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Artificial intelligence and the family: Emerging threats and educational implications

Sztuczna inteligencja (SI) a rodzina: nowe zagrożenia i konsekwencje edukacyjne

Abstract

The rapid development of artificial intelligence (AI) is exerting an increasingly significant influence on contemporary family life, shaping communication patterns, knowledge acquisition, and the organization of everyday activities. The aim of this article is to analyze emerging threats associated with the use of AI-based technologies within the family environment and to identify their potential educational implications. Particular attention is devoted to issues such as the reduction of direct interpersonal interactions, technology dependence, misinformation, privacy violations, and the weakening of critical thinking skills among children and adolescents. The article also examines the impact of AI on educational and parenting processes, highlighting both the risks involved and the need to foster digital competencies and responsible use of new technologies. The analysis leads to the conclusion that effective preparation of families for functioning in an AI-driven world requires comprehensive educational support and the promotion of attitudes grounded in responsibility, critical reflection, and digital safety.

Keywords: artificial intelligence, family environment, digital threats, digital competence and digital safety, education, law, safety

Streszczenie

Dynamiczny rozwój sztucznej inteligencji wywiera coraz większy wpływ na funkcjonowanie współczesnej rodziny, kształtując sposób komunikacji, zdobywania wiedzy oraz organizacji życia codziennego. Celem artykułu jest analiza nowych zagrożeń związanych z wykorzystaniem narzędzi opartych na sztucznej inteligencji w środowisku rodzinnym oraz identyfikacja ich potencjalnych konsekwencji edukacyjnych. Szczególną uwagę poświęcono problemom związanym z ograniczaniem

bezpośrednich relacji interpersonalnych, uzależnieniem od technologii cyfrowych, dezinformacją, naruszeniem prywatności oraz osłabieniem kompetencji krytycznego myślenia dzieci i młodzieży. W artykule omówiono również wpływ sztucznej inteligencji na proces wychowania i edukacji, wskazując zarówno na ryzyko, jak i na potrzebę rozwijania kompetencji cyfrowych oraz odpowiedzialnego korzystania z nowych technologii. Przeprowadzona analiza prowadzi do wniosku, że umiejętność posługiwania się technologiami cyfrowymi (*digital literacy*) i skuteczne przygotowanie rodziny do funkcjonowania w świecie sztucznej inteligencji wymaga świadomego wsparcia edukacyjnego oraz kształtowania postaw opartych na odpowiedzialności, refleksyjności i bezpieczeństwie cyfrowym.

Słowa kluczowe: sztuczna inteligencja, rodzina, środowisko, zagrożenia cyfrowe, kompetencje i bezpieczeństwo cyfrowe, edukacja, prawo, bezpieczeństwo

Introduction

The rapid development of artificial intelligence (AI) represents one of the most significant technological transformations of the twenty-first century, generating profound social, cultural, and educational changes. While technologies based on machine learning algorithms were initially associated primarily with industrial, economic, and scientific sectors, they have now become an integral part of everyday life, increasingly influencing domestic practices, educational processes, and family relationships. Within this evolving landscape, the family emerges as a key context in which the opportunities offered by artificial intelligence intersect with fundamental issues concerning educational responsibility, privacy protection, the quality of interpersonal relationships, and the holistic development of children and adolescents.

The adoption of AI-based tools by parents is frequently driven by the demands and complexities of contemporary family life. Parents are increasingly required to balance professional commitments, educational responsibilities, household management, and the need to ensure the well-being and safety of all family members. Such circumstances may contribute to phenomena of cognitive overload, understood as a condition in which the quantity of information and tasks exceeds an individual's capacity to process and manage them effectively.[1] In this context, AI systems are increasingly employed as supportive tools for managing everyday activities, organizing family routines, and facilitating decision-making processes related to parenting and education.[2]

Generative AI applications are progressively assuming the role of digital parenting assistants, providing support in areas such as meal planning, family scheduling, time management, and the identification of educational strategies perceived as effective.[3] However, the significance of artificial intelligence within the family

[1] J. Zieliński, *Przeciążenie informacyjne we współczesnym procesie edukacyjnym*, "Kultura – Przemiany – Edukacja" 2024, No. 14–15, pp. 114–128.

[2] S. Quan, Y. Du, Y. Ding, *Young Children and ChatGPT: Parents' Use of ChatGPT in Parenting* [in:] *Extended Abstracts of the CHI Conference on Human Factors in Computing Systems*, 2024, pp. 1–7.

