DAJE Volume 02 (1) 2026 [January-June]
Published on: 26 August, 2026

Received: 17 March, 2026 /Revised: 15 July, 2026/Accepted: 16 July, 2026

A Review of Educational Opportunities and Concerns of Artificial Intelligence among Generation Alpha

Mohd Gufran Barkati[1]

Abstract

This review paper analyses the influence of artificial intelligence (AI) on the educational experiences of "Generation Alpha," through an analysis of the existing literature. This generation has been deeply involved in technology from the birth, resulting in distinct learning styles, interests and capabilities compared to prior generation students. This paper examines the efficacy of AI-driven solutions, including chatbots, adaptive learning platforms and virtual tutors in facilitating personalized, accelerated and inclusive education for Generation Alpha. The paper also suggests methods for educators and policymakers to promote AI literacy, establish ethical guidelines and implement teaching strategies that emphasize human oversight. The paper concludes why there is need to strike a balance between technology and humanistic pedagogy in ensuring that the future generations are not only technologically knowledgeable but also socially responsible and ethically enlightened.

Keywords: *Artificial Intelligence in Education, Generation Alpha, AI-mediated learning, personalized learning, Adaptive learning technologies, AI ethics in education.*

Introduction

Generation Alpha refers to those children who were born after the year 2010 (Höfrová et al., 2024). This is the first generation that has grown up in a completely digital environment (Bandara, et. al, 2024) and surpassed all other generations, comprising 24.4% of the global populations (Intelpoint, 2025). These children are introduced to technologies such as smartphones, tablets, internet and artificial intelligence from their childhood (McCrindle, 2021). These technologies play significant role in the ways students learn, communicate and access information. This rapid shift of technology is gradually reshaping the learning experiences of students in meaningful ways (Coolsaet, 2024). Nowadays, AI is being used to provide students personalized learning experiences, immediate feedback and simplifying complex tasks (Kaswan, et al., 2024).

[1] Assistant Professor, Center for Distance and Online Education, Maulana Azad National Urdu University, Hyderabad

Published by: Department of Education, Doctor Harisingh Gour Vishwavidyalaya, Sagar (MP)

DAJE Volume 02 (1) 2026 [January-June]
Published on: 26 August, 2026

In the twenty-first century, where understanding emerging technologies has become as important as reading, writing and calculating, the relevance of this subject increases even more. Today's teaching is not limited to bookish knowledge; technical skills and critical thinking are also given equal importance. In such a situation, it becomes crucial to understand how Artificial Intelligence is influencing the thoughts, behaviours, and learning processes of Generation Alpha.

Objectives of the Study

This review paper aims to:

i. Identify the cognitive, behavioural, and emotional characteristics of Generation Alpha as digital-age learners.
ii. Analyse the role of Artificial Intelligence in shaping Generation Alpha's learning experiences.
iii. Identify the major concerns and challenges associated with AI integration in education.
iv. Critically analyse AI-mediated learning through relevant educational theories and perspectives.
v. Propose practical strategies for educators and policymakers to ensure responsible and balanced AI use in education.

Literature Search and Selection Criteria

This paper adopts a narrative review approach to synthesise existing conceptual/theoretical literature on Generation Alpha and AI in educational contexts.

Search strategy: Searches were conducted across six electronic databases: ResearchGate, Google Scholar, Scopus, Web of Science, PubMed, and ERIC to ensure broad disciplinary coverage across education and technology studies. Search terms were combined using Boolean operators (AND/OR) and included "Artificial Intelligence in Education", "Generation Alpha", "AI and learning", "AI tools for students", and "AI ethics in education". Searches were restricted to publications between 2015 and 2025. The keywords, filters, and record counts applied to each database are summarised in Table 1.

