KL11, KL14	3	13.0
	Homework	KL1, KL2, KL3, K5, KL9, KY5	6	26.1
	Haven't Used	KL6, KL7, KL12, KL13, KL16, KL17, KY2, KY3, KY4, KY6	10	43.5

When **Table 3** is viewed, participants' answers about first resources of information on ChatGPT are analyzed by dividing them into 4 subtitles. It is determined that most of the participants (19 participants, 82.6%) had already been informed about ChatGPT before this field research and also that the "Social Media" code has the widest (9 participants, 39.1%) share amongst the information resources. Also, it is seen that amongst the first information resources, there are other codes such as circle of friends and lectures. Lastly, some of the participants stated they had never heard of ChatGPT. Some of the opinions obtained from the research which belong to the participants are given below:

"Yes, I've heard it first in a circle of friends." (KL1).

"Yes, I've heard it first from social media platforms." (KL6).

"Yes, I've heard it first in a lecture." (KL14).

"No, I haven't heard it before." (KY4)

The participants are asked, "*Have you ever utilized ChatGPT before this field research? If yes, for which purpose have you utilized? Please explain*." Their answers are examined as frequency and percentage. In **Table 4**, similar answers of participants about whether they had ever used ChatGPT before this study and, if they had, which purpose they had aimed at are categorized under the same subtitles.

When **Table 4** is viewed, participants' answers about usage areas of ChatGPT before this research are examined broadly under 4 subtitles. It shows that before the research, most of the participants of this research had used ChatGPT for areas like researching, chatting, and preparing homework (13 participants, 56.5%). Some opinions of the participants obtained from this study about usage areas of ChatGPT are given below:

"I have used it for it to help my homework." (KL3).

"I have used it to chat with it." (KL10).

Table 5. Distributions Upon Purposes of Usage of ChatGPT before the Research.

Category	Code	Participant Code	f	%
Emotions while using ChatGPT	Astonished	KL2, KL9, KL13, KL17, KY2	5	21.8
	Excited	KL1, KL7, KL10	3	13.0
	Relaxed	KL3, KL11, KL12, KL15, KY3, KY5	6	26.1
	Happy	KL5, KL8, KL14, KY1, KY4, KY6	6	26.1

"No, I haven't used it before." (KL17).

"I have used it to find answers to questions that caught up to my mind while doing research." (KY1).

The participants are asked, *"How did using ChatGPT, which is an artificial intelligence program, make you feel?"*. Similar answers the participants had given are categorized under the same codes. The research participants' answers about emotions they felt while using ChatGPT are summed under the same subtitles and examined in **Table 5**.

When **Table 5** is viewed, answers of the research participants about emotions they had felt during the usage of ChatGPT are analyzed under 5 subtitles. Answers given are seemingly gathered under "Relaxed" (6 participants, 26.1%) and "Happy" (6 participants, 26.1%) codes. Also, other participants in the research are dispersed towards "Excitement," "Astonishment," and "Unease/Anxiety" codes. Some opinions about the participants' emotions, which are obtained from the research, are given below:

"This excited me." (KL1).

"Not sure but I felt a bit uncomfortable." (KL6).

"I realized flaws and inadequacies of artificial intelligence, and this surprised me." (KL13).

"Ability of easy access to information is time saving and this gladdened me." (KY1)

"I'm amazed and astonished." (KY2).

The participants who attended the research were asked, "*Have you ever utilized an artificial intelligence program similar to ChatGPT? If yes, what was its name, and what was the purpose of your usage? Please explain.*" **Table 6** answers the research participants' questions about whether they had

Table 6. Distribution of ChatGPT-like AI Utilization.

