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ARTIFICIAL INTELLIGENCE IN EDUCATION: DEVELOPING ETHICAL PRINCIPLES

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This research presents a conceptual study on artificial intelligence (AI), a concept increasingly discussed in the information age. The use of AI in education, in particular, has raised ethical concerns. The study aims to develop a general set of ethical principles by analyzing specific examples of AI and its use in Turkey and worldwide. Especially in recent years, AI has become accessible to all stakeholders in education through the ChatGPT software, offered free of charge to all users by Open AI. Its ease of use, simple interface, and most importantly, its purpose-driven nature have accelerated its adoption. This research will identify the ethical principles that should be applied to each case, based on national and international case studies, and aims to contribute to decisions made by both the Ministry of National Education (MEB) and the Council of Higher Education (YÖK) regarding the use of AI in education. It is believed that these principles will be beneficial not only for education but also for all other fields. The case studies will be analyzed objectively and subjectively. Case studies related to AI were gathered from news articles, social media, and academic studies. In this context, events covered in different media have been presented in chronological order. Specific news sources have not been used for general events, such as students, especially at the undergraduate level, having artificial intelligence complete their assignments and projects. In this context, example cases and ethical principle inferences can be listed as follows;

Case 1: Approximately 400 university students in the UK were investigated for plagiarism in their assignments using ChatGPT. Figures obtained by the student newspaper The Tab show that 377 UK university students were investigated for cheating on their assignments. Of these, at least 146 have been found "guilty" so far, and investigations are still ongoing at dozens of universities. Data released under the Freedom of Information Act also shows that this problem exists in 40% of all universities in the UK. These universities include 23 of the 24 Russell Group Universities, such as LSE, UCL, and the University of Glasgow. Despite the

rising numbers, some universities say the true figures may be "significantly higher" as they are only just beginning to see the surface of the problem.

Source: Cumhuriyet Gazetesi, 06.07.2023, link: https://www.cumhuriyet.com.tr/dunya/ogrencilere-chatgpt-kullanarak-intihal-yaptiklari-gerekcesiyle-sorusturma-acildi-2096748.

Analysis: This situation is seen as the biggest problem arising from the use of artificial intelligence in education, both in our country and in other countries. This is becoming increasingly common, especially at the undergraduate level, due to the use of ChatGPT by students in online exams and assignments, and the inability to verify whether these assignments or exams were actually created by this software. The situation needs to be examined in two dimensions. First, online exams. Online exams have become particularly prominent after the COVID-19 pandemic, when distance education began to spread. In these types of exams, teachers or instructors prepare the exams using software created by the institutions, and students take the exam at the specified time and date within a certain time frame. It is known that students use ChatGPT in these exams. Indeed, such situations occurred in online exams conducted by the author of this article, and were later admitted by the students. The easiest solution here might be to suggest conducting exams in person. However, in the information age, especially with the advancement of technology, such a solution will not be practically feasible. Although its negative aspects outweigh its negative ones, the future of education is seen as distance education. When proposing solutions, the online nature of exams should be considered. As seen in the media, particularly during the Covid-19 pandemic, some universities have allowed students to turn on their cameras or even place mirrors in the background to ensure their screens are visible during exams. While these might seem like solutions, they lack legal basis. Respecting the privacy of a student taking the exam from home is essential. Furthermore, requiring every student taking the exam to have a mirror and camera at home could constitute a separate legal offense. The most appropriate solution is to utilize technology. It is known that students copy and paste information from artificial intelligence or the internet into the exam screen during online exams. Therefore, it is crucial that institutional software is coded to prevent copy-pasting. Additionally, the problem of manually typing data generated by artificial intelligence arises. To address this problem, Open AI needs to develop a similarity software similar to iThenticate or Turnitin used in academia. If this software were offered to the masses free of charge, instructors or teachers administering the exams could determine whether the information on the exam papers in the online exam platform was taken from the internet.

Furthermore, if this software were directly integrated into the institutions' systems, similarity rates could be provided without the need for a separate application. While all these are considered temporary solutions, the easiest solution is to change perceptions and attitudes. If students are not given a reason to cheat, the cheating problem will solve itself. For this, a gradual transition to exam-free education could be implemented, especially at the undergraduate and graduate levels. Indeed, there is not always a positive and linear correlation between exam success and professional success. Serious work on exams is essential. Jonathan Choi, a professor at the University of Minnesota Law School, administered the same exam he gave his students to ChatGPT. The artificial intelligence passed the exam, which consisted of 95 multiple-choice and 12 written questions. In this context, it is a mystery what an artificial intelligence that can achieve high scores even in a field like law school will bring to the future.

Ethical principles:

1. Institutional systems that do not accept copy-paste functionality in online exams must be established.

2. Instructors or teachers giving online exams should develop a propensity to use similarity programs, especially those adapted to ChatGPT, or an AI similarity program developed by Open AI.

3. Despite all this, the grades of students who use AI software in online exams should be processed by the system with a "K" (failed) without the need for any application. Indeed, if this process is left to the instructor, abuses and injustices may occur.

