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Parents' perception on the impact of artificial intelligence on cognitive development among primary school children in Kisii County, Kenya

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Abstract

Artificial Intelligence have emerged as a potent instrument for efficient and successful learning in education in recent years, providing all the resources required to establish inclusive and accessible learning environments for all. The AI application in educational settings has given teachers the ability to offer their learners individualized and superior services. Students themselves gain even more from technology and parents are involved the provision AI gadgets and supervision of digital platform among children. The aim of the study was to examine how parents perceive the impact of generative artificial intelligence on the cognitive development of children in primary schools in Daraja Mbili and Nyamataro region, Kisii County. The target population was Parents of primary schools. A sample of 15 primary schools and 225 parents were chosen from target population using simple random sampling method. Based on two research hypotheses, descriptive research design was incorporated with questionnaires in collecting quantitative and interview guide for qualitative data from parents. The quantitative data was analysed using SPSS version 20 program while qualitative data was categorized into different thematic categories and narratively alongside with the quantitative data. Mean of 4.50 and above rule was considered significant and acceptable. The study's findings indicated H_1 t-value was 10.13 and H_2 t-value was 21.04 at 0.05 level of significant. In parental gender, female values were mean of 4.73 and male 4.92 all indicating above threshold mean 4.50 hence concurs AI affects primary school children and their perceptions varied. Among other things, it was advised that parents understand the importance of being discerning users of AI-based learning resources, making sure they select materials that actually aid in their children's cognitive growth.

Keywords: Cognitive Development; Artificial Intelligence; Educational Settings; Parents' Perception; AI Gadgets; Digital Platform

1. Introduction

Artificial Intelligence is used nearly every day by children worldwide. The majority of child-friendly interactive are toys, games and online platforms which rely on artificial intelligence (Kayusi et al., 2025). The majority of parents have not thought about how Artificial Intelligence (AI) would impact their children's cognitive development, despite the fact that technology is developing more quickly than anyone anticipated (Omwenga et al., 2025). Any civilization's future well-being depends on its children's healthy growth, and failing our children has a huge cost to society. Artificial intelligence (AI) technologies have the potential to enhance our natural intelligence and skills, enabling us to obtain information more quickly and perform better in a variety of personal and professional capacities. Whether it is by enabling us to

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compute equations at significantly faster and more complex rates or by employing a machine to carry out several duties, allowing us to focus on our interests.

The use of AI in the educational process has raised ethical questions about academic integrity and plagiarism Though, which has caused major anxiety among parents. Does using AI to guide or manage children's conduct make sense and should students give AI their cognitive tasks? Furthermore, while the text output of AI-generated responses to academic writing assignments was largely unique and pertinent to the subjects, it lacked the personal viewpoints and improper allusions that AI is typically unable to provide (Kumar, 2023).

Furthermore, generative AI is a valuable tool for learning which encourages creativity and can inspire and motivate children in a range of ways to prepare for adulthood (Munzer, 2024). However, the content generated by this technology can be skewed, inaccurate or harmful, for instance, images may contain nakedness or vulgarity and might be generated for malicious reasons, falsehoods or misinformation (Omwenga & Gathure, 2024). As such, its use must be done with caution as it may compromise children's cognitive abilities and pose a serious threat to educational integrity in primary schools.

1.1. Objectives of the study

To investigate out how parents perceive artificial intelligence on cognitive development among primary school-aged children in Daraja Mbili and Nyamataro, Kisii, Kenya.

1.2. Hypotheses

- Private primary school students' cognitive development is not substantially impacted by artificial intelligence, according to parents' perceptions.
- There is a low level of parental perception of artificial intelligence's detrimental impact on students' cognitive development.
- The perceptions of male and female parents on the challenges of artificial intelligence and cognitive development do not differ significantly.

2. Literature Review

Parents, teachers and academics have expressed a great interest in the application of artificial intelligence (AI) in education. The increasing adoption of AI in the classroom makes it essential to understand how parents perceive the technology's effects on the cognitive development of primary school students (Juma et al., 2025). Artificial intelligence (AI) is based on how the human brain analyzes information to complete tasks. This includes processing facts, explanations, feedback, visuals and much more. On the other hand, AI compiles the data, organizes it, and provides it to us immediately.

