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THE IMPACT OF AI AND CHAT GPT ON EDUCATION AND THE ROLE OF THE TEACHER

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ABSTRACT

This paper is the result of the project "The World of Work Before and After Chat GPT – 'Chat GPT - The Perfect Worker Without Consciousness?'", which involved activities with teachers and students from primary and secondary schools in Kruševac. As technology increasingly becomes an inseparable part of our present, we will encounter artificial intelligence (AI) more frequently in both formal and informal education. The use of AI can support student learning and growth, enhance their motivation and engagement, facilitate access to learning resources, and make the educational process more efficient. However, during the project activities with teachers, the authors encountered various biases related to the application of AI. These included fears that AI would replace them, insufficient knowledge and understanding of the advantages and challenges of AI integration, as well as unfamiliarity with or low confidence in using various AI tools that can facilitate teaching, increase student engagement, and motivate learning. Consequently, these tools can contribute to the development of digital competencies necessary for life and work in the 21st century. The goal of this paper is to provide answers and clarify the role of teachers in the new digital environment, as well as to help overcome the aforementioned fears among the teaching staff.

KEYWORDS

AI, Chat GPT, teacher's role, teaching, education

INTRODUCTION

Artificial Intelligence (AI) is steadily becoming a key driver of transformation across various sectors. In education, AI's role spans from personalized learning to the automation of administrative tasks. Among the innovations brought by AI, the Chat GPT model, based on advanced natural language technologies, stands out, opening new perspectives in the interaction between students, teachers, and educational resources-a subject that will be explored in greater detail in this paper.

The term "artificial intelligence" was first defined by Stanford University professor John McCarthy in 1955 as the science and engineering of making intelligent machines (Manning, 2020). As technology

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has advanced, so too has the definition of AI. A more contemporary definition describes AI as "technology that uses machines to simulate human perception, cognition, reasoning, decision-making, and other cognitive processes" (Stanić, Stanić, 2024).

In the context of education, the current application of AI involves Artificial Narrow Intelligence (ANI), which enables the execution of specific, simple tasks. In addition to ANI, there is also Artificial General Intelligence (AGI), a form of AI currently under development that aims to fully replicate human intelligence and solve complex problems in unfamiliar situations. Lastly, Artificial Super Intelligence (ASI) represents a hypothetical and most advanced level of AI, possessing superhuman intelligence, the realization of which is uncertain and remains a matter of debate.

Chat GPT is based on deep learning technology, specifically on Recurrent Neural Networks (RNN), which are trained on a large dataset of textual information. Here is a detailed explanation of how Chat GPT functions:

- ***Recurrent Neural Networks (RNN):*** These are a type of neural network specifically designed to process sequential data, such as sequences of words in a sentence. RNNs have "memory" that allows information from previous steps to be used in processing the current step.
- ***Training on a Large Dataset***: Chat GPT is trained on a massive dataset of textual information, including books, articles, websites, forums, blogs, and other text sources available on the internet. This extensive dataset enables the model to learn a wide range of language patterns, vocabulary, and writing styles.
- ***Generative Model:*** Chat GPT is a generative model, meaning it can generate text based on input data or context. When a user asks a question or inputs a query, Chat GPT uses learned language patterns and context to generate an appropriate response.
- ***User Interaction:*** Chat GPT is designed to interact with users in real-time. Users can ask questions, give commands, or input textual data, and Chat GPT responds based on the learned patterns and context.
- ***Content Control:*** Users can control the generated content. For example, they can set specific parameters for the style, tone, or length of the response. Additionally, filters or rules can be applied to restrict the content that Chat GPT generates.
- ***Continuous Improvement:*** Chat GPT is continuously improved and updated to enhance its ability to generate quality responses. Through an iterative process of training and feedback, the model is constantly refined to meet the diverse needs and demands of its users.