Case 2: Researchers at Northwestern University and the University of Chicago presented medical articles, typed into ChatGPT, to scientists. Many reviewers couldn't distinguish between genuine and fake articles. They provided reviewers with both genuine and fake articles and asked them to differentiate between the two. Scientists reviewing the articles correctly interpreted 68% of the ChatGPT abstracts but classified 14% of the genuine articles as fake. While the fake articles were 100% unique when measured by plagiarism detection software, only 8% met the formatting requirements of scientific journals.

Source: Gazete Oksijen, 10.01.2023, Link: https://gazeteoksijen.com/teknoloji/chatgptye-yazdirilan-makaleler-bilim-insanlarina-sunuldu-gerceklerinden-ayiramadilar-168249.

Analysis: This issue stands out as a problem frequently discussed in the media, especially recently. Currently, there is no mechanism to determine whether an article or book chapter was written by a real person or by artificial intelligence. In this context, a study was recently conducted by OpenAI. The creators of ChatGPT, which has generated excitement with its ability to mimic human handwriting, have developed a new bot that detects whether a text was written by artificial intelligence. This software needs to be distributed quickly and free of charge to educational institutions. However, first, scientific studies are needed to determine whether the software performs accurate scans and the consistency rate of its detections. Otherwise, it is predicted that erroneous decisions may be made and irreparable consequences may arise. If such software is not somehow developed and made available for use, many institutions, especially in higher education, will decide to ban artificial intelligence. Indeed, Sciences Po, a prestigious university in France, banned the use of ChatGPT, an AI-based system capable of generating complex texts with simple commands, to prevent plagiarism. Sciences Po announced that emails have been sent to all students and faculty, banning ChatGPT and other AI-based tools. Similarly, in the US, ChatGPT has been banned in some public schools in New York and Seattle. Sciences Po, whose main campus is in Paris, also stated that the penalty for using the software could range from expulsion from the institution to exclusion from French higher education.

Ethical principles:

1. All educational institutions, especially higher education, should use software to determine whether a work has been written by artificial intelligence.

2. Penalties or sanctions for the detection of assignments written using artificial intelligence should be prepared in the form of legislation. Indeed, current disciplinary regulations do not include such issues.

3. Concepts such as plagiarism, citation, originality, and copyright should be included in the curriculum from primary school onwards.

4. Written legislation should be developed to clarify the status of works such as articles, books, or theses written using artificial intelligence. Currently, whether an article written with artificial intelligence constitutes plagiarism depends on subjective evaluations. General provisions regarding such issues should be put into writing by the Ministry of National Education or the Council of Higher Education.

5. The use of artificial intelligence software by juries in the associate professorship processes of the Interuniversity Council should be encouraged. While it is unknown whether they currently use similarity programs, given the prediction that many articles will be written using artificial intelligence in the near future, the UAK (University Academic Council) should centrally conduct these assessments before sending the files to the juries during the application process. 6. Just as journals and publishing houses request similarity reports, they should also request artificial intelligence detection reports from authors.

Case 3: Volkswagen drew attention with its commercial celebrating its 70th anniversary. The Brazilian advertisement featured Elis Regina, a famous singer who died in 1982 at the age of 36. The commercial, which included Elis Regina, one of Brazil's most valuable musicians, and her Grammy-winning daughter Maria Rita, sparked controversy. Brazil's advertising watchdog, Conar, announced it would investigate whether the use of such methods to "bring a deceased person back to life" constituted a potential ethical violation. Conar stated that due to numerous complaints, questions arose regarding whether the use of such techniques could lead to confusion between fiction and reality, particularly among children and young people. The organization will evaluate the matter and make a decision within approximately 45 days. Joao Marcello Boscoli, the eldest son of Elis Regina's music production company, offered a perspective on the controversy by emphasizing the unifying aspect of music. Volkswagen, which sparked the controversy, defended the commercial. Volkswagen, the company that produced the commercial, stated that they had received approval from the singer's family. The company explained that the aim of the advertisement was "to use artificial intelligence to create a unique moment that reunites Elis Regina, one of the greatest singers in Brazilian music history, with her daughter Maria Rita, a contemporary icon."

Source: HaberX, 15.07.2023, Link: https://www.haberx.com/yapay-zeka-sarkici-elis-reginayi-canlandirdi/

Analysis: Applications in education, particularly within the metaverse, have gained momentum. The combination of metaverse systems and artificial intelligence allows for the recreation and adaptation of historical figures to the present day. This technology enables precise adaptation of images, sounds, and behaviors. For example, Sultan Mehmed the Conqueror, who conquered Istanbul, could be recreated using artificial intelligence and used in any history lesson. Or, Gazi Mustafa Kemal Atatürk could be recreated to conduct a question-and-answer session with students about that era. While these sound like positive developments,

they also bring several problems. Firstly, recreating a deceased person using artificial intelligence could upset their relatives or loved ones. Conversely, recreating Adolf Hitler during a historical event from World War II could deeply affect certain groups and even lead to psychological problems. Therefore, permission should be obtained from the deceased person's relatives (if they are alive), and copyright fees should be paid if necessary. Furthermore, inappropriate language or statements might be used in such recreations. This is the main problem. For example, the portrayal of a national hero known for his nationalist characteristics from one country (by another country) and his harsh statements or criticisms directed at that country could even be a cause for war. Preventing all of this seems very difficult. Even if rules or ethical principles are established, those who set these ethical principles may have different opinions than the general public.