CC BY

Table 1: Database Search Summary

Database	Keywords Applied	Filters Used	Records Found
Google Scholar	"Artificial Intelligence in Education" AND "Generation Alpha"	2015–2025; Peer reviewed	116
Scopus	AI, Education, Generation Alpha, Teaching	2015–2025; Articles & Conference Papers; Open Access; English	12
PubMed	"Artificial Intelligence in Education and Generation Alpha"	2015–2025; Full text; English	6
ERIC	"Artificial Intelligence in Education" AND "Generation Alpha"	2015–2025; Peer reviewed; Full text	3
Web of Science	Artificial Intelligence AND Generation Alpha	Education category; Open Access; English	1
ResearchGate	"Artificial Intelligence in Education", "Generation Alpha"	2015–2025; Full-texts only	Not quantifiable. Used as supplementary source.

Screening process

The search returned 116 records from Google Scholar, 12 from Scopus, 6 from PubMed, 3 from ERIC, and 1 from Web of Science, yielding a combined total of 138 quantifiable records across these five databases. ResearchGate was used as a supplementary source to identify additional relevant literature; as its search interface does not display a total record count, results from this database were screened individually rather than through a numerical screening process. The 6 records returned by PubMed and 1 record by Web of Science were found to be unrelated to the review objectives and were excluded at the screening stage. After removing 7 duplicates across the remaining databases, 124 records were screened by title and abstract, of which 69 records were excluded because they did not meet the review objectives, while 55 full-text articles were assessed for eligibility against the inclusion and exclusion criteria presented in Table 2. Following the full-text assessment, 17 articles were excluded for not meeting the inclusion criteria, and 38 studies were included in the final review. Additional relevant literature identified through ResearchGate was used to supplement the evidence where appropriate.

CC BY

Table 2: Inclusion and Exclusion Criteria

Criteria Type	Details
Inclusion	Peer-reviewed journal articles, conference papers and book chapters
	Published in English between 2015 and 2025
	Addressed AI applications in educational contexts
	Addressed cognitive, emotional, or behavioural characteristics of Generation Alpha
	Empirical, review, and conceptual/theoretical studies providing substantial evidence or relevant theoretical insights
Exclusion	Technical AI papers with no educational context
	Studies focused solely on generations prior to Generation Alpha, unless providing relevant theoretical grounding
	Non-peer-reviewed sources
	Studies not aligned with the objectives of the review despite keyword matches
	Duplicate records retrieved from multiple databases

Limitations of the search process

As a narrative rather than systematic review, this study did not employ formal quality-appraisal protocols (e.g., PRISMA), and the search was restricted to indexed academic databases, which may have excluded relevant grey literature. These choices align with the review's aim of providing a broad, integrative synthesis rather than an exhaustive systematic account.

Understanding Generation Alpha as a Learner

Generation Alpha, i.e. the generation born after the year 2010, is a generation that has been growing up with technology since birth (Jha, 2020). It is important to understand them as a learner because their cognitive, emotional and behavioural characteristics are quite different from previous generations.

Cognitive, Emotional and Behavioural Characteristics

Generation Alpha children have the ability to process information at a fast pace (Bilal, 2025). This generation is comfortable with multitasking and can learn quickly through visual and interactive mediums (Bandara et al., 2024). On an emotional level, these children expect immediate feedback and instant gratification (Hatfield, 2025). Their attention span is

CC BY

becoming shorter than it was before, which can make it challenging to stay focused on a single task for an extended period (Gaumeau, 2025). Behaviourally, these children are more independent and curious, but at the same time, some reduction in patience and deep social communication skills can also be seen due to constant digital interaction (Swargiar, 2024).

Growing Up with Technology and Digital Skills

The relationship of Generation Alpha children with technology is very natural and spontaneous. These children are surrounded by things like smartphones, tablets, voice assistants and social media since childhood (Swargiar, 2024). When all these are present around them at such a young age, it becomes easy and common for them to adopt new technologies. Due to this digital world, they get information instantly and they learn new things quickly. However, this technological environment has also distanced them a bit from traditional reading, writing and speaking abilities (Kerneža, 2023; Höfrová, 2024). When everything is available on the screen, the direct connection with books and the depth of conversation seems to be decreasing somewhere (Arsiwie et al., 2024).

