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ChatGPT in Education

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Abstract

The aim of this study is to reveal students' thoughts on the use of ChatGPT in education. Therefore, the study was designed and conducted according to a qualitative research method. Data was collected through semi-structured interviews. The study group of the research consisted of voluntary students from one of the 4th grade classes of a public school in Türkiye. An interview form was developed and used as the data collection tool. The obtained data was analyzed using the content analysis method. Based on the results, it was observed that the students found the use of ChatGPT in teaching to be engaging and enjoyable. Moreover, incorporating artificial intelligence in teaching was found to promote academic achievement and offer a greater amount of information compared to conventional printed resources such as textbooks. Additionally, ChatGPT was perceived to provide accurate, prompt, and clear responses to queries posed by students. The students expressed their recommendation to use ChatGPT in studying other subjects like social studies, mathematics, and Turkish, as it is a valuable tool for enhancing academic success and expanding access to information.

Keywords: Education, artificial intelligence (ai), ChatGPT.

Introduction

Technological developments have brought many new dimensions to the field of education. At this point, educational environments have also undergone changes from a technological perspective. Children born in this era are referred to as the digital generation and their immediate surroundings are surrounded by technological tools. In this context, it is observed that learning environments are affected by studies in the field of artificial intelligence (Kayahan, 2018). Artificial intelligence [AI] is a field of study that aims to produce computers and machines (Coppin, 2004) with human-like intelligence and the resulting innovations and developments (Chen et al., 2020). Intelligence in humans can be defined as the ability to think, reason, judge, and draw conclusions. Artificial intelligence emerged as a result of studies aimed at enabling machines to perform these abilities. In other words, artificial intelligence aims to mimic the mental skills of the human brain, such as problem-solving, decision-making, prediction, and inference (Arslan, 2020; Drigas et al., 2009; Kış, 2019). Although it is known that artificial intelligence is a product of human intelligence and human intelligence is still superior to artificial intelligence in many aspects (Teng, 2019), there are differences in favor of artificial intelligence in terms of speed, accuracy, decision-making, adaptation, energy consumption, function, awareness level, and interaction points (Aksut, 2021). AI provides opportunities to improve the teaching environment with technologies such as the Internet of Things [IoT], virtual reality [VR], and augmented reality [AR] (Vincent-Lancrin & van der Vlies, 2020).

The term artificial intelligence was first used by John McCarthy at a workshop held at Dartmouth College in 1956 (Arslan, 2020; Coşkun & Gülleroğlu, 2021). In the same year, Allen Newell, Herbert A. Simon, and Cliff Shaw presented and discussed the Logic Theorist, which is considered the first artificial intelligence program (Fadel et al., 2019). Artificial intelligence algorithms are artificial neural networks produced by taking inspiration from the brain's neural networks. At this point, artificial intelligence requires dense and high-quality data. The abilities of artificial intelligence programs increase as a result of dense and high-quality data (Kış, 2019; Kolchenko, 2018).

The use of artificial intelligence in education has a relatively short history. The first examples of AI in education emerged in the 1960s and 1970s with the goal of personalizing education. Then, in the 1980s and 1990s, the proliferation of personal computers and the internet facilitated the development

of more complex educational software and online learning platforms. Since the 2000s, developments in machine learning and natural language processing have led to the emergence of more advanced education tools supported by artificial intelligence (Zhai, 2022). In parallel with the increase in the use of the Internet in daily life, the use of artificial intelligence in education has also gained increasing momentum. In this context, intelligent tools have been developed in many fields, such as natural language processing, inference, intelligent agents, the semantic web, ontology, and speech recognition (Drigas et al., 2009). The techniques used in education with artificial intelligence can be listed as chatbots, expert systems, and intelligent tutoring systems (Meço & Coştu, 2022). Artificial intelligence in education is part of the concept of advanced learning technologies, which refers to intelligent tutoring systems that leverage artificial intelligence to determine what, how, and to whom to teach. In other words, intelligent tutoring systems are software programs that teach complex subjects by modeling a human teacher and offering one-on-one teaching opportunities (Akdeniz & Özdinç, 2021; Bahçeci & Gürol, 2010; Kayahan, 2018; Keleş & Aytürk Keleş, 2002). Intelligent tutoring systems are the most common application of AI in education. In these systems, as the student progresses, the system automatically adjusts the level of difficulty (Fadel et al., 2019). Examples of AI-based intelligent education systems include platforms such as Carnegie Learning, Jill Watson, EBA ADES, and iTalk2Learn (Çetin & Aktaş, 2021).

The use of artificial intelligence in education is accepted that gaining benefits for students such as monitoring educational progress, providing continuous access to education, and developing the ability to use digital assistants. On the other hand, using AI is beneficial for teachers, managing student populations, analyzing and evaluating learning outcomes, and providing feedback (Osetskyi et al., 2020). Kış (2019) claims that AI-based instruction increases student engagement, motivation, and independence. In addition, AI has improved the effectiveness, efficiency, and quality of work done by AI teachers. In this context, productivity has been considered in terms of presenting relevant content in accordance with the curriculum, retaining information in students' minds, and taking into account students' abilities and interests (Chen et al., 2020; Joseph, 2019). AI contributes to the personalization of learning materials. Personalized learning is an approach that aims to customize learning according to students' individual needs and strengths (Vincent-Lancrin & Van der Vlies, 2020). Furthermore, teachers spend 20 to 40% of their hours on activities that can be automated using current technology. However, teachers can allocate this time to activities that support students. Additionally, the areas with the greatest potential for automation are preparation, management, evaluation, and feedback (Bryant et al., 2020). The use of artificial intelligence (AI) in education has progressed from the use of computers and related technologies to web-based and online intelligent learning systems, and finally to humanoid robots and web-based chatbots (Chen et al., 2020). Chatbots are generally AI software that provides information or performs a task through text-based dialogue with the user (Meço & Coştu, 2022; Özkol et al., 2019). Some chatbots are rule-based, while others are AI-based. It is claimed that AI-based chatbots are more useful in education (Palasundram et al., 2019). Chatbots are considered to be one of the most suitable ways for students to study (Kasthuri & Boloji, 2021). Furthermore, chatbots provide the opportunity for students to ask questions at any time of the day, particularly in situations where the teacher is unavailable due to the limited duration of the lesson or psychological reasons (Deveci Topal et al., 2021). Chatbots equipped with reasoning and knowledge perform exemplification much faster than humans and use natural language. In this respect, the use of chatbots can be seen as a tool for the constructivist learning approach (Palasundram et al., 2019).

Chatbots that contribute to the individual development of students have begun to spread in the field of education (Arruda et al., 2019; Deveci Topal et al., 2021; Nghi et al., 2019). Chatbots such as Alex, ELIZA, megaHAL, PARRY, ANTswers, A.L.I.C.E., and GPT-3 have been developed (Kane, 2016; Osetskyi, 2020; Özkol et al., 2019). One of the developed chatbots is ChatGPT. One of the most important features that distinguishes ChatGPT from other AI-based chatbots is that it is more successful in activities that require creativity. ChatGPT is a general-purpose chatbot developed by OpenAI. The effects of this chatbot on education are not known. It is thought that the impact of ChatGPT on learning goals, learning activities, and measurement and evaluation practices will be very significant as it may lead to changes in these areas (Zhai, 2022).

AI is being applied in different ways in educational institutions, including the automation of administrative processes, curriculum and content development, and instruction (Chen et al., 2020). However, it is seen that AI-based applications in education are not sufficient. AI applications are generally used for data storage and constitute a small part of classroom activities (İşler & Kılıç, 2021). However, AI applications can enhance the quality of education in personalized education programs, performance monitoring, and preparation of course content (Meço & Coştu, 2022). When the literature is examined, it can be seen that there are many studies on the use of artificial intelligence in education (Aygün, 2019; Kabiljagić et al., 2022; Kim & Han, 2021; Kim & Park, 2017; Ottenbreit-Leftwich et al., 2021; & 2017; Shin, 2020; Shin et al., 2018; Shin & Shin, 2020; Son, 2020). However, it can be said that there is a lack of studies on the use of AI-based chatbots in education. Studies have been conducted with undergraduate students (Essel et al., 2022; Mokmin, and Ibrahim, 2021), middle school students (Deveci Topal, 2021), elementary school students (Kabiljagic et al., 2022), and foreign language education (Yıldız, 2022). However, no study has been found in which ChatGPT chatbot is used in teaching.

The aim of this study is to reveal students' thoughts on the use of ChatGPT in education. It is believed that this study will contribute to teachers in terms of implementing artificial intelligence in the classroom, raise awareness about the use of AI in education, provide researchers with a new perspective on the use of AI-based chatbots, and present a positive example to education officials about the use of chatbots in the classroom.

Method

Study Design and Participants

This research was designed and conducted with the Natural analysis approach, which is a qualitative research method. It has gained an important place in scientific research by combining both natural examination, research and examination (Calhoun et al., 2007). In the natural analysis approach, the researcher does not interact with the individuals involved in the application and examines the application in its purely natural environment. While avoiding interaction in this approach, the researcher can also use data collection tools such as interview and product analysis (Lindlof & Taylor, 2002). The study group of the research consists of 15 4th grade students studying in a public school in Türkiye in the 2022-2023 academic year. The study group of the research was determined by convenient sampling method. Convenient sampling is a fast and convenient sampling strategy (Patton, 2014/2018). Therefore, a 4th grade class was determined as the study group in the primary school where the researcher worked. In addition, there is only one 4th grade class in the school.

Table 1. *Demographic information of the study group*

	Age	Gender	Knowledge of ChatGPT	Previous Teaching Experience with ChatGPT
Participant 1	9	F	Few	No
Participant 2	9	F	Few	No
Participant 3	9	F	Few	No
Participant 4	9	M	Few	No
Participant 5	10	F	Few	No
Paticipant 6	9	F	Few	No
Participant 7	10	F	Few	No
Participant 8	10	F	Few	No
Participant 9	10	M	Few	No
Participant 10	9	M	Few	No
Participant 11	9	M	Few	No
Participant12	10	F	Few	No
Participant 13	9	F	Few	No
Participant 14	9	M	Few	No
Participant 15	10	M	Few	No

Measurement Tools

In qualitative research, data is collected through interviews, observations and documents (Creswell, 2013/2021; Patton, 2014/2018). For this reason, the data in the research were obtained through semi-structured interviews. The interview form was developed by the researchers and the form was finalized by making corrections in line with the opinions of two experts from the field of basic education. The interview form consists of two parts. The first part includes demographic information. The second part includes interview questions. In the demographic information section, students were also asked about their knowledge of ChatGPT and their previous teaching experience with ChatGPT.