Ethical principles:

1. First of all, even if all precautions are taken, such AI-generated animations can harm people of different backgrounds or beliefs. In this context, copyright should be obtained from the closest relatives of the person being animated, and applications should be carried out within the framework of permissions. However, this will create different problems for people who have died long ago. Indeed, if first or second-degree relatives cannot be found, from whom will permissions be obtained? This situation should be planned in the form of legislation.
2. In particular, the animation of religious, political, or military leaders who deeply affect a society or group should be prohibited. Indeed, if such situations become widespread and the control mechanism does not function adequately, it can lead to friction, conflicts, and even wars between societies.
3. In the context of education, certain scientists can be used after certain conditions are met and with the condition that the editing feature is disabled.

Case 4: YouTube is testing a new feature that uses AI to create quizzes to help users reinforce their understanding of educational videos. By experimenting with short, AI-generated quizzes for its mobile app, YouTube aims to help viewers learn more from educational videos. These AI-generated quizzes will help users understand how well each video covers a particular topic on YouTube. The quiz feature will appear as links below recently viewed videos in the homepage feed and can be used for specific sections of English-language content. YouTube has not yet decided whether to continue with this feature. YouTube has long been known as a platform where users go to learn new things. Educational accounts like TED-Ed and

HowToBasic are among the popular educational YouTube channels with 18.8 million and 17.3 million subscribers respectively. Many teachers also create educational content or discover and share videos for their students on YouTube.

Source: NTV haber, 08.07.2023, Link: https://www.ntv.com.tr/teknoloji/youtubedan-sinav-ozelligi-egitim-videolarinda-yapay-zeka-test-olusturacak,0WdY6IhL7k-pS38LkCyoOg.

Analysis: The most attractive aspect of using artificial intelligence in education is exam preparation. However, preparing a valid and reliable exam for students is not as easy as it seems. The exam must have content validity. For content validity, it is necessary to ask questions in similar proportions from each subject. In addition, premises such as internal consistency must be considered. In multiple-choice questions, item analysis, especially regarding item difficulty and item discrimination, must be carefully considered. These kinds of technical analyses may not be known by every teacher. Even teachers who know them may skip these difficult processes. As a result, the validity and reliability of the resulting exams can be questioned. Artificial intelligence is important because it can perform these analyses very quickly and, in particular, can instantly prepare hundreds of questions on a subject. This feature of artificial intelligence should be used especially in measurement and evaluation processes. The most important point here is that the software must be written correctly and reliably. Security vulnerabilities or interference with the software can undermine trust. In addition, keeping the software constantly updated will ensure that the questions are also up-to-date. Furthermore, teachers should be encouraged to use this software. The Council of Higher Education (YÖK) should add courses on using artificial intelligence for assessment and evaluation to the undergraduate curricula of education faculties. Existing teachers should also be provided with in-service training to acquire these skills. A recent development regarding this issue has appeared in the media. According to the news report: “Some of the UK’s leading universities have announced they will revise their teaching and assessment processes to include the principle of ‘ethical use of artificial intelligence.’ The ‘Russell Group,’ an alliance of 24 leading universities in the UK, including Cambridge, Oxford, and the London School of Economics (LSE), issued a joint statement outlining a set of principles to help universities leverage artificial intelligence. The statement notes that a new set of principles has been created to support universities in ensuring that students and staff become ‘AI literate,’ thus enabling them to take advantage of the opportunities that technological breakthroughs provide for teaching and learning. The statement also highlights that the new principles, developed in collaboration with

AI and education experts, will allow for the recognition of both the risks and opportunities of generative AI." (Haberler2023)

Ethical Principles:

1. The use of artificial intelligence should not be mandatory in exams, especially those prepared for primary schools under the Ministry of National Education (MEB). Since classroom teachers know children best during this crucial first and most important period of the academic year, this process should be left entirely to the teachers' discretion. Furthermore, it is recommended that exams not be conducted, particularly in the first and second grades, as the focus is primarily on teaching and developing initial reading and writing skills.

2. In middle and secondary schools under the MEB, an examination committee should be established in each school. These committees should include subject matter experts and teachers with sufficient expertise in using artificial intelligence software. Rules and questions for the assessment and evaluation processes in schools should be prepared by this committee with the help of artificial intelligence.

3. The Council of Higher Education (YÖK) should establish a similar examination committee within each university, and if faculty members so desire, questions can be generated by artificial intelligence.

4. A set of rules and principles regarding the use of artificial intelligence in the assessment and evaluation process should be prepared in writing by each university senate.

Case 5: At Near East University's AI Engineering Department, which is approved by YÖDAK (Higher Education Planning, Supervision, Accreditation and Coordination Council of Turkey), two introductory courses will be taught by artificial intelligence in the upcoming semester. With an application developed by the university's Artificial Intelligence Institute, students' grades in these courses will also be determined by artificial intelligence. In recent years, rapidly developing artificial intelligence technologies have a much more visible impact on many areas of life. With its potential for "personalized learning," AI has the strongest potential for change in education. Near East University is preparing to take the role of artificial intelligence in education a step further. Setting a precedent not only among Turkish universities but also in Europe, Near East University's AI Engineering Department, approved by YÖDAK, will have two core courses taught by artificial intelligence starting from the next academic semester. With the application developed by the International Artificial Intelligence and Internet

of Things (IoT) Research Center, which operates within the Near East University Artificial Intelligence Institute, using GPT3.5 and GPT4 infrastructure, students studying artificial intelligence engineering will interact directly with artificial intelligence. Moreover, students' grades in these courses will also be determined by artificial intelligence. With this application, the university aims to offer students a personalized and interactive learning experience.