However, AI cannot connect newly acquired knowledge to everything else we have encountered in life if human wisdom is not present. Artificial intelligence (AI) is a wide field that is focusing on creating computers to perform work that is usually require human intelligence. According to Göde (2023) such duties involve parental perception which needs language understanding, comprehension, problem-solving and reasoning. Artificially intelligent automation, processing of natural language and machine learning are just a few of the technologies that fall under the umbrella of artificial intelligence (AI), which allows computers to analyze data, identify patterns and make decisions for themselves (Chen et al., 2020).

By enhancing academic achievement, offering personalized learning experiences, and increasing student engagement, artificial intelligence (AI) in education has the potential to completely transform the way that students are taught (Ifenthaler, 2024; Tang, 2024). The field of education has seen the emergence of numerous artificial intelligence (AI) tools that enhance student learning. Using AI algorithms to tailor educational materials to each student's unique needs and learning preferences is a well-known application of adaptive learning technologies (Eynon & Young, 2020). To keep students from becoming disengaged or feeling overworked, these systems modify the activities' degree of difficulty according to student performance data (Leoste et al., 2021). Furthermore, AI-powered learning platforms may give students immediate feedback, enabling them to recognize their strengths and weaknesses and enabling instructors to step in when needed (Slimi, 2021).

The usage of chatbots and virtual assistants is another important way that AI is being used in education. These AI algorithms can help students with their academic questions, offer resources, and even provide subject-specific coaching, claim Chen et al. (2020). For example, chatbots could be used to engage students in interactive lessons and improve their comprehension and memory of the material by responding to inquiries and assisting students in comprehending difficult concepts (Slimi, 2021). Additionally, teachers can concentrate more on teaching by using AI to automate administrative responsibilities like evaluation and grading (Slimi, 2021; Crompton & Burke, 2023).

Additionally, collaborative learning environments are being supported by an increasing number of AI solutions. AI may, for instance, assess group interactions and recommend the best group arrangements depending on each member's advantages and disadvantages, improving collaborative projects and peer learning (Ifenthaler, 2024). Additionally, by offering translation services and making educational materials accessible to students from a variety of linguistic backgrounds, AI technology can aid in the removal of language barriers (Tang, 2024).

A number of factors such as parents' knowledge with the technology and their opinions regarding their children's cognitive development, affect how they view AI's role in education. Many teachers agree with parents who see the potential advantages of using technology in the classroom. A study by Uygun (2024) claims that artificial intelligence (AI) is a useful supplementary tool for improving academic performance. Su's findings (2023), which show that parents noticed improvements in their children's comprehension and attitudes regarding AI after their involvement in educational programs centered on AI literacy, provide further credence to this optimistic viewpoint.

These programs not only enhance children's cognitive skills but also prepare them for future STEM careers, which parents are starting to place a greater emphasis on (Su, 2023).

Customizing learning is another benefit of integrating AI into schooling. Al-Qiam emphasizes how AI can adapt educational support to the needs and learning preferences of individual students (Al-Qiam, 2023). Because it supports their desire for their children to receive an education that considers both their unique strengths and deficiencies, parents are particularly drawn to this personalization (Omwenga et al., 2025). However, parents must be informed about the process and actively participated in order for AI to be successfully applied in educational settings, as their involvement can significantly affect their children's learning outcomes (Rusli, 2023).

Parents are especially worried about the cognitive development of their elementary school-aged children, and artificial intelligence is involved in many aspects of this process. Through the use of adaptive learning technologies that adapt to kids' developmental stages, AI has been shown to enhance cognitive ability (Al-qiam, 2023).

AI systems, for example, can give students immediate feedback, assisting them in identifying areas for growth and strengthening their knowledge (Akintayo, 2024). In addition to promoting cognitive development, this ability helps students build a growth mindset by teaching them to rise to challenges and persevere in the face of adversity. Parents, however, are equally worried about the possible negative effects of AI in the classroom. For instance, although some research shows that AI chatbots improve learning results, other studies show that students may become frustrated and lose interest when using these tools (Wu & Yu, 2023). This disparity in experiences emphasizes how important it is for parents to become discerning users of AI learning resources, making sure they select materials that actually aid in their children' cognitive growth.

3. Methodology

This study used descriptive survey research design. The Daraja Mbili and Nyamataro regions were study area. The study's population consists of all local primary school parents. To sample 15 primary schools (10 public and 5 private) for the study, a simple random sampling procedure was employed. Using a similar methodology, 15 parents were chosen from each school giving a sample size of 225 parents who represented the intended demographic. A researcher developed a questionnaire on 'Parental Perception Cognitive Development Artificail Intelligence Questionnaire' (PPCDAIQ) to collect relevant quantitative data interview guide for qualitative data in the study. There were two sections in the questionnaire. Information on characteristics like LGA, age, and sex was elicited in Section A. A 4-point Likert-type questionnaire with 20 items was used in Section B to gather data on how parents perceive artificial intelligence's impact on cognitive development. Ten items assessed their negative perception, and ten items assessed their favorable perception.