[3] M. Ashraf, *A systematic review on the potential of AI and ChatGPT for parental support and child well-being*, arXiv preprint arXiv:2407.09492, 2024.

extends far beyond its practical and organizational functions. Its most consequential implications emerge when these technologies begin to shape family interactions, educational practices, and children's developmental experiences, thereby influencing the very foundations of the family as a primary socializing institution.

The increasing integration of intelligent systems into family life raises important questions regarding their impact on children's development and on the quality of intergenerational relationships. Although artificial intelligence offers new opportunities for learning, support, and the personalization of educational experiences, it is essential to recognize that no technology can replace the value of human relationships. Children's cognitive, emotional, and social development continues to depend fundamentally on meaningful interactions with significant adults who are capable of listening, interpreting, guiding, and helping them make sense of their lived experiences.[4] Consequently, the central issue is not whether artificial intelligence should replace family relationships, but rather how these technologies can be integrated in ways that support educational functions without diminishing the presence, responsibility, and formative role of parents and other caregivers.

Against this background, the present article aims to examine the major emerging threats associated with the growing presence of artificial intelligence in family life and to explore their educational implications. Particular attention is devoted to transformations in family relationships, risks related to digital dependency, challenges concerning privacy and data protection, the development of critical thinking skills, and the need to promote responsible, conscious, and ethically grounded uses of intelligent technologies within both family and educational contexts.

Artificial intelligence and its impact on family relationships

The growing integration of artificial intelligence into family life is accompanied not only by new opportunities but also by a range of emerging risks and challenges whose consequences may significantly affect family functioning.[5] One of the most frequently discussed concerns is the potential weakening of direct interpersonal relationships. Excessive reliance on digital technologies may contribute to a reduction in face-to-face communication, diminished emotional engagement, weakened family bonds, and a decline in the time devoted to meaningful conversations and shared activities. Children and adolescents, in particular, may be vulnerable to replacing authentic social interactions with engagements mediated by digital devices, thereby limiting opportunities for the development of interpersonal and socio-emotional competencies.

[4] J.H. Chin, S. Lee, M. Ashraf et al., *Young children's creative storytelling with ChatGPT vs. Parent: Comparing interactive styles*, CHI EA 2024: Extended Abstracts of the CHI Conference on Human Factors in Computing Systems 2024, No. 9, pp. 1–7, DOI: https://doi.org/10.1145/3613905.3650770.

[5] S. Russell, P. Norvig, *Artificial Intelligence: A Modern Approach*, Harlow 2021, pp. 31–33.

Another significant challenge concerns the transformation of the nature of family relationships under the influence of artificial intelligence. Of particular relevance is the gradual blurring of traditional boundaries between human beings and technology. The widespread presence of intelligent voice assistants, AI-driven monitoring systems, and algorithm-based digital devices increasingly positions technological systems as active participants in everyday family life. Rather than functioning solely as tools, these technologies are becoming integrated into domestic routines, communication practices, and decision-making processes, thereby reshaping patterns of interaction within the family environment.

Furthermore, the continuing advancement of AI systems-including social robots, conversational agents, and virtual companions-raises the possibility that technologies may increasingly assume functions that have traditionally been fulfilled through human relationships.[6] Such developments create conditions in which individuals may form emotional attachments to technological entities that are perceived not merely as tools but as companions, partners, or even members of the family.[7] As a consequence, certain aspects of intimate and emotional relationships may gradually shift from the sphere of direct human interaction to technologically mediated environments.

This phenomenon raises important social, psychological, and educational questions regarding the long-term implications of substituting elements of interpersonal relationships with interactions involving artificial intelligence systems. The emergence of emotionally meaningful relationships with virtual agents challenges traditional understandings of intimacy, companionship, and family belonging, while simultaneously encouraging critical reflection on the future role of technology in shaping human relationships.[8] From an educational perspective, these developments highlight the necessity of fostering critical digital literacy and relational competencies that enable children, adolescents, and adults to engage with AI technologies responsibly while preserving the central importance of authentic human relationships within family life.

Artificial intelligence and emerging educational challenges

Artificial intelligence is increasingly transforming contemporary educational environments, creating new opportunities for personalized learning while simultaneously raising important pedagogical and ethical concerns. In traditional

[6] C. Becker, S. Kopp, I. Wachsmuth, *Why emotions should be integrated into conversational agents* [in:] *Conversational informatics: an engineering approach 3*, London 2007, pp. 49–67.

[7] M. Dziergwa, K. Kaczmarek, P. Kaczmarek et al., *Long-term cohabitation with a social robot: a case study of the influence of human attachment patterns*, "Int J of Soc Robotics" 2018, No. 10, pp. 163–176, DOI: https://doi.org/10.1007/s12369-017-0439-2.