Source: Söz Gazetesi, 10.07.2023, https://www.diyarbakirsoz.com/egitim/yapay-zeka-yeni-egitim-doneminde-egitmen-olarak-ders-basi-yapacak-259108.

Analysis: Another topic that has frequently come to the forefront recently is whether artificial intelligence will replace teachers. In fact, claims that teachers will become unemployed or that the teaching profession will become history are frequently seen on social media. First of all, the concept of using artificial intelligence as a teacher must be seriously considered. Will artificial intelligence replace teachers or will it assist them? To address this more simply, we can consider the concepts of internet-based education and internet-supported education. In internet-based education, the entire process takes place online. The teacher, tools, curriculum, and assessment processes are all conducted online. In internet-supported education, while the teacher remains the subject, the focus is on providing students with multiple affective elements or obtaining internet support in situations that might be difficult for the teacher. The use of artificial intelligence in education and teaching processes will be similar to internet-supported education. Indeed, artificial intelligence has not yet been able to approach human capabilities, especially in terms of emotional intelligence. Both emotional and mental elements are considered together in educational processes. In this context, it is unlikely that artificial intelligence, which currently lacks emotional intelligence, will replace teachers. It is important to reiterate that this discourse is currently under development. Whether artificial intelligence will possess emotional intelligence in the future is unknown. Even if an AI could replace a teacher, very serious research should be conducted, and the process should only be implemented after pilot applications. In this context, rapidly transferring the teaching task from teachers to artificial intelligence is considered risky.

Ethical principles:

1. Artificial intelligence should support teachers rather than replace them. In this context, it is necessary to improve the AI skills of all teachers.

2. If any lesson is conducted entirely by artificial intelligence, real-time monitoring of the system is essential. After all, a technology-based system can always produce errors.

3. If only artificial intelligence is used instead of a teacher, it is mandatory that the people coding the software are experts in their field. In this context, coding skills alone are not sufficient when developing such software; the support of field experts should be obtained.

4. The most fundamental problem in education given with artificial intelligence is manipulation. Indeed, the person who creates the software may prepare content that suits personal interests instead of scientific facts. It will be very difficult for students, especially in the early stages, to see the errors or manipulations in the content.

5. Serious sanctions should be included in the legal legislation for manipulation that can be done in artificial intelligence software, especially in the content part, in post-truth situations.

6. Students should be taught post-truth and questioning skills from primary school onwards. Therefore, to counter the misleading influences of artificial intelligence, students need to question things, gather information from different sources, and compare this information.

Case 6: The Turkish Grand National Assembly's Industry 4.0 artificial intelligence research stated that adapting to Industry 4.0 requires training the workforce, starting with coding lessons and AI training from preschool. The research also examined the Industry 4.0 education model under a monthly heading. It stated that "the Industry 4.0 education model includes individuals and organizations with advanced thinking skills, who utilize digital technology, use personalized data and open-source content, are globally connected, can respond to the needs of the technological world, and can produce and transfer knowledge, and are designers." It was noted that Industry 4.0 envisions an education system that enables individuals to continuously learn from childhood through school and into working life, helping them to acquire a strong role and make a difference. The research, which states that the principles of openness, personalization, informal education programs, new educational approaches independent of time and place, and new educational technologies such as virtual reality, cloud classrooms, interactive books, videos, and animations are supported, uses the following expressions: "In this process, teachers are seen not only as transmitters of information but also as individuals who impart skills, work together, and continuously improve themselves

professionally and personally." The research states that in order to adapt to Industry 4.0, the workforce needs to be trained, and coding lessons and artificial intelligence training should begin from preschool. It explains that this would enable students to gain analytical and systematic thinking skills, and that providing financial literacy education would make it possible to cultivate individuals who understand the difference between wants and needs. The research notes that elements related to Industry 4.0 technology should be incorporated into every stage of the education curriculum, and that countries need individuals who are critical thinkers, inquisitive, creative; scientifically, mathematically, and technologically literate; proficient in web tools; and knowledgeable about Industry 4.0, through STEM-A (Science, Technology, Engineering, Mathematics, plus Arts) education. The research, which emphasized the use of the "5E learning model" consisting of "attention-introduction, exploration, explanation, elaboration, and evaluation" in STEM-A, stated that it has gained importance, especially in vocational education, and that its assimilation by young people is of great importance.

Source: Milliyet Gazetesi, 04.06.2023, https://www.milliyet.com.tr/gundem/anaokulunda-yapay-zeka-egitimi-6957621.

Analysis: Concepts such as artificial intelligence, robotic coding, and the Internet of Things will become even more important in the future. These concepts are abstract and are easier to understand after a certain age. They are particularly difficult for children in the sensorimotor and concrete operational stages to grasp. However, although abstract concepts, robotic coding can be adapted to all ages. Educational kits for robotic coding are readily available at all educational levels. Indeed, robotic coding doesn't necessarily require the use of technological tools or software development; coding can be done with a device like a remote control. Especially in preschool, children cannot think abstractly and learn more through play. In this context, concepts like robotic coding and artificial intelligence can be introduced to students through gamification rather than directly as concepts. Furthermore, developing awareness before teaching skills is crucial. Preschool teachers have a great responsibility in this regard. Before introducing concepts like artificial intelligence and robotic coding, it is necessary to plan activities aimed at increasing students' awareness of digital transformation.

