Seminare

The Use of Language Models in Education
Wykorzystanie modeli językowych w edukacji

Kamil Wroński

Maria Curie-Skłodowska University in Lublin, Poland

ORCID: 0000-0003-0095-0762

kamil.wronski@mail.umcs.pl

Abstract: The aim of this article is to analyse the ways in which language models can be used in education from the perspective of the theory of dual media articulation. Addressing this issue is important given the growing significance of artificial intelligence in educational processes. Qualitative, exploratory desk research was conducted using 38 sources, selected for their relevance and contribution. These included reports from international institutions (such as OECD), national studies, governmental documents, and publicly available online materials. In the research conducted through the lens of material articulation, language models were identified as tools that support the learning process through personalization and increase knowledge accessibility. Within symbolic articulation, these tools represent a new form of communication and organization of teaching, which influences the process of information acquisition by students and contributes to a shift in traditional teaching methods. Language models are both an opportunity and a challenge in education. Although initial regulations regarding their use are already emerging, there remains a need for detailed legal, ethical, and implementation frameworks.

Keywords: language models, education, youth

Abstrakt: Celem artykułu było przeanalizowanie sposobów wykorzystania modeli językowych w edukacji z perspektywy teorii podwójnej artykulacji mediów. Podjęcie tego zagadnienia jest istotne ze względu na rosnącą rolę sztucznej inteligencji w procesach edukacyjnych. Przeprowadzono jakościowe, eksploracyjne badanie desk research, wykorzystując 38 źródeł wybranych ze względu na ich trafność i wkład merytoryczny. Źródła te obejmowały raporty międzynarodowych instytucji (takich jak OECD), krajowe badania, dokumenty rządowe oraz publicznie dostępne materiały online. W ramach badań przeprowadzonych przez pryzmat artykulacji materialnej modele językowe zidentyfikowano jako narzędzia wspierające proces nauki poprzez personalizację oraz zwiększające dostępność wiedzy. W ramach artykulacji symbolicznej narzędzia te stanowią nową formę komunikacji i organizacji nauczania, które wpływają na proces przyswajania informacji przez uczniów oraz prowadzą do zmiany tradycyjnych metod nauczania. Modele językowe stanowią zarówno szansę, jak i wyzwanie w edukacji. Chociaż pojawiają się już pierwsze regulacje dotyczące ich wykorzystania, wciąż istnieje potrzeba opracowania szczegółowych rozwiązań prawnych, etycznych i wdrożeniowych.

Słowa kluczowe: modele językowe, edukacja, młodzież

Introduction

Artificial intelligence has gained popularity in recent years thanks to language models developed for communication with users, primarily ChatGPT 3.5 and its improved version, ChatGPT 4, a tool that generates responses which, in most cases, are indistinguishable from texts written by humans (Köbis and Mossink 2020, 1-6).

The introduction of artificial intelligence solutions allows for maximizing work outcomes, including teaching and learning, in much less time. Language models can be an important tool used by students and teachers in the educational process, becoming an element of the educational system (Jaskuła 2023, 13). It should be noted that the role of these tools is not limited to providing information, but also affects the nature of pedagogical relationships and the way knowledge is acquired by young people. Language models lead to the automation of the teaching process and the personalization of learning. Impact Research conducted a survey between February 2-7, 2023, with a representative group of students and teachers in the United States on behalf of the Walton Family Foundation. The survey showed that ChatGPT was positively evaluated by teachers. More than 51% of teachers had already started using the language model, with 40% using it at least once a week. Additionally, 72% of teachers believed that AI tools have the potential to significantly improve learning outcomes. In the case of students, the percentage of users of this tool is lower (22%), but both most students and teachers agree that the ChatGPT invention should lead to changes in the teaching system in schools (Walton Family Foundation 2023). It should be noted that the study conducted by Impact Research on behalf of the Walton Family Foundation in February 2023 encompassed a representative sample of 1,002 teachers and 1,000 students from the United States, allowing for the generalisation of the findings to the national population. The samples were appropriately weighted to align their demographic structure with estimates derived from the American Community Survey, conducted by the US Census Bureau (five-year data) (Walton Family Foundation 2023). Although the primary data originates from the United States, it is possible to cautiously speak of emerging global trends in the application of artificial intelligence in education. Nevertheless, it is important to emphasise that generalising these findings on an international scale would require further, more extensive research. Researchers agree that artificial intelligence, including language models, will be present in education at various levels (Krzypkowska 2023, 5-8).