Learning Preferences and Challenges

Generation Alpha children prefer interactive, visual, and game-based learning (Fernando & Premadasa, 2024). These children are attracted to learning experiences that are tailored according to their interests and pace; that is, they want to learn at their pace and at their time (Ojha, 2025). But this flexible learning experience also comes with some challenges. For example, it may be a bit difficult for these children to maintain attention for a long time, analyze a topic in depth, or solve complex problems (Vedechkina & Borgonovi, 2021). In addition, the increasing habit of studying on screens has also limited opportunities for physical activities and face-to-face social engagement, which is a matter of concern for their overall development (Delisle Nyström et al., 2023).

Rise of Artificial Intelligence in Education

In the last few years, Artificial Intelligence (AI) has AI has significantly transformed the field of education (Wang et. al, 2019). Learning is no longer limited to books and traditional pedagogy (Bakhmat, 2025); technology has made it more personalized, accessible, and effective (Singh et al., 2025). AI has begun to reshape the learning experience both inside and outside the classroom (Mishra, 2024).

CC BY

Overview of AI Technologies in Education

Nowadays, a variety of AI technologies are being used by the learners around the world. For example, AI chatbots like ChatGPT, DeepSeek, Copilot, Gemini, and Grok,Claude etc are being used to answer students' questions, assist with writing, and develop ideas (Rahman et al., 2025). Adaptive learning platforms such as DreamBox, Knewton adapt the curriculum to the pace and needs of students, allowing each student to learn at their level of ability (Akintola et al., 2025, p. 2). AI tutors like Squirrel AI provide students with additional practice and help simplify complex topics (Wang, 2025). At the same time, automated assessment tools save teachers' time and are helpful in making the evaluation of a large number of answer sheets quick and fair (Pettit et al., 2015).

Integration of AI in Formal, Informal and Hybrid Learning

In today's world, the use of AI is not limited to just inside the classroom. In formal education, schools and colleges are adopting AI-based learning management systems such as Moodle, Canvas, which help organize and track course material (Mehnen & Pohn, 2024, p. 1130). The role of AI has also increased in informal education like students are learning new things at their own pace and interest through Khanmigo, Duolingo, Socratic or other learning apps (Mehnen & Pohn, 2024, p. 1133). In hybrid learning environments, schools are adopting AI-enabled models that integrate physical classroom experiences with digital tools, providing students the flexibility to learn both in-person and remotely.

AI in Data-driven and Personalized Learning

AI has also been used to make education more personalized (Kaswan et al., 2024). Currently, learning paths are designed with respect to the individual student by identifying the learning style, the pace, and the weak areas of the student. With the help of data analysis, AI enlightens educators on what students need extra help in particular subjects (Ouyang et al., 2023). This activity makes the teaching process more specific and effective. Moreover, data-driven decisions assist in enhancing the educational programs and the development of policies. The integration of Artificial Intelligence in education is a representation of a paradigm shift. The process of learning has been so customized, personalized, and made accessible that it has exceeded the flexibility levels of the past (Singh et al., 2025). In schools, as well as in homes, AI already has a significant presence in formal and informal learning. Despite the fact that this technology provides opportunities to many possibilities, it also has its challenges, such as issues of data privacy, technological dependence, and protection of

CC BY

human values (Hoxhaj et al., 2023). The place of AI in the future education system should be accepted in a moderate way where technology would be a means and not an end. It is critical that teachers, parents, and policymakers use AI to develop higher-order thinking abilities, creativity, and social sensitivity in children equally.

Role of AI to Generation Alpha's Learning

The modern generation known as Generation Alpha is growing up in a world where technology is in all aspects of life. The Artificial Intelligence (AI) in the education sector has played a significant role in making the learning experiences of this new generation more entertaining, effective, and personalised (Ojha, 2025; Singh et al., 2025).