Ethical principles:

1. Preschool teacher candidates need to know the concepts required in artificial intelligence and digital transformation and gain awareness regarding this transformation. In this context, the preschool teacher training undergraduate curriculum should be reviewed. Indeed, a teacher cannot provide quality education to their students without gaining awareness.
2. The needs of children in the preschool period are different from those in higher grades. Socialization and play are especially important for children. In this context, artificial intelligence applications can be used by integrating them with STEM through gamification.
3. Using artificial intelligence through distance education in the preschool period is not appropriate. Indeed, in the preschool period, which is a critical period for socialization skills, it is important for children to socialize, communicate, and play.
4. Using artificial intelligence in the preschool period is an endeavor that requires attention. For this reason, the tools, equipment, or books/software to be used should be prepared by experts, and strict controls should be implemented in this regard.
5. Coding lessons should not be given directly conceptually or theoretically in preschool. If students are challenged in the initial stages, they may develop negative attitudes. In this context, gamified coding applications should be implemented.

Case 6: At Google's traditionally held Google I/Oda event this year, the most notable AI robot was Bard. Among the products and services introduced at the event were the new PaLM 2 large language model for AI, new AI writing tools for Gmail, the Pixel 7a Android phone, the Pixel Tablet, and the $1799 Pixel Fold foldable phone, while new features for the AI chatbot Bard were also unveiled. In a statement, the company noted that nearly two months had passed since Bard's launch, and that much feedback had been received for the AI service, initially launched in the US and UK. The statement indicated that adaptation efforts were rapidly underway to improve the user experience, and that Bard had recently migrated to the more capable PaLM 2 large language model, enabling many of the recent improvements, including enhanced mathematical and reasoning skills and coding capabilities. The statement emphasized that the momentum gained in two months was just the beginning and provided information about future updates to Bard. The statement indicated that the waiting list has been removed to allow more people to try Bard and share feedback as additional improvements and new features are introduced. It was stated that Bard is now available in over 180 countries and regions, and the AI service now supports Japanese and Korean, with support for 40 more

languages coming soon. The statement also mentioned that Bard will soon become more visual, allowing users to receive visual responses to explore topics in addition to text. Users will also be able to submit requests with images, utilizing Google Lens capabilities. The statement also discussed coding updates based on developer feedback, including new features such as source citations, a dark theme, and an "export" button. Finally, it was noted that Bard can integrate with Google apps and services like Docs, Drive, Gmail, and Maps, and that privacy settings will remain under user control when using these tools.

Source: Söz Gazetesi, 11.05.2023, https://www.diyarbakirsoz.com/bilimteknoloji/googlein-yeni-sohbet-arkadasi-bard-hizli-gelisiyor-254868.

Analysis: Language development is particularly important for children in primary and preschool years. Indeed, during this critical period for language development, students are expected to expand their vocabulary and demonstrate speaking skills sufficient to meet their needs through dialogues. In primary school, four learning areas stand out in Turkish language instruction: listening, speaking, reading, and writing. Students who have mastered listening and speaking skills begin primary school with these skills already acquired. Classroom teachers, knowing that these two skills are already established, tend to focus more on reading and writing skills. As seen in many studies, listening and speaking skills are often overlooked. It's a known fact that young children are curious and constantly ask adults questions. Considering that many parents work and therefore cannot spend much time with their children, the use of artificial intelligence as a conversational companion for young children is a positive development. After all, AI is tireless and never sulks; it can always be there for children. Furthermore, being equipped with up-to-date information will ensure that children receive the most current answers to their questions. The effectiveness of the conversational companion in multiple languages is another important feature of the application. The only issue here is moderation. It is essential that the chat program used is subject to moderation, that it does not give answers that are contrary to the mental and emotional development of children, or that it can immediately change the subject in such cases. As a result, chatbots with a moderation mechanism such as a child or age filter will contribute to children's language development. It's not just for children; adults also need to vent at certain times. In this context, AI-based chatbots can allow people to vent, get advice, and relieve stress.

Ethical principles:

1. Age-appropriate filter software should be developed and mandatory for these types of chatbots.

2. Since chatbots are connected to the internet, they can be updated. Although this may seem good, the update process makes monitoring difficult. In this context, chatbots should be checked at regular intervals and erroneous updates should be corrected.

3. Children should receive training before using chatbots. In this context, instead of giving them directly to the child, they should first use them with an adult for a while, and children should be informed about situations that may arise and how to seek support from adults in case of problems.

4. Chatbots prepared for adults should also be written based on ethical and moral principles. After all, racist or intrusive situations may arise.

5. Word scanners should also be included in the filters prepared for chatbots. With word scanners, the software should instantly detect words that we do not want children to use and directly report these words to adults.

6. Although chatbots are useful, they should not be addictive and should not replace real friends. In this context, families in particular should be informed. And they should be told what addiction is and at what level it is necessary to use drugs.