This form consists of open-ended questions aiming to reveal students' thoughts, experiences and needs regarding the process of teaching through ChatGPT intelligence. In form; (a) What do you think about ChatGPT? (b) What do you think about learning with ChatGPT? (c) What did you like about learning with ChatGPT? (d) What did you dislike about learning with ChatGPT? (d) How can lessons be better with ChatGPT? questions are included.

Reliability of The Research

The research process has not been strictly guided by the personal judgments of the researchers. In line with the purpose of the research, semi-structured interviews were conducted with the students. Questions were prepared to make the students participating in the practical interviews more sensitive. In Interviewing process, It was tried to create an interview environment in which they could freely express their ideas, compatible with their questions. In addition, the real names of the students were not expressed in the research and were encrypted (P1, P2...etc.). Accordingly, in the session, the participants were given the freedom to leave the study at any point in the interviewing process. The information obtained during the semi-structured interviews was not used by any researchers other than the researchers in the sessions.

Participants were informed by the researcher leading the discussion that no one other than the researchers and participants was allowed to attend the interview sessions. Again, the participants were convinced that the obtained material would be presented in an encrypted form in the research presentations to be made about the study in the future. Before the semi-structured interviews, an

informed consent form was obtained from each parent stating that they allowed their child to participate in the study. In order to support the results reached by the researchers and to reflect the perspectives of the students, sample quotations from the interview texts are included. On the other hand, in order to ensure validity in the study, detailed descriptions through direct quotations were also included (Lincoln & Guba, 1985).

Procedure

In the research, the subject of recycling, which is included in the primary school 4th grade Science program, was handled for three weeks, two hours a week, through an artificial intelligence software, ChatGPT.

The procedures for the implementation process are listed below:

1. Before the application, four recycling-oriented images were created in different themes through another artificial intelligence software, DALL-E, and presented to the students. These pictures were discussed with the students. In addition, a brief information about the DALL-E software was given to the students. In addition, these pictures were hung on the classroom boards by the students.

2. ChatGPT was introduced to the students with the help of the smart board in the classroom. Then, brief information about ChatGPT is given.

3. The students were informed that the recycling issue will be handled via ChatGPT.

4. ChatGPT was asked what the concept of recycling is. ChatGPT's answer is voiced via the ReadAload plugin. In addition, ReadAloud plugin was used in all answers given by ChatGPT.

5. ChatGPT was asked to write a story about recycling, suitable for the level of 4th grade primary school students. It was ensured that the story written by ChatGPT was read aloud by all students. The story was then discussed in class.

6. The question of which wastes can be recycled was asked to ChatGPT and an answer was received. It was ensured that the answer was read by all students.

7. A blank sheet of paper was distributed to the students. Students were asked to write two questions each to be asked to ChatGPT about recycling. Students who wanted to write more questions were not prevented. The questions were collected and the same questions were separated.

8. The questions written by the students were put in an empty box. Each student was allowed to choose a question from the box. Students read aloud the questions on the paper they drew. Each question was directed to ChatGPT.

9. Volunteer students wrote down the questions answered by ChatGPT in their notebooks.

10. Some examples of questions asked by students to ChatGPT are given below.

Q1. What is the purpose of recycling?

Q2. Where does the garbage we throw in the trash go?

Q3. What are the benefits of recycling?

Q4. How are metals recycled?

Q5. How is waste glass recycled?

Q6. How are plastics recycled?

11. Students were asked to produce slogans about recycling. The slogans created by the students were read aloud in the classroom.

12. ChatGPT was asked to write a poem about recycling appropriate for the level of 4th grade students in primary school. This poem was read by each student. Then the students wrote this poem in their notebooks.

13. ChatGPT was asked to prepare 10 questions in the context of the studies. It was ensured that these questions were appropriate to the level of the students. Students gave written or oral answers to these assessment questions.

Data Collection

After the application via ChatGPT, appointments were made to interview the volunteer participants. The interviews were conducted face-to-face in a quiet room (Parent meeting room) allocated by the school administrators on dates agreed with the participants. In addition, a voice recorder was used during the interview. Approval was obtained from the parents of the students regarding the audio recording of the interview. All of the data obtained at the end of the interviews were transcribed and transferred to Microsoft Word.

Data Analysis

The audio recordings of the semi-structured interviews conducted in this study were transcribed using the Microsoft Word program. After this stage, the transcribed data were read and preliminary exploration was made by taking notes. The content analysis method was used when analyzing the data obtained from the qualitative phase of this study (Patton, 2018; Saldana, 2015/2019). An inductive approach was adopted in the data analysis process and the analysis process was carried out accordingly (Lincoln & Guba, 1985). First of all, the data obtained were coded separately by the researcher, and then themes related to these codes were created. This whole process was carried out with qualitative research analysis software called "Nvivo for Windows".

Ethical Permits of Research

In this study, all the rules specified to be followed within the scope of "Higher Education Institutions Scientific Research and Publication Ethics Directive" were complied with. None of the actions specified under the heading "Actions Contrary to Scientific Research and Publication Ethics", which is the second part of the directive, have been taken.

Ethics Committee Permission Information:

Name of the committee that made the ethical evaluation = Muğla Sıtkı Koçman University Social and Human Studies Ethics Committee

Date of ethical review decision = 21.02.2023

Ethics assessment document issue number= 28

Findings

The participants' opinions obtained through semi-structured interviews in the research were subjected to content analysis, and as a result of this analysis, 5 themes and codes related to these themes were identified. The themes reached are (1) General thoughts regarding teaching with ChatGPT, (2) Positive aspects of teaching with ChatGPT, (3) Negative aspects of teaching with ChatGPT, (4) Recommendations for teaching with ChatGPT, and (5) Applications of ChatGPT for students.

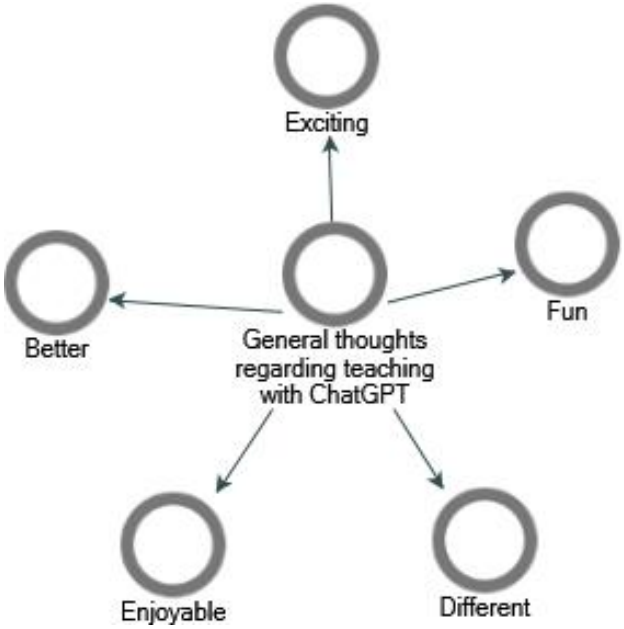

Figure 1. General thoughts regarding teaching with ChatGPT

When the theme of students' attitudes towards teaching with ChatGPT was examined, opinions such as liking teaching with ChatGPT, finding teaching with ChatGPT more beautiful, finding teaching with ChatGPT fun, making students happy, being different with teaching with ChatGPT, and finding teaching with ChatGPT exciting were expressed. All students stated that they liked teaching with ChatGPT. In this context, one student expressed their opinion as *"I liked everything, actually" [P5].* Nearly half of the students expressed that teaching with ChatGPT was more beautiful, and one student expressed this as *"It's becoming more beautiful" [P2].* Additionally, one student emphasized that teaching with ChatGPT was fun by stating *"It's really fun" [P8],* while another student expressed that teaching with ChatGPT made them happy by saying *"I was happy" [P11].* Furthermore, one student mentioned that teaching with ChatGPT was different by stating *"It seemed different" [P1].* Another student emphasized the excitement of teaching with ChatGPT by stating *"I was excited at first, then it turned out to be very good" [P23].*

Based on the above views, it can be said that students appreciate and find it enjoyable to engage in the course process using ChatGPT, one of the artificial intelligence-based software. In addition, the artificial intelligence course process has made students happy.

