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Research Article

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Attitudes and Perceptions of Secondary Education Greek Teachers on The Use of Artificial Intelligence in The Educational Process

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Abstract

Over the past decade, significant progress has been made in the field of artificial intelligence (AI), characterizing it as an emerging technology with potential importance in the field of education. The present study aims to outline the extent of the use of artificial intelligence by Greek teachers in the educational process. For this purpose, a survey was conducted among secondary school teachers of the Prefecture of Achaia. The survey sought to measure how informed teachers are, whether they have been trained, whether they use AI applications, how often they use them, and whether the school has integrated AI into the educational process. An additional parameter studied is its main advantages in the educational, teaching and learning context, as well as its potential disadvantages. The research methodology followed was based on the preparation of a structured quantitative research questionnaire which consists of 15 closed-ended questions and 2 open-ended questions to better document the respondents' response. The questionnaire was created using the Google forms platform and was sent by email to the Secondary Education Schools of the Prefecture of Achaia.

Keywords: *Artificial intelligence; educational research; teachers' opinions.*

Introduction

Artificial intelligence (AI) has impacted many aspects of our lives, and education is no exception (Yeruva, 2023). Artificial intelligence has the potential to revolutionize the way we learn and teach, making it more personalized, engaging, and effective (Alneyadi, Wardat, Alshannag, & Abu Al-Aish, 2023). In this article, we will explore the role of artificial intelligence in education and how much it has penetrated Greek education and teachers (T. Vinoth Kumar et al., 2022) (Samad, Hamza, Muazzam, Ahmad, et al., 2022). Artificial intelligence in education refers to the use of artificial intelligence technologies, such as machine learning and natural language processing, to improve the learning experience (Alneyadi et al., 2023). It involves the use of algorithms that analyze data, identify patterns, and make predictions, allowing teachers to personalize learning for each student (Khan et al., 2022). The potential benefits of using artificial intelligence in education are significant. Personalized learning, one of the most important advantages of artificial intelligence in education, can lead to better student outcomes, as students can learn at their own pace and in a way that suits their learning style (Shrivastava et al., 2023). Smart teaching systems, chatbots, and automated grading and assessment can increase efficiency, save teachers time, and provide more accurate and consistent feedback. However, there are also challenges associated with the use of artificial intelligence in education. Privacy and security concerns, lack of trust, cost, and potential bias are some of the challenges that need to be addressed (Jarrah, Wardat, & Gningue, 2022).

Ethical issues must also be considered, such as ensuring accessibility, transparency, and fairness in AI-based educational systems (AlArabi, Tairab, Wardat, Belbase, & Alabidi, 2022) (Tariq et al., 2022). Despite these challenges, the potential of artificial intelligence in education is enormous (M Al-Bahrani, Gombos, & Cree, 2018). Artificial intelligence can provide better data analysis, allowing educators to make decisions based on that data. It can also improve student engagement by providing interactive and engaging learning experiences (Yang et al., 2022) (Wardat, Belbase, & Tairab, 2022). With the help of artificial intelligence, education can become more accessible and inclusive, allowing learners of all backgrounds to access high-quality education. In the following sections of this review article, we will explore the degree of penetration of artificial intelligence applications in Greek education, including personalized learning, smart teaching systems, chatbots, and grading and evaluation (Madasamy, Raja, AL-bonsrulah, & Al-Bahrani, 2022). We will also discuss how well teachers know AI, whether they have been trained, whether they want to be trained, and the benefits and challenges of using artificial intelligence in education. Finally, we will explore the future of artificial intelligence in Greek education and the opportunities it presents for innovation and development. One of the main challenges is the inadequate preparation of teachers for AI-based technology, which, if offered at all, is rather sporadic and unsystematic (Ayanwale MA, et al, 2022, Sanusi IT, Oyelere SS, Omidiora JO. 2022, Vazhayil A, et. al. 2019). The rapid release of new applications is widening the gap in fundamental AI literacy, making it difficult for educators to stay informed about the latest developments, make appropriate choices, and learn practical applications (Sanusi IT, Oyelere SS, Omidiora JO. 2022). Furthermore, the controversy surrounding the benefits and drawbacks of AI technology adds to educators' hesitations about implementing AI-based technology in the educational process (Chounta I, Bardone E, Raudsep A, Pedaste M 2022, Nazaretsky T, Ariely M, Cukurova M, Alexandron G 2022). As a result, teachers' attitudes towards artificial intelligence vary depending on demographic, psychological, pedagogical, and other influences. The current research has explored the views and degree of familiarity of teachers in the region of Western Greece with artificial intelligence.

