CHATGPT AND AI IN K-12 EDUCATION: VIEWS AND PRACTICES OF GREEK TEACHERS

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Abstract

The study aims to explore teachers' views and practices on the use of ChatGPT in education, analyzing survey answers from 106 teachers about effectiveness, challenges, and possible opportunities. Findings suggest a moderate level of familiarity with ChatGPT, alongside a high potential for the facilitation of personalized learning. Moreover, concerns regarding data privacy, algorithmic bias, and the necessity for adequate training and support were reported as significant challenges. This research underscores the need for rigorous teacher training as well as the formulation of relevant policies and support towards an effective and ethical use of AI in education.

Introduction

The advent of new AI tools in education encompassing adaptive learning systems, analytical tools, and automation functionalities is about to bring a paradigm shift in the educational sector (Doroudi, 2023). It has unveiled new possibilities and further augmentation is envisioned in the form of innovative AI tools like ChatGPT (GPT: Generative Pre-Trained Transformers), which, when oriented towards content creation and dynamic interactivity, holds immense potential to revolutionize education (Crompton & Burke, 2024). However, AI in education (AIED) is confronted with substantial challenges (Hays et al., 2024). Coupled with the risk of oversimplifying educational processes, the need for an established ethical and regulatory framework in the realm of AI-operated education becomes even more critical (Kim & Adlof, 2024). Hence, it is crucial to address these concerns effectively to ensure the successful implementation of AIED while upholding the necessary ethical standards. Moreover, since 2023 with the advent of Generative AI, there has been an exponential surge in research interest on AIED (Yim & Su, 2024), while a Foresight research project about the use of Generative AI in Greece (National Centre for Social Research (EKKE) & National Centre of Scientific Research "Demokritos" (NCSR "D"), 2023) reported that AI seems to indicate an

explosive and perhaps irreversible techno-social initiative with which we must learn to coexist. In this context, this study aims at investigating educators' views and practices regarding the use of ChatGPT in school education, focusing on benefits, challenges and necessary actions for an effective and ethical AIED.

CHATGPT in Education

ChatGPT is a Large Language Model (LLM) leveraging patterns and linguistic structures to comprehend and generate automated text (OpenAI, 2023). Initially trained through a vast data of human dialogues, ChatGPT was released for use online in Nov 2022. It utilizes deep learning techniques for Natural Language Processing (NLP), creation of natural human language (Farrokhnia et al., 2024), and generation of realistic texts as pertinent responses to user queries (prompts) (Ray, 2023). Generative AI applications like ChatGPT have created new possibilities and perspectives in the way humans interact with machines, significantly affecting education (Waltzer et al., 2023). Crompton & Burke (2024) outline the primary applications of ChatGPT as supporting teaching, automating processes, providing ongoing support for students, clarifying complex concepts, fostering dialogic support, assisting in writing tasks, facilitating self-assessment, and augmenting students' engagement. Nevertheless, they highlight reliability, integrity, and data security issues as challenges. Similarly, Kim & Adlof (2024) categorise the potential benefits of ChatGPT in the field of productivity, preparation, and problem-solving, both inside and outside the classroom, for both students and educators, while expressing concerns about academic integrity, the risk of misinformation, and the decrease in critical thinking. Also, in their review van den Berg & du Plessis (2023) mentions lesson plan development, openness, and critical thinking as educational opportunities provided by ChatGPT. Regarding educators' perspectives: Ali et al. (2023) report positive views of ChatGPT as a tool for fostering and enhancing reading and writing skills; Bekeš & Galzina (2023) report low awareness among educators about AI; Monteiro et al. (2024) report that educators believe that ChatGPT will significantly impact the quality of education, particularly in the domain of student assessment; while Galindo-Dominguez et al. (2024) report that despite having a positive attitude towards ChatGPT, only a small percentage incorporate it in their teaching, mainly for content production. From the indicative studies presented above, it becomes evident that there is a high degree of global interest in examining the use of ChatGPT in school education, as well as in identifying views and practices of educators towards AIED. Also, the fact that literature review shows a lack of relative research in Greece is reinforcing the need to further research Greek educators' perceptions concerning AIED.