Category	Code	Participant Code	f	%
ChatGPT-like AI programs	Diffit.me	KL1, KL10, KL13, KL14, KL17	5	21.8
	Gamma.app	KL4, KY6	2	8.7
	Magicschool.ai	KY1	1	4.3
	Bard	KY2, KY3, KY4	3	13.1
	Monica.im	KY5	1	4.3
	Popai.pro	KL3	1	4.3
	Haven't used before	KL2, KL5, KL6, KL7, KL8, KL9, KL11, KL12, KL15, KL16	10	43.5

Table 7. Distribution of Positive and Negative Opinions on ChatGPT and ChatGPT-like AI Programs.

Category	Theme	Code	Participant Code	f	%
Positive and Negative Opinions	Positive	Convenience	KL1, KL4, KL5, KL8, KY4	5	21.8
		Productivity	KL2, KL3, KL11, KL13, KL14, KL16, KL17, KY1, KY5	9	39.1
		Time saving	KL6, KL7, KL9, KL10, KL12, KL15, KY2, KY3, KY6	9	39.1
	Negative	Self-Repetition	KL5, KL7, KL17, KY6	4	17.3
		Unreliability	KL10, KL11, KL12, KL14, KY1, KY4, KY5	7	30.5
		Laze	KL6, KL16, KY2, KY3, KY4	5	21.7
		Misinformation	KL1, KL2, KL4, KL8, KL9, KL13, KL15	7	30.5

used any artificial intelligence program similar to ChatGPT or not and, if they had, which ones. Those programs are summed under the same subtitles based on the similarities.

When **Table 6** is viewed, participants' answers about the utilization of any ChatGPT-like AI programs are examined under 7 subtitles. The participants that had used an AI program other than ChatGPT mostly gathered in the "Diffit.me" code (5 participants, 21.8%), seemingly. Additionally, the fact "Gamma.App", "Magicschool.ai," "Bard," "Monica.im," and "Popai.pro" programs were also used is determined. Some opinions belonging to the participants that are obtained from the research are given below:

"I had used Popai application." (KL3).

"No, I haven't used any." (KL8).

"I haven't used before." (KL9).

"I had used Diffit.me application for generating questions." (KL14).

"I had used Google Bard application to try it." (KY3).

"I had used Gamma.app application to prepare a presentation." (KY6).

The research participants are asked, "*What are the positive and negative aspects of ChatGPT and ChatGPT-like artificial intelligent programs when used in the educational field? Please explain*." Similar answers of the participants telling their positive and negative opinions on ChatGPT and similar AI programs are summed and examined on **Table 7** based on resemblances.

When **Table 7** is viewed, answers to the participant's opinions on ChatGPT and ChatGPT-like programs are grouped into 2 categories, "positive" and "negative" ones. 3 subtitles are under the "positive" category, and 4 are under the "negative" category. Positive opinions of the participants are gathered under "Convenience," "Productivity," and "Timesaving" codes, whereas negative opinions are gathered under "Self-Repetition," "Unreliability," "Laze," and "Misinformation" codes. Some opinions that are obtained from the research about the positive/negative thoughts of the participants are given below:

"To me, the greatest good of it is that it provides ease while researching, not necessarily it gives the most correct results, and it does the job." (KL5, positive).

"Using it, we end up doing similar homeworks with friends." (KL5, negative).

"When I am stuck at some point, it can be consulted to get an idea." (KL11, positive).

"It isn't always reliable." (KL11, negative).

"It significantly decreases the time a research takes, this is quite useful." (KL15, positive).

"It may offer incorrect information. Using without verification may give rise to problems." (KL15, negative).

"It may ease up the job while generating questions. It can be utilized in order to make introductions of lectures more interesting." (KY4, positive).

"Since students would extensively rely on these programs while doing homework, they will use the information they get as is, without verification. This will lead them to laze and prevent the instinct of curiosity and researching in them." (KY4, negative)

Table 8. Distribution According to the Opinions of the Participants on Lectures Taught Using ChatGPT.

