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Perceptions and Usage of AI-based Technology Among Preschool Children in Bulgaria

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ABSTRACT

This study investigates the attitudes of parents and teachers of preschool children (aged 3–6 years) toward the emergence and use of AI-based technologies, with a focus on Bulgaria. Utilizing an online survey format, data were collected during October 2024 from parents and teachers (N = 150), primarily residing in urban areas. The findings reveal that while AI-driven technologies such as smartphones, tablets, and smart TVs are integrated into children's daily life, newer AI tools like virtual assistants and creative AI applications remain underutilized, especially in kindergartens. Teachers primarily use AI-related tools for educational purposes, such as e-blackboards and multimedia, but report limited training and information about emerging AI technologies. Parents were found to be more open to integrating AI-based tools at home, though primarily for practical applications relevant to daily activities. Both groups expressed dissatisfaction with the existing regulatory framework in the country, citing inadequacies in policies addressing the challenges of AI usage for vulnerable age groups. The study highlights the importance of a more inclusive approach to understanding AI exposure among children, as well as the need for targeted policy reforms and training programs. The findings contribute to ongoing discussions about integrating AI into early childhood education and provide actionable insights for educators, parents, and policymakers.

Keywords: AI, Preschool children, Educators, Parents

INTRODUCTION

AI-based technology is becoming an integral part of our daily lives. Like any new innovation, it brings significant benefits to society but also poses certain risks and challenges. These risks are particularly concerning for vulnerable age groups, such as preschool children, who are in critical stages of their physical and psychological development (Su et al., 2023). As a result, understanding and responsibly integrating AI-based technology into children's upbringing and education is increasingly important. The term "Artificial Intelligence" is commonly defined as "the science and engineering of making intelligent machines" (McCarthy, 1981). While there is growing awareness of what AI entails, the ability to effectively and responsibly engage with it—referred to as "AI literacy"—is becoming a key competency (Ng et al., 2021a; Ng et al., 2021b).

Today, AI is embedded in a wide range of technologies and devices, serving various purposes. Recently developed tools, such as ChatGPT, explicitly state their foundation in artificial intelligence (Loos et al., 2023). Over time, numerous programs and software have incorporated AI algorithms in people's lives. Examples include navigation apps, online streaming platforms, educational tools like e-blackboards, fitness and wellness trackers, home assistants, and voice recognition systems (Su et al., 2023; Loos et al., 2023).

Previous research indicates that parents generally hold positive attitudes toward using AI technology to foster AI literacy in kindergarten-aged children (Su, 2024). Additionally, prior studies suggest that teachers who feel confident in their AI-related skills are more inclined to integrate such technologies into their teaching practices (Ayanwale et al., 2022). We hypothesize that Bulgarian teachers may share a similar perspective.

As AI technology becomes increasingly integrated into everyday routine, there is a growing demand for public regulation of its development and use. In the European Union, alongside the recently adopted Digital Services Act (European Commission, https://digital-strategy.ec.europa.eu/en/policies/digital-services-act-package), various initiatives aim to manage and regulate the potential of AI-based technologies (European Commission, https://digital-strategy.ec.europa.eu/en/policies/european-approach-artificial-intelligence). However, a comprehensive and unified regulatory framework has yet to be established.

The objective of this study is to examine the extent to which AI literacy and the use of AI-based tools are being developed and integrated into the daily activities of preschool children. The study explores also how AI-based technology is utilized across different types of devices. The research focuses on the attitudes of parents and teachers of preschool children, as well as their perceptions of the current state of public policies related to these topics.

This research offers a timely contribution to the underexplored intersection of early childhood education and AI, especially within the unique cultural and regulatory context of Bulgaria.

Building on this foundation, the study addresses two research questions:

1. How do preschool children aged 3 to 6 years in Bulgaria perceive the emergence and usage of AI driven technology in everyday life?

2. To what extent is AI generated technology conceived and accepted by parents and teachers of preschool children aged 3 to 6 years old in Bulgaria from a regulatory point of view?

RESEARCH METHODS

This study employs a methodological framework divided into three main sections, based on two targeted surveys. The questionnaires are designed for two key groups: kindergarten teachers and parents of preschool children aged 3 to 6 years.

The surveys consist primarily of closed questions and were conducted voluntarily through an online form. The answers have been anonymized. Data collection was carried out over a one-month period (October 1–31, 2024).