However, the use of language models in education is associated with controversy and raises concerns among educators (Hong 2023, 37-45). Teachers face the challenge of how to recognize whether specific works are created by students or generated by artificial intelligence. The development of AI, particularly advanced language models, also raises questions about future professions and the type of education that will respond to changing work conditions (Vincent-Lancrin 2019). According to the Organisation for Economic Co-operation and Development (OECD) report, education in the digital age thus faces two significant

challenges: harnessing the benefits of AI tools to streamline the learning process and preparing students for new future jobs (Vincent-Lancrin and Van der Vlies 2020, 1-16).

The aim of this paper was to analyze the ways in which language models are used in education and assess their impact on the teaching process. In the section "Use of Language Models in Education," the ways in which artificial intelligence is used in education by students were described, and the risks associated with using these tools were identified. The research was conducted in relation to the theory of dual articulation of media. In the section "Recommendations from the Ministry of Education and Science," the recommendations from the Ministry of Education and Science (MEiN) regarding the use of artificial intelligence in education were outlined. A total of 38 sources were analysed, including academic publications, reports from international institutions (such as OECD), national studies, governmental documents, and publicly accessible online materials. The temporal scope of the reviewed sources primarily covers the years 2019 to 2024, with the selection based on their relevance, representativeness, and substantive contribution to the research topic.

The theory of dual articulation helps to understand the relationship between society and the media, which is why its selection in the context of the significance of language models in education is justified. According to the creator of this theory, Roger Silverstone, media should be analysed through both symbolic and material articulation. Material articulation refers to the physical and technological aspects of media and their use. Symbolic articulation pertains to meanings, values, and identities associated with media (Silverstone 1994). Stuart Hall understood articulation as the linking of cultural practice with meaning, which changes depending on the author, context, or purpose of the statement (Storey 2003). In the context of this study, material articulation refers to language models as technological tools enabling access to education, while symbolic articulation refers to these tools as new forms of communication and knowledge organization, which influence the ways students acquire knowledge, social relationships, and cognitive processes.

A qualitative research methodology of an exploratory-verification nature was applied, based on the analysis of existing sources (desk research), including subject literature, scientific reports, and detailed guidelines from the Ministry of Education and Science (MEiN) regarding the use of artificial intelligence in education. The study addressed the following research questions:

1. What are the possible ways of using language models in education? (material articulation)
2. How does the use of language models affect the way students acquire knowledge? (symbolic articulation)

This research makes a significant contribution to the ongoing discussion on the application of artificial intelligence in education by highlighting both the benefits and potential risks associated with these tools.

1. The Use of Language Models in Education

Dimension of Analysis	Impact of Language Models
Material Articulation	Language models as a tool supporting learning, facilitating access to knowledge, and personalizing education.
Symbolic Articulation	Language models reshaping the perception of the roles of students and teachers as well as the ways information is acquired.

Source: Own elaboration

From the perspective of material articulation of media, it is important to note that language models play a significant role as part of the information architecture, influencing the personalization of learning and the automation of knowledge access. These tools are available 24/7, effectively acting as a free tutor tailored to the student's age and level of knowledge (Nee et al. 2023). Numerous scientific studies indicate that language models, as virtual assistants, can improve academic performance (Pane et al. 2017) and help students develop their competencies by providing quick and accurate answers to their questions (Janus-Sitarz 2023, 19-20).