[8] H. Yamaguchi, *"Intimate relationship" with "virtual humans" and the "socialification" of familyship. Paladyn*, "Journal of Behavioral Robotics" 2020, No. 11(1), pp. 357–369. DOI: https://doi.org/10.1515/pjbr-2020-0023.

educational settings, even highly qualified teachers may face difficulties in fully adapting instructional methods to the individual needs of every student. AI-powered technologies, however, can analyze large volumes of data related to learning processes and subsequently generate personalized learning pathways that take into account students' knowledge levels, learning pace, strengths, and preferred learning styles. Such capabilities have the potential to enhance intellectual development, support cognitive growth, and improve the overall effectiveness of educational processes. Furthermore, the personalization of instruction may increase student engagement and motivation, as well as lead to greater satisfaction with learning experiences.

Contemporary adaptive learning systems can provide targeted support to students experiencing academic difficulties by offering supplementary educational materials, individualized guidance, and immediate feedback on errors. At the same time, high-achieving learners may benefit from access to more advanced content designed to foster the development of their talents and interests. Consequently, AI technologies can contribute to a more inclusive educational environment in which learning opportunities are tailored to individual developmental needs.

The growing popularity of AI-supported applications extends beyond formal education and increasingly encompasses psychological well-being and self-regulation. For example, platforms designed to support mindfulness and relaxation practices have gained widespread adoption. One notable example is the Calm application, one of the most frequently used mindfulness platforms worldwide, which offers personalized meditation programs, breathing exercises, and tools aimed at reducing stress and improving sleep quality.[9] Similarly, educational platforms such as Duolingo employ machine-learning mechanisms to personalize foreign-language learning by analyzing users' progress and adapting the difficulty of tasks to their current competencies.[10] These innovations contribute to making education more flexible, responsive, and aligned with individual learning trajectories, while facilitating the systematic monitoring of student progress and the identification of areas requiring additional support.

Despite these benefits, it is essential to recognize the potential risks associated with excessive reliance on AI-based educational tools. Overuse of such technologies may limit the development of imagination, originality, and the capacity for independent problem-solving and creative thinking. The routine replacement of independent information seeking, critical source evaluation, and analytical reasoning with AI-generated responses may contribute to the weakening of cognitive competencies, reduced learning motivation, and diminished ability to formulate

[9] J. Huberty et al., *Characteristics and Usage Patterns Among 12,151 Paid Subscribers of the Calm Meditation App: Cross-Sectional Survey*, "Journal of Medical Internet Research" 2019, No. 21(11), e15648, DOI: 10.2196/15648.

[10] B. Settles, B. Meeder, *A trainable spaced repetition model for language learning* [in:] *Proceedings of the Association for Computational Linguistics (ACL)*, pp. 1848–1858.

independent judgments and conclusions.[11] Particularly concerning is the perception of artificial intelligence as a shortcut to academic success that minimizes the need for intellectual effort, which remains a fundamental prerequisite for cognitive development and the cultivation of intellectual autonomy.[12]

Another significant educational challenge concerns the impact of artificial intelligence on the reliable assessment of students' actual competencies. Contemporary generative AI models are capable of producing essays, presentations, analyses, projects, and other educational materials of remarkable linguistic and substantive quality. This creates the possibility that AI-generated content may be presented as students' own intellectual work, thereby blurring the distinction between independent learning and technologically assisted performance. Although educators are often able to recognize content that has been substantially generated with AI support, unequivocal verification of authorship remains problematic.

At the same time, the development of AI-based technologies opens new possibilities for collaboration between schools and families. Parents increasingly have access to tools that enable them to monitor their children's educational progress, analyze learning activities, and identify areas requiring additional support. AI systems can generate personalized reports on student achievement, detect learning difficulties, and recommend interventions tailored to individual educational needs. Such solutions may strengthen parental involvement in the educational process and contribute to a more effective partnership between families and educational institutions.

One of the most significant risks associated with the use of artificial intelligence in family and educational environments is the possibility of algorithmic bias.[13] AI models are trained on vast datasets created by humans and may therefore reflect existing social, cultural, and cognitive biases. Consequently, artificial intelligence systems may not only reproduce but also reinforce and disseminate stereotypes. This issue is particularly important in the case of children and adolescents, whose beliefs and perceptions may be influenced by biased algorithmic outputs. Within family contexts, where children increasingly rely on AI systems for information seeking, educational decision-making, and worldview formation, algorithmic bias may have especially far-reaching consequences. If AI systems contain biases related to gender, ethnicity, socioeconomic status, or other social characteristics, they may shape young people's attitudes and contribute to the perpetuation of stereotypical patterns of thinking.[14]

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[11] *Guidance for Generative AI in Education and Research*, UNESCO 2023, DOI: https://doi.org/10.54675/EWZM9535.