Research

The study seeks to explore current practices and benefits, barriers and necessary actions for the effective use of ChatGPT by Greek educators with the following research questions:

- RQ1: *What are the teachers' views of and perceived readiness for ChatGPT*?
- RQ2: *What are the teachers' perceived benefits and challenges of using ChatGPT*?
- RQ3: *What are the teachers' perceived necessary actions towards ethical AIED*?

The study follows a quantitative approach based on empirical data gathered via a survey questionnaire, which was constructed based on the corresponding literature review. The questions, aimed at gauging views and current practices of the participants, were structured mainly on a Likert scale (from 1 (lowest) to 5 (highest) response value), composed of 25 questions in total, and were grouped as follows:
- Demographic data [Questions: 1-10]
- Teachers' views and perceived readiness [Questions: 11-16]
- Teachers' perceived benefits and challenges [Questions: 17-18]
- Teachers' perceived necessary actions from the state [Questions: 19-25]

Data was gathered by distributing an online survey through email to school teachers using convenience sampling (Creswell, 2012), making the response collection process quick and effective. Responses were collected using Google Forms and analyzed with IBM SPSS v.26. A total of 106 teachers responded to the survey, mostly females (84.9%), between 22-40 years old (68.9%), with moderate teaching experience (1-6 years) (62.3%), with postgraduate studies (60.38%), certified ICT skills (91.6%) and a balanced level of training in AI tools (Table 1).

Table 1

Demographics and ICT Background of Teachers Responding to Survey

Demographics & Background	Frequencies (N %) (most frequently occurring response is bold-faced)
Gender	M: 15 (14.2%), **F: 90 (84.9%)**, Other: 1 (0.9%)
Age	**22-29: 41 (38.7%)**, 30-35: 20 (18.9%), 36-40: 12 (11.3%), 41-45: 8 (7.5%), 45+: 25 (23.6%)
Teaching experience	**1-3: 44 (41.5%)**, 4-6: 22 (20.8%), 7-11: 11 (10.4%), 12+: 29 (27.4%)

Demographics & Background	Frequencies (N %) (most frequently occurring response is bold-faced)
Studies*	Bachelor: 51 (48.11%), **Master: 64 (60.38%)**, PhD: 5 (4.7%)
Training in AI	Yes: 45 (42.5%), **No: 61 (57.5%)**
ICT skills*	None: 9 (8.4%), **ECDL: 70 (65.4%)**, L1: 11 (10.3%), L2: 15 (14%), Bachelor: 8 (7.5%)

Note: For "Studies" and "ICT skills", respondents could choose more than one answer.

Results

Results are presented according to the research questions, which are related to three parts of the survey tool, as described in the previous section.

RQ1: What are the Teachers' Views of and Perceived Readiness for ChatGPT?

According to Table 2, only 28 participants (26.4%) state that they have used ChatGPT for educational purposes, where 78 participants (73.6%) state that either they do not know ChatGPT, or they have not used it or used it in in their teaching.

Table 2

Teachers' Self Reports of Familiarity with AI and ChatGPT

Response Options	N	%
I know ChatGPT but I have never used it	34	32.1
I know ChatGPT and I have used it, but not in education	32	30.2
I know ChatGPT and I have used it in education	28	26.4
I don't know ChatGPT	12	11.3

Regarding educators' perceived readiness to use Generative AI tools in education on a scale of 1-5, participants' answers revealed low familiarity with ChatGPT (M=2.61, SD=1.21) and high needs for training in using AI tools (M=4.14, SD=0.98) as we can see in Table 3.

Table 3

Teachers' Perceived Readiness to Use AI and ChatGPT

Readiness Questions (1="Totally Disagree", 2="Disagree", 3="Neutral", 4="Agree", 5="Strongly Agree")	M	SD
I am interested in receiving more training on AI tools	4.14	0.98
I feel ready to incorporate Generative AI in my teaching	2.89	1.25
I am familiar with integrating ChatGPT into my teaching	2.61	1.21

Regarding ChatGPT as a support mechanism for education (Table 4), most of the teachers see the role of ChatGPT as moderately effective in facilitating personalized learning experiences (M=3.08, SD=0.93) and enhancing students' interactivity and commitment (M=3.08, SD=1.03).