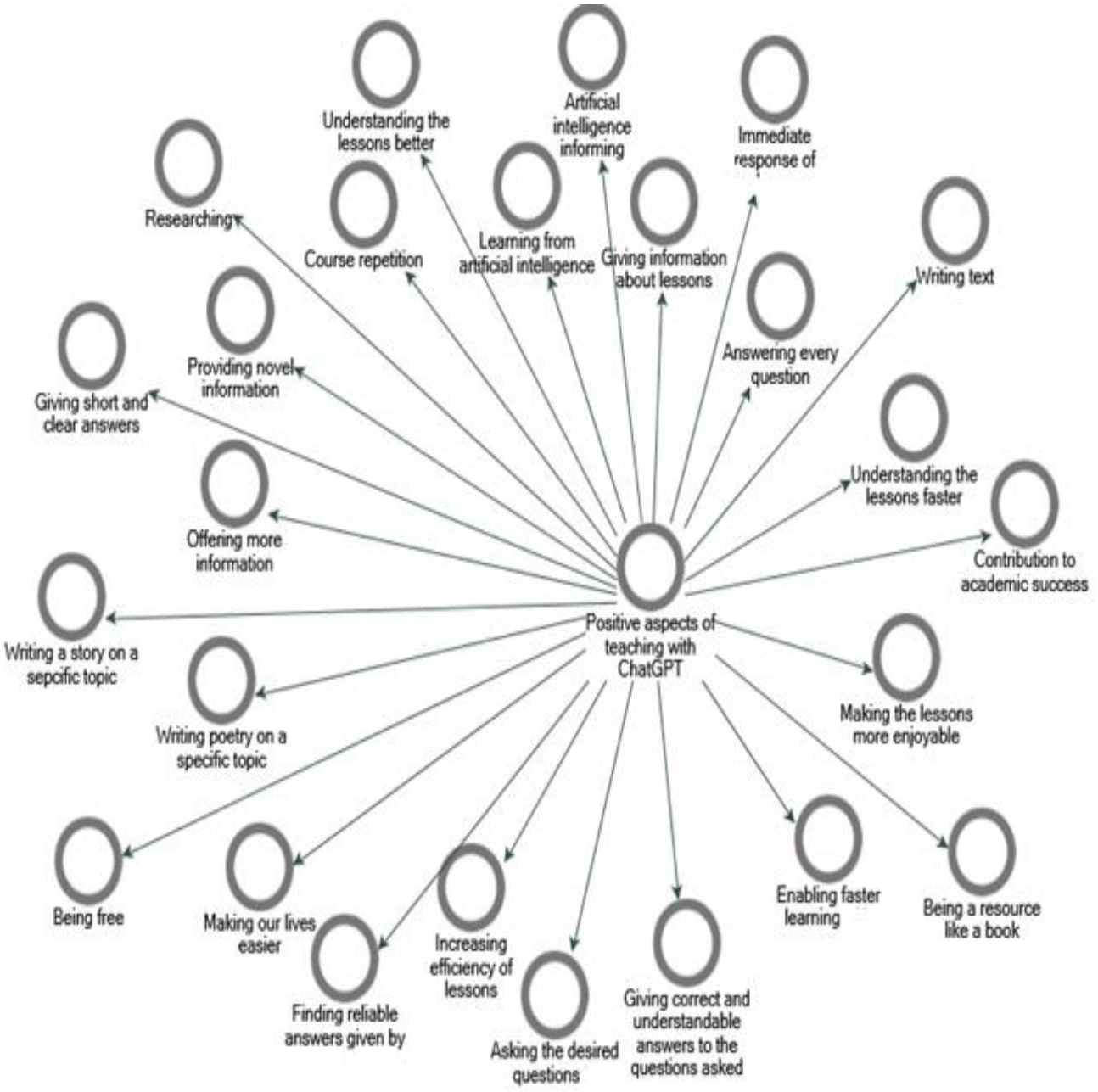

*Figure 2. P*ositive aspects of teaching with artificial intelligence

When examining the positive aspects of teaching with ChatGPT, it is evident that teaching with ChatGPT contributes to academic success, provides more information, gives accurate and understandable answers to questions, provides short and concise answers, allows for knowledge acquisition, enables the asking of desired questions, writes text, responds promptly, makes the lesson more enjoyable, provides knowledge, composes poems on specific subjects, allows open access to everyone, responds in writing, writes stories on desired subjects, can answer any question, simplifies our lives, facilitates learning of different information, includes visuals in the teaching process, enables research with ChatGPT, and leads to effective teaching outcomes.

All of the students have stated that processing lessons with ChatGPT contributes to academic success. In this context, two student views were expressed as *"Because it can provide a good contribution to us in our lessons" [P12]* and *"It does provide and has provided a little bit" [P6].* More than half of the

students emphasized that ChatGPT provides more information compared to textbooks and other sources. Some of these students expressed their thoughts on this topic as *"I also learn other things while working with ChatGPT" [P3], "There is more information beyond the book" [P11],* and *"We obtain more in-depth knowledge about ChatGPT than a normal science lesson" [P6].* While nearly half of the students highlighted that ChatGPT provides accurate and understandable answers to the questions asked, one student mentioned this topic as *"ChatGPT gives correct and understandable answers" [P2].* While it is observed that some students express their thoughts on ChatGPT giving short and clear answers, one student mentioned this topic as *"Max (the name given by the students to ChatGPT) explains briefly to us" [P8].* One of the students emphasized the aspect of acquiring knowledge from ChatGPT as *"We can ask questions about things we have mixed up in our lessons and acquire knowledge" [P11],* and another student expressed the aspect of being able to ask desired questions to ChatGPT as *"We can ask what we want" [P6].* Additionally, one student elaborated on the ability of ChatGPT to write text as *"We cannot write text when we cannot see something or imagine it. But ChatGPT, in other words, can write a text for us, like creating nature" [P12].* Furthermore, one student highlighted the aspect of ChatGPT providing immediate answers to the questions asked as *"Because you receive an answer. You get the answer the moment you ask it" [P2].* Some students have found classes that are taught using ChatGPT to be more fun. One student expressed their thoughts on this matter by stating, *"I find the class both entertaining and more informative, which is why I want to attend it" [P6].* Another student commented on the ability of AI to provide information by stating, *"It provides very good information" [P11].* Yet another student mentioned the ability of AI to write original poetry by saying, *"For example, it writes a poem when we tell it to" [P2].* Additionally, one student emphasized the importance of AI being open source, stating, *"For instance, textbooks are written for one person, for children. AI is written for everyone" [P9].* One student mentioned the ability of AI to respond in writing, saying, *"...and it also writes to us" [P1],* while another student highlighted the ability of AI to write stories, saying, *"It can write stories" [P2].* One of the positive aspects of AI mentioned by the students is its ability to provide answers to any question. One student remarked on this by saying, *"It answered the questions I asked" [P11].* Another positive aspect mentioned is the fact that AI makes life easier for humans. One student summarized this idea by stating, *"AI makes people's work easier" [P1].* Additionally, one student mentioned the ability of AI to facilitate learning, saying, *"We can study by asking something we don't know" [P8],* and another student elaborated on this idea by saying, *"With AI, we can research things we don't know, even in our classes or in school, and find the meaning or something else" [P12].* Based on these opinions, it is believed that ChatGPT is used as an effective and efficient research method in both classes and other disciplines, although it may not be prevalent. Finally, one student expressed their belief that classes are more efficient with the use of AI by stating, *"It helps us become more aware, which is why it is more efficient" [P6].*

Based on the opinions above, it can be said that students liked and found the process of teaching with ChatGPT, one of the artificial intelligence-based software, enjoyable. In addition, it is observed that teaching with artificial intelligence contributes to academic success and provides more information than printed sources such as textbooks. Furthermore, ChatGPT provides accurate, clear, and instant answers to the questions asked. In short, from the perspective of students, artificial intelligence is a quality that will make their lives easier.

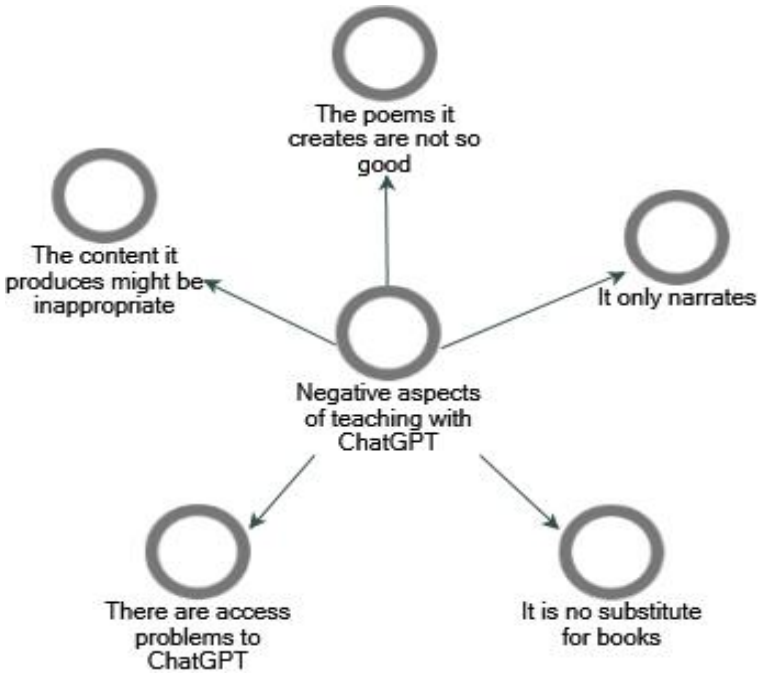

Figure 3. Negative aspects of teaching with ChatGPT

When examining the negative aspects of teaching with ChatGPT (AI), several issues have emerged, including limited access to AI, AI's limited ability to provide instruction, the potential for inappropriate content generated by AI, the lack of any significant difference in AI-assisted instruction compared to other forms of instruction, unfavorable views towards AI-generated poetry, the inability of AI to replace books, and the potential for increased exposure to radiation.

Students commonly express difficulties in accessing AI. Two students stated, *"It could be an internet problem, that's why we couldn't get in" [24],* and *"It gives us an error message when we try to ask questions" [20].* In contrast, other views were expressed less frequently (*f*=1). For example, one student commented on the limited ability of AI to provide instruction, stating, *"AI only explains. But normal classes both explain and... " [22],* while another student highlighted the potential for inappropriate content generated by AI, stating, *"While browsing through AI, we may come across scary things and the like" [15].* Another student mentioned that there was no significant difference between AI-assisted instruction and other forms of instruction, stating, *"There was no difference between this and other classes" [19].* Furthermore, one student did not appreciate the poetry generated by AI, stating, *"The poems it wrote weren't really like poetry" [18].* Only one student expressed the view that AI could not replace books, stating, *"Can it replace books? No, it can't" [13].* Additionally, one student's concern about increased radiation exposure due to the use of AI is noteworthy. The student stated, *"That's why we were exposed to more radiation" [12].* In summary, students emphasize the access problem as the most fundamental problem related to learning with ChatGPT.