AI Enhanced Engagement and Interactivity

Traditional pedagogical methods used to be unilateral where the teacher presented the information, and the students simply absorbed them (Yap, 2016). AI has broken such a paradigm by making education a two-way, interactive, and participative process (Strielkowski et al., 2025). Currently, the active learning is made possible by numerous tools and platforms, which include virtual laboratories, computer-generated demonstrations, quizzes, and gamified experiences. These inventions not only arouse curiosity but it also makes the process of learning enjoyable.

Personalized Feedback and Adaptive Content

Every child is unique and has different speeds of understanding, preferences and ways of learning. AI systems recognize this heterogeneity and supply customized instructional material tailored to each learner (Admane et al., 2024). As they work or train, AI checks their performance, provides immediate feedback, and suggests further exercises or solutions accordingly (Hooda et al., 2022). Such a mechanism allows the learners to eliminate their weaknesses and advance with renewed confidence.

Supporting Inclusive and Diverse Learning Needs

The learning requirements of the students are inherently heterogeneous since they do not have the same linguistic competence and cognitive development. There are the learners who experience language-based problems, exhibit slower learning processes or need specific assistance. AI-based educational resources work to identify and support these various learners. Assistive technologies like text to speech, automated translation and speech to text provide remarkable support to learners with linguistic differences, aural or visual impairments. As a result, the incorporation of these AI-powered features adds to the more

CC BY

inclusive education process by improving an equal access to learning opportunities (Admane et al., 2024).

Overall, AI has turned the education process to be more engaging, individualized, and accessible to Generation Alpha. When applied in the right way, this kind of technology not only exposes them to the world of knowledge, but it also makes them strive to become self-reliant and sensitive citizens of the world.

Emerging Concerns and Challenges

Although, AI has streamlined education at one level, on the other, some serious issues have also begun to start appearing. The generation Alpha, having been brought up in an era of technology, is currently at a crossroads where the boundary between convenience and reliance is becoming unclear.

Overreliance on AI for Thinking, Writing and Decision-making

Students increasingly rely on AI-powered tools for basic tasks even for small curiosities. Whether it is a question, writing an essay or taking a decision, often the first step is taken towards technology. Gradually, this habit starts pushing back their own thinking ability. Due to this dependence, instead of facing the difficulty, they look for an easy way, which weakens the spirit of self-reliance and struggle (Zhai, Wibowo, & Li, 2024).

Decline in Higher Level Thinking Skills

Higher level intellectual skills like analysis, evaluation and synthesis do not come from merely absorbing information — they require deep thinking, comparison and finding solutions. But relying directly on answers prepared by AI does not develop these skills (George, Baskar, & Srikaanth, 2024). As a result, children's ability to understand complex problems and find solutions gradually weakens.

Reduced Creativity and Original Problem-solving

Where earlier children used to think, imagine and find creative solutions on their own, now the same work is being done by AI. This threatens to put a stop to their own imagination, experimentation and original thinking. The tendency to repeatedly take readymade solutions can suppress the creative spark within them (George, Baskar, & Srikaanth, 2024).

Ethical Questions, Surveillance and Data Privacy Concerns

Another serious challenge related to AI is ethics. Many times, students are unable to understand where the use of AI tools is appropriate and where it is not. Also, many AI platforms track student activities, which can affect their privacy. The collection and use of

CC BY

data without explicit consent have become a big question, especially when it comes to children (Huang, 2023).

Changing Role of Teachers and Lack of Human Contact

When AI dominates education, teachers are limited to the role of guides or supervisors. This gradually reduces the traditional skills of teachers such as explaining, building emotional bonds and instilling confidence in children. Also, the human relationship that exists between students and teachers in the classroom also starts to fade away amidst technology (Fitria, 2023).

AI is a powerful tool, but it is beneficial only when used thoughtfully. Generation Alpha needs to be taught to live in a balanced way with technology instead of becoming solely dependent on it. It is important that we motivate them to think, ask questions and find solutions so that they can become not just good users but also responsible and sensitive thinkers.