Category	Code	Participant Code	f	%
Opinions on lectures taught using ChatGPT	Different	KL3, KL5, KL6, KL7, KL8, KL9, KL10, KL11, KL13, KL14, KL15, KL16, KL17, KY1, KY3, KY4, KY5	18	78.3
	Not different	KL1, KL2, KL4, KL12, KY2	5	21.7

Table 9. Distribution According to Intended Purposes of ChatGPT After Once Using It.

Category	Code	Participant Code	f	%
Intended Purposes of ChatGPT after Once Using It	Creating Texts	KL1, KL16	2	8.7
	Designing of Lesson Plans and Experiments	KL8, KL10, KY1	3	13.1
	Researching	KL4, KL11, KL14, KL15, KL17, KY4, KY6	7	30.4
	Question Generation	KL5, KL6, KL9, KL12, KY3, KY5	6	26.1
	I wouldn't use	KL2, KL3, KL7, KL13, KL17	5	21.7

The research participants are asked, "*Do you think a lecture taught using ChatGPT or conventional methods are different? If yes, which differences are there in your opinion? Please explain*." In **Table 8**, similar answers of the research participants about opinions on the differences between lectures taught using ChatGPT or conventional methods are summed and analyzed based on similarities.

In **Table 8**, answers the participants gave on whether there is any difference between lectures taught using ChatGPT or conventional methods are examined. Most of the participants (18 participants, 78.3%) stated lectures taught using ChatGPT have differences. Some opinions of the research participants are given below:

> *"Yes, it will be different. Because this way we incorporate technology into the lecture more." (KL7).*
>
> *"Yes, it will be different. It will be useful in the aspect of learning new knowledge and practices in lectures." (KL10).*
>
> *"Sometimes, AI programs may have an error, apart from that there won't be any differences." (KL12).*

"To me, there would be difference. In conventional methods we are given the knowledge directly but using ChatGPT, we can investigate and question the knowledge." (KL16).

"I don't think there would be any difference." (KY2).

The research participants are asked, "Would you use ChatGPT, an artificial intelligence program, as an educational tool again? If yes, what would be the reason? Please explain."

In **Table 9**, similar answers of the research participants about whether they would use ChatGPT for educational purposes again and what purposes they would aim for are summed and examined under the same subtitles based on similarities.

When **Table 9** is viewed, the answers of the participants, asking if they would use ChatGPT for educational purposes again and if they would, what the purposes would be, are divided under 5 subtitles. Most research participants (18 participants, 78.3%) stated they would use ChatGPT as an educational tool again. Also, the participants who stated they would use it again mentioned that they would have intended purposes such as "Creating Texts," "Designing Lesson Plans and Experiments," "Researching," and "Question Generation." Some opinions of the participants obtained from the research are given below:

"I would use it again to make it create texts." (KL1).

"I would use it again in order to get opinions when I got stuck while creating questions and educational contents." (KL6).

"I would use it to get help while preparing lesson plans or educational contents or studying for an exam." (KL10).

"No, I wouldn't use it." (KL17).

"Yes, I would use it again. I think it ensures more active participation to the lecture since it engages attentions of students. Students researching and trying to reach to the information rather than being given the knowledge directly to them in lecture times makes the learning process more yielding." (KY1).

"I would use it even as a regular search engine." (KY6).

The research participants are asked, "*What are the prompt structures you have used while asking ChatGPT to generate questions? Please share an example conversation screen of yours"*. The participants' answers are

Table 10. Distribution of the Prompt Structures the Participants Had Used While Asking ChatGPT to Generate Questions.