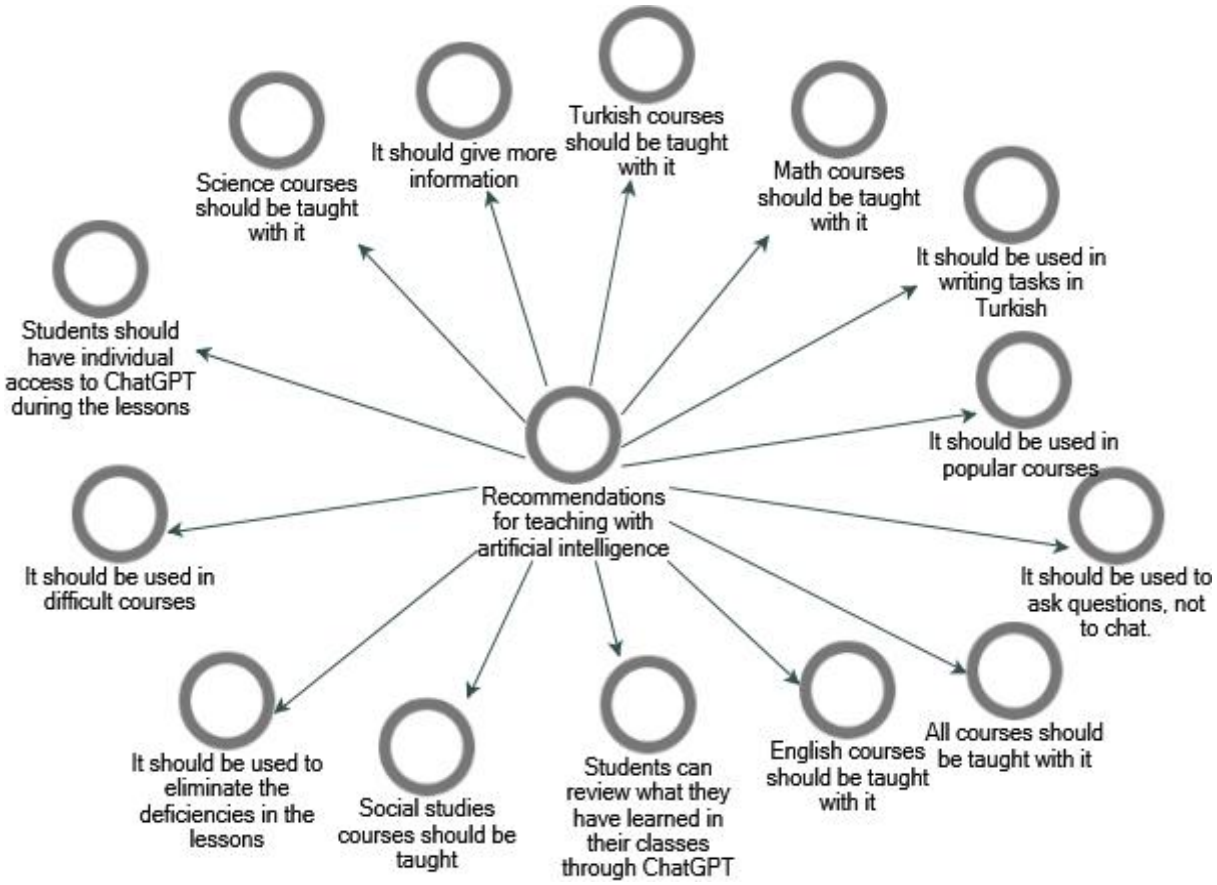

Figure 4. Recommendations for teaching with ChatGPT

When examining the theme of suggestions for teaching with ChatGPT, several recommendations have emerged. These include using ChatGPT for repeating science courses, processing social studies courses with ChatGPT, teaching mathematics with ChatGPT, teaching Turkish with ChatGPT, using ChatGPT for favored courses, processing all courses with ChatGPT, using ChatGPT for difficult courses, excluding those who do not require it from application, using ChatGPT to remedy deficiencies in courses, teaching English courses with ChatGPT, utilizing ChatGPT for mathematical operations, utilizing ChatGPT for writing tasks in Turkish, providing personalized answers based on user age, using ChatGPT for course repetition, enabling students to access ChatGPT individually during class for the purpose of asking questions rather than chatting, providing more information in processed courses, and being able to ask more unknown questions.

Most of the students have expressed their interest in revising their science lessons with ChatGPT. In this context, one student expressed their opinion as *"I want to revise my science lessons" [P3].* Almost half of the students have expressed their interest in processing social studies, mathematics, and Turkish lessons with ChatGPT. The students listed their suggestions as *"Social studies, for example..." [P7], "Mathematics, and something else" [P12],* and *"I want to process Turkish" [P1].* One student expressed their suggestion about using ChatGPT in the students' favorite courses as *"I like mathematics. I have some difficulty with Turkish" [P5],* while another student expressed the suggestion of using ChatGPT in all courses as *"Mathematics, social studies, everything" [P14].* Some students have expressed their opinions about using ChatGPT in the courses that students find challenging, and one student emphasized this issue as *"English, as my English is not good" [P6].* One student's suggestion stands out, which argues that *"Even those who do not need it can access it. They hinder those who need it. I don't think such a thing should*

be done" [P7], based on the fact that access to ChatGPT is not provided due to density. Additionally, it has been seen that using ChatGPT to eliminate deficiencies in courses has been presented as a suggestion. One student emphasized this issue as *"Sometimes I can make mistakes in exams. It should be used to correct these deficiencies" [P11].* The suggestion of processing English lessons with ChatGPT has been expressed much less (*f*=1) than other courses. It was observed that one student expressed this suggestion as "English lessons should be processed". Additionally, it has been seen that all other suggestions were expressed by only one student. The suggestion of using ChatGPT in mathematics operations was expressed as *"We can do such an operation in mathematics" [P1],* the suggestion of using ChatGPT in Turkish writing tasks was expressed as *"For example, we write something in Turkish" [P2],* the suggestion of using ChatGPT to revise the courses was expressed as *"For example, if we don't understand this subject, we can review it better on this smart board or TV, phone" [P12],* the suggestion of having individual access to ChatGPT during courses was expressed as *"If everyone had a tablet or something similar... Everyone could ask and answer questions themselves" [P3],* the suggestion of using ChatGPT for asking questions instead of chatting was expressed as *"Well... If there is something to ask a question about, it is used not in a conversation or in a ranking format" [P8],* the suggestion of providing more information during the course by researching more was expressed as *"Gaining more information by researching more" [P1],* and the suggestion of asking more unknown questions was expressed as *"Well... Asking more questions about something we don't know frequently" [P9].* In summary, students have expressed various suggestions about using ChatGPT in courses, ranging from revising courses to writing tasks and asking questions. From another perspective, a suggestion regarding the provision of responses by ChatGPT based on the user's age was elaborated by one of the students as follows: *"So, if there was such a thing in ChatGPT, wouldn't it be necessary to categorize it for children aged 7-11, 11-18 years old, etc.?" [P4].*

Based on the above opinions, it can be seen that students suggest processing not only science courses but also social studies, mathematics, and Turkish courses with ChatGPT. In addition, students recommend the use of ChatGPT in reviewing lessons and completing academic deficiencies.

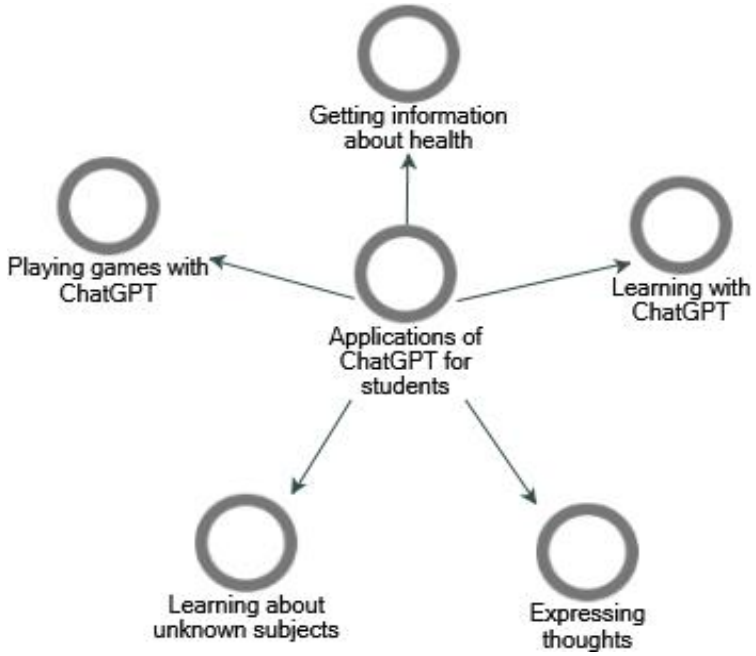

Figure 5. Applications of ChatGPT for students

When examining the theme of the applications of ChatGPT for students from the perspective of students, it is observed that usage areas such as acquiring information on unknown topics, processing lessons with ChatGPT, playing games with ChatGPT, obtaining information on health, and expressing thoughts have emerged. From the perspective of students, ChatGPT is primarily used to acquire knowledge on unknown topics and to process lessons. Students expressed these topics as *"For us to learn, to learn something that nobody knows" [P8]* and *"It can be used for teaching" [P6].* Additionally, playing games with ChatGPT was also mentioned as one of the areas of usage. One of the students mentioned this topic as *"New games can be played" [P3].* Furthermore, while one student expressed the area of obtaining health-related information as *"In subjects like health" [P1],* another student emphasized the area of expressing thoughts as *"For example, we can express our thoughts" [P10].*

In summary, students listed acquiring knowledge, studying, playing games, and healthcare as the areas of application for ChatGPT. It can be seen that students have limited knowledge about the areas of application of ChatGPT. The most important reason for this may be insufficient knowledge and experience in this context.

Discussion and Conclusion

The present study found that students enjoyed and found it fun to learn science through ChatGPT. However, students found learning with an AI-based software like ChatGPT to be different experience. These findings are similar to the results of many studies focusing on the use of chatbots in education, in terms of students' emotional responses (Chen et al., 2020; Deveci Topal et al., 2021; Essel et al., 2022; Fryer & Carpenter, 2006; Liu et al., 2022). When examining the results of these studies, it can be seen that students liked, found interesting, and enjoyed the teaching processes that were designed and implemented interactively with chatbots. Additionally, the chatbot named "Jill Watson," developed by the University of Georgia, was used in computer science classes, and students expressed more interest in the course. In Yıldız's (2022) study, students preferred using chatbots as a resource that provided feedback. Similarly, in Nghi et al.'s (2019) study on English language education, students found chatbots to be fun and exciting. From another perspective, Ryu and Han (2017) examined the images of artificial intelligence in students' minds and found that students described AI as innovative and unprecedented. In some studies, the use of artificial intelligence in the education of children has been evaluated as an interesting and motivating experience for researchers and teachers (Akdeniz, 2019; Kamite et al., 2019; Jia & Chen, 2009; Keleş & Aytürk Keleş, 2002; Kolchenko, 2018). Furthermore, it can be seen that children are positively affected by the process, particularly when chatbots are used in education. Students support the educational use of chatbots both inside and outside the classroom, a view that is consistent with general approaches in the literature. In this context, the use of artificial intelligence in education has been noted to have features such as personalized learning, encouraging student participation, and stimulating student interest (Ryu & Han, 2017). However, in a study aimed at revealing the opinions of elementary school students regarding artificial intelligence, Shin, and others (2018) found that students metaphorically described artificial intelligence as a servant, friend, and enemy. For this reason, artificial intelligence programs should be designed considering that some students may be adversely affected. This study also highlights that children have pointed out that artificial intelligence can generate inappropriate content.

In this study, students expressed their belief that using ChatGPT in teaching would contribute to their academic success. This finding is consistent with many studies conducted with chatbots. For

example, a chatbot developed by Lin, and Chang (2020) to facilitate psychology students' thesis writing had a significant impact on their success. Chen et al. (2020) found that a chatbot designed for foreign language learning significantly improved student achievement. Essel et al. (2022) conducted a study showing that interacting with a chatbot as a teaching assistant positively affected students' academic performance. However, Yin et al. (2020) determined in their study with university students that chatbot applications had positive effects on the experimental group's intrinsic motivation, but there was not much difference between the performance of the experimental and control groups. Overall, it has been stated that the use of artificial intelligence in education contributes to students' academic success (Grudin & Jacques, 2019; İşler & Kılıç, 2021; Kim & Han, 2021; Meço & Coştu, 2022; Pokrivcakova, 2019).