Cognitive and Socio-cultural Perspectives on AI in Education

Over the past few years, there has been a growing shift in the learning pattern particularly among children of Generation Alpha. They're growing up in a time where asking questions to a chatbot or relying on auto-generated content feels as normal as picking up a pencil used to feel for us. But does that make learning easier, or are we skipping something vital?

Cognitive Perspectives on AI-Mediated Learning

Bloom's Taxonomy: It is possible to consider this in the framework of Bloom taxonomy, which has been in use by many educators over the years. It classifies thinking skills, the simplest (such as remembering) ones as well as the most complex (such as evaluating and creating). AI is not bad at assisting the kids in remembering such facts as dates, definitions, and summaries. But it also brings the question of whether we are also letting AI to take over the more complex cognitive tasks. Once students begin applying AI to create complete essays or solve problems without understanding them, they lose the critical thinking, which forms the key part of the genuine learning (Hui, 2025).

Theory of Constructivism

It is founded on the premise that we learn most effectively when we are actively engaged in determining things, experimenting with ideas and even being stuck. The struggle of that kind is where true learning usually occurs. However, AI is more likely to reduce this constructive confrontation by providing quick answers. Although this efficiency can have pedagogical

CC BY

value but it can also reduce the mental activities of the learners by which they apply their knowledge creatively and formulate an understanding (Gerlich, 2025).

Cognitive Load Theory (CLT)

CLT is yet another dimension that makes us aware of the fact that the human mind has a restricted capacity of the information it can handle at a given moment. In this respect, AI can be truly beneficial, and it assists in making instructions easier, providing hints at the right time, and minimizing distractions that do not have significant value. Simultaneously, in case of the excessive streamlining of tasks, there is a danger that students will not have a chance to learn to retain information, struggle with complicated concepts, and maintain focused mental activity in the long term (Gerlich, 2025).

This suggests that educators must ensure that AI tools are used to scaffold lower-order thinking while intentionally designing activities that promote analysis, evaluation, and creation.

Socio-cultural Implications of AI for Generation Alpha

Children are not just learning facts; they're also learning how to be human, how to talk and listen to others, work in groups, and navigate differences. When AI becomes a constant companion in learning, the risk is that children spend less time developing those real-world, person-to-person skills which is arguably even more concerning than the over-reliance on AI itself. It is also important to note that AI is trained by the people. If the data on which the AI is trained is not inclusive in nature, then there are most likely that it might leave out certain voices or reinforce existing biases. For a generation growing up in a socially and culturally complex world, these subtle influences can slowly affect how children understand others and how they see themselves (Jha, 2020).

Strategies for Educators and Policymakers

Some of the important strategies for educators and policymakers regarding the use of AI in education are as follows:

Responsible Use of AI

Nowadays, the use of artificial intelligence in schools is increasing rapidly. In such a situation, teachers, parents and policy makers will have to decide together how to use it correctly and wisely. It is important that children are not only taught to operate AI tools, but also explained how they work, what their purpose is and what can be the consequences if

CC BY

they are misused. Creating digital intelligence and responsibility in children is the need of the hour (Huang, 2023; Hoxhaj et al., 2023).

Human-Guided AI Learning

In this digital age, education does not mean just giving information to the learners. It is time to involve children in the learning process meaningfully so that they ask questions, go deeper and develop their own thinking. AI tools can help children, but the real impact comes only when a teacher stands with that technology. Machines can give information, but the art of thinking is taught by humans (Fitria, 2023).

Establishing Ethical AI Guidelines

There is a need to create clear, safe and ethical rules for the use of AI, keeping in mind children's age, understanding and emotional needs. Issues such as screen time, data security and dependence on technology are now serious. Therefore, schools and governments should work together to set rules that are safe and equitable for every child (Huang, 2023; Hoxhaj et al., 2023).