Language models make the learning process more individualized, positively impacting not only the speed and efficiency of learning but also its enjoyment. As a result, they enhance the overall effectiveness of education (Tu 2024, 198). Additionally, these tools track students' progress, adjust the difficulty level accordingly, and generate personalized study plans and tests, allowing students to focus on their weaker areas (Lakshmi and Majid 2022, 15-18). For example, they can assist in solving math problems by outlining the necessary steps to arrive at a solution. This level of individualized support is not feasible for a teacher in a traditional classroom setting, where they must oversee all students and cannot tailor their teaching methods to the specific needs of each individual. Furthermore, language models eliminate the risk of teacher subjectivity, which may arise from personal biases toward students (Olszowy and Nanek 2024, 19).

They can also provide significant support in essay and dissertation writing by assisting in structuring texts, checking grammar and writing style, and identifying factual errors (Olszowy and Nanek 2024, 19).

Moreover, they play a crucial role in supporting students in learning foreign languages. Technology enables conversations on any topic in a foreign language, simulating natural dialogues. Additionally, built-in automatic correction systems assist in learning foreign language grammar (Tarasiuk and Czapski 2023, 54).

Language models also support students with special needs by teaching social norms and aiding in communication. In this sense, they contribute to increasing the inclusivity of education and accommodating the needs of students with

disabilities (Olszowy and Nanek 2024, 19). Another important aspect is their integration with specific educational systems. AI-based educational platforms are already available on the market. Among them, Coursera and Khan Academy stand out—these platforms offer academic-level courses, track students' progress, assess their strengths and weaknesses, and recommend suitable didactic content (Olszowy and Nanek 2024, 38).

AI-powered educational solutions are most effective in supporting learning when applied to repetitive and predictable tasks, where their efficiency surpasses that of traditional teaching methods (Holmes, Bialik and Fadel 2019). Thus, they are particularly useful for acquiring procedural knowledge (how to do something) (Commint 2025) rather than conceptual knowledge (why something works a certain way) (Training Industry 2025). In this context, it is worth noting the research conducted by Agnieszka Franczyk and Anna Rajchel. Their findings indicate that students of technical and scientific disciplines approach these tools more enthusiastically than students in the humanities (Franczyk and Rajchel 2024, 99). In the case of technical and scientific disciplines, the emphasis is placed on procedural knowledge, while in the case of humanities, the focus is on conceptual knowledge. This distinction may explain the differing attitudes of students toward language models.

At the same time, it is important to note that language models can generate incorrect or biased information. This issue arises mainly from the fact that these tools are not infallible and tend to "hallucinate," meaning they can produce numerous factual errors (Zieliński 2023, 17). A lack of adequate competence among students and teachers in evaluating AI-generated responses may lead to the unintentional incorporation of false information into the learning process. From the perspective of material articulation, risks also include dishonest practices by students who misuse AI tools. These tools are constantly being updated, which results in increasingly accurate responses that better align with users' expectations. Each subsequent AI-generated work is of a higher substantive quality due to the system's ever-expanding database. However, this also has a negative impact on students, who may passively absorb content that does not align with reality (Porwoł 2023, 57-68). It is therefore reasonable to ask how to prevent the dishonest use of language models by students, especially given that there is currently no reliable way to verify whether a particular piece of work has been generated by artificial intelligence (Pięta 2024, 151).

Another risk concerns cybersecurity and the protection of uploaded data. Most users rely on free versions of language models, which means that sensitive data they enter may be intercepted and used by the chatbot. This could lead to breaches of data security and privacy, such as violations of GDPR regulations. Language models can collect and analyse data on students' habits, increasing both the risk of cyberattacks and the use of data for commercial purposes (Jaskuła 2023, 16-18). Monika Podkowińska has highlighted the risks associated with the broader cyberspace, and many of the phenomena she identified can be directly linked

to the dangers of using these tools. Young people spend an excessive amount of time in the virtual world, which leads to technology addiction and a reduction in social interactions. Additionally, they are often unaware of data security risks and misinformation (Podkowińska 2024). This raises the need to enhance digital education in society.