The test-retest method was used to assess the instrument's reliability, involving 17 parents who were not involved in the final study. The data collected was evaluated using a population t-test and the estimates of reliability for the positive and negative perceptions of the research variables were 0.79 and 0.85 respectively. The quantitative data was analysed

using SPSS version 20 program while qualitative data was categorized into different thematic categories and narratively alongside with the quantitative data. The study question was answered using the mean; 4.50 decision rule was applied. Items with a mean assessment score of 4.50 or higher were considered to be acceptable, while those with a score lower than 4.50 were considered disagreeable or unaccepted.

4. Results of the study

Hypothesis 1 stated that parents' perceptions of artificial intelligence's impact on primary school students' cognitive development are not significantly high, and Hypothesis 2 stated that parents' perceptions of artificial intelligence's negative impact on students' cognitive development are not significantly high. The result of these two hypotheses' population t-test is presented in *table 1* below.

Table 1 Parents' perceptions about AI using a population t-test

Factors	n	SD	M	t-value
Positive perception	600	6.14	29.06	10.13
Negative impact	600	6.04	30.11	21.04

Significant at 0.05 level; df=601; critical t-value =1.992

According to Table 1's population t-test analysis, hypothesis 1's t-value was 10.13, whereas hypothesis 2's t-value was 21.04. At the 0.05 level of significance, these two t-values were found to be more than the essential t-value of 1.992 for 601 degrees of freedom. For this reason, the null hypotheses were retained.

The findings in *Table 2* demonstrate that both male and female parents' judgments of items 1 through 7 had mean values above the threshold mean value of 4.50. This indicates that respondents concur with every point made above on artificial intelligence's potential to hinder primary school students' cognitive development.

Table 2 Perceptions of artificial intelligence and cognitive development stipulations by male and female parents

Items	Female parents			Male parents		
Score	Score	Mean	Decision	Score	Mean	Decision
Can produce material that is factually incorrect	1083	4.81	Accepted	1056	4.70	Accepted
It causes students to become overly dependent on generative AI tools	102	4.54	Accepted	1105	4.91	Accepted
Using generative AI tools like ChatGPT will prevent me from honing general or transferable abilities like leadership, problem-solving, and teamwork	1063	4.72	Accepted	1047	4.65	Accepted
Capacity to manage challenging tasks	1074	4.77	Accepted	1069	4.75	Accepted
Ability to socialize and engage with people while doing my schoolwork by generative AI technologies like ChatGPT	1133	5.04	Accepted	1186	5.27	Accepted
Depend too much on statistics, which may restrict its applicability in some situations	1074	4.77	Accepted	1176	5.23	Accepted
Can produce incorrect or out-of-context information	1101	4.89	Accepted	1114	4.95	Accepted
Total Mean	1064	4.73	Accepted	1108	4.92	Accepted

5. Discussion

Parents' positive perceptions toward artificial intelligence in relation to their children's cognitive development are based on the idea that AI can increase educational opportunities and enhance student performance. The majority of

parents expressed a desire to use Artificial Intelligence in their education and future practice and concurred that it had a significant positive influence on their children's' cognitive development and future jobs. As a result, they saw Artificial Intelligence integration as an essential component of the curriculum. The positive perception is consistent with research by Uygun (2024) and Su (2023), who argued that AI is still an effective supplemental tool for improving learning outcomes in classroom settings and that it helps children develop their knowledge, attitudes and cognitive abilities while preparing them for potential careers in STEM fields areas that parents are becoming more and more interested in.

6. Conclusion

Artificial intelligence (AI) is transforming the way schools operate by providing innovative resources that improve educational experiences, customize instruction and streamline administrative procedures. The continued development and integration of AI in learning settings is expected to result in more inclusive, effective, and efficient learning environments for students. The complex interplay between benefits and drawbacks affects how parents view AI's effects on the cognitive development of elementary school students. Though they are also aware of the threats that new technologies may pose, many parents are aware of how AI could enhance educational opportunities and promote cognitive growth. The advent of AI is transforming education, and parents, teachers, and lawmakers need to work together to create a setting that optimizes AI's advantages while resolving its disadvantages.