Bibliographic review

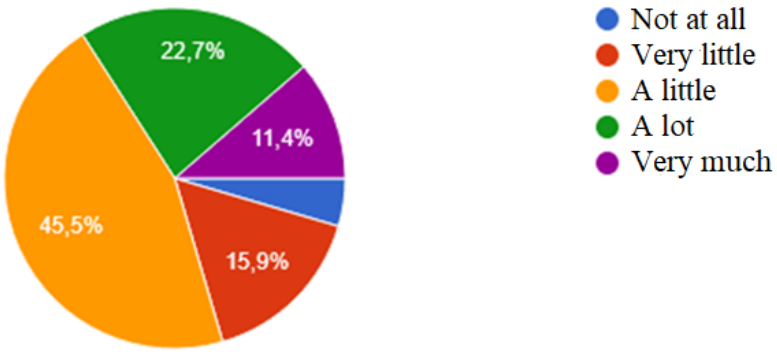
Recently, some studies have explored teachers' perspectives on artificial intelligence and the variables that influence these perspectives. Yue et al. examined the influence of demographic variables and technological-pedagogical knowledge on teachers' attitudes towards artificial intelligence (AI). The survey was conducted online among 1664 Chinese teachers (Wang S, Sun Z, and Chen Y.2023). The authors concluded that whether or not teachers use AI in the classroom is directly related to their general attitude towards AI. Teachers who were more familiar with and already using AI-based technology showed greater enthusiasm and confidence in the educational potential of AI. Other variables, such as instructors' overall technological proficiency, pedagogical expertise, and knowledge of AI content, did not affect their level of interest or confidence in using AI. Based on their findings, the authors recommend that teacher preparation programs provide practical training and education in the use of artificial intelligence for pedagogical purposes. Several studies have highlighted the relationship between teachers' acceptance of the usefulness of technology and their readiness to use it in their teaching practices (Al-Furaih SAA, and Al-Awidi HM, 2020, Ayanwale MA et. al. 2022, Darmansyah D et. al. 2021, Nikolopoulou K, et. al. 2021, Zhang C et. al.2023). According to Nazaretsky et al., educators who had confidence in the effectiveness and accuracy of AI-based technologies were more likely to have more favorable attitudes toward them (Nazaretsky et al. 2021). A study of 452 German teachers showed that teachers' propensity to use AI technology was significantly correlated with their perceptions of AI's usability and ease of use. The authors also noted significant gender differences in acceptance of AI related to anxiety, with female teachers showing a higher level of anxiety (Zhang C et. al. 2023). Another study involving 368 serving K-12 teachers in Nigeria found that teachers' perceptions of the relevance of AI to educational goals were strongly related to their readiness to implement AI in their teaching practice (Ayanwale MA et. al. 2022). Similar to Yue et al., the authors' suggestion is to invest in professional development programs that will prepare teachers with the necessary knowledge, skills, and confidence to integrate AI technology. Kim and Kim emphasized the importance of practical experience in teachers' acceptance of AI technology. They found that teachers' attitudes towards AI could change after training. Having used any AI tool, teachers were more positive about its potential for teaching and learning. Kim and Kim also observed that younger teachers were more enthusiastic about AI technology in their teaching. Their findings align with several studies linking the genealogical characteristics of teacher populations to their attitudes toward technology (Hernandez-de-Menendez M et. al. 2020, Puiu S, Semerci A, and Aydın MK 2017, Trujillo-Torres J, et. al.2020). For example, educators born after 1980 (also known as Generation Y or Millennials) and those born in 1995 or later (also known as Generation Z or technoholics) were more favorably disposed toward AI technology than their older counterparts (Chan CKY et. al. 2023). Age differences are attributed to the familiarity and inherent tendency of younger generations towards technology, which they acquire as they grow up in a technologically advanced society (Dai Y et. al. 2020, Kim J et. al. 2020, Tshuma N. 2021). Prensky used the term "digital natives" to describe people who acquire technological skills in a manner comparable to the way they learn their first language.