Reinforcing the Teacher's Role in a Tech-Driven Environment

In this technological era, there have been a lot of changes in the education sector but one thing that has still not changed is having a good teacher. AI or a machine can never provide the human connection, understanding and inspiration that a teacher does. Teachers are the bridge that maintains the balance between technology and humanity (Fitria, 2023).

Conclusion

This review paper shows that AI is already incorporated into the learning experiences of Generation Alpha. Adaptive learning tools, virtual tutors, and assistive technologies make education more perceptive to individual needs, accommodate learners with different abilities, and allow students to study at a self-paced rate (Admane et al., 2024; Kaswan et al., 2024). In cases when the learners are pre-disposed to the interactive and visual forms of learning, these technologies help make the process more engaging and accessible (Bandara et al., 2024). However, the review highlights that the growing role of AI presents a number of challenges. As a learner becomes more dependent on AI in order to think, write, or solve problems, there is a significant danger that key skills, including the ability to think critically, creatively, or independently, will be lost over an extended period (George, Baskar, and Srikaanth, 2024; Zhai et al., 2024). Theoretically, AI reduces learning to a superficial level by taking over the duties that should involve analysis, contemplation, and thought, which

CC BY

are the focus of the Taxonomy of Bloom, constructivist theory, and Cognitive Load Theory (Gerlich, 2025; Hui, 2025). Such ethical concerns as data privacy, surveillance, and bias are especially serious when the users are minors and might not be able to understand the data collection and use process (Huang, 2023).

The review, therefore, promotes a middle way instead of opposing AI adoption in education extensively or blindly accepting it. Although AI may be utilized to support learning, it cannot replace the role of the human teacher in guiding the thought process, building values and supporting social-emotional growth (Fitria, 2023). The role of teachers and policymakers should be to focus on developing responsible usage of AI, increasing AI literacy, and creating clear ethical limits. The use of AI intelligently and under human management can help Generation Alpha become not a technology-savvy only learner but also a thinker, socially aware and moral person (Jha, 2020).

Acknowledgement

The authors acknowledge the contributions of various researchers whose works have been referenced and reviewed in this paper.

Financial Assistance

No external funding or sponsorship was received for the preparation of this article.

Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this article.

References

- Admane, R., Sawale, P. S., Jayasree, R., Kurup, S. J., & Thomas, S. A. (2024). Artificial Intelligence in Education: Tailoring Curriculum to Individual Student Needs through AI-Based Systems. *Library of Progress-Library Science, Information Technology & Computer*, *44*(3).
- Akintola, A. S., Akintayo, M., Kadri, T., Oforgu, C. M., Michael, M., & Nwanna, M. (2025). Adaptive AI systems in education: Real-time personalised learning pathways for skill development. *Journal of Artificial Intelligence, Machine Learning and Data Science, 3*(1). https://doi.org/10.51219/JAIMLD/Akinyemi-Sadeeq-Akintola/534
- Arsiwie, S. R., Latifah, M., & Muflikhati, I. (2024). Reading Habit in Alpha Generation Students: The Role of Mother Attachment and Family Literacy Environment. *International Journal of Research and Innovation in Social*