From the perspective of symbolic articulation, it is important to recognize that advanced language models are changing how students approach learning and organize information. The traditional division of roles between student and teacher is diminishing. From the student's perspective, the teacher is no longer solely a provider of knowledge but rather a mentor who should focus on helping students develop soft skills. The learning process becomes much more interactive, allowing students to ask questions, engage in conversations, and request the chatbot to assume specific roles. Scientific research indicates that using AI tools in education can significantly impact the emotional aspect of the learning process. In this context, language models increase students' satisfaction with learning, help transform negative emotions into positive ones, and improve students' attitudes toward education (Nee et al. 2023). Traditional learning environments can generate stress, which lowers the quality of learning. These risks are minimized in the case of language models, which can be used in a private setting. ChatGPT does not evaluate the intellectual level, age, or gender of the conversation partner (Cholewa and Rak 2023, 34).

From the perspective of symbolic articulation, it is important to note that language models may lead to a decrease in independent thinking, problem-solving skills, and creativity if students rely solely on the tool's responses (Chinonso, Mfon-Ette and Aduke 2023, 32-33). An important point was raised by Wojciech Czerski, who noted that chatbot-based tools can be useful only when students have mastered critical thinking skills and use these tools to assist the educational process (Czerski 2023, 55-62). Therefore, it can be concluded that improper use of this technology could limit the development of humanistic values, such as reflectiveness and creativity.

 Additionally, it should be noted that the responses generated by AI are not neutral; they are the result of algorithms designed by their creators. This can lead to a situation where the flow of information is restricted. These tools can filter access to knowledge and promote certain ideological, political, and economic narratives, thus trapping users in informational bubbles (Krakowska 2022). There is a risk that the use of language models will lead to algorithmic thinking, meaning choosing the most likely answers rather than critically analysing a specific problem from multiple perspectives. In the literature on the subject, this issue has been referred to as Fast Food Education (Aguilar 2025).

These tools also cause a shift in the paradigm of the relationship between the student and teacher, contributing to the dehumanization of this relationship and weakening the teacher's authority (Olszowy and Nanek 2024, 26). Interpersonal relationships between students and teachers may be weakened as students focus

solely on this technology (Koziej 2023, 16-17). It should be noted that language models are just tools that do not have empathy mechanisms, so they cannot replace real contact with a teacher. Meanwhile, advanced artificial intelligence tools, such as Carnegie Learning, are already emerging, enabling the learning process without the physical involvement of a teacher (Olszowy and Nanek 2024, 18).

In the light of educational philosophy, a process of depersonalization of the teaching process may occur, leading to a redefinition of the previously mentioned teacher's authority. It seems reasonable to ask whether the student-teacher relationship can be replaced by a student-language model relationship (Olszowy and Nanek 2024, 18). However, the answer to this question seems to be no, as humans learn not only by acquiring knowledge but also through interpersonal interactions. Moreover, these tools do not teach ethics, responsibility, and moral norms, areas where the role of the teacher and parent is irreplaceable. It is worth noting that research by Katarzyna Nosek-Kozłowska shows that the personality of the teacher plays a crucial role in the education of their students. A teacher should respond to the challenges of the modern world and possess versatile competencies: managing various tasks simultaneously, identifying the individual needs of students, and being knowledgeable in modern technologies. Moreover, a modern teacher should understand and identify the emotions of their students (Nosek-Kozłowska 2024, 102-103). It can therefore be concluded that language models will not replace the teacher, but as previously mentioned, they will redefine their role.

From the perspective of symbolic articulation, language models can also change the way students think about learning. Learning requires engagement, time, reflection, analysis, and critical thinking, but at the same time, it allows for a deep understanding of the subject matter. Irresponsible use of these tools may lead to a situation where the learning process becomes focused on immediate access to information, rather than on a thorough understanding of it. There is a risk that students will begin to treat learning as an on-demand ready-made product. Replacing the process of acquiring knowledge with its production can lead to the aforementioned loss of critical thinking skills.