Case 7: A new debate has begun in the scientific world. While companies that write theses for money are being combated, the use of artificial intelligence in scientific texts, a topic only just beginning to be discussed in many countries, has also entered the academic agenda in Türkiye. AI programs like ChatGPT have started to be used not only in assignments and articles but also in doctoral theses. ChatGPT is an online program that allows anyone to write articles and essays. Such programs also pass plagiarism tests successfully because the software can produce original text that is not copied from anywhere else. Moreover, it can do this in a few hours. Prof. Dr. Hasan Nuri Yaşar, a lecturer in Administrative Law at Marmara University Faculty of Law and a member of the Higher Education Council, evaluated the developments in this field for Sabah. Professor Yaşar stated, "The system brought about by artificial intelligence shows that we are facing a completely different danger or a completely different opportunity. Is this an opportunity or a real danger? This issue has not yet been clarified. But one thing is certain: the problems that artificial intelligence programs create in an academic sense go far beyond the opportunism of the old days. Because this is software that can write a thesis in a

short time and create software. One thing is certain, we are certainly not going to leave our intellectual capacity to the whims or commands of artificial intelligence. Measures must definitely be taken against this." Regarding whether a thesis prepared with artificial intelligence would fall under the scope of plagiarism, Professor Yaşar commented, "If the person already accepts that they produced it with artificial intelligence, first of all, they will not have written the work themselves. A problem will be encountered from the outset. We will see them as someone who is not the owner of the work, that is, someone who has plagiarized. But if we accept what was produced by artificial intelligence as if it were a work, then we can move on to the plagiarism section." Professor Yaşar stated that he believes this issue will eventually evolve into legal regulations. He also drew attention to the measures that could be taken regarding companies that write theses for money on social media, noting that many countries have conducted large-scale operations and revoked tens of thousands of diplomas. Regarding whether the jury could detect theses written for money, Professor Yaşar said, "The jury has a great responsibility. It's not very consistent with human psychology for someone to defend something that belongs to someone else as if it were their own. Therefore, a person can never defend a work that doesn't belong to them, that they didn't produce, as if it were their own. For this reason, well-prepared academics who are experts in their field can easily understand and detect such theses."

Source: Sabah Gazetesi, 17.05.2023, https://www.sabah.com.tr/egitim/akademide-yapay-zeka-alarmi-6475864.

Analysis: This situation essentially existed even before artificial intelligence or ChatGPT were on the market. The key point here is whether juries can understand a thesis written by AI. Indeed, anyone with even a little experience with AI will see that a text written by ChatGPT looks similarly written by a human. In this case, even a highly skilled expert might not be able to tell whether the thesis was written by AI or by a human. There are two possible solutions to this problem. The first is the AI detection software mentioned earlier. If this software is used within every institute, the problem will be eliminated. The other solution falls to the juries. Even though the thesis is written by AI, if in-depth question-and-answer processes are implemented, especially among the juries, it can be revealed that the student did not write the thesis themselves. In this context, the importance of juries in thesis processes is increasing. It is especially important that field experts are included in the juries. Today, many departments

or, in the US, faculty members who are not field experts are involved. In this situation, the juries formed often lack expertise in the field and are unable to ask in-depth questions.

Ethical principles:

1. In master's or doctoral dissertations, individuals with doctorates in the relevant field should be selected as jury members. This should not be left to the department's discretion but should be included in written regulations.

2. Software capable of detecting artificial intelligence should be used in all institutes throughout Türkiye. Furthermore, the detection reports provided by these programs should be included in the appendices of the theses.

3. All postgraduate jury sessions should be recorded on camera and made publicly available. Indeed, jury processes will be of higher quality in such an environment.

4. Admissions to postgraduate programs are made through juries. However, professors or associate professors in the department are usually appointed to the juries. Here, the primary criterion in jury selection should be field expertise rather than title. In the student admissions of any department, individuals with associate professorships or doctorates in that field should serve on the juries.

5. The regulations prepared by the Council of Higher Education (YÖK) should be updated to include artificial intelligence. Currently, it is unclear what punishment will be given to a person who includes quotations from artificial intelligence in their thesis when a disciplinary investigation is opened.

Case 8: Bahçeşehir College, which developed the AI-based personalized digital learning platform “Metodbox,” has made the application available to all students and teachers. Aiming to continue its contributions to education in Turkey, particularly in digital education, Bahçeşehir College has achieved a first by developing the AI-based personalized digital learning platform “Metodbox.” Details of the platform were shared with the press at a launch event held at Bahçeşehir University. The launch was attended by Enver Yücel, President of Bahçeşehir Uğur Education Institutions, Özlem Dağ, General Manager of Bahçeşehir College, and academics. As the first K12 educational institution in Turkey to implement AI literacy education, Bahçeşehir College, with Metodbox, provides students with a more enjoyable learning process, access to information resources tailored to their learning style and different learning needs, and access to digital content that reinforces what they have learned in class. The system, which