Science, *8*(6), 1272-1280. https://dx.doi.org/10.47772/IJRISS.2024.806093

- Bakhmat, N., Barbashova, I., Mamychenko, S., Ponomarova, M., & Mozulenko, D. (2025). The History of Pedagogy as a Paradigm Shift: The Role of AI at the Current Stage. *Cadernos de Educação Tecnologia e Sociedade*, *18*(se1), 234-246. https://doi.org/10.14571/brajets.v18.nse1.234-246
- Bandara, N., Chathurika, R., & Katukurunda, K. G. W. K. (2024). An Overview of Teaching Methods for Fostering Generation Alpha (Gen Alpha) Learning Process. *International Journal of Research Publication and Reviews (IJRPR)* 5(8), 1446-1461.
- Bilal, K. (2025). *Generation Alpha: Who are they and why are they important?* Find My Kids Blog. https://findmykids.org/blog/en/gen-alpha
- Coolsaet, D. (2024). The impact of technological advancements on higher education: a study of generation alpha's educational prospects. *International Journal Software Engineering and Computer Science (IJSECS)*, *4*(1), 58-67. https://doi.org/10.35870/ijsecs.v4i1.2147
- Delisle Nyström, C., Carlander, A., Cassel, S., Rosell, M., J-Son Höök, M., & Löf, M. (2023). Physical activity and screen time in Swedish children and adolescents: The generation pep study 2018–2021. *Acta Paediatrica*, *112*(3), 460-468. https://doi.org/10.1111/apa.16594
- Fernando, P. A., & Premadasa, H. S. (2024). Use of gamification and game-based learning in educating Generation Alpha. *Educational Technology & Society*, *27*(2), 114-132. https://www.jstor.org/stable/48766166
- Fitria, T. N. (2023). The use of artificial intelligence in education (AIED): Can AI replace the teacher's role?. *Epigram*, *20*(2), 165-187.
- George, A. S., Baskar, T., & Srikaanth, P. B. (2024). The erosion of cognitive skills in the technological age: How reliance on technology impacts critical thinking, problem-solving, and creativity. *Partners Universal Innovative Research Publication*, *2*(3), 147-163.
- Gerlich, M. (2025). AI Tools in Society: Impacts on Cognitive Offloading and the Future of Critical Thinking. *Societies*, *15*(1), 6. https://doi.org/10.3390/soc15010006
- Gourneau, B. (2025). Teaching the Alpha Generation in Elementary Schools: Gaining Insight into Their Worlds. In *Society for Information Technology & Teacher*

CC BY

Education International Conference (pp. 2158-2168). Association for the Advancement of Computing in Education (AACE). https://www.learntechlib.org/primary/p/225781/.

- Hatfield, J. L. (2025). From chalkboard to smartboard: an exploratory study of experienced teachers' perspectives on student generations X, Y, Z and Alpha. *Education and Information Technologies*, 1-53. https://doi.org/10.1007/s10639-025-13645-y
- Höfrová, A., Balidemaj, V., & Small, M. A. (2024). A Systematic Literature Review of Education for Generation Alpha. Discover Education, 3(1), 125. https://doi.org/10.1007/s44217-024-00218-3
- Hooda, M., Rana, C., Dahiya, O., Rizwan, A., & Hossain, M. S. (2022). Artificial intelligence for assessment and feedback to enhance student success in higher education. *Mathematical Problems in Engineering*, *2022*(1), 5215722.
- Hoxhaj, O., Halilaj, B., & Harizi, A. (2023). Ethical implications and human rights violations in the age of artificial intelligence. *Balkan Social Science Review*, *22*(22), 153-171.
- Huang, L. (2023). Ethics of artificial intelligence in education: Student privacy and data protection. *Science Insights Education Frontiers*, *16*(2), 2577-2587.
- Hui, E. S. Y. E. (2025). Incorporating Bloom's taxonomy into promoting cognitive thinking mechanism in artificial intelligence-supported learning environments. *Interactive Learning Environments*, *33*(2), 1087-1100.
- Jha, A. K. (2020). Understanding Generation Alpha. https://doi.org/10.31219/osf.io/d2e8g
- Kaswan, K. S., Dhatterwal, J. S., & Ojha, R. P. (2024). AI in Personalized Learning. *Advances in Technological Innovations in Higher Education*,103-117.
- Kerneža, M., & Aberšek, M. K. (2023). Specifics of digital literacy development during the reading process in digital learning environments in primary school. In *INTED2023 Proceedings* (pp. 4877-4883). IATED. 10.21125/inted.2023.1271
- McCrindle, M. (2021). *Generation alpha*. Hachette, United Kindom.
- Mehnen, L., & Pohn, B. (2024, September). Supporting academic teaching with integrating AI in learning management systems: Introducing a toolchain for students and lecturers. In *2024 International Conference on Software, Telecommunications*