Research Methodology

The present study aims to outline the extent of the use of artificial intelligence by Greek teachers in the educational process. For this purpose, a survey was conducted among secondary education teachers in the Prefecture of Achaia, in Western Greece. The survey attempted to measure how informed teachers are, whether they have been trained, whether they use artificial intelligence applications, how often they use them, and whether the school has integrated AI into the educational process. An additional parameter that was studied is its main advantages in the educational, teaching and learning context, as well as its possible disadvantages. The research methodology followed was based on the drafting of a structured quantitative research questionnaire, which consists of 15 closed-ended questions and 2 open-ended questions to better document the responses. The questionnaire was created using the Google forms platform, and was sent via email to secondary schools in the Prefecture of Achaia. A total of 44 questionnaires were collected, of which 23 teachers had over 20 years of service, 11 from 10 to 20 years and 10 up to 10 years of service.

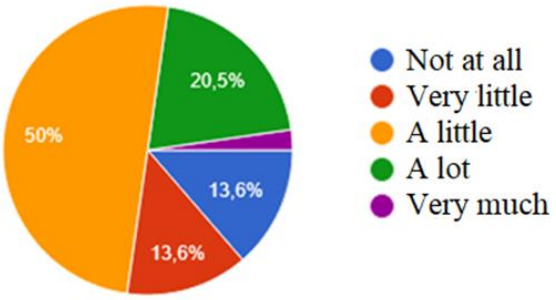
Results and Discussion

Initially, we investigated the level of information and knowledge of teachers. The question asked was: "How informed do you think you are regarding the concept of artificial intelligence (AI)?" As shown in Graph 1, a percentage of 4.5% answered "not at all", 61.4% answered "a little" and "very little", 22.7% "a lot" and 11.4% "very much".



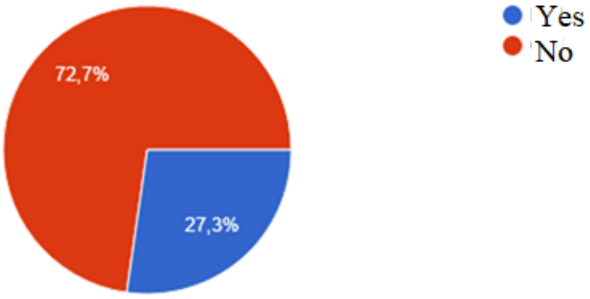
Graph 1: How informed do you think you are regarding the concept of artificial intelligence?

We then asked the teachers: "Do you believe you have sufficient knowledge and skills in AI?" As shown in Graph 2, a percentage of 13,6% answered "not at all", a 13,6% answered "very little", a 50% "a little", a 20,5% "a lot" and only a 2,3% answered "very much".



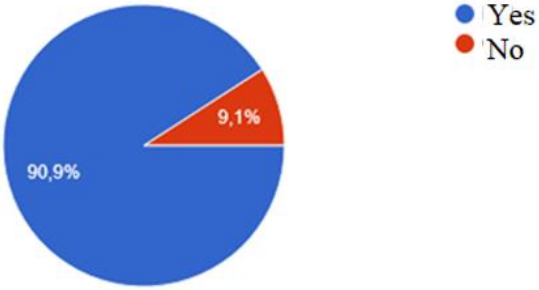
Graph 2: Do you believe you have sufficient AI knowledge and skills?