As with any technology, Chat GPT also presents certain potential risks and dangers (National AI Platform):

- ***Inaccuracy or Errors in Responses:*** Chat GPT can generate responses that are inaccurate, incomplete, or misinterpret user queries. This can lead to the spread of misinformation or the provision of incorrect information.
- ***Bias in Generated Responses:*** The model can learn and reproduce existing biases from training data, such as prejudices based on race, gender, religion, sexual orientation, and other characteristics. This may result in the generation of responses that are inappropriate, discriminatory, or harmful.

- ***Misuse and Manipulation:*** Chat GPT can be misused to spread misinformation, propaganda, fraud, or other forms of manipulation. The generated responses may be used to target or exploit users or to pursue malicious intentions.
- ***Lack of Awareness and Autonomy:*** Chat GPT is a machine learning-based model that operates autonomously, meaning it lacks awareness, moral understanding, or the ability to assess the implications of its responses. This can lead to situations where the generated responses are not morally or ethically responsible.
- ***Privacy and Data Protection:*** The model can process and store large amounts of user data, which poses a risk to privacy and data protection.
- ***Dependency on Technology:*** **The use of Chat GPT can lead to user dependency on technology, reducing the ability to think independently, solve problems, and communicate effectively in the real world**.

To mitigate these risks, it is crucial for users to be aware of the limitations of Chat GPT as a technology and to apply it responsibly. This involves carefully monitoring the generated responses, thinking critically, and using additional information sources to verify the accuracy of the content provided.

By leveraging AI, especially through tools like ChatGPT, educational resources can become more accessible to a wider range of students. For instance, students can use it to clarify doubts, practice language skills, or explore topics not covered in the standard curriculum.

The application of AI in education, such as ChatGPT, also offers the potential to automate administrative processes, giving teachers more time to focus on quality interaction with students and developing creative and innovative educational approaches.

The integration of AI into the education system must be guided by principles of responsible innovation, ensuring that the human element remains at the center of the educational process.

THE FRAMEWORK FOR IMPLEMENTING AI AND CHAT GPT IN EDUCATION

Regarding the legal framework for the application of artificial intelligence in the Republic of Serbia, there is the ***Strategy for the Development of Artificial Intelligence in the Republic of Serbia for the period 2020–2025*** ("Official Gazette of RS", No. 96/2019) and the ***Conclusion on the Adoption of Ethical Guidelines for the Development, Implementation, and Use of Trustworthy and Responsible Artificial Intelligence*** ("Official Gazette of RS", No. 23/2023)

In the field of education, the following documents are used to establish a framework of competencies for teachers:

- The European Framework for the Digital Competence of Educators (Punie and Redecker, DigCompEdu, 2017);
  - SELFIE for Teachers (developed as a self-reflection tool to support teachers in further developing their digital competence) (DigCompEdu, 2021);
  - DigComp 2.2 (The Digital Competence Framework for Citizens) with new examples of knowledge, skills, and attitudes (Vuorikari, Kluzer, and Punie, DigComp 2.2, 2022);
- Digital Competence Framework – Teacher for the Digital Age (2017, 2019, 2024);

– UNESCO ICT Competency Framework for Teachers (ICT-CFT, 2018).

In the aforementioned documents that constitute this framework for teachers' digital competencies, several key areas are mentioned, including digital competencies in teaching and learning, empowering students, media literacy, communication and collaboration, safety, and more. A significant shift has occurred with the emergence of "***New Competencies for the Ethical Use of AI" and the European Commission's ethical guidelines on the use of artificial intelligence (AI) and data in teaching and learning for educators*** (European Commission: Directorate-General for Education, Youth, Sport and Culture, 2022). These guidelines highlight ethical AI usage, AI usage models, positive and negative applications of AI, misuse, and control of AI

Australian education ministers were the first to publish a consultative document seeking input on the draft ***National AI Framework in Education*** (Australian Department of Education, 2023). This document, in addition to addressing teaching and learning, for the first time emphasizes human well-being and transparency in AI use. It also stresses the importance of ensuring that both teachers and students learn to use AI, fairness in AI usage, maintaining human control over AI, and the continued role of human decision-making. Additionally, it underscores the significance of safety and security in AI usage, a critical and prominent issue (Australian Department of Education, 2023)