Both surveys include five demographic questions covering age, gender, education, employment status, and place of residence. Additionally, participants were asked one open-ended question about their current occupation. Parents were asked two supplementary questions regarding the age and gender of their children, while teachers were asked one additional question about the type of educational institution in which they work.

The core section of the survey features nine closed questions for both groups, focusing on the usage of various AI-related technologies in daily life. Both groups were also invited to respond to an open-ended question about their perspectives on the current challenges and policies related to AI development and usage in Bulgaria.

In total, the parents' survey includes 18 questions, while the teachers' survey contains 17 questions.

RESULTS

The responses from the online questionnaires were used to assess the attitudes, challenges, and usage of various AI technologies among preschool children (aged 3–6 years) during the survey period (October 1–31, 2024). A total of 33 teachers participated in the survey, while 117 parents completed the survey.

Demographics

Among the parents who responded to the survey, those between 18 and 30 years are 12 %, while the majority (79.5%) are aged between 31 and 45 years, and 6% are between 46 and 60 years. Insignificant is the percentage of those older than 61, which likely indicates that some grandparents completed the survey. Regarding the teachers, 61.3% are between 31 and 45 years old, 25.8% are between 46 and 60 years, 9.7% are between 61 and 74 years, and 3.2% are between 18 and 30 years old.

In terms of gender, 88% of the responding parents are women, and 12% are men. Among the teachers, 96.8% are women, while 3.2% are men. Notably, no participant in either group selected the option to withhold their gender.

Regarding education, the majority of parents (76.1%) hold a university degree, 17.9% have completed high school. Less than 6% either hold PhD and DSc degree or have less than a high school diploma. Among the teachers, 83.8% hold a university degree, 6.5% are PhDs, and another 6.5% completed high school, while 3.2% have only basic education.

In terms of employment status, 87.8% of parents are full-time employees, compared to 93.5% of teachers. Additionally, 11.3% of parents are freelancers, whereas only 6.5% of teachers are. The percentage of retires in both groups is insignificant.

Most participants from both groups live in the capital city: 87.1% of parents and 83.3% of teachers. A smaller portion reside in villages (6.9% of parents and 13.4% of teachers), and 6% of parents and 3.3% of teachers live in towns.

Regarding their children's ages, 30.8% of parents reported having 3-year-olds, 15.4% have 4-year-olds, 23.9% have 5-year-olds, and 22.2% indicated their children are 6 years old. The remaining 7.7% fall outside the 3–6 age range.

On the question of their children's sex, 49.1% of parents reported having daughters, and 46.6% have sons. 4.3% of parents preferred not to answer.

For the teachers, the responses to the additional question about their workplace showed that 80.6% work in municipal kindergartens, 16.2% are employed at institutions not listed in the options, and 3.2% work as freelancers. No respondents indicated they work in private or specialized kindergartens.

Comparative Analysis

Both groups were asked nine key closed questions regarding the daily use of AI technologies by preschool children, along with an open-ended question seeking their opinions on the challenges of AI developments in Bulgaria. Parents and teachers were asked the same questions about the children they are taking care of, with participants choosing from ten options. An additional option, "electronic blackboard," was included in the teachers' survey, with 90.6% of teachers reporting its use in their educational practices. In terms of devices, 53.1% of teachers use computers, and 43.8% use e-learning platforms. At home, the parents reported that the majority of children (74.3%) use smartphones, with nearly half familiar with smart TVs (48.7%) and educational toys or robots (43.4%).

One common question asked participants to rate the effectiveness of current policies in Bulgaria in addressing the challenges posed by AI technology, particularly concerning vulnerable generations. A significant majority in both groups, 93.1% of parents and 96.8% of teachers, either felt that the current policies were insufficient or were uncertain about their effectiveness.

The remaining seven questions focused on the use of AI in different settings, such as at home or at school. Participants were asked whether children use AI-based educational apps, games that provide instant feedback, AI-driven creative apps, virtual assistants like Alexa or ChatGPT, and general AI-based devices (e.g., smartphones, tablets) at home or in kindergarten. With the exception of the final question, the vast majority of both parents and teachers reported that children either never use or seldom use these technologies (with over 75% of responses in each case). However, 36.4% of teachers reported that children use such devices daily or frequently, while 55.6% of parents stated that their children use them often or more frequently at home.