directs children to tests, exercises, and games appropriate to their inclinations, is intended for use by teachers, primary, middle, and high school students. The app, suitable for students from first to twelfth grade, can be accessed via the Apple Store, Google Play, and www.metodbox.com. Speaking at the launch, Enver Yücel, President of Bahçeşehir Uğur Education Institutions, stated that the developed application would also increase equality in education, saying, "May our artificial intelligence-based learning platform be beneficial to everyone. It is very important that an artificial intelligence-based education platform has emerged from our country today. Since we entered the education sector, we have advocated that everyone has their own unique learning system. Therefore, we have developed personalized learning methods. This platform also features personalized teaching, and this time we have incorporated artificial intelligence. Our goal is to reach everyone who wants to learn under equal conditions. Until this era, the education system in both the world and our country has not undergone significant changes, except for minor things. However, with artificial intelligence, both the dynamics of learning and the role of the teacher have changed. I believe that with the personalized use of artificial intelligence, the education system will be much different, and equality of opportunity in education will be better. Now, whether far away or near, access to education will be easier with this technology, and no child will be left behind. In this sense, I would like to express my thanks again to everyone who contributed." Israfil Dilmeç, Founding Partner of Bahçeşehir College Mobile Company, who was involved in the development process of the Metodbox application, also provided information about the application, stating: "We have developed a personalized, AI-based education platform. At Bahçeşehir College, it is served under the name Metodbox Junior from first to fourth grade, and under the name Metodbox from fifth to twelfth grade. The platform is offered to five actors in total: students, teachers, parents, guidance counselors, and administrators. Within this application, our students can access lesson materials with an enriched virtual blended learning model, and our teachers can access the lessons they will give on the smart board with micro-learning components. Our students can watch solution videos for every question in the lessons and tests they have seen. At the same time, in the personalized model, students can receive an education system that is more challenging or easier for them in the subjects where they have deficiencies based on learning outcomes, in a way that the artificial intelligence recognizes them. Our teachers can also create virtual groups and conduct digital tutoring for students in addition to the lessons they give on smart boards, thus easily and quickly educating students when they have learning gaps."

Source: İHA, 17.09.2023, https://www.iha.com.tr/haber-yapay-zeka-metodbox-ile-egitim-sistemine-girdi-801374.

Analysis: Technological advancements such as artificial intelligence and robotic coding are particularly paving the way for individualized learning. Indeed, a teacher in a classroom needs to spend a significant amount of time getting to know 30 students and identifying each student's level of intelligence. Furthermore, it becomes even more difficult to provide appropriate feedback or reinforcement if students' attitudes and interests change over time. In such situations, especially in large classes, getting to know each student and providing personalized instruction becomes very challenging. This is where artificial intelligence comes in. Within the scope of individualized instruction, AI recognizes the student and offers them appropriate instruction. It can offer a new program or process based on the feedback it receives, especially considering the student's development throughout the process. Indeed, considering Generation Beta, they have been interacting with smartphones, tablets, and computers since birth, making online applications very familiar to them. Thus, they can easily adapt to this type of instruction. The use of artificial intelligence in individualized instruction can save both time and space. Indeed, getting to know a student and developing a program tailored to them is both very difficult and becomes impossible in crowded classrooms. Furthermore, AI-assisted instruction can continue even if a student is disabled or ill. Moreover, the online nature of AI allows it to take current developments into account. In fact, changing a teacher and adapting to a new system is much more difficult than it is for an AI.

Ethical principles:

1. Awareness-raising activities should be conducted for students regarding individualized instruction starting from the primary school level.

2. Students should be informed from a young age about how to satisfy their curiosity or how to obtain the information they need.

3. 24/7 support services should be provided for these AI-supported software programs.

4. If students wish to receive compulsory education online with AI support, appropriate legal regulations should be made.

5. Programs prepared for AI-supported individualized instruction should be reviewed by field experts and then implemented after corrections.

CONCLUSION

Artificial intelligence plays a significant role in technology and society, and its use is becoming increasingly widespread. However, it is crucial that this powerful technology is used ethically and safely. The following recommendations can be offered regarding the use of artificial intelligence:

1. Ethics and Transparency: Ethical principles and transparency should be adhered to when developing artificial intelligence applications. How algorithms and data are used should be understandable, and user safety should be considered.

2. Data Privacy and Security: The privacy and security of the data used by artificial intelligence systems must be ensured. Data should be protected from unauthorized access and malicious use.

3. Exclusion and Bias: Internalized biases and discrimination should be avoided in artificial intelligence algorithms. Training data should be diverse, and situations that may lead to biased results should be considered.

4. Community Participation: Community participation should be ensured in the development and use of artificial intelligence systems. The different perspectives of decision-makers, experts, and the public should be taken into account.

5. Education and Awareness: Education and awareness campaigns about artificial intelligence should be organized. It is important for society to understand the potential benefits and risks of artificial intelligence.

6. Responsibility and Accountability: Developers and users of artificial intelligence systems are responsible for and must accept responsibility for the use of the technology. In case of any negative impact or error, accountability should be the basis.

7. Human-Centered Design: Artificial intelligence systems should be designed in accordance with human needs and values. Technology should be developed in a way that benefits people.

8. Control in Application Areas: Artificial intelligence is used in medicine, security, education, transportation, and many other fields. It is important that these applications are used in a controlled manner and that potential risks are managed.

9. Workforce and Education: Artificial intelligence can cause changes in the workforce. Therefore, it is important to train a workforce suitable for artificial intelligence technology and to update education systems.

10. International Cooperation: Artificial intelligence is a cross-border technology, and it is important to make regulations and create standards through global cooperation. These recommendations can contribute to the safer and more beneficial use of artificial intelligence for society. As technology develops and its areas of application expand, it is crucial to pay more attention to ethical and safety principles.