The OECD Employment Outlook 2023 (OECD, 2023), while indirectly related to education, identifies two types of skills that are increasingly prevalent in the context of AI usage. The first group includes skills for developing and managing AI systems, while the second group encompasses skills for adapting to, using, and interacting with AI. From this, it can be inferred that knowledge of artificial intelligence, critical thinking, problem-solving, creativity, communication, and other related competencies are required

A document that directly addresses teachers' competencies in the age of AI is the "***AI Competency Framework for Teachers***" (UNESCO, 2024), which outlines the structure of AI competencies for educators. This framework emphasizes the importance of a human-centered mindset, encouraging students to understand their relationship with AI, teaching responsible AI use, providing basic knowledge and skills for working with AI, and promoting the enhancement of problem-solving skills, creativity, and critical thinking.

THE ROLE OF TEACHERS IN AN AI-DRIVEN ENVIRONMENT

The role of teachers is inevitably changing due to the advent of artificial intelligence and Chat GPT. The focus is shifting increasingly from the mere transfer of information to the development of skills such as critical thinking, problem-solving, and collaboration. Teachers are becoming facilitators of learning, adapting to technological changes and encouraging students to actively engage and apply their knowledge. While Chat GPT can serve as a resource to support learning, the human element remains crucial in tailoring the teaching process to the individual needs of students The paper is based on the assumption that Chat GPT can ease teachers' workloads, reduce administrative tasks, and allow teachers to use their time more creatively and productively, as evidenced by the experience from the project "The World of Work Before and After Chat GPT – 'Chat GPT - A Perfect Worker Without Consciousness?' (2023). The questions addressed in this paper are: What is the role of teachers in the age of AI and Chat GPT? How is AI and Chat GPT used in teaching? What are examples of how Chat GPT is applied in teaching to ease teachers' work?

There are various perspectives and understandings when it comes to integrating AI – such as Chat GPT – into teaching, learning, and professional practice. Some view Chat GPT as a valuable tool for enhancing productivity, efficiency, and even creativity. Others are concerned about the potential negative impacts and ethical considerations of using such advanced technology. Therefore, it is essential to consider all perspectives and approach the integration of AI in a responsible and thoughtful manner.

Margaret Mead, a renowned authority in education and anthropology, highlighted in 1970 that "the greatest problem our society will face in the future is the problem of the digital divide. This divide will widen between those who have access to digital technologies and those who do not. Those with access to digital technologies will have a significant advantage in education, employment, and social life." (Mead, 1970.). This can be considered a compelling reason to first educate on the use of, and then to adequately apply, AI and Chat GPT in educational institutions and teaching, ensuring that students become proficient with these technologies

Table 1. Objectives of Basic Point 1: Digitally Qualified Population and Highly Qualified Digital Professionals

Targets of cardinal points 1: A digital population and highly skulled digital professionals

EU's objective for 2030: "A tech savvy continent where all are digitally empowered"		
Dimension	2030 EU Target vs baseline	Source
ICT specialists	20 million employed ICT specialists, with convergence between women and men (2019 baseline: 7,8 million)	DESI, ESTAT

Source: Commission to the European Parliament 2030 Digital Compass: the European way for the Digital Decade, Brussels

As outlined in the ***European Skills Agenda and Digital Education Action Plan***, digital skills will play a central role in strengthening collective resilience as a society. "Basic digital skills for all citizens and the ability to acquire new specialized digital skills for employees are prerequisites for active participation in the digital decade" (European Commission, 2021, The European Pillar of Social Rights Action Plan). "The Action Plan for the Implementation of the European Pillar of Social Rights for 2030 sets a target of 80% of adults having at least basic digital skills, and access to education for basic digital skills should be a right for all EU citizens, with lifelong learning becoming a reality" (European Commission, 2021, The European Pillar of Social Rights Action Plan).