The use of chatbots in education has many positive aspects from the perspective of students. For instance, ChatGPT provides accurate, understandable, concise, and clear answers. This is due to ChatGPT's ability to process information in a correct, efficient, systematic, and informative manner (Zhai, 2022). According to Kasturi and Balaji (2021), chatbots can accurately answer user questions. Additionally, in the study conducted by Deveci Topal et al. (2021), using a chatbot application specifically programmed for the "States of Matter" unit of the 5th-grade Science course, students were able to ask the chatbot any question, and the chatbot was able to answer all of their questions and write text. In this study, students reported that they could acquire knowledge related to the lessons and other areas from ChatGPT. This finding is consistent with the results of Brandtzaeg and Folstad's (2017) study, which aimed to identify why people use chatbots. According to Brandtzaeg, and Folstad (2017), one reason people (aged 16-55) prefer chatbots is to acquire knowledge. In short, chatbots are mostly used to provide information to users and to answer their questions quickly (Uzun et al., 2021). Chen et al. (2020) also stated that chatbots increase students' knowledge. In this context, obtaining reliable information is crucial. Chatbots are an artificial intelligence-based technological product that can provide students with reliable information (Deveci Topal et al., 2021). Students believe that ChatGPT's ability to respond quickly is one of its positive aspects. In line with the results of Essel et al.'s (2022) study, students expressed satisfaction with using chatbots and emphasized that chatbots provide instant feedback. One of the findings of this study is that students emphasized the importance of open-source artificial intelligence. Open-source AI-based programs are important in terms of providing global access to education (Mikropoulos & Natsis, 2019). However, it should not be overlooked that open-source AI may cause access issues, as expressed by the students in this study. In this context, Muramatsu and Wangmo (2020) stated that students experienced stress due to network interruptions during online education.

In this study, students have expressed multiple suggestions for the use of chatbots in education as a result of their experiences processing science lessons with ChatGPT. For example, the students have indicated that they would like to repeat science lessons using ChatGPT. Furthermore, the students have expressed a desire to use this method to process other subjects, including Turkish, mathematics, English, and social studies. In Deveci Topal et al.'s (2021) study, which was conducted using chatbots, students also expressed a desire to use chatbots in different subjects besides science. This result is consistent with the findings of Lipko's (2016) study, in which students expressed a desire to use chatbots in subjects other than computer science. Additionally, chatbots have been used in teaching English (Yıldız, 2022), mathematics (Aygün, 2019; Kabiljagić et al., 2022), and social studies (Son, 2020), as well as in science instruction (Deveci Topal et al., 2021; Shin & Shin, 2020). It can be assumed that this situation is parallel to the opinions of the students who participated in the study. In this study, students have also

suggested using artificial intelligence to fill in gaps in the lessons and to review lessons. According to Alanoğlu and Karabatak (2020), AI-based systems can be used to improve students' areas of need. In other words, students can complete their gaps in the learned topic (Deveci-Topal et al., 2021). Furthermore, Grudin and Jacques (2019) have indicated that students can review previous topics through chatbots.

In this study, it was observed that students emphasized acquiring knowledge and processing lessons as the areas where artificial intelligence can be used. This can be explained by the students' lack of knowledge and experience in the field of artificial intelligence, which formed the study group. Additionally, in this study, students identified healthcare as another area where artificial intelligence can be utilized. According to the students, playing games is also one of the potential uses of artificial intelligence. In the study conducted by Çam et al. (2021), prospective teachers ranked medical and educational fields as the areas where artificial intelligence can be used. It is also known that chatbots are used in the marketing industry (Pokrivcakova, 2019). In addition to these, artificial intelligence is used in almost every aspect of our lives, such as communication, location finding, accessing information quickly, entertainment, storage, banking, finance, social media, healthcare, and ensuring institutional and national security (Çetin & Aktaş, 2021). In light of all these, the use of artificial intelligence in education has the potential to greatly enhance the effectiveness of education (Zhai, 2022).

Recommendations

Based on this study, some recommendations can be provided for teachers, academics, and officials from the Turkish Republic Ministry of National Education (MoNE) who will use chatbots in education and teaching processes. These recommendations are listed below:

1. Technological awareness should be developed in children from an early age.
2. The use of artificial intelligence in education should be expanded.
3. An education program depending on artificial intelligence should be prepared for children.
4. In-service training should be given to teachers at the point of teaching lessons through artificial intelligence.
5. It should be ensured that children use some artificial intelligence software such as chatbots in the presence of their parents or teachers.
6. The use of chatbots in lessons should be promoted.

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BIOGRAPHICAL NOTES

Contribution Rate of Researchers

Author 1: 34%

Author 2: 33%

Author 3: 33%

Conflict Statement

There is no material or individual organic connection with the people or institutions involved in the research and there is no conflict of interest in the research.

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Eğitimde ChatGPT

Giriş

İçinde bulunduğumuz çağ hız ve değişim çağı olarak nitelendirilebilir. Bu hız ve değişim en çok teknolojik gelişmelerde kendini göstermektedir. Teknolojik gelişmeler eğitim alanına da birçok yeni boyut kazandırmaktadır. Bu bağlamda öğrenme ortamlarının yapay zeka alanında yapılan çalışmalardan etkilendiği görülmektedir (Kayahan, 2018). Yapay zeka, insan benzeri zekaya sahip bilgisayar ve makineler (Coppin, 2004) üretmeyi amaçlayan bir çalışma alanı ve bunun sonucunda ortaya çıkan yenilik ve gelişmelerdir (Chen vd., 2020). İnsanda zeka, düşünme, akıl yürütme, yargılama ve sonuç çıkarma yeteneklerinin tamamı olarak tanımlanabilir. Bu yeteneklerin makinelerce yapılabilmesine yönelik çalışmaların bir ürünü olarak yapay zeka ortaya çıkmıştır. Başka bir söylemle yapay zeka insan beyninin problem çözme, karar verme tahmin ve çıkarım yapma gibi zihinsel becerilerini taklit etmeyi amaçlamıştır (Arslan, 2020; Drigas vd., 2009; Kış, 2019).

Yapay zekanın eğitimde kullanılan teknikleri ise chatbot (sohbet robotu), uzman sistemler ve akıllı öğretim sistemleri olarak sıralanmaktadır (Meço, & Coştu, 2022). Eğitimde yapay zeka ileri öğrenme teknolojileri kavramının altında yer alan akıllı öğretim sistemlerinin bir parçasıdır. Akıllı öğretim sistemleri neyi, nasıl ve kime öğreteceğini bilen, yapay zeka teknolojisinden yararlanan bilgisayar programları olarak tanımlanabilir. Başka bir söylemle akıllı öğretim sistemleri karmaşık konuları bir insan öğreticiyi model alarak öğreten ve bire bir öğretim fırsatı sunan yazılım programlarıdır (Akdeniz & Özdinç, 2021; Bahçeci & Gürol, 2010; Kayahan, 2018; Keleş, 2002). Akıllı öğretim sistemleri yapay zekanın eğitimdeki en yaygın uygulamasıdır. Bu sistemde öğrenci ilerledikçe sistem otomatik olarak zorluk seviyesini ayarlamaktadır (Fadel vd., 2019). Bu bağlamda Carnegie Learning, Jill Watson, EBA ADES, iTalk2Learn gibi platformlar yapay zeka tabanlı akıllı eğitim sistemlerine örnek olarak verilebilir (Çetin & Aktaş, 2021).

Öğrencilerin bireysel gelişimine katkı sağlayan sohbet robotları da eğitim alanında yaygınlaşmaya başlamıştır (Arruda vd., 2019; Deveci Topal vd., 2021; Nghi vd., 2019). Alex, ELIZA, megaHAL, PARRY, ANTswers, A.L.I.C.E. ve GPT-3 gibi sohbet robotları geliştirilmiştir (Kane, 2016; Osetskyi, 2020; Özkol vd., 2019). Geliştirilen sohbet robotlarından biri de ChatGPT'dir. ChatGPT'yi diğer yapay zeka tabanlı sohbet robotlarından ayıran en önemlim özelliklerden biri yaratıcılık gerektiren aktivitelerde daha başarılı olmasıdır. ChatGPT, openAI tarafından geliştirilen genel amaçlı bir sohbet robotudur. Bu robotun eğitim üzerindeki etkileri bilinmemektedir. ChatGPT'nin kapasitesi öğrenme hedefleri, öğrenme etkinlikleri ve ölçme değerlendirme uygulamalarında değişikliklere yol açabileceğinden bu alanlardaki etkisinin çok büyük olacağı düşünülmektedir (Zhai, 2022).

Alanyazın incelendiğinde yapay zekanın eğitimde kullanımını konu alan birçok çalışmanın (Aygün, 2019; Kabiljagic vd., 2022; Kim ve Han, 2021; Kim ve Park, 2017; Ottenbreit- Leftwich vd., 2021; Ryu, & Han, 2017; Shin, 2020; Shin ve Shin, 2020; Shin vd., 2018; Son, 2020) olduğu görülse de yapay zeka tabanlı sohbet robotlarının eğitimde kullanımını konu alan çalışmaların yeterli olmadığı söylenebilir. Bu noktada lisans öğrencileriyle (Essel vd., 2022; Mokmın ve Ibrahim, 2021), ortaokul öğrencileriyle (Deveci Topal, 2021), ilkokul öğrencileriyle (Kabiljagic vd., 2022) ve yabancı dil eğitiminde (Yıldız, 2022) çalışmalar yapılmıştır. Ancak ChatGPT sohbet robotunun öğretimde kullanıldığı herhangi bir çalışmaya rastlanmamıştır.

ChatGPT'nin eğitimde kullanımını ortaya koymayı amaçlayan bu çalışmanın öğretmenlere yapay zekanın sınıfta uygulanması noktasında katkı sağlayacağı, eğitimde yapay zeka kullanımına ilişkin farkındalık kazandıracağı, araştırmacılara yapay zeka tabanlı sohbet robotunun kullanımına yönelik yeni bir bakış kazandıracağı, MEB yetkililerine sohbet robotlarının sınıf içinde kullanılabileceğine ilişkin olumlu bir örnek sunacağı düşünülmektedir.