Two questions were specific to each group. Teachers were asked whether they use AI-based e-blackboards or multimedia in their teaching, and 55.4% indicated regular usage. When asked about training or information on AI-based tools for child learning, 78.8% of teachers reported that they either never receive such training or receive it only occasionally. Parents, on the other hand, were asked about the use of AI-based parental controls at

home, with 81.2% stating they either never use such technology or use it only occasionally. The second question for parents inquired whether their children use AI-generated translation or speech recognition tools at home, and 94.1% of responses indicated that their children have either never used such technologies or use them only seldom.

DISCUSSION

The two surveys examined attitudes toward and usage of AI-driven technology among preschool children aged 3 to 6 years in Bulgaria. Overall, the results indicate that children, their parents, and teachers are familiar with the concept of AI and are incorporating it into their daily lives. However, both parents and teachers tend to use more established and widely known devices such as smartphones, tablets, and smart TVs, rather than directly implementing newer AI-based technologies in the children's upbringing.

Interestingly, children are not using or are not permitted to use most AI-driven devices in kindergarten, relying instead on their teachers to integrate such technologies into their educational programs. The findings suggest a clear trend where teachers utilize specific devices like e-blackboards, multimedia tools, and educational software. However, the majority of teachers reported that the children under their care do not use AI-driven technologies, such as virtual assistants (e.g., ChatGPT or Alexa) or real-time feedback games, nor do they engage with AI-based technology in creative activities. One possible explanation for these results is that teachers rarely receive training or information on the latest technological developments. Another factor could be the rigid structure of the Bulgarian education system, which prescribes specific methods of instruction that teachers have limited flexibility to modify.

At home, parents appear more open to allowing children to use AI-based technology. The findings suggest that children are more likely to engage with AI-driven technologies directly relevant to their daily activities. Technologies that have no direct impact on the child's routine, such as navigation systems or virtual assistants, are less commonly part of their AI exposure. This may be due to the availability and popularity of certain technologies in Bulgaria—for instance, virtual assistants like Alexa are not widely used in Bulgarian households. Another factor could be the level of parents' familiarity and comfort with specific technologies. Further research is needed to explore whether there is a connection between parents' awareness and acceptance of certain AI technologies and their decision to allow their children to use them.

Regarding the first research question—how preschool children perceive the emergence and use of AI-based technology—the results suggest that children are primarily exposed to technologies that are relevant to their daily activities.

With regard to the second research question, despite the increasing integration of AI into daily life in Bulgaria, the majority of both parents and teachers view current regulations as inadequate or ineffective, with many unable to assess their impact. This suggests two key interpretations: first, that Bulgaria needs updated AI-related policies to effectively address the

challenges of the modern world; and second, that there is a lack of awareness among individuals regarding current policies and their implications. A communication strategy is necessary to raise awareness and ensure people are informed about existing regulations.

CONCLUSION, LIMITATIONS AND IMPLICATIONS FOR FURTHER RESEARCH

The findings of this study are in tune with the existing research which would further enhance its impact. A larger and more diverse sample would help us to generalize the findings across a broader population of people who typically use early childcare. The majority of responses were from parents and teachers living in the capital city, with very few participants from villages or smaller towns. People living in metropolitan areas tend to be more tech-savvy and open to embracing new technology, which may not reflect the broader population. Future research should aim to obtain a more diverse sample, particularly from smaller communities.

The availability and popularity of certain AI-based technologies in Bulgaria at this point are yet limited. While smartphones and tablets are commonly used by preschool children, devices such as Alexa are either not available, not affordable, or not suited to the Bulgarian standard of living. Future studies should incorporate more widely accessible AI technologies that align with the local context.

Additionally, this study did not directly interview preschool children, as the questions were not adapted to their level of understanding. Instead, we relied on the perspectives of their parents and teachers, which may not fully reflect the actual use of AI technologies by the children themselves. Future research should seek to gather children's opinions on AI-based technologies to provide a more direct insight.

Despite these limitations, the results indicate that preschool children in Bulgaria predominantly use AI-based technologies for educational purposes. However, the regulatory framework in the country is currently insufficient to support the effective development and implementation of AI technologies in early childhood education.

This study contributes to the examination of the attitudes of parents and teachers toward the emergence, usage, and development of AI-based technologies in everyday life. The originality of the research lies in its focus on two often-overlooked demographics—preschool children and the elderly—thus filling a critical gap in Bulgarian AI literacy scholarship. The findings may be useful for educational institutions in Bulgaria as they integrate AI technologies into preschool education. Additionally, the results could assist regulatory authorities in their efforts to create a robust framework for the adoption, use, and development of AI technologies, particularly in supporting the education and development of preschool children.

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