"Advanced digital skills go far beyond knowledge of programming or basic computer science. Through digital training and education, specialized digital skills must be acquired that will enable citizens to secure quality jobs and build fulfilling careers. In 2019, there were 7.8 million ICT professionals (Table 1), with an annual growth rate of 4.2%. If this trend continues, the EU will face a significant shortfall of the projected 20 million experts needed in key areas such as cybersecurity or data analysis. The situation is further exacerbated by the lack of specialized educational and training programs in areas such as artificial intelligence, quantum security, and cybersecurity, as well as the weak integration of digital topics and multimedia teaching resources in other disciplines. Addressing this issue requires substantial investment in the training of future generations of workers and the upskilling and reskilling of the workforce" (European Commission, 2021, 2030 Digital Compass: The European Way for the Digital Decade).

Will a teacher ever be replaced by artificial intelligence at the classroom podium? And if so, when?

The role of teachers before the advent of AI primarily involved transmitting information, possessing critical thinking skills, analytical abilities, empathy, and soft skills.

In the era of AI, the role of teachers is shifting and no longer solely involves the transmission of information. In addition to the previously mentioned skills, **digital literacy** is now crucial. Teachers' roles have evolved to include guiding, monitoring, and supporting students. They are responsible for organizing, supporting, selecting, motivating, encouraging, managing classroom activities, planning, communicating, and adapting. In the classroom, collaboration between teachers and AI is possible.

An example of how ChatGPT can be applied in education might involve the teacher providing personal interaction and support to students, understanding individual needs, and tailoring instruction accordingly. The teacher encourages the development of critical thinking, emotional intelligence, and social skills, and remains adaptable to unforeseen situations and classroom dynamics. ChatGPT offers quick and broad access to information, serves as an additional resource for supporting learning, and is useful for writing exercises, creativity, and individualized learning.

Different approaches and methods for using ChatGPT (Vukmirović, 2023) can be adapted to meet various needs and goals. Some of the appropriate approaches include:

- ***Conversational Assistant:*** Can communicate with users in real-time, provide answers to their questions, offer information, perform tasks, etc. It can be used for user support, scheduling management, technical support, or as a virtual customer service agent.
- ***Creative Writing:*** Can be used to generate creative content, such as stories, poems, jokes, or other types of text. It can serve as a brainstorming tool or as an aid in writing projects, blogs, or other texts.
- ***Education and Learning:*** Can function as a virtual tutor or teacher. It can provide explanations, answer questions, give examples, or review material interactively. It is useful for language learning, mathematics, and other subjects.
- ***Testing and Evaluation:*** Can be employed for testing users' knowledge and skills. It can ask questions, evaluate responses, and provide feedback. It can be used to assess students' or learners' knowledge.
- ***Creative Partner:*** For users who want to experiment with ideas, create new concepts, or develop projects. It can provide inspiration, generate ideas, or offer alternatives based on input parameters and provided information.
- ***Personal Assistant:*** ChatGPT can act as a personal assistant for task management, reminders, planning, and organization. It can be used for scheduling, setting reminders, searching for information, and performing other tasks that facilitate daily life.
- ***Character Simulation:*** Can be used to simulate characters in video games, virtual reality, or other interactive environments. It can create characters with realistic dialogues and reactions to user actions.
- The integration of AI and ChatGPT models into the educational system should be guided by principles of responsible innovation, with the human factor remaining a central element of the educational process. Here are five reasons why AI cannot replace teachers:

- ***Human Interaction and Empathy***: Teachers provide emotional support and understanding that current AI technologies cannot offer. Human interaction contributes to a better understanding of students' needs.
- ***Teacher Adaptability***: Teachers are capable of adjusting their teaching methods to different learning styles and individual student needs. While AI can offer personalized approaches, the human factor contributes flexibility in adapting to various situations.