Yöntem

Araştırma nitel bir araştırma olarak tasarlanmış ve yürütülmüştür. Nitel araştırma, bireylerin veya grupların sosyal veya bireysel sorunlarına ilişkin araştırma sorularının incelenmesini içeren yorumlayıcı çerçevelerin kullanıldığı bir araştırma yöntemidir (Creswell, 2013/2021). Araştırmanın çalışma grubu, 2022-2023 eğitim-öğretim yılında Aydın ili Köşk içesindeki bir devlet okulunda okuyan 15 4. sınıf öğrencisinden oluşmaktadır. Araştırmanın çalışma grubu uygun örnekleme yöntemi ile belirlenmiştir. Uygun örnekleme hızlı ve kullanışlı bir örnekleme stratejisidir (Patton, 2014/2018). Bu nedenle çalışma grubu ikinci araştırmacının çalıştığı devlet ilkokulundaki öğrenciler arasından belirlenmiştir.

Nitel araştırmalarda veriler görüşmeler, gözlemler ve belgelerle toplanmaktadır (Creswell, 2013/2021; Patton, 2014/2018). Bu nedenle, araştırmadaki veriler yarı yapılandırılmış görüşmelerle elde edilmiştir. Görüşme formu araştırmacılar tarafından geliştirilmiş ve form, temel eğitim alanındaki iki uzmanın görüşleri doğrultusunda düzeltmeler yapılarak tamamlanmıştır.

Katılımcılar, araştırmacı ve katılımcılardan başka kimsenin görüşme oturumlarına katılmasına izin verilmeyeceği konusunda bilgilendirilmiştir. Yine katılımcılar, elde edilen materyalin gelecekte yapılacak araştırmalarda şifrelenmiş bir biçimde sunulacağına ikna edilmiştir. Yarı yapılandırılmış görüşmelerden önce, her ebeveynden, çocuğunun çalışmaya katılmalarına izin verdiklerini belirten bilgilendirilmiş bir onay formu alınmıştır. Araştırmacıların ulaştığı sonuçları desteklemek ve

öğrencilerin bakış açılarını yansıtmak için görüşme metinlerinden örnek alıntılar da çalışmaya dahil edilmiştir (Lincoln & Guba, 1985).

Araştırmada, ilkokul 4. sınıf Fen Bilimleri programına dahil olan geri dönüşüm konusu, yapay zeka temelli bir yazılım olan ChatGPT aracılığıyla haftada iki saat, üç hafta boyunca ele alınmıştır. ChatGPT'nin uygulam sürecinden sonra gönüllü katılımcılarla görüşmek için randevular düzenlenmiştir. Görüşmeler, katılımcılarla kararlaştırılan tarihlerde okul yöneticileri tarafından tahsis edilen sessiz bir odada (veli toplantı odası) yüz yüze gerçekleştirilmiştir. Ayrıca, görüşme sırasında ses kaydedici cihaz kullanılıştır. Görümelerin kaydedileceğine ilişkin öğrenci velilerinden onay alınmıştır. Bu çalışmada yapılan yarı yapılandırılmış görüşmelerin ses kayıtları Microsoft Word ortamına akarılmıştır. Bu aşamadan sonra, transkript edilen veriler okunmuş ve not alınarak ön keşif yapılmıştır. Sonra elde edilen veriler içerik analizi yöntemi ile çözümlenmiştir (Patton, 2014/2018; Saldana, 2015/2019). Yine veriler araştırmacı tarafından ayrı ayrı kodlanmıştır ve daha sonra bu kodlarla ilgili temalar oluşturulmuştur. Tüm bu süreç " NVIVO for Windows " adı verilen nitel araştırma analiz yazılımı ile gerçekleştirilmiştir. Veri analizi sürecinde endüktif bir yaklaşım benimsenmiştir ve analiz süreci buna göre gerçekleştirilmiştir (Lincoln ve Guba, 1985).

Bulgular

Bu çalışmada, yarı yapılandırılmış görüşmeler yoluyla elde edilen veriler üzerinde içerik analizi yapılmış ve bu analiz sonucunda 5 tema ve bu temalara ilişkin kodlara ulaşılmıştır. Ulaşılan temalar (1) ChatGPT'ye yönelik genel düşünceler, (2) ChatGPT ile yapılan öğretimin olumlu yönleri, (3) ChatGPT ile yapılan öğretimin olumsuz yönleri, (4) ChatGPT ile yapılan öğretime yönelik öneriler ve (5) Öğrenciler perspektifinden ChatGPT'nin kullanım alanlarıdır.

ChatGPT'ye yönelik genel düşünceler teması incelendiğinde, öğrencilerin ChatGPT ile ders işlemeyi beğendiği ve farklı bulduğu görülmüştür. Bununla birlikte ChatGPT ile Fen dersi işleme süreci öğrencileri mutlu etmiştir. Ayrıca bu öğretim süreci öğrenciler açısından eğlenceli bulunmuştur. ChatGPT ile yapılan öğretimin olumlu yönleri teması incelendiğinde öğrencilerin çoğunun bu yöntemle yürütülen derslerin akdemik başarılarına olumlu yönde etki edeceğini ifade ettiği görülmüştür. Öğrenciler ChatGPT'den doğru, anlaşılır, kısa ve net cevaplar alınabildiğini belirtmiştir. Ek olarak öğrenciler ChatGPT'den bilgi edinmelerini bu sohbet robotunun olumlu özelliklerinden biri olarak vurgulamıştır. Öğrenciler ChatGPT'nin metin yazabilmesini, şiir yazabilmesini, istenilen her soruya cevap verebilmesini, sorulara hemen yanıt vermesini ve açık kaynak kodlu olmasını da bu yapay zeka temelli yazılımın olumlu özellikleri olarak sıralamıştır.

ChatGPT ile yapılan öğretimin olumsuz yönleri teması incelendiğinde, öğrencilerin çoğunun erişim sorununa dikkat çektiği görülmüştür. Ek olarak öğrenciler, ChatGPT'nin uygunsuz çerik oluşturabileceği, kitapların yerini alamayacağı, radyasyona maruz kalınması ve sadece anlatım yapması gibi olumsuz yönlerini de ifade etmiştir. ChatGPT ile yapılan öğretime yönelik öneriler teması incelendiğinde ise öğrencilerin çoğunun tekrar ChatGPT ile Fen dersi işlemeyi önerdiği görümüştür. Ayrıca öğrenciler Fen dersinin yanı sıra Sosyal Bilgiler, Matematik, Türkçe ve İngilizce derslerinde de ChatGPT 'yi kullanmayı önermiştir. Öğrenciler açısından ChatGPT sadece ders işleme amacıyla değil derslerdeki eksiklerin tamalanması ve işlenen konuların tekrarında da kullanılmalıdır. Başka bir açıdan öğrenciler, ChatGPT'nin ihtiyaç harici kullanılmaması gerektiği üzerinde durmuştur. ChatGPT'ye yönelik

önerilerden biri de sohbet robotlarının kullanıcıların yaşını dikkate alarak yanıtlarını gözden geçirmesidir.

Öğrenciler perspektifinden yapay zekanın kullanım alanları teması incelendiğinde, öğrenciler deneyimlerine ve yapay zekaya ilişkin bilgi düzeylerine paralel olarak yapay zekanın ders işleme ve bilgi edinmek amacıyla kullanıldığını ifade etmiştir. Ek olarak öğrenciler yapay zekanın oyun oynamak ve düşünceleri ifade etmek amacıyla da kullanıldığını belirtmiştir. Öğrencilerin az bir kısmının yapay zekanın sağlık alnında kulanıldığını ifade etmesi gözden kaçırılmamalıdır.

Tartışma ve Sonuç

Bu çalışmada öğrenciler ChatGPT ile Fen dersi işlemeyi beğenmiş ve bu süreci eğlenceli bulmuştur. Ek olarak ChatGPT'yi Fen öğretimi için kullanmak öğrencileri mutlu etmiştir. Ayrıca öğrenciler, ChatGPT gibi yapay zeka tabanlı bir yazılımla öğrenmenin farklı olduğunu ifade etmiştir. Bu bulgular, eğitimde sohbet robotu kullanımına odaklanan birçok çalışmanın sonuçlarıyla örtüşmektedir (Chen vd., 2020; Deveci-Topal vd., 2021; Essel vd., 2022; Fryer ve Carpenter, 2006; Liu vd., 2022). Bu çalışmaların sonuçları incelendiğinde, öğrencilerin sohbet robotları ile etkileşimli olarak tasarlanan ve uygulanan öğretim süreçlerini beğendikleri, ilginç buldukları ve keyif aldıkları görülmektedir. Benzer şekilde, Nghi ve diğerlerinin (2019) İngilizce eğitimi üzerine yaptığı çalışmada, öğrenciler chatbotları eğlenceli ve heyecan verici bulmuşlardır. Başka bir bakış açısıyla, Ryu ve Han (2017), öğrencilerin zihnindeki yapay zeka imajlarını incelemiş ve öğrencilerin yapay zekayı yeni ve heyecan verici olarak tanımladıklarını bulmuştur. Araştırmacılar ve öğretmenler için yapay zekanın çocuk eğitiminde kullanılması ilgi çekici ve motive edicidir (Akdeniz, 2019; Kamite vd., 2019; Jia & Chen, 2009; Keleş & Aytürk Keleş, 2002; Kolchenko, 2018). Ayrıca özellikle eğitimde sohbet robotları kullanıldığında çocukların süreçten olumlu etkilendikleri görülmektedir.