Category	Code	Participant Code	f
The Prompt Structures Used While Asking ChatGPT to Generate Questions	Grade Level	KL3, KL5, KL6, KL8, KL9, KL10, KL11, KL14, KL15, KL16, K17, KY1, KY3, KY4 , KY6	15
	Unit	KL10, KL13, KY2	3
	Subject Area	KL1, KL2, KL3, KL4, KL5, KL6, KL8, KL9, KL10, KL11, KL13, KL14, KL15, KL16, KL17, KY1, KY2, KY3, KY5	19
	Learning Outcomes	KL9, KL10, KY2	3
	Type of Question	KL1, KL2, KL3, KL4, KL9, KL10, KL11, KL13, KL15, KL16, KL17, KY3, KY4, KY5, KY6	14
	Number of Questions	KL3, KL4, KL8, KL9, KL10, KL11, KL13, KL17, KY1, KY2, KY6	11
	Difficulty Level of Question	KL6, KL9, KL10, KY 4, KY5	5

summed under similar codes, and conversation screens are inspected. In **Table 10**, similar answers the research participants gave about the prompt structures they had used while asking ChatGPT to generate questions are gathered and inspected under the same subtitles based on similarities.

When **Table 10** is viewed, similar to each other, phrases about the prompt structures the participants had used while asking ChatGPT to generate questions are analyzed. When the aforementioned prompt structures are inspected, "Grade Level," "Unit," "Subject Area," "Learning Outcomes," "Type of Question," "Number of Questions," and "Difficulty Level of Question" are indicated in them, seemingly. Additionally, when the conversation screens of the participants were inspected, they hadn't indicated several options for the questions they asked ChatGPT to generate.

Based on the participants' conversation screens, it is clear that several options for ChatGPT's questions have to differ on grade level. Some conversation screens of the participants showing the dialogue with ChatGPT are given below:

When the prompt structure the participant used while asking ChatGPT to generate questions is inspected, the prompt structure above includes "Grade Level" and "Subject Area" codes (**Figure 1**.).

When the prompt structure the participant used while asking ChatGPT to generate questions is inspected, the prompt structure above includes all the codes in the category (**Figure 2**.).

When the prompt structure the participant used while asking ChatGPT to generate questions is inspected, the prompt structure above includes "Grade Level", "Subject Area" and "Type of Question" codes (**Figure 3**.)

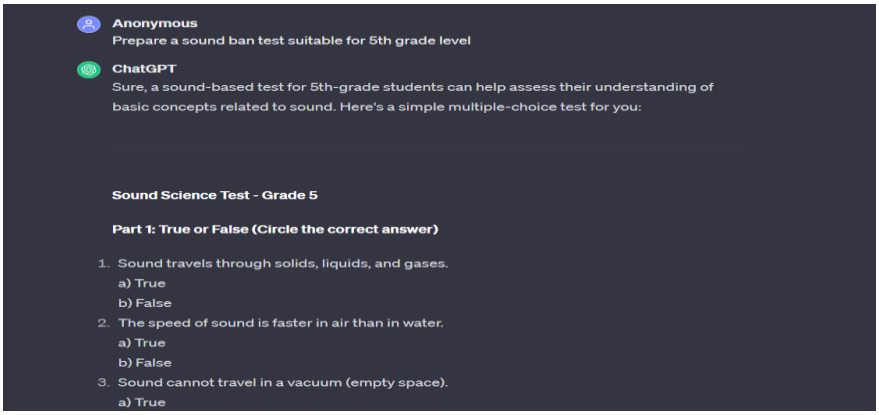

Figure 1. Conversation Screen of the Participant and ChatGPT's Dialogue Belongs to KL5 [18].