A more responsible and successful use of AI in educational contexts can result from increased parental support and involvement, which has significant ramifications for both teaching and learning.

Recommendations

- For AI to be successfully implemented in educational settings, parents' involvement can have a significant impact on their children's learning outcomes, so administrators at schools and the government ought to encourage parents to be actively involved in their children's use and supervision of AI tools.

- In order to choose materials that actually aid in their children's cognitive development, parents need to recognize the importance of becoming discerning consumers of AI educational tools.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

References

[1] Akintayo, O. (2024). Integrating AI with emotional and social learning in primary education: developing a holistic adaptive learning ecosystem. Computer Science & It Research Journal, 5(5), 1076-1089. https://doi.org/10.51594/csitrj.v5i5.1116

[2] Al-qiam, H. (2023). Artificial intelligence and its relationship to teaching school and university mathematics in Jordan. International Journal of Membrane Science and Technology, 10(2), 19721980. https://doi.org/10.15379/ijmst.v10i2.2726

[3] Juma, L., Chavula, P., Kayusi, F., Omwenga, M. K., Mishra, R., & Mwewa, T. (2025). AI in Dissertation Examination: Opportunities for Undergraduates and Postgraduates in Zambia, Rwanda, and Kenya. LatIA, 3. https://doi.org/10.62486/latia2025329

[4] Kayusi, F., Vallejo, R. G., Juma, L., Omwenga, M. K., & Chavula, P. (2025). A Bibliometric Analysis of Segment Anything (SA) Research: Global Trends, Key Contributors, and Thematic Insights. Babylonian Journal of Machine Learning, 2025, 27–41. https://doi.org/10.58496/BJML/2025/003

[5] Omwenga, M. O., & K, M. J. (2024). A Study on Causes of Stress among Teachers and its Effect on the Academic Performance at Schools in Nairobi, Kenya. Asian Journal of Advanced Research and Reports, 18(12), 272–284. https://doi.org/10.9734/ajarr/2024/v18i12824

[6] Muner, T. (2024). How will artificial intelligence (AI) affect children? Michigan: American Academic of Psychology.

[7] Omwenga MK, Kayusi F, Chebet E, Juma L, Agura Kayus B, Moraa Siro R, et al. African Education Systems in the Role of Artificial Intelligence (AI) in Automated Decision-Making. LatIA [Internet]. 2025 May 7 [cited 2025 Jun. 3]; 3:319. Available from: https://latia.ageditor.uy/index.php/latia/article/view/319

[8] Omwenga, M. K. (2025). Influence of Drug Substance on Conduct Disorders Among Children at Manga Institution, Kisii, Kenya. Indonesian Journal of Community Services, 4(1), 61-69. https://doi.org/10.47540/ijcs.v4i1.1852

[9] Omwenga, M. K., Juma, L., Kayusi, F., & Vallejo, R. G. (2025). Antisocial behavior that influences academic performance of students in an educational environment in Kenya. Actas Iberoamericanas En Ciencias Sociales, 3(1), 83–97. https://doi.org/10.69821/AICIS.v3i1.79

[10] Rusli, N. (2023). How much does parental involvement matter when autism spectrum disorder (asd) children use artificial intelligence (AI) in the learning process? Mesterséges Intelligencia, 5(1), 51-71. https://doi.org/10.35406/mi.2023.1.5 1 2024), 1477-1492.

[11] Slimi, Z. (2024). Unveiling the potential: experts' perspectives on artificial intelligence integration in higher education. European Journal of Educational Research, volume-132024(volume-13-issue-4-october https://doi.org/10.12973/eujer.13.4.1477

[12] Su, J. (2023). Ai literacy curriculum and its relation to children's perceptions of robots and attitudes towards engineering and science: an intervention study in early childhood education. Journal of Computer Assisted Learning, 40(1), 241-253. https://doi.org/10.1111/jcal.12867

[13] Uygun, D. (2024). Teachers' perspectives on artificial intelligence in education. Advances in Mobile Learning Educational Research, 4(1), 931-939. https://doi.org/10.25082/amler.2024.01.005

[14] Vasoya, N. (2023). The role of parents and educators in managing the risks of artificial intelligence. Asian Journal of Education and Social Studies, 41(4), 1-5. https://doi.org/10.9734/ajess/2023/v4 1i4899.

[15] Wu, R. and Yu, Z. (2023). Do ai chatbots improve students' learning outcomes? Evidence from a meta-analysis. British Journal of Educational Technology, 55(1), 10-33. https://doi.org/10.1111/bjet.13334