While there are many advantages to using artificial intelligence in education, there are also some disadvantages. Some of the disadvantages of using artificial intelligence in education can be listed as follows:

1. Weakening of the Human-Instructor Relationship: AI-powered education systems can reduce student interaction with human instructors. This can be particularly important for the social and emotional development of children.

2. Ignoring Student Individuality: While artificial intelligence has the potential to offer students personalized learning experiences, sometimes these systems may not fully understand students' individual needs, and personalization may be lacking.

3. Understandability of the Learning Process: Due to the complexity of their algorithms, AI-based education systems may sometimes struggle to fully explain the learning process. This can cause difficulties for both students and instructors in understanding the learning process.

4. Data Privacy Concerns: The use of artificial intelligence in education means the collection and analysis of student data. This can lead to concerns about data privacy and security, especially the risk of student data falling into the wrong hands.

5. Changing the Role of Teachers: Artificial intelligence can automate some educational tasks and change the role of teachers. Teachers may have to take on a role that is more focused on managing technology and providing support to students.

6. Algorithmic Biases: AI algorithms may contain biases in data collection and analysis processes. This can lead to inequalities and discrimination in education.

7. Technology Dependence: AI-based education systems can lead to over-reliance on technology and replace traditional teaching methods. This can cause students to become overly dependent on technology.

8. Technical Problems: AI technologies can sometimes encounter technical problems, which can disrupt the educational process or affect reliability.

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1. Institutional systems that do not accept copy-paste functionality in online exams need to be established.

2. Instructors and teachers giving online exams need to develop a policy of using similarity programs, especially those adapted to ChatGPT, or an AI similarity program developed by Open AI.

3. Despite all this, the grades of students who use AI software in online exams should be automatically processed with a "K" (failed) or similar designation without the need for any application. If this process is left to the instructor, abuses and injustices may occur.

4. All educational institutions, especially higher education, should use software that can detect whether a work has been written by artificial intelligence.

5. Penalties or sanctions for the detection of assignments written using artificial intelligence should be prepared in the form of legislation. Current disciplinary regulations do not address these issues.

6. Concepts such as plagiarism, citation, originality, and copyright should be included in the curriculum from primary school onwards.

7. Written legislation should be developed to clarify the status of works such as articles, books, or theses written using artificial intelligence. Currently, whether an article written with artificial intelligence constitutes plagiarism depends on subjective evaluations. General provisions regarding such issues should be put into writing by the Ministry of National Education or the Council of Higher Education.

8. The Interuniversity Council (UAK) should encourage juries in associate professorship processes to use artificial intelligence software. While it is unknown whether they currently use similarity programs, it is predicted that many articles will be written with artificial intelligence

in the near future. Therefore, UAK should centrally conduct these assessments before sending files to juries during the application process.

9. Journals and publishing houses should request artificial intelligence detection reports from authors, just as they request similarity reports.

10. First of all, even with all precautions taken, such AI-generated animations can harm people of different backgrounds or beliefs. In this context, copyright should first be obtained from those closest to the person being portrayed, and applications should be carried out within the framework of permissions. However, these situations will create different problems for people who died much earlier. Indeed, if first or second-degree relatives cannot be found, from whom will permission be obtained? This situation should be planned in the form of legislation.

11. It is necessary to prohibit the portrayal of religious, political, or military leaders who deeply affect a society or group. Indeed, if such situations become widespread and the control mechanism does not function adequately, it could lead to friction, conflicts, and even wars between societies.

12. In the field of education, certain scientists can be used after certain conditions are met and with the condition that the ability to make revisions is disabled.

13. The use of artificial intelligence should not be mandatory in exams prepared for primary schools, especially those under the Ministry of National Education. Indeed, since children are best known by their classroom teachers during this first and most important period of the education period, this process should be left entirely to the teacher's initiative. Furthermore, it is recommended that exams not be held, especially in the first and second grades, as the focus will be on teaching and developing initial reading and writing skills.

14. In middle and secondary schools affiliated with the Ministry of National Education, examination committees should be established in every school. These committees should include subject matter experts and teachers with sufficient expertise in using artificial intelligence software. The rules and questions for the measurement and evaluation processes to be conducted in the school should be prepared by this committee with the help of artificial intelligence.

15. The Council of Higher Education should establish a similar examination committee within each university, and if the teaching staff so desires, the questions can be generated by artificial intelligence.

16. A set of rules and principles regarding the use of artificial intelligence in the measurement and evaluation process should be prepared in writing by each university senate.

17. Artificial intelligence should be in a supportive role for teachers, rather than replacing them. In this context, it is necessary to improve the artificial intelligence skills of all teachers.

18. If any course is conducted entirely by artificial intelligence, real-time monitoring of the system is essential. After all, a technology-based system can always produce errors.

19. If only artificial intelligence is used instead of teachers, it is mandatory that the people coding the software are subject matter experts. In this context, coding skills alone are not sufficient when developing such software; the support of field experts should be sought.

20. The most fundamental problem in education given with artificial intelligence is manipulation. Indeed, the decision-maker who creates the software may prepare content that suits personal interests instead of scientific facts. Especially in the initial stages, students may make mistakes in the content.

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