Regarding the level of training of teachers, we recorded a percentage of 72.7% who have not been trained, while only 27.3% (12 teachers) have been trained (Graph 3).



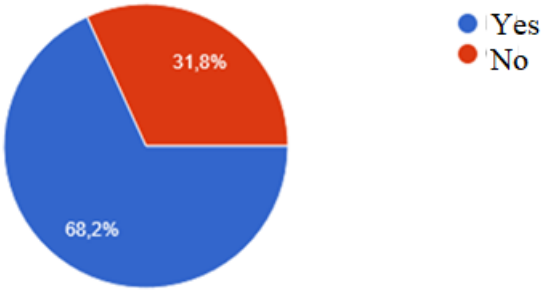
Graph 3: Percentage of teacher training in Artificial Intelligence.

Of the 12 teachers who have been trained, most have attended an eTwinning seminar, while a small number have been trained in-school. Of the remaining teachers who have not been trained (32 teachers), 90.9% want to be trained, while there is also a 9.1% who are not interested in being trained (Graph 4).



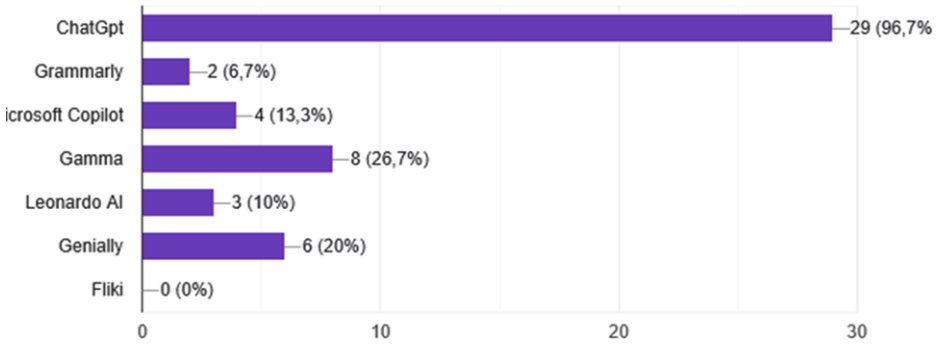
Graph 4: Desire for teacher training in Artificial Intelligence.

Now regarding the degree of use of AI in education, despite the lack of training for teachers, 68.2% (30 teachers) use some AI tool in education, while 31.8% do not, which indicates the need for personal improvement (Graph 5).



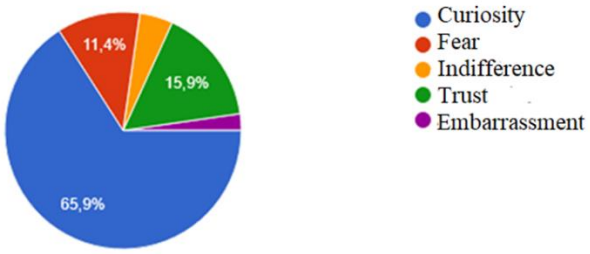
Graph 5: Degree of use of AI in education.

In the question "Which artificial intelligence tool do you use?" with the possibility of selecting more than 1 answer, ChatGPT has the most options, probably due to the fact that it is the best known, mainly through social networks and media, followed by Gamma, Genially, Microsoft Copilot, etc. (Graph 6).



Graph 6: Which artificial intelligence tool do you use?