[12] *Digital Education Outlook 2023: Towards an Effective Digital Education Ecosystem*, Paris 2023, p. 63, DOI: https://doi.org/10.1787/c74f03de-en.

[13] *Ibidem*, pp. 245–257.

[14] S.U. Noble, *Algorithms of Oppression: How Search Engines Reinforce Racism*, New York 2018, p. 5.

Equally important is the possibility that artificial intelligence may gradually alter functions historically associated with adult caregivers. AI technologies may influence the formation of family rituals and narratives, which play a crucial role in constructing identity and strengthening emotional bonds.[15] The ability of AI systems to generate personalized stories, play scenarios, and suggestions for family activities creates new opportunities for shared symbolic experiences and family engagement.[16] However, when increasing aspects of emotional regulation, family mediation, and conflict resolution are delegated to technological systems, there is a risk of gradually weakening the educational and caregiving role of adults.

Children themselves increasingly perceive intelligent devices as social actors and may develop emotional attachments toward them. Excessive dependence on immediate responses generated by AI systems can reduce opportunities for dialogue with parents, limit occasions for independent thinking, impoverish linguistic experiences, and weaken children's ability to tolerate frustration and delay gratification. Nevertheless, these concerns do not imply that artificial intelligence constitutes an inherent threat to family life. Rather, the crucial issue lies in maintaining an appropriate balance in which technology remains a tool that supports human development rather than replacing human presence, responsibility, and engagement.

It must therefore be emphasized that modern technologies cannot substitute for personal relationships, dialogue-based education, or experiences acquired through direct engagement with the real world. The foundations of healthy cognitive, emotional, and social development continue to rest upon human relationships characterized by closeness, mutual trust, and authentic communication.[17] Preserving the primacy of these values, while recognizing that artificial intelligence can only support rather than replace human relationships, constitutes one of the fundamental conditions for the responsible and safe integration of emerging technologies into family life.

Threats related to privacy protection and data security

Among the most significant challenges associated with the increasing integration of artificial intelligence into family life are those concerning privacy protection and data security. As AI-powered technologies become embedded in everyday domestic

[15] S.J. Wolin, L.A. Bennett, *Family rituals*, "Family Process" 1984, No. 23(3), pp. 401–420, DOI: https://doi.org/10.1111/j.1545-5300.1984.00401.x.

[16] M. Petsolari, S.B, Ibrahim, P. Slovak, *Sociotechnical imaginaries: Envisioning and understanding AI parenting supports through design fiction* [in:] *Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems*, eds. F.F. Mueller, P. Kyburz, J.R. Williamson et al., 2024, pp. 1–27.

[17] M.B. Szondy, Á. Magyary, *Artificial intelligence (AI) in the family system: Possible positive and detrimental effects on parenting, communication and family dynamics*, "European Journal of Mental Health" 2025, No. 20, pp. 1–8, DOI: https://doi.org/10.5708/EJMH.20.2025.0038.

activities, family members – and particularly children – are increasingly exposed to risks related to the collection, storage, processing, and dissemination of personal information. Children using AI-based applications and conversational systems may unknowingly disclose sensitive data, including their names, home addresses, telephone numbers, school information, photographs, or other personally identifiable details. Due to their limited awareness of digital risks and their developmental characteristics, children often lack the ability to fully understand the long-term consequences of sharing personal information within digital environments. Consequently, the widespread adoption of AI technologies in educational and family contexts raises important questions regarding the protection of children's digital rights and the responsibilities of parents, educators, and technology providers.

A related concern is the phenomenon commonly referred to as *sharenting*, which describes the extensive sharing of information, photographs, videos, and personal details about children by parents on social media platforms and other online environments.[18] While many parents engage in such practices with positive intentions, including documenting family experiences or maintaining connections with relatives and friends, the long-term implications for children's privacy are often underestimated. Once digital content has been published online, it may remain accessible for many years, even after its removal from the original platform. Information can be archived by search engines, replicated across social media networks, stored on external servers, or downloaded and retained by other users. As a result, children may enter adulthood with extensive digital footprints created without their informed consent.