Table 4

Teachers' Reported Types of Support using ChatGPT in Teaching and Learning

Types of Support (Support level: 1="None", 2="Small", 3="Moderate", 4="Strong")	M	SD
Personalized learning	3.08	0.93
Interactive learning and commitment of students	3.08	1.03
Evaluation and feedback	2.87	0.99
Administrative tasks	2.87	1.06
Participation	2.86	1.03

In addition, it was revealed that most teachers use ChatGPT to plan their lessons, create educational resources, conduct their research and proofreading, edit, and improve their written texts, as Table 5 demonstrates.

Table 5

Teachers' Perceived Educational Affordances of ChatGPT

Types of Educational Affordances	N	%
Design lesson plan and curriculum	22	50.00
Research	17	38.60
Edit written text	17	38.60

Types of Educational Affordances	N	%
Create educational content	17	38.60
"Live" use during teaching	12	27.30
Evaluation, feedback and comments	9	20.50
Administrative tasks	9	20.50
Programming	5	11.40

RQ2: What are Teachers' Perceived Benefits and Challenges of Using ChatGPT?

Most of the teachers reported that they saved time using ChatGPT (N=53, 50%) and that teaching was more creative (N=48, 45.28%). Also, most of the teachers reported that using ChatGPT was helpful for students with special needs (N=39, 36.79%), provided faster feedback to students (N=34, N=32.08%), and better student engagement due to educational material of better quality generated from ChatGPT (Table 6).

Table 6

Teachers' Perceived Benefits of ChatGPT in Education

Perceived Benefit	N	%
Time saved in lesson preparation	53	50.00%
More creative teaching	48	45.28%
More help for students with learning or other difficulties	39	36.79%
Faster feedback to students	34	32.08%
Greater student engagement	32	30.19%
Higher quality of educational materials	27	25.47%
Higher level of personalized teaching and learning	26	24.53%

Finally, Table 7 shows that the three main concerns related to the use of ChatGPT are limitations in literacy skills such as writing (N=76, 71.70%), and critical thinking (N= 69, 65.09%) and increase of legal issues such as intellectual property and data protection (N=65, 42.45%). Also, increased dependency from AI tools was reported as a major challenge from the participants (N=64, 60.38%), as well as limited quality and reliability of content produced from Generative AI tools (N=58, 54.70%) and limited human control of AI (N=47, 44.34%).

Table 7

Teachers' Perceived Challenges of ChatGPT in Education

Perceived Challenge	N	%
Limit writing and information literacy of the students	76	71.70%
Limit critical thinking	69	65.09%
Increase intellectual property and data protection issues	65	61.30%
Increase dependency from AI tools	64	60.38%
Limited quality and reliability of content	58	54.70%
Limit human control over content produced from AI	47	44.34%
Increase plagiarism	47	44.34%
Limit students' cognitive abilities	45	42.45%
Limit academic integrity	37	34.91%
Increase dependency from private companies	36	33.96%
Limit teacher's role	35	33.02%
Increase digital divide in education	25	23.58%

RQ3: What are Teachers' Perceived Necessary Actions towards a Proper and Ethical AIED?

As can be seen from Table 8, according to the perceptions of the Greek teachers, the top 3 priority actions from the state should do are: a) ensure that data privacy and security measures are strictly adhered to in educational AI applications (M=4.66, SD=0.64), b) formulate policies to guide the ethical use of AI in education (M=4.44, SD=0.78) and c) invest in technological infrastructure to ensure equal access to artificial resources intelligence in education in different regions and communities (M=4.29, SD=0.95).