CC BY

and Computer Networks (SoftCOM) (pp. 1–6). IEEE. https://www.doi.org/10.23919/SoftCOM62040.2024.10722016

- Mishra, S. (2024). Transformative impact of AI on education: Personalizing learning and addressing challenges. *International Journal for Research in Applied Science & Engineering Technology (IJRASET), 12*(8), 1183–1187.
- Ojha, D. R. (2025). AI-Driven Personalized Learning Systems for Gen Alpha and Beta: Opportunities and Challenges. *American Journal of Innovation in Science and Engineering*, *4*(2), 17-22. https://doi.org/10.54536/ajise.v4i2.4644
- Ouyang, F., Wu, M., Zheng, L., Chen, J., & Xu, Y. (2023). Integration of artificial intelligence performance prediction and learning analytics to improve student learning in online engineering course. *International Journal of Educational Technology in Higher Education, 20*(1), 4. https://doi.org/10.1186/s41239-022-00372-4
- Pettit, R. S., Homer, J. D., McMurry, K. M., Simone, N., & Mengel, S. A. (2015). Are automated assessment tools helpful in programming courses?. In *2015 ASEE Annual Conference & Exposition* (pp. 26-230).
- Qadeer, M., Tahir, R. K., Zulfiqar, N., & Ali, A. (2025). Impact of Technology on Education. *Contemporary Journal of Social Science Review*, *3*(2), 1128-1140.
- Rahman, A., Mahir, S. H., Tashrif, M. A., Aishi, A. A., Karim, M. A., Kundu, D., Debnath, T., Moududi, M. A. A., & Eidmum, M. Z. A. (2025). Comparative analysis based on DeepSeek, ChatGPT, and Google Gemini: Features, techniques, performance, future prospects. *arXiv*. https://doi.org/10.48550/arXiv.2503.04783
- Singh, T. M., Reddy, C. K. K., Murthy, B. R., Nag, A., & Doss, S. (2025). Ai and education: Bridging the gap to personalized, efficient, and accessible learning. In *Internet of behavior-based computational intelligence for smart education systems* (pp. 131-160). IGI Global. https://doi.org/10.4018/979-8-3693-8151-9.ch005
- Strielkowski, W., Grebennikova, V., Lisovskiy, A., Rakhimova, G., & Vasileva, T. (2025). AI‐driven adaptive learning for sustainable educational transformation. *Sustainable Development*, *33*(2), 1921-1947.

CC BY

- Swargiary, K. (2024). *The impact of digital learning environments on cognitive, social, and emotional development in Generation Alpha children: A comparative analysis*. SSRN. https://doi.org/10.2139/ssrn.4904338
- Vedechkina, M., & Borgonovi, F. (2021). A review of evidence on the role of digital technology in shaping attention and cognitive control in children. *Frontiers in psychology*, *12*, 611155. https://doi.org/10.3389/fpsyg.2021.611155
- Wang, B., Liu, H., An, P., Li, Q., Li, K., Chen, L., & Gu, S. (2019). Artificial intelligence and education. In Y. Wang (Ed.), *Reconstructing our orders: Artificial intelligence and human society* (pp. 129–161). Springer Singapore. https://doi.org/10.1007/978-981-13-2209-9_5
- Wang, J. (2025). Revolutionizing Education for Sustainable Development through Adaptive Learning and Artificial Intelligence. In *Rethinking the Pedagogy of Sustainable Development in the AI Era* (pp. 63-92). IGI Global Scientific Publishing. https://doi.org/10.4018/979-8-3693-9062-7.ch004
- Yap, W. L. (2016). Transforming conventional teaching classroom to learner-centred teaching classroom using multimedia-mediated learning module. International journal of information and education technology, 6(2), 105-112.
- Zhai, C., Wibowo, S., & Li, L. D. (2024). The effects of over-reliance on AI dialogue systems on students' cognitive abilities: a systematic review. *Smart Learning Environments*, *11*(1), 28.

CC BY