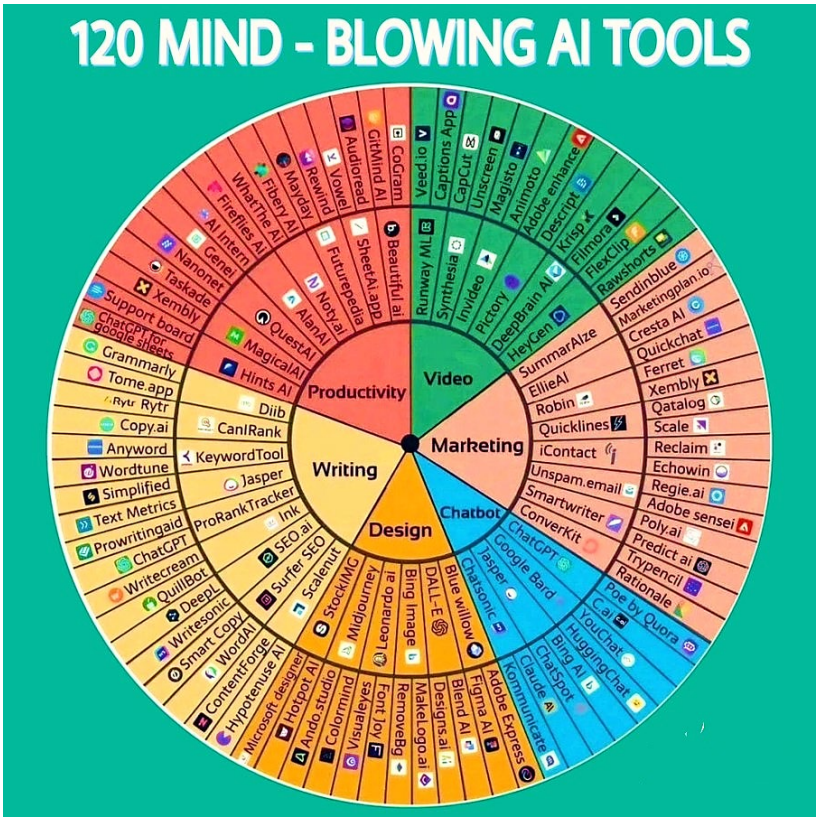

Figure 1. Overview of AI Tools for Various Fields
Source: https://x.com/alldexone/status/1694364439271891136

- ***Motivation and Inspiration***: Teachers have the ability to motivate students, provide inspiration, and stimulate creativity in ways that current AI technologies cannot achieve. The human element plays a crucial role in fostering enthusiasm for learning.
- ***Moral and Ethical Dilemmas***: Teachers make moral decisions and impart values, while AI systems are limited in understanding deep ethical issues and context in teaching. Humans are better equipped to make sensitive decision.
- ***Human Creativity***: Teachers encourage students' creativity through interactive and stimulating activities. While AI can support creative thinking processes, human creativity remains a unique ability that is difficult to replace.

It is expected that most teachers, after the transformation of teaching and the application of AI, will redirect some of their freed capacities towards more productive and creative teaching activities. This dynamic is already visible in companies that have adopted AI in their business processes. Therefore, it

is crucial to emphasize: **Teachers will not be replaced by AI, but rather by teachers who know how to use digital technology and AI in education.**

EXAMPLES OF CHAT GPT APPLICATIONS IN TEACHING THAT FACILITATE TEACHER'S WORK

AI and ChatGPT in education, based on experiences from the project "The Future Education with AI," can be used for various tasks such as: providing information, obtaining examples of applied knowledge, offering definitions, creating debates - student vs. ChatGPT, assisting in lesson planning, generating any type of text, formulating questions, summarizing text, paraphrasing text, creating various types of assignments, quizzes, etc. While ChatGPT can be a valuable resource and support in education, it does not replace traditional learning processes, mentorship, and interaction with teachers and professional staff.