Bu çalışmada öğrenciler ChatGPT'yi öğretimde kullanmanın akademik başarılarına katkı sağlayacağına inandıklarını ifade etmişlerdir. Bu bulgu, chatbotlarla yapılan birçok çalışma ile tutarlıdır. Örneğin, Lin ve Chang (2020) tarafından psikoloji öğrencilerinin tez yazmalarını kolaylaştırmak için geliştirilen birsohbet robotu, öğrencilerin tez yazma yerliliklerini önemli ölçüde arttırmıştır. Chen ve diğerleri (2020) ise yabancı dil öğrenimi için tasarlanmış bir sohbet robotunun öğrenci başarısını önemli ölçüde artırdığı sonucuna ulaşmıştır. Essel ve diğerleri (2022) de öğretim asistanı olarak bir chatbot ile etkileşim kurmanın öğrencilerin akademik performansını olumlu yönde etkilediğini gösteren bir çalışma yürütmüştür. Ancak, Yin ve diğerleri (2020), üniversite öğrencileriyle yaptıkları çalışmada, chatbot uygulamalarının deney grubunun içsel motivasyonuna olumlu etkilerinin olduğunu ancak deney ve kontrol gruplarının performansları arasında çok fazla fark olmadığını belirlemiştir. Genel olarak eğitimde yapay zeka kullanımının öğrencilerin akademik başarılarına katkı sağladığı belirtilmiştir (Grudin & Jacques, 2019; İşler & Kılıç, 2021; Kim & Han, 2021; Meço & Coştu, 2022; Pokrivcakova, 2019). Sohbet robotlarının eğitimde kullanılmasının öğrenciler açısından birçok olumlu yönü bulunmaktadır. Örneğin, ChatGPT doğru, anlaşılır, özlü ve net yanıtlar sağlar. Bunun nedeni, ChatGPT'nin bilgileri doğru, verimli, sistematik ve bilgilendirici bir şekilde işleme yeteneğidir (Zhai, 2022). Kasturi ve Balaji'ye (2021) göre, sohbet robotları kullanıcı sorularını doğru bir şekilde yanıtlayabilmektedir. Ayrıca Deveci Topal ve diğerleri (2021), 5. sınıf Fen Bilimleri dersinin "Maddenin Halleri" ünitesi için özel olarak programlanmış bir sohbet robotu uygulaması kullanıldıkları çalışmalarında, öğrenciler sohbet robotuna her türlü soruyu sorabilmiş ve sohbet robotu da öğrencilerin tüm sorularını cevaplamıtır. Bu çalışmada öğrenciler ChatGPT'den derslere ve diğer alanlara ilişkin

bilgiler edinebileceklerini belirtmişlerdir. Bu bulgu, Brandtzaeg ve Folstad'ın (2017) insanların neden sohbet robotu kullandığını belirlemeyi amaçlayan çalışmasının sonuçlarıyla tutarlılık göstermektedir. Brandtzaeg ve Folstad'a (2017) göre insanların (16-55 yaş arası) sohbet robotlarını tercih etme sebeplerinden biri bilgi edinmektir. Kısacası chatbotlar çoğunlukla kullanıcılara bilgi sağlamak ve sorularını hızlı bir şekilde cevaplamak için kullanılmaktadır (Uzun vd., 2021).

Bu çalışmada öğrenciler, ChatGPT ile Fen dersi işleme deneyimleri sonucunda, eğitimde sohbet robotu kullanımına yönelik birçok öneride bulunmuşlardır. Örneğin, öğrenciler Fen derslerini tekrar ChatGPT kullanarak işlemek istediklerini belirtmiştir. Ayrıca öğrenciler bu yöntemi Türkçe, matematik, İngilizce ve sosyal bilgiler gibi diğer dersleri işlemek için de kullanmak istediklerini ifade etmiştir. Deveci Topal ve diğerlerinin (2021) çalışmasında öğrenciler, sohbet robotlarını Fen dersi dışında farklı konularda da kullanmak istediklerini belirtmiştir. Bu sonuç, Lipko'nun (2016) öğrencilerin bilgisayar bilimi dışındaki konularda da sohbet robotlarını kullanmak isteklerini ifade ettiği çalışmanın bulgularıyla da tutarlıdır. Ayrıca sohbet robotlarının Fen öğretiminde (Deveci Topal vd., 2021; Shin ve Shin, 2020), İngilizce öğretiminde (Yıldız, 2022), matematik öğretiminde (Aygün, 2019; Kabiljagić vd., 2022) ve Sosyal Bilgiler (Son, 2020) öğretiminde kullanıldığı görümektedir. Bu durumun araştırmaya katılan öğrencilerin görüşleri ile paralellik gösterdiği düşünülebilir. Ayrıca bu çalışmada öğrenciler yapay zekanın derslerdeki boşlukları doldurmak ve dersleri gözden geçirmek için kullanılmasını da önermiştir.

Bu çalışmada öğrencilerin yapay zekanın kullanılabileceği alanlar olarak bilgi edinme ve dersleri işleme konularına vurgu yaptıkları görülmüştür. Bu durum çalışma grubunu oluşturan öğrencilerin yapay zeka alanındaki bilgi ve deneyim eksiklikleri ile açıklanabilir. Ayrıca bu çalışmada öğrenciler sağlık hizmetlerini yapay zekanın kullanılabileceği bir diğer alan olarak tanımlamışlardır. Öğrencilere göre oyun oynamak da yapay zekanın potansiyel kullanım alanlarından biridir. Çam ve diğerlerinin (2021) yürüttüğü çalışmada öğretmen adayları, yapay zekanın kullanılabileceği alanlar olarak tıp ve eğitimi işaretetmiştir. Sohbet robotlarının pazarlama sektöründe de kullanıldığı bilinmektedir (Pokrivcakova, 2019). Bunların yanı sıra iletişim, yer bulma, bilgiye hızlı erişim, eğlence, depolama, bankacılık, finans, sosyal medya, sağlık, kurumsal ve ulusal güvenliğin sağlanması gibi hayatımızın hemen her alanında yapay zeka kullanılmaktadır (Çetin & Aktaş, 2021). Tüm bunların ışığında eğitimde yapay zeka kullanımı, eğitimin etkinliğini büyük ölçüde artırma potansiyeline sahiptir (Zhai, 2022).

Öneriler

Bu çalışmadan hareketle sohbet robotlarını öğretim süreçlerinde kullanacak öğretmenlere, akademisyenlere ve Türkiye Cumhuriyeti Milli Eğitim Bakanlığı [MEB] yetkililerine bazı önerilerde bulunulabilir. Bu öneriler aşağıda sıralanmıştır:

1. Çocuklarda küçük yaşlardan itibaren teknolojik farkındalık geliştirilmelidir.

2. Yapay zekanın eğitimde kullanımı yaygınlaştırılmalıdır.

3. Çocuklar için yapay zeka konusunda bir eğitim programı hazırlanmalıdır.

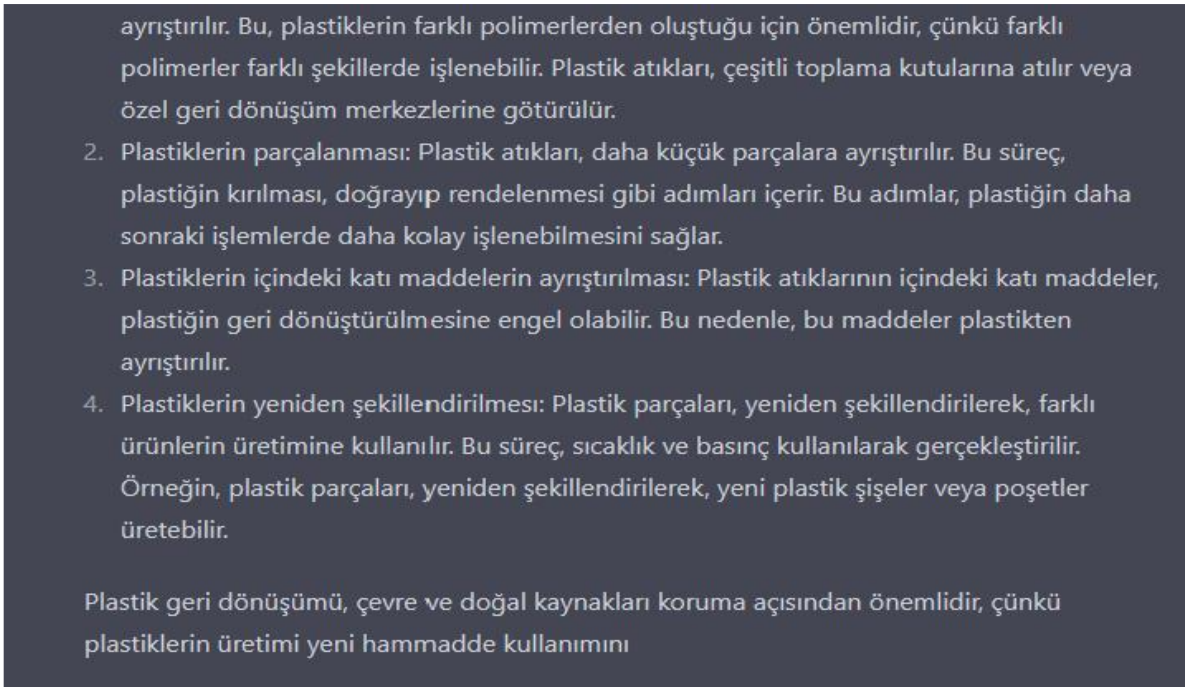
4. Öğretmenlere derslerin yapay zeka ile işlenmesi noktasında hizmet içi eğitimler verilmelidir.

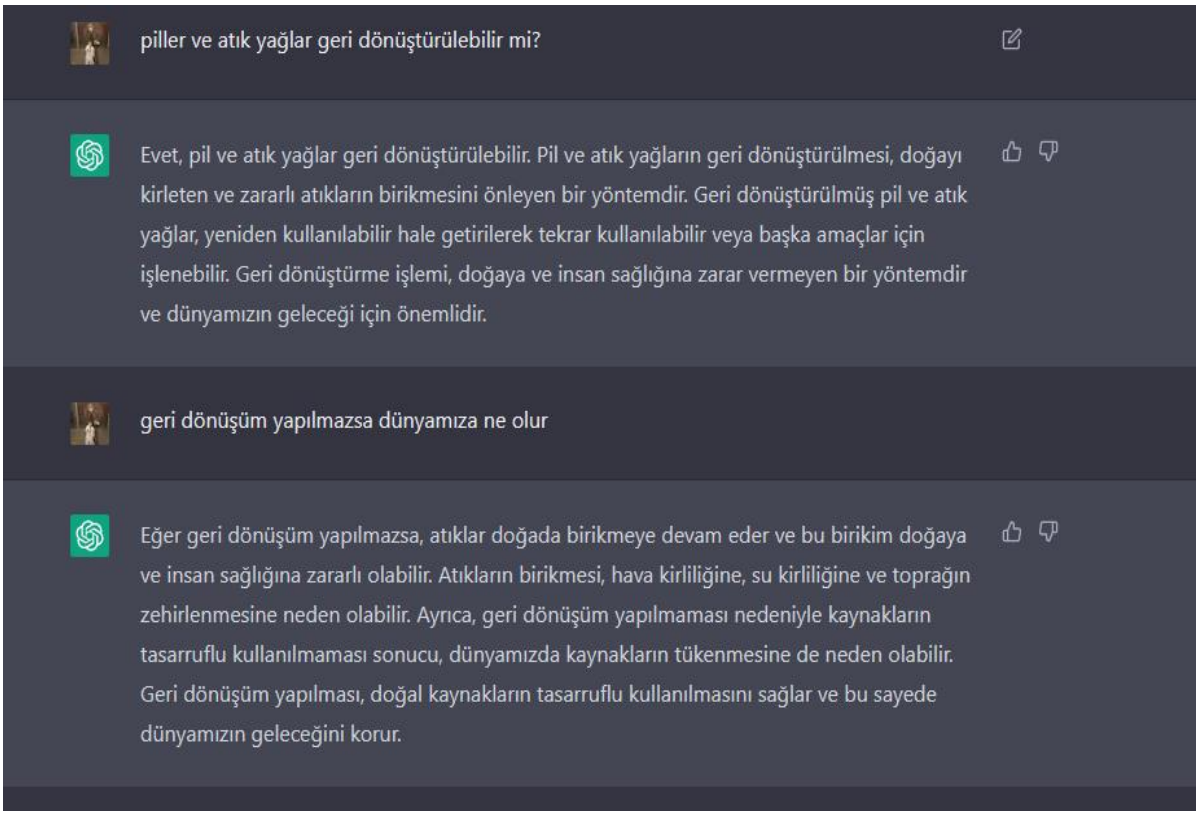
5. Çocukların, ebeveynlerinin veya öğretmenlerinin rehberliğinde yapay zeka yazılımlarını kullanmaları sağlanmalıdır.