Table 8

Teachers' Attitudes towards Proper and Ethical AIED

The state should… (1="Totally Disagree", 2="Disagree", 3="Neutral", 4="Agree", 5="Strongly Agree")	M	SD
ensure that data privacy and security measures are strictly adhered to in educational AI applications	4.66	0.64

The state should… (1="Totally Disagree", 2="Disagree", 3="Neutral", 4="Agree", 5="Strongly Agree")	M	SD
formulate policies to guide the ethical use of AI in education	4.44	0.78
invest in technological infrastructure to ensure equitable access to AI resources in various regions and communities	4.29	0.95
be involved in setting standards and guidelines for integrating AI into educational programs	4.17	0.90
promote and support research and innovation in AI for educational purposes	4.16	0.99
play a significant role in providing training to educators on AI technologies	4.14	0.99
allocate funds and resources to support the integration of AI technologies in educational institutions	4.07	1.05

Finally, regarding teachers' professional development on AI Literacy, Table 9 presents the thematic topics that teachers perceived as the most important and that training programs should contain: data privacy and security (M=4.47, SD=0.71), and technical aspects of using AI tools (such as operation, troubleshooting, updates) (M=4.40, SD=0.80).

Table 9

Dimensions of Teachers' Professional Development on AI

Importance of Different Types of Professional Development (1="Totally Disagree", 2="Disagree", 3="Neutral", 4="Agree", 5="Strongly Agree")	M	SD
Training on data privacy and security is necessary in the context of AI applications in education	4.47	0.71
Training on the technical aspects of using AI tools (such as operation, troubleshooting, updates) is important	4.40	0.80
Understanding the ethical implications and responsible use of AI in the classroom is an essential part of educator training	4.35	0.71
Educator training should include strategies for effectively integrating AI tools into lesson planning and delivery	4.34	0.71
Educators should be trained in adapting pedagogical methods to effectively integrate AI technologies into their teaching	4.30	0.76
It is important that training covers the limitations and potential biases inherent in AI technologies	4.29	0.76

Discussion and Conclusions

This study presents results from a survey in Greece about primary school teachers' perceptions of various aspects of ChatGPT use in education. Teachers rated ChatGPT and AI tools in general as somewhat effective in personalizing learning experiences and better engaging students, while improving administrative effectiveness. Teachers are also concerned about the privacy of data and showed concerns with algorithmic biases, recommending that strict ethical guidelines and security measures be put in place in the implementation of AI in education. Most of the teachers were clueless about the practical application of ChatGPT, which also reflects general uncertainty about integrating AI tools and teaching practices. This research clearly expresses the pressing need for comprehensive training programs for upgrading the technical skills and the level of awareness of teachers about the pedagogical implications of AI. The role of the state in AI integration emerged as crucial since the majority of teachers strongly agreed that the government should be responsible for ensuring data privacy, developing ethical guidelines, investing in technological infrastructure, and supporting AI research and training for education. This indicates the necessity of proactive policy formulation to ensure equitable access to AI resources and education innovations. These teacher-training programs should look at AI not only from a technical point of view but also from pedagogical adaptations, some of its possible ethical implications, data privacy, and avoidance of biases. The teachers indicated they needed to understand how to incorporate effectively the AI tools in the planning and delivery of their lessons.

While the adoption of AI by the teachers was relatively low, participants who used AI reported improvements in terms of preparing lessons and curriculum development. Inadequate training, organizational support, and the lack of familiarity with AI tools were reported as challenges that need immediate attention in teacher training and resource provisioning. Opportunities lay in this ability to offer better teaching materials and improved ways of assessing, as well as efficiency to an improved level, hinting at the potential transformation in practices that AI could bring to education. While this potential puts AI in the forefront of changing educational practice, rapid developments in AI and tool-specific concerns with, for example, ChatGPT, dictate the need for research and continuous updating of teacher training curricula to keep abreast of technological development. Other concerns over AI emanated from the possible decline in some essential academic skills because students over-relied on technology. This implied that the balance between the integration of AI had to be reached by supporting skill development but not taking away critical thinking or problem solving. Future predictions for AI in education are an expanded role for AI in teacher training, access to tools, and community education, underlining AI's transformation potential in reshaping educational landscapes.

Study limitations include the diminished generalizability of this study because of the specific sample and educational context—limitations imposed by the quantitative data, which do not capture the entire spectrum of teacher experiences and attitudes, and the fast-changing field of AI, where findings may soon become outdated. Future research should also look to mixed methods, deepen understanding, and assure that technological progress continues to update findings. In conclusion, whilst AI possesses significant potential to improve educational practice, there are substantial obstacles to overcome. These challenges include providing adequate training, developing robust policy frameworks, and securing ongoing support from educational institutions and the state. Addressing these challenges effectively is crucial for harnessing the potential advantages that AI could provide to education.