The permanence of digital records raises important ethical and educational concerns. Individuals may later experience discomfort, embarrassment, or psychological distress when childhood images, personal stories, or sensitive information remain publicly accessible and no longer correspond to their current identity, personal values, or life circumstances. Furthermore, extensive digital profiling may affect future educational, social, and professional opportunities. These considerations highlight the growing importance of digital responsibility and reinforce the principle that protecting children's privacy constitutes one of the fundamental parental obligations in the era of artificial intelligence.[19] The privacy challenges associated with AI technologies extend far beyond the voluntary disclosure of information by users. Contemporary AI systems are not limited to responding to commands; they are increasingly capable of continuously collecting, analyzing, and interpreting data related to users' everyday activities, behaviours, preferences, and interactions. Smart speakers, voice assistants, intelligent home monitoring systems, wearable devices, and connected household appliances generate vast

[18] Ş.B. Tosuntaş, M.D. Griffiths, *Sharenting: A systematic review of the empirical literature*, "Journal of Family Theory & Review" 2024, No. 16(3), pp. 525–562, DOI: https://doi.org/10.1111/jftr.12566.

[19] M. Tartari, A. Lavorgna, P. Ugwudike, *Share with care: Negotiating children's health and safety in sharenting practices*, "Media, Culture & Society" 2023, No. 45(7), pp. 1453–1470, DOI: https://doi.org/10.1177/01634437231182002.

amounts of data that can be used to construct detailed profiles of family members. Consequently, establishing clear boundaries between the private sphere and the domain of data collection becomes increasingly difficult. Activities that were once considered entirely private may now become part of complex digital ecosystems in which personal information is continuously generated, processed, and potentially shared across multiple technological platforms.

In this context, issues related to individual autonomy, privacy protection, and the influence of digital technologies on interpersonal relationships acquire particular significance. The increasing presence of AI-driven technologies within domestic environments raises concerns regarding the extent to which everyday family interactions are subject to observation, analysis, and algorithmic interpretation.[20] The home has traditionally been regarded as a protected space characterized by intimacy, trust, and freedom from external surveillance. However, the proliferation of intelligent technologies introduces new forms of data collection that may fundamentally alter perceptions of privacy and personal autonomy within family life.

Particularly controversial is the possibility that AI systems may collect and process highly sensitive information concerning emotional states, interpersonal conflicts, communication patterns, and other intimate aspects of family relationships.[21] Recent advances in affective computing and emotional AI increasingly enable technological systems to infer emotional conditions through voice analysis, facial expressions, behavioural patterns, physiological signals, and interaction histories. While such capabilities may offer benefits in areas such as mental health support and personalized services, they simultaneously raise serious concerns regarding the surveillance of emotional life and the potential misuse of deeply personal information.

The expansion of AI-based technologies therefore blurs the distinction between legitimate data collection and excessive intrusion into private life. As algorithms become more sophisticated and data-driven systems gain access to increasingly comprehensive information about individuals and families, important questions emerge concerning data ownership, informed consent, transparency, accountability, and the limits of technological intervention within the family sphere. These challenges are particularly significant in the case of children, whose developmental vulnerability and limited capacity to provide informed consent necessitate enhanced forms of legal and ethical protection.

From an educational perspective, these developments underscore the urgent need to cultivate digital literacy, privacy awareness, and critical understanding of data practices among both parents and children. Family members should be equipped with the knowledge and competencies necessary to make informed decisions

[20] J.S. Edu, J.M. Such, G, Suarez-Tangil, *Smart home personal assistants: A security and privacy review*, "ACM Computing Surveys" 2021, No. 53(6), pp. 1–36, DOI: https://doi.org/10.1145/3412383.

[21] A. McStay, *Emotional AI, soft biometrics and the surveillance of emotional life: An unusual consensus on privacy*, "Big Data & Society" 2020, No. 7(1), DOI: https://doi.org/10.1177/2053951720904386.

regarding the disclosure of personal information, the use of AI-powered services, and the management of their digital identities. Educational initiatives should therefore promote not only technical skills but also ethical reflection concerning the consequences of data sharing, surveillance, and algorithmic decision-making.

Against this background, the development of coherent legal frameworks and ethical standards becomes increasingly important. Such frameworks should establish clear principles governing the collection, processing, storage, and use of personal and family-related data while ensuring respect for the autonomy, dignity, and privacy of all family members.[22] Ultimately, the responsible integration of artificial intelligence into family life requires a careful balance between technological innovation and the preservation of fundamental human rights, ensuring that advances in data-driven technologies contribute to family well-being without compromising privacy, security, and personal freedom.

Ethical dilemmas surrounding the use of artificial intelligence

Alongside the numerous opportunities offered by artificial intelligence, its growing presence within family environments raises a series of complex ethical dilemmas that extend beyond technological considerations and touch upon fundamental questions concerning human autonomy, responsibility, privacy, and the moral dimensions of family life. As AI systems become increasingly integrated into domestic routines, educational practices, and interpersonal interactions, families are confronted with the challenge of determining how these technologies can be used in ways that enhance human well-being without undermining individual agency, relational authenticity, or ethical accountability.