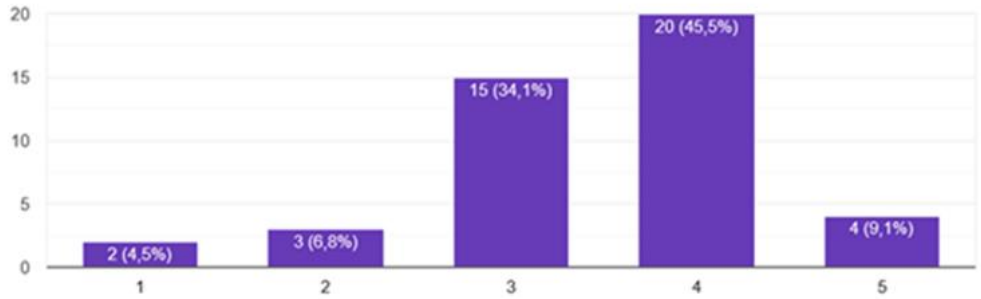
On the other hand, the emotional aspect, i.e. the thoughts and feelings that AI evokes, is also important. To the sentence: "When you think about artificial intelligence you feel…..", a percentage of 65.9% answered "curiosity". This answer could also justify the fact that even though some teachers have not been trained, they use an AI tool. Curiosity could be another motivation for personal improvement and use of AI. Also, 15.9% responded "trust", which may be due to the training they have attended as well as the level of information they have. In addition, 11.4% feel "fear", which could be reduced through training and information. This is also reinforced by the teachers' responses to the question: "How informed do you think you are regarding the concept of artificial intelligence (AI)?" where 65.9% answered from "not at all" to "a little" (Graph 7).



Graph 7: Thoughts and emotions evoked by AI.

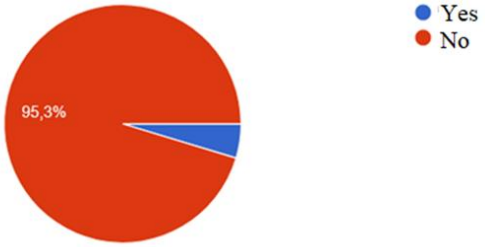
In coordination with the findings and studies of other researchers, we studied teachers' opinions regarding the usefulness of AI in the educational process.

To the question "How useful do you think artificial intelligence is in the educational process?" (1- not at all useful, 2- very little, 3- a little, 4- a lot, 5- very much), 45.5% answered "A lot" and 9.1% "very much", while 34.1% "A little" and 6.8% "very little". We see that the opinions of teachers are divided (Graph 8).



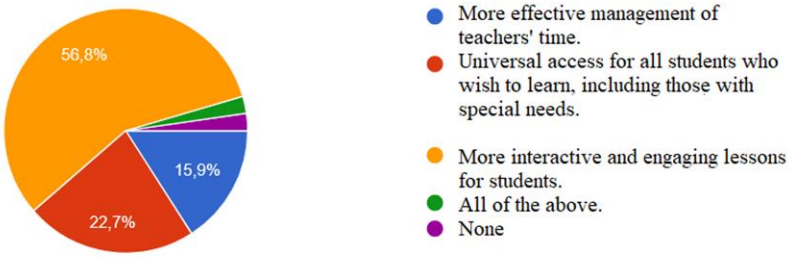
Graph 8: Usefulness of AI in the educational process.

Related to the usefulness of AI in the educational process, is the question of whether the courses created and delivered primarily by artificial intelligence are more valuable than traditional ones, where a 95.3% answered "No" and a 4.7% answered "Yes" (Graph 9).



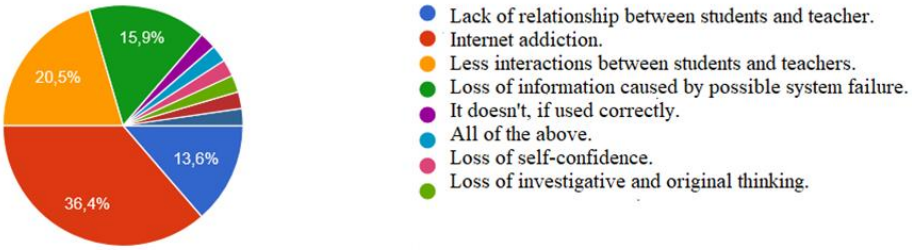
Graph 9: Do you consider courses created and delivered primarily by artificial intelligence to be more valuable than traditional courses?