References

Ali, J. K. M., Shamsan, M., A. A., Hezam, T. A., & Mohammed A. A. Q. (2023). Impact of ChatGPT on learning motivation: Teachers and students' voices. *Journal of English Studies in Arabia Felix*, *2*(1), 41-49. https://doi.org/10.56540/jesaf.v2i1.51

Bekeš, E. R., & Galzina, V. (2023). Exploring the pedagogical use of AI-powered chatbots educational perceptions and practices. *46th MIPRO ICT and Electronics Convention (MIPRO)*, 636–641. https://doi.org/10.23919/MIPRO57284.2023.10159734

Creswell, J. (2012). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research (4th ed.)*. Pearson.

Crompton, H., & Burke, D. (2024). The educational affordances and challenges of ChatGPT: State of the field. *TechTrends 68*, 380–392. https://doi.org/10.1007/s11528-024-00939-0

Doroudi, S. (2023). The intertwined histories of Artificial Intelligence and education. *International Journal of Artificial Intelligence in Education*, *33*, 885–928. https://doi.org/10.1007/s40593-022-00313-2

National Centre for Social Research (EKKE) & National Centre of Scientific Research "Demokritos" (NCSR "D"). (2023). *Generative AI Greece 2030: Possible futures of Generative Artificial Intelligence* in Greece. Athens: Special Secretariat of Foresight. https://foresight.gov.gr/wp-content/uploads/2024/04/Gen_AI_Greece_EN_s.pdf

Farrokhnia, M., Banihashem, S. K., Noroozi, O., & Wals, A. (2024). A SWOT analysis of ChatGPT: Implications for educational practice and research. *Innovations in Education and Teaching International*, *61*(3), 460–474. https://doi.org/10.1080/14703297.2023.2195846

Galindo-Domínguez, H., Delgado, N., Losada, D. & Etxabe, J-M. (2024). An analysis of the use of artificial intelligence in education in Spain: The in-service teacher's perspective. *Journal of Digital Learning in Teacher Education*, *40*(1), 41-56. https://doi.org/10.1080/21532974.2023.2284726

Hays, L., Jurkowski, O. & Sims, S.K. (2024). ChatGPT in K-12 Education. *TechTrends*, 68, 281–294. https://doi.org/10.1007/s11528-023-00924-z

Kim, M., & Adlof, L. (2024). Adapting to the future: ChatGPT as a means for supporting constructivist learning environments. *TechTrends, 68*, 37–46. https://doi.org/10.1007/s11528-023-00899-x

Monteiro F.F., Souza P.V.S., da Silva, M.C., Maia, J.R., da Silva, W.F. & Girardi D. (2024). ChatGPT in Brazilian K-12 science education. *Frontiers in Education*, *9*, 1321547. https://doi.org/10.3389/feduc.2024.1321547

OpenAI (2023). *Introducing ChatGPT*. https://openai.com/blog/chatgpt

Ray, P. P. (2023). CHATGPT: A comprehensive review on background, applications, key challenges, bias, ethics, limitations and future scope. *Internet of Things and Cyber-Physical Systems*, *3*, 121–154. https://doi.org/10.1016/j.iotcps.2023.04.003

Waltzer, T., Cox, R. L., & Heyman, G. D. (2023). Testing the ability of teachers and students to differentiate between essays generated by CHATGPT and high school students. *Human Behavior and Emerging Technologies*, *1*, 1–9. https://doi.org/10.1155/2023/1923981

van den Berg, G. & du Plessis, E. (2023). ChatGPT and Generative AI: Possibilities for its contribution to lesson planning, critical thinking and openness in teacher education. *Educational Sciences*, *13*(10), (998). https://doi.org/10.3390/educsci13100998

Yim, I.H.Y., & Su, J. (2024). Artificial intelligence (AI) learning tools in K-12 education: A scoping review. *Journal of Computers in Education*. https://doi.org/10.1007/s40692-023-00304-9

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