One of the most significant ethical concerns relates to the collection, processing, and use of sensitive personal data. AI-powered systems routinely gather large amounts of information generated through users' interactions, behaviours, preferences, and communication patterns. Within family settings, such data may include highly sensitive information concerning children's developmental trajectories, educational performance, emotional states, health conditions, and interpersonal relationships. Consequently, important questions emerge regarding who has access to these data, how they are stored and processed, and for what purposes they may ultimately be used. The increasing reliance on data-driven technologies requires families to navigate a complex landscape in which the benefits of personalization and convenience must be balanced against the protection of privacy and individual rights.

[22] V. Wylde, E. Prakash, C. Hewage, J. Platts, *Ethical challenges in the use of digital technologies: AI and Big Data* [in:] *Digital transformation in policing: The promise, perils and solutions. "Advanced Sciences and Technologies for Security Applications" 2023*, eds. R. Montasari, V. Carpenter, A.J. Masys, pp. 33–58, DOI: https://doi.org/10.1007/978-3-031-09691-4_3.

In this context, the development of AI literacy assumes particular importance. AI literacy may be understood as the ability to comprehend the basic principles underlying artificial intelligence systems, critically evaluate the mechanisms through which data are collected and utilized, and recognize the influence that algorithmic systems can exert on human behaviour, decision-making processes, and social relationships.[23] Beyond technical knowledge, AI literacy encompasses critical reflection on the ethical, social, and psychological implications of intelligent technologies. It enables individuals to make informed decisions regarding the use of AI tools and to recognize both their opportunities and limitations.

The cultivation of AI literacy is particularly important in contemporary families, where children and adolescents often become familiar with emerging technologies at an early age and may develop digital skills that exceed those of their parents. This generational asymmetry can create challenges for parental guidance and reduce adults' ability to support children effectively in navigating digital environments. When parents lack sufficient understanding of AI technologies, they may encounter difficulties in identifying potential risks, establishing appropriate boundaries, or promoting responsible technology use. As a result, educational researchers increasingly emphasize the importance of intergenerational learning models that encourage parents and children to explore AI technologies together. Such approaches not only contribute to the development of digital competencies but also strengthen family relationships through dialogue, collaboration, and shared reflection on the ethical dimensions of technological innovation.[24]

Another important ethical dilemma concerns the potential influence of AI systems on human autonomy and independent judgment. The increasing availability of AI-generated recommendations, advice, and decision-support mechanisms may encourage users to rely on algorithmic outputs rather than engaging in independent reflection and critical reasoning. Within family contexts, this tendency may affect educational choices, parenting decisions, and everyday problem-solving practices. While AI can undoubtedly provide valuable support, excessive dependence on algorithmic guidance may weaken individuals' capacity to make autonomous decisions and assume responsibility for the consequences of their actions. This issue is particularly relevant for children and adolescents, whose critical thinking skills and moral reasoning capacities are still developing.

Furthermore, ethical concerns arise regarding transparency and accountability. Many contemporary AI systems operate as so-called "black boxes," making it difficult

[23] S. Druga, F.L, Christoph, A.J. Ko, *Family as a third space for AI literacies: How do children and parents learn about AI together?* [in:] *Proceedings of the 2022 CHI Conference on human factors in computing systems (CHI '22)*, eds. S. Barbosa, C. Lampe, A. Appert, D.A. Shamma, S. Drucker, J. Williamson, K. Yatani, 2022. pp. 1–17. Association for Computing Machinery. https://doi.org/10.1145/3491102.3502031.

[24] M. Salah, F. Abdelfattah, H.A. Halbusi, *The good, the bad, and the GPT: Reviewing the impact of generative artificial intelligence on psychology*, "Current Opinion in Psychology" 2024, No. 59, DOI: https://doi.org/10.1016/j.copsyc.2024.101872.

for users to understand how specific recommendations, classifications, or decisions are generated. The opacity of algorithmic processes may limit users' ability to evaluate the reliability, fairness, and accuracy of AI-generated outputs. In family and educational contexts, such limitations can become particularly problematic when technologies influence learning pathways, behavioural assessments, or recommendations concerning children's development. Ethical use of artificial intelligence therefore requires not only technological innovation but also transparency, explainability, and mechanisms that allow users to question and critically assess algorithmic decisions.

In the field of educational applications of artificial intelligence, particular responsibility rests with parents, who play a crucial role in shaping the digital competencies of children and adolescents. Their task extends beyond discussing the opportunities and risks associated with emerging technologies. Parents are also responsible for providing appropriate supervision, establishing clear rules regarding technology use, and encouraging critical engagement with AI-generated content. Effective parental mediation involves helping children understand the limitations of artificial intelligence, recognize potential misinformation, protect their privacy, and develop the capacity to use technological tools in a reflective and ethically responsible manner.