6. Derslerde sohbet robotlarının kullanımı teşvik edilmelidir.

APPENDIX 1.

Photos of The Application Process



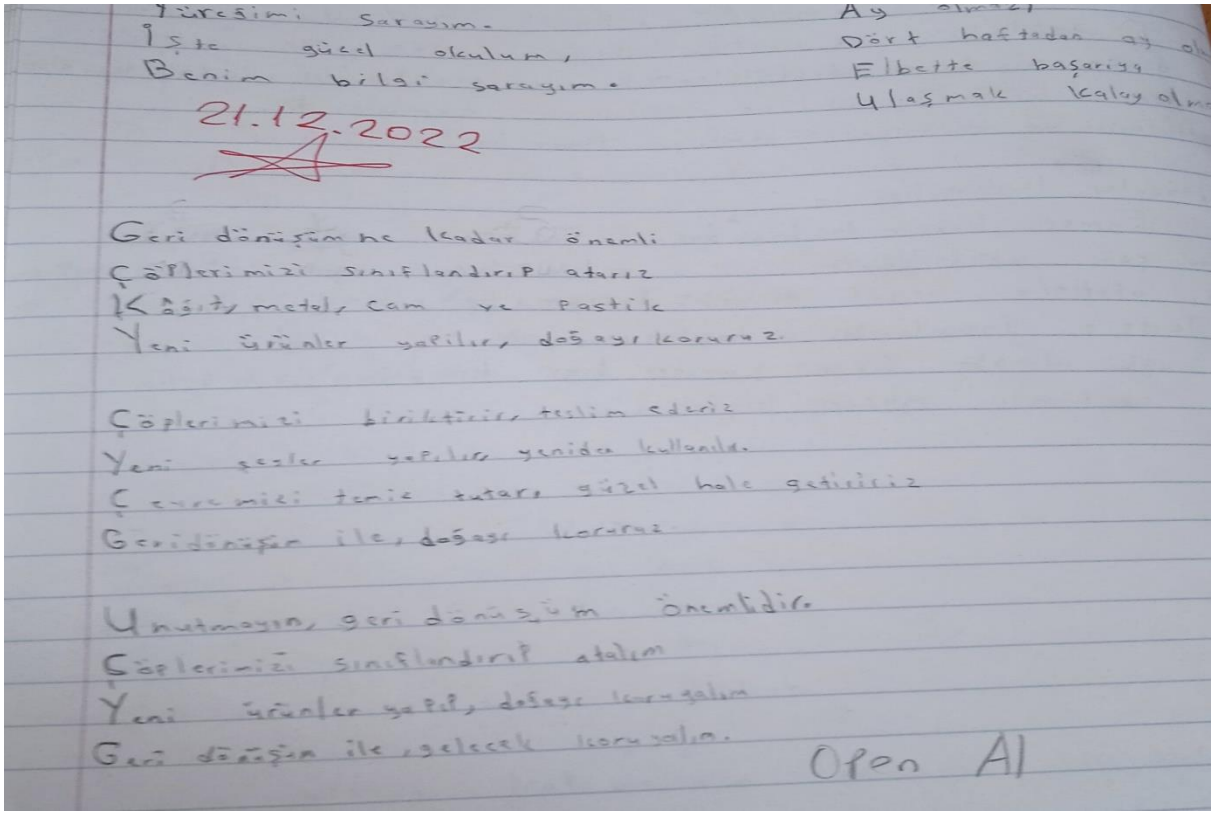


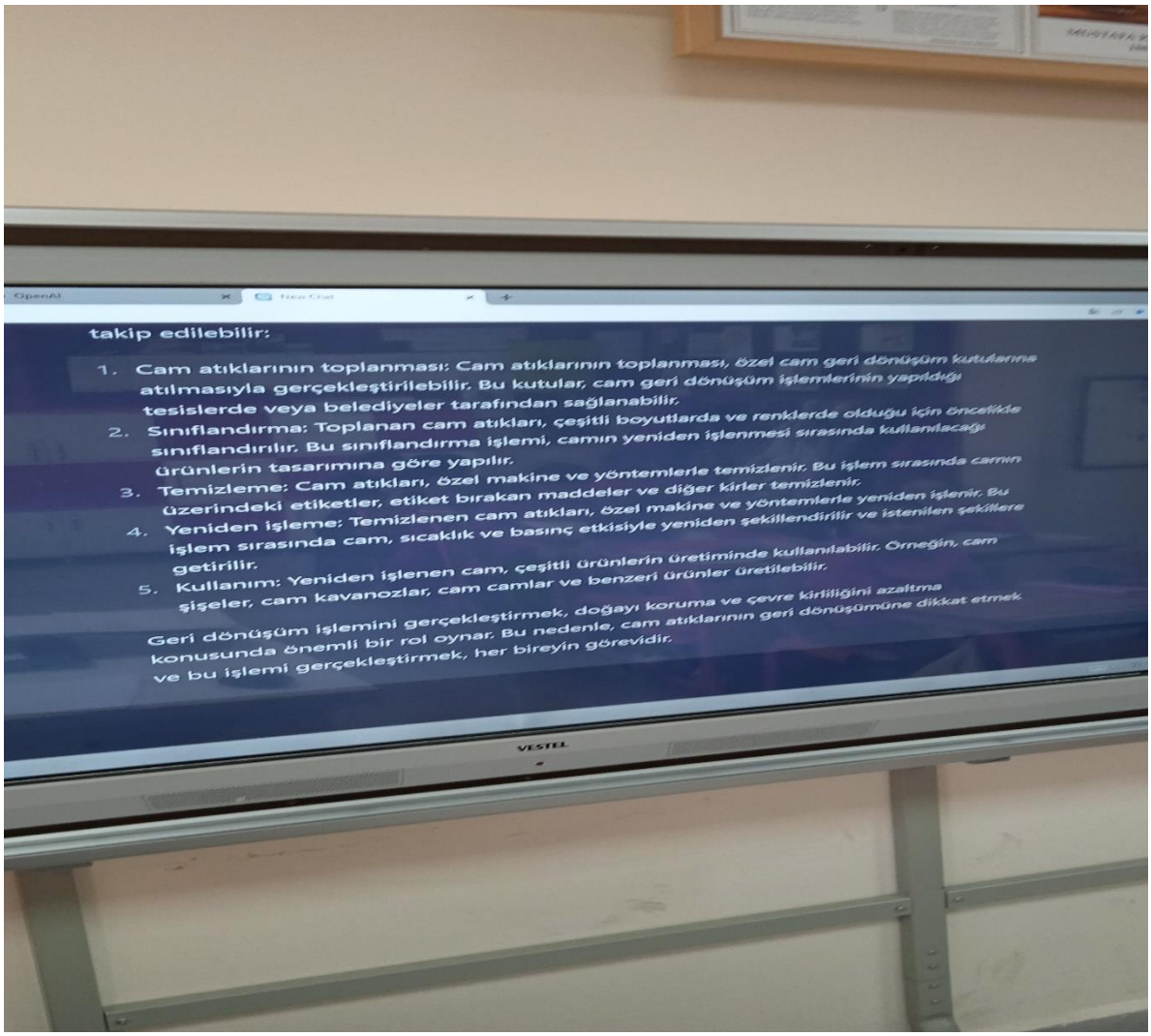
Tabii! İşte başka bir geri dönüşüm şiiri:

Atıkları toplamak bizim görevimiz,
Geri dönüşüm sayesinde dünyamız korunur.
Cam, metal, kağıt ve plastik,
Hepsi geri dönüşür, yeniden kullanılır.

Çöp yığını azaltırız bu şekilde,
Dünyamızı temiz tutarız.
Her gün geri dönüştürmeyi unutmayalım,
Dünyamızı daha iyi bir yer yapalım.

Çevremizi koruyalım, atıkları toplayalım,
Geri dönüşüm sayesinde dünyamızı koruyalım.
Gelecek kuşaklara temiz bir dünya bırakalım,
Geri dönüşümü unutmayalım hiçbir zaman.




takip edilebilir:
1. Cam atıklarının toplanması: Cam atıklarının toplanması, özel cam geri dönüşüm kutularına atılmasıyla gerçekleştirilebilir. Bu kutular, cam geri dönüşüm işlemlerinin yapıldığı tesislerde veya belediyeler tarafından sağlanabilir.
2. Sınıflandırma: Toplanan cam atıkları, çeşitli boyutlarda ve renklerde olduğu için öncelikle sınıflandırılır. Bu sınıflandırma işlemi, camın yeniden işlenmesi sırasında kullanılacağı ürünlerin tasarımına göre yapılır.
3. Temizleme: Cam atıkları, özel makine ve yöntemlerle temizlenir. Bu işlem sırasında camın üzerindeki etiketler, etiket bırakan maddeler ve diğer kirler temizlenir.
4. Yeniden işleme: Temizlenen cam atıkları, özel makine ve yöntemlerle yeniden işlenir. Bu işlem sırasında cam, sıcaklık ve basınç etkisiyle yeniden şekillendirilir ve istenilen şekillere getirilir.
5. Kullanım: Yeniden işlenen cam, çeşitli ürünlerin üretiminde kullanılabilir. Örneğin, cam şişeler, cam kavanozlar, cam camlar ve benzeri ürünler üretilebilir.
Geri dönüşüm işlemini gerçekleştirmek, doğayı koruma ve çevre kirliliğini azaltma konusunda önemli bir rol oynar. Bu nedenle, cam atıklarının geri dönüşümüne dikkat etmek ve bu işlemi gerçekleştirmek, her bireyin görevidir.
VESTEL