Regarding the advantages of AI in the educational process, in the question "What do you think is the main advantage that artificial intelligence will have in the educational process?", three options were given and the opportunity to state what they consider to be the main advantage. Based on the teachers' responses, 56.8% responded "More interactive and engaging lessons for students", 22.7% responded "Universal access for all students who wish to learn, including those with special needs" and 15.9% responded "More effective management of teachers' time" (Graph 10).



Graph 10: Advantages of AI in the educational process.

Finally, on the other hand, regarding the disadvantages of AI in the educational process, in the question "What do you think is the main disadvantage that artificial intelligence will have in the educational process?", they were given 4 options but also the opportunity to mention whichever option they considered to be the main disadvantage. According to Graph 11, 36.4% answered "Internet addiction", 20.5% "Less interactions between students and teachers", 15.9% "Loss of information caused by possible system failure" and 13.6% "Lack of relationship between students and teacher".



Graph 11: Disadvantages of AI in the educational process.

Teachers' views – comparison with the traditional lesson

As mentioned above, in the questionnaire two open-ended questions were given in order to better record teachers' views. Educators expressed a variety of opinions regarding the question "Do you believe that courses created and delivered primarily by artificial intelligence are more valuable than traditional courses?" Some of their views are presented below:

"Student-teacher interaction is irreplaceable, as it is based on a relationship that is not only educational in nature but more passionate, emotional and pedagogical. AI courses can function as auxiliary tools in the educational process".

"Artificial intelligence is not going to take into account the particularities and individual needs of all students, as well as the unforeseen events that affect the educational process".

"*The human factor and classroom dynamics are a fundamental element of education and of the learning process and AI cannot replace traditional teaching or the teacher, but can only assist and improve it".*

Teachers' views – Teachers' concerns regarding the use of AI tools in educational process

The teachers emphasized that "the uncritical reproduction of information/presentations and assignments, without search/research or personal effort by the students, is not pedagogically and educationally desirable." They pointed out that "AI only incorporates knowledge that is posted on the internet, while there is a lot of important knowledge in books and libraries." They referred to the dangers of "reducing imagination and critical thinking and, secondarily, loss of students' personality." They expressed concerns about "social isolation of students", and of course that reckless computer use leads to the well-known problems (addiction, concentration & behavioral problems). Many educators fear the devaluation of the teacher, emphasizing that teachers cannot be replaced by AI tools. Some educators stated that "we are too busy using Artificial Intelligence, and we do not notice the ever-decreasing use of children's Natural Intelligence." There was a strong

concern that AI would "end up being a ready-made task machine without any involvement from students, who would then subsequently lose the practice of their skills." Essentially, they refer with anxiety to the "lack of production of research and original thinking by students and their dependence on mechanical thinking."

Conclusions

In complete agreement with the findings of other researchers at an international level, we also reached in the following conclusions: A large percentage of teachers have not been trained, but would like to be trained and also are not sufficiently informed and do not have AI knowledge and skills. However, a percentage of 68.2% use some AI tool in the educational process, mainly ChatGPT. The term AI mainly causes curiosity in the majority of respondents, while it also causes fear in a small percentage, which may be due to a lack of training and information. Regarding the usefulness of AI in the educational process, teachers' opinions are almost divided, 45% consider it to be a little to not at all useful and 55% consider it to be a lot to very much. In addition, the largest percentage believes that lessons created and delivered with the help of AI are not more valuable than traditional ones because the interaction between students and teacher and the human factor are mainly missing.Classroom dynamics are a fundamental element of education and the learning process. AI courses can function as auxiliary tools in the educational process.The main advantage of AI in the educational process is that it creates more engaging and interactive lessons for students, as well as universal access for all students, including those with special needs. On the other hand, disadvantages of AI in the educational process are the addiction it can cause to the internet and the lack of interaction between students and teachers.

Finally, let's ask ourselves: "Maria Callas never listened to her recordings because they were so perfect from the studio that they were inhuman." Where did we hear that we should provide children with perfect knowledge on a plate, without teaching them to use their minds, and especially without them experiencing the fruitful creativity after the frustration of a mistake or failure?

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