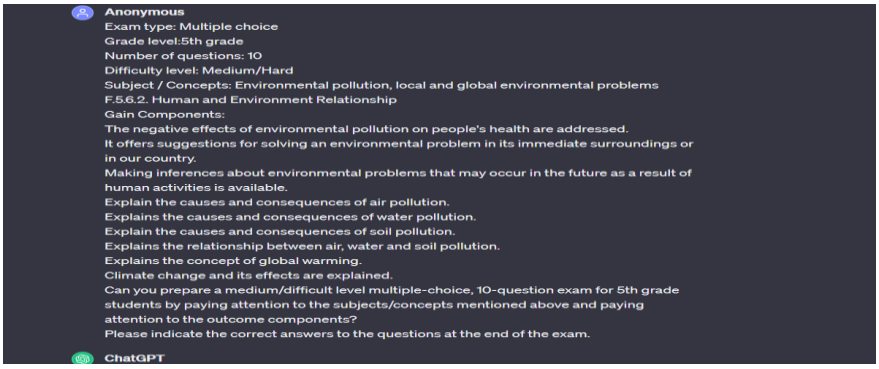

Figure 2. Conversation Screen of the Participant and ChatGPT's Dialogue Belongs to KL10 [18].

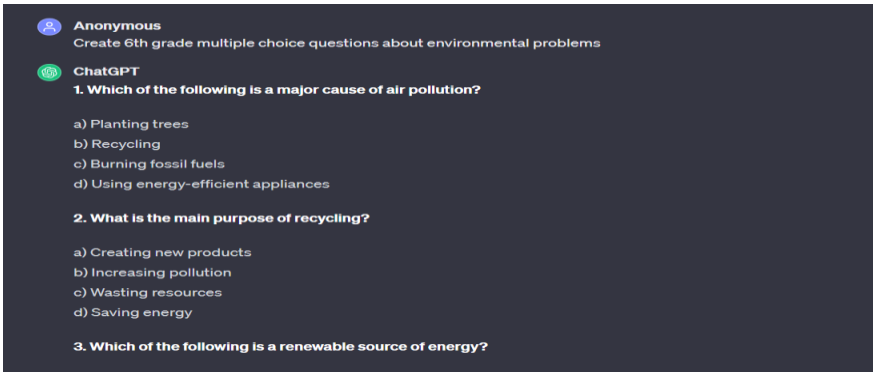

Figure 3. Conversation Screen of the Participant and ChatGPT's Dialogue Belongs to KL16 [18].

Discussion and Conclusion

The purpose of this research is to determine the opinions of undergraduate and graduate students on ChatGPT and its use in education, as well as the prompt structures they use when creating questions with ChatGPT. For this purpose, undergraduate and graduate students were asked about their opinions on ChatGPT and conversation screenshots showing the prompt structures they used when generating questions with ChatGPT were requested. The answers given by the participants were gathered under similar titles and analyzed. The opinions of the participants on ChatGPT were examined under 8 categories. It was determined that the sources from which the participants were first informed about ChatGPT were environments such as friends, classes, and social media. In the research, it was found that the most selected code as the first source of information for the participants was "Social Media" (9 participants, 39.1%). In comparison, the least selected code was "Classes" (3 participants, 13.0%). The reason for the participants choosing the "Class" code less as one of the first information resources is thought to be that integrating tools such as language learning models into educational environments is still relatively new.

Additionally, when the purposes of the participants' ChatGPT usage activities before this research were examined, it was determined that they had used it for purposes such as researching, chatting, and preparing homework. As an important finding, in addition to the fact that a limited number of participants (4 participants, 17.4%) have not heard of ChatGPT, the number of people who have not used it before the application (10 participants, 43.5%) is significant. As a reason for this situation, it can be argued that participants' perceptions of risk related to artificial intelligence technologies are influential. In a study created by Çağal and Keskin (2023), one of the studies on this subject, the opinions of 15 participants with different demographic characteristics were collected, and the data obtained were analyzed using the descriptive analysis method. According to the results obtained in the study, it was determined that participants felt risk from the advancement of artificial intelligence robot technology (Çağal & Keskin, 2023). In another study created in this field, Benzer and Benzer (2023) examined the concerns of university students towards artificial intelligence, and as a result of the research, it was determined that the anxieties of university students arise from the thoughts of that artificial intelligence will make people lazy and take away their jobs (Benzer & Benzer, 2023). Another category of the research has focused on the emotions experienced by the participants during the usage of ChatGPT. In this regard, it was identified that the participants expressed emotions such as astonishment, excitement, comfort, happiness, and unease. It was considered that the emotions experienced by the participants while using the application