Ultimately, the ethical challenges associated with artificial intelligence cannot be addressed solely through technological solutions. Addressing these challenges requires the development of a broader culture of ethical innovation based on transparency, responsibility, social participation, and awareness of the long-term consequences of technological decisions.[25] They require continuous dialogue among families, educators, policymakers, and technology developers concerning the values that should guide the design and use of intelligent systems. From this perspective, AI literacy becomes not only a technological competence but also a civic and ethical one, enabling individuals to participate responsibly in an increasingly AI-mediated society. The future integration of artificial intelligence into family life will therefore depend not only on technological advancements but also on the capacity of individuals and communities to ensure that innovation remains aligned with human dignity, personal autonomy, social responsibility, and the well-being of future generations.

The need for education for the responsible use of artificial intelligence

In light of the opportunities and risks associated with the rapid development of artificial intelligence, fostering a culture of responsible technology use has become one of the fundamental objectives of contemporary education. Digital education can no longer be limited to teaching technical skills related to the operation of devices

[25] P. Jura, *W stronę ekointeligencji – narzędzia AI w ochronie środowiska i edukacji ekologicznej*, "Studia ad Didacticam Scientiarum Socialium Pertinentia" 2025, No. 424(15), pp. 140–142, DOI 10.24917/20837276.15.9.

and applications. Rather, it must encompass the development of critical reflection, personal responsibility, ethical awareness, and the capacity to navigate increasingly complex digital environments in an informed and autonomous manner. In this context, scholars emphasize that the responsibility for introducing children and adolescents to the world of emerging technologies rests primarily with parents, educators, and educational institutions.[26] Consequently, one of the central educational tasks of the twenty-first century is the cultivation of digital competencies, critical thinking skills, the ability to evaluate the quality and credibility of information sources, and the responsible use of AI-based resources.[27]

The educational significance of artificial intelligence is particularly evident among children and adolescents, who grow up in environments deeply embedded in digital technologies. Unlike previous generations, they are exposed from an early age to AI-powered systems such as recommendation algorithms, intelligent assistants, educational platforms, and generative language models, which have become common tools for learning, communication, and information seeking. As a result, artificial intelligence is transforming both educational environments and the processes of learning and knowledge acquisition.

This transformation challenges traditional models of education based on the transmission of knowledge from teacher to student. Increasingly, educational systems are adopting adaptive and personalized approaches that use data analytics and machine learning to respond to individual learning needs. In this context, students become active participants in the learning process, while AI systems can monitor progress, identify learning difficulties, and recommend tailored educational activities, thereby supporting both academic achievement and learner autonomy.

However, the benefits of AI in education can only be fully realized when accompanied by the development of appropriate digital competencies. Families play a crucial role in fostering responsible and critical engagement with technology. Essential skills include evaluating the credibility of information, recognizing misinformation and algorithmic bias, understanding the limitations of AI-generated content, and managing one's digital identity. Equally important is establishing clear principles for the educational use of AI, ensuring that technology supports learning, creativity, and independent thinking rather than replacing intellectual effort and personal engagement.

A well-functioning family represents one of the most important protective factors against the risks associated with excessive technology use and digital dependency. Consequently, preventive measures, including media and digital education, assume increasing significance in contemporary family life.[28] Media education

[26] L. Floridi, *The Ethics of Artificial Intelligence*, Oxford 2023, pp. 88–95.

[27] N. Selwyn, *Education and Technology: Key Issues and Debates*, London 2021, pp. 102–109.

[28] S. Dzierzyńska-Breś, *Rodzic jako uczestnik profilaktyki uzależnień w szkole* [in:] *Profilaktyka zachowań ryzykownych – dobre praktyki i dowody naukowe*, eds. M. Muskała, H. Karaszewska, Poznań 2023, pp. 7–9.

should support children's healthy functioning within digital environments while promoting balanced habits that contribute to both psychological well-being and physical health. Such educational efforts should not be directed solely at children but should encompass the entire family environment, since the home remains the primary context in which children access and engage with digital media.[29]

Parents occupy a particularly important position in shaping children's first experiences with digital technologies. They introduce children to the digital world, establish rules regarding media use, and define appropriate boundaries for engagement with technological devices.[30] Their role extends beyond supervision and regulation; parents also serve as primary models whose behaviours significantly influence children's attitudes toward technology. Through their own patterns of media consumption and technology use, adults communicate norms regarding responsible, balanced, and purposeful engagement with digital tools.