In lesson planning and preparation, its efficiency in performing administrative tasks stands out. It is an effective tool for researching and gathering information needed for planning and preparing lessons. It allows for the generation of ideas for activities, provides suggestions for exercises, assignments, etc. Since teachers tailor lessons to students' abilities and needs, ChatGPT can be useful in creating individualized materials and tasks. It can also assist in generating test questions, especially when tasks of varying difficulty levels are required to align with Bloom's taxonomy in primary and secondary education. It can be particularly effective in such tasks when clear guidelines and requirements are provided.

ChatGPT can also aid in creating various reports. For example, by copying a text (minute book) and asking ChatGPT to generate a report with specific elements and items. Additionally, it can assist in writing emails, particularly automatic ones, such as notifications, appointment invitations, etc.

ChatGPT can help teachers differentiate lessons by suggesting various ways to adapt content, learning environments, teaching processes, and learning products according to students' interests, profiles, learning styles, and types of intelligence. It can also be used to create various interactive content, especially video materials. For producing synthetic teaching materials, the platform Synthesia is suggested for generating text-to-video (TTV) with photorealistic generated actors (ChatGPT video generator).

Language learning and practice are significantly facilitated by AI and ChatGPT (Krsmanović & Tica, 2023) through conversations in the target language, correcting language errors, vocabulary and phrases, pronunciation practice, simulating real-life situations, and tracking progress.

Students can be given debate topics with ChatGPT, which helps them develop critical thinking and learn how to form and defend their opinions with proper arguments. Debating also aids in developing public speaking and oratory skills, with ChatGPT taking opposing positions and providing arguments that students must refute or defend their stance.

In the area of assessment, which poses a challenge for teachers due to objectivity, handwriting, and various test combinations, ChatGPT can be beneficial. Generating tests based on the curriculum is one of the significant time-saving aspects for teachers (Farazouli et al., 2023). Automated grading for such tests is possible. ChatGPT can also evaluate scanned tests, even if handwritten. It can analyze student work and identify errors, which eases the process of grading and providing feedback.

ChatGPT can also assist in monitoring student progress – evaluation, and even self-assessment. It can propose potential products of student work for evaluation (composition, essay, drawing, project, etc.).

When teaching in the AI world, teachers need to pay attention to: empathy and socialization, internet safety, data privacy and protection, digital violence and proper internet communication, ethical use of technology and data, digital literacy, media literacy, AI literacy (Bošković et al., 2024), which represents a set of competencies enabling individuals to critically assess AI technologies, communicate and collaborate with AI, and use AI as a tool.

It is important to emphasize that ChatGPT provides quality responses based on properly formulated prompts (Tlili et al., 2023). ChatGPT is not a replacement for a teacher's knowledge, expertise, and experience. The model has significant potential for performing time-consuming tasks, allowing teachers more time for creative work. The teacher's role when working with ChatGPT should include checking, selecting, correcting, confirming, and finalizing responses. ChatGPT is a tool intended to assist teachers, not replace them. If a teacher cannot verify the accuracy or quality of the results, it is irresponsible to use it for decision-making or present it as their own.

CONCLUSION

AI and ChatGPT have the potential to enhance education and teaching by providing personalized experiences, automating administrative tasks, and broadening access to educational resources. Despite the challenges associated with integrating these technologies, their careful and ethically considered development can significantly benefit the field of education.

Although ChatGPT is a useful tool, it remains a language model and, as such, cannot replace human experience, creativity, and emotional intelligence. The combination of its analytical power with the knowledge and skills of educators can be both useful and effective in the teaching profession. The ability of teachers to use ChatGPT effectively depends on their knowledge and ability to integrate the information obtained into their teaching processes. Only in this way can the advantages of this tool be maximally utilized. Therefore, continuous and lifelong learning is essential, and it must be emphasized that **AI will not replace teachers but rather those teachers who know how to use digital technology and AI in teaching!**

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