could be related to their positive and negative views about the application. In this context, positive evaluations of the participants on using ChatGPT were classified under the codes of convenience, productivity, and time-saving. On the other hand, negative evaluations were classified under codes such as self-repetition, unreliability, laze, and misinformation. The positive emotions felt by the participants during the usage may be due to the convenience, time-saving, and productivity they experienced while using. Montenegro-Rueda et al. (2023) created a systematic review study that included the advantages and disadvantages of using ChatGPT in education. In their study, they found that the use of ChatGPT in educational settings enriches the learning experience but, at the same time, can lead to ethical issues with long-term use (Montenegro-Rueda et al., 2023). Similarly, Adeshola and Adepodoju (2023) examined the opportunities and challenges created by using ChatGPT in education in their study. In the research, while the usability of ChatGPT in different fields and its ability to quickly solve problems were evaluated as positive, the idea that using it for assignments would threaten academic integrity and harm the development of critical thinking skills was considered a negative view (Adeshola & Adepodoju, 2023). Therefore, it can undoubtedly be concluded that while benefiting from the productivity and speed of ChatGPT, the accuracy of the answers ChatGPT gives should not be unquestionably accepted, and they should be evaluated with a critical eye.

In addition, the participants were asked whether there would be a difference between the lectures in which ChatGPT was involved and the conventional lectures. Most participants (18 participants, 78.3%) were found to believe that the lectures ChatGPT would involve would be different. This is due to positive evaluations based on factors such as quick and easy access to information or increased productivity during usage.

One other question of the study is whether the participants will use ChatGPT again for educational purposes after this research and what their intended uses would be. It is determined that the participants using it would have purposes such as researching, generating questions, designing lesson plans and experiments, and creating text. Reasons for the participants who will not use it include negative experiences related to ChatGPT providing repetitive answers and incorrect information during usage.

The prompt structures used by the participants while generating questions in the research were also asked to the participants. When the prompt structures used by the participants while generating questions in ChatGPT were examined; it is observed that the participants specify the grade level, unit, subject area, learning outcomes, question type, number of questions, and question difficulty levels in the prompt structures they used. However, it was observed that none of the participants in the research specified the number of options for the question they would create in their prompt structure. Since this parameter was not specified, the ChatGPT

algorithm determined the number of options in a non-standardized way, left to the algorithm to decide, while generating questions. This scene that emerges shows us that the importance and sensitivity of the prompt structure, which is the essential interface while ensuring seamless communication and harmony between human and the artificial intelligence that aims to assist human consciousness, cannot be denied. The role of creating an optimal prompt structure emphasizes the importance of prompt engineering concepts in artificial intelligence-human interaction. In a study by Lee et al. (2023), an automatic question generation (AQG) system developed using massive-scale language models like ChatGPT for English education was designed. At the forefront of the inputs examined in this study comes the contribution of prompt engineering in the effectiveness of questions generated by AQG and the feasibility of creating a prompt engineering protocol based on these contributions (Lee et al., 2023). Research has shown that prompt engineering has positively influenced the quality of the work created on language models. Similar results have been achieved by Heston and Khun (2023) in their study examining the use of massive-scale language models in medical education and the importance of prompt engineering in those models. The research has shown that prompt engineering is effective in massive-scale language models and that the models are used to achieve effective results in medical education (Heston & Khun, 2023).

In this regard, it is concluded that participants should use appropriate prompt structures and receive training on prompt engineering to achieve the desired outcome when using massive-scale language models. The studies by Lee et al. (2023) and Heston and Khun (2023) highlight the importance of prompt engineering in language models. Therefore, it can be concluded that more focus should be placed on prompt engineering in training programs and guidelines related to language model usage. This way, by ensuring the effective and efficient use of language models, teachers, and teacher candidates can achieve the results they desire.

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