The modelling of healthy technology-use behaviours constitutes a key dimension of contemporary digital parenting. By demonstrating moderation, critical reflection, and self-regulation, parents shape children's attitudes toward digital technologies. It is therefore important to ensure that technology use does not limit opportunities for social interaction, family communication, physical activity, or educational development.

Another essential aspect of digital education concerns privacy and data protection. Parents should verify whether the applications and AI systems used by their children comply with data protection standards and respect children's privacy rights. At the same time, children should be educated about privacy, informed consent, digital footprints, and responsible data-sharing practices.

Preparing children for life in an AI-driven society requires more than technical skills. It also demands the development of critical thinking, ethical awareness, autonomy, and responsibility. This approach is consistent with broader analyses of the societal consequences of artificial intelligence, which emphasise that future generations will need not only digital competencies but also adaptability, emotional intelligence, cognitive flexibility, and the ability to cooperate effectively with AI-supported systems in both educational and professional environments.[31] By fostering these competencies and maintaining the primacy of human relationships, families can help ensure that artificial intelligence serves as a tool for human development rather than a source of dependency or manipulation.

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[29] R. Matusiak, *Edukacja medialna jako forma kształtowania postaw prozdrowotnych i przeciwdziałania uzależnieniu od mediów*, „Kwartalnik Naukowy Fides et Ratio" 2017, No. 32(4), pp. 176–184.

[30] M. Dinleyici et al., *Media Use by Children, and Parents' Views on Children's Media Usage*, „Interactive Journal of Medical Research" 2016, No. 5(2), e18, DOI: https://doi.org/10.2196/ijmr.5668.

[31] M. Kawa, *The Future of Skills and Labor Market in the Age of AI*, "Studia Ad Didacticam Scientiarum Socialium Pertinentia" 2025, No. 424(15), pp. 168–170, DOI: 10.24917/20837276.15.11.

From the perspective of family safety, Article 95 §1 of the Polish Family and Guardianship Code[32] obliges parents to exercise parental responsibility in a manner that protects children from digital threats, including risks associated with the misuse of artificial intelligence technologies. Furthermore, the legal framework established in Chapter 4 of the Polish Act of 18 July 2002[33] on the Provision of Electronic Services provides safeguards for the protection of personal data within digital services, which is particularly relevant for families increasingly relying on AI-based technologies in everyday life.

Conclusion

The rapid development of artificial intelligence is transforming family life, which remains the primary environment for socialization, education, and emotional development. As AI technologies become increasingly integrated into everyday domestic practices, they offer new opportunities for learning, communication, organization, and personalized support. At the same time, their growing presence raises important educational, ethical, and social challenges that require careful consideration.

This article has shown that the impact of artificial intelligence on families extends far beyond its practical functions. AI systems increasingly influence communication patterns, educational practices, and interpersonal relationships. While they can assist parents in managing daily responsibilities and provide valuable educational support, excessive dependence on technological solutions may weaken direct human interactions, reduce opportunities for meaningful dialogue, and gradually replace functions traditionally fulfilled through family relationships.

Particular attention has been devoted to challenges related to privacy protection, data security, algorithmic bias, digital dependency, and the emergence of emotional attachments to artificial agents. These issues demonstrate that technological innovation is not value-neutral and inevitably raises questions concerning autonomy, responsibility, transparency, and the protection of fundamental rights. Children and adolescents are especially vulnerable to these risks due to their developmental stage and intensive use of digital technologies.

The analysis also highlights the importance of AI literacy as a key competence for contemporary families. In an environment increasingly shaped by algorithmic systems, individuals require not only technical skills but also critical thinking, ethical awareness, and informed decision-making abilities. Parents, educators, and

[32] Polish Family and Guardianship Code of 25 February 1964 (Journal of Laws 2023, item 2809, as amended).

[33] Polish Act of 18 July 2002 on the Provision of Electronic Services (Journal of Laws 2024, item 1513, as amended).

schools play a crucial role in helping young people understand both the opportunities and limitations of AI and in promoting its responsible use.

The effective integration of artificial intelligence into family life depends on maintaining a balance between technological innovation and human relationships. AI should be regarded as a supportive tool that enhances educational processes and family well-being rather than a substitute for parental involvement, interpersonal communication, or emotional engagement. The development of empathy, moral responsibility, and social competence continues to rely primarily on authentic human interactions that cannot be fully replicated by technology.

Finally, the growing role of artificial intelligence underscores the need for comprehensive educational strategies, ethical guidelines, and legal frameworks that protect the rights and well-being of all family members. Only through the combination of technological innovation, ethical awareness, and educational responsibility can artificial intelligence become a tool that supports family functioning and contributes positively to the development of future generations.

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