Language models can contribute both to the democratization of education and to its elitism. These tools can increase access to education for people from less developed areas who cannot afford to hire private tutors. At the same time, there is a risk that people who have access to the latest technologies will gain an advantage over those who, for various reasons, do not use them (Olszowy and Nanek 2024, 32).

2. Recommendations from the Ministry of Education and Science for Teachers

The Ministry of Education and Science has responded to the challenges associated with the use of artificial intelligence solutions, such as language models. The Ministry has published two reports: "Chat GPT w Szkole – Szanse i Zagrożenia" („Chat GPT in Schools – Opportunities and Threats") (Machura 2023) and "Do

czego AI nie służy – Przewodnik dla nauczycieli stworzony przez grupę roboczą ds. AI" ("What AI Is Not For – A Guide for Teachers Created by the AI Working Group") (Łukawski, Łukawski and Rafał 2023). The first document provides an introduction to considerations about artificial intelligence, explaining what AI is, where it is used, and what Chat GPT is. This report also includes a conversation with Chat GPT about possible ways of utilizing it in education. The document describes the risks associated with students using Chat GPT to write homework and recommends that such tasks should be completed by students during class time. It also recommends using Chat GPT in a way that supports students' critical thinking skills, by questioning some of the language model's formulations and verifying information from other sources. An example of using Chat GPT by the teacher could be to ask students to prepare an article with the help of Chat GPT, and then critically review it during class. The report also states that students should receive clear guidelines from the teacher regarding how to use the chatbot in their work (Machura 2023). It is also emphasized that appropriate collaboration with technology can contribute to the development of soft skills, referred to as future competencies. These include critical thinking, creativity, communication, and cooperation (Lamri 2021).

The report also emphasized that to verify if a piece of work was written by a student, attention should be paid to whether the writing style is characteristic of the student, by having a conversation with the student about the details included in the work, and by checking the text using plagiarism detection software or software for detecting artificial intelligence. However, it should be noted that AI detection programs in student works are imperfect, and their effectiveness remains low at the moment. The report highlighted the risks associated with the use of artificial intelligence. However, it lacks specific guidelines for schools regarding the use of technology and assessing student work generated by Chat GPT, as well as the procedures that should be followed in the case of misuse (Machura 2023).

A much more comprehensive report is "What AI Is Not For – A Guide for Teachers Created by the AI Working Group." The document describes the functioning of the technology and highlights significant risks associated with its use. It provides examples of specific prompts that teachers can use when working with students and stresses the importance of asking detailed and precise questions. It also advises against providing sensitive data to the chatbot, as it could be exposed. It is recommended that a teacher be present during the process of students using the technology, monitoring the entire process, paying attention to the ethical aspect, and checking for possible "hallucinations" by the chat (Łukawski, Łukawski and Rafał 2023).

The report also expands on possible uses of the technology by students, such as using Chat GPT as a conversation partner (including in a foreign language), which will point out gaps in the student's speech, or as an assistant helping in creating quizzes and tasks. Additionally, the report points to the possibility of creating custom versions of Chat GPT, tailored to meet the individual educational

needs of students. The report also includes guidelines for teachers, advising that educators should not use the tool to work with documents containing sensitive data, nor should it be used for administrative tasks or to assess students' behaviour and achievements (Łukawski, Łukawski and Rafał 2023).

It is important to note that while this report contributes to raising teachers' awareness of the functioning of language models, it offers relatively few practical guidelines for teachers regarding the responsible use of artificial intelligence solutions in schools. However, such guidelines are already being developed. In this context, attention should be drawn to the guidelines of the Maria Grzegorzewska University of Special Education in Warsaw (Akademia Pedagogiki Specjalnej im. Marii Grzegorzewskiej 2025). Additionally, study programs related to the use of AI solutions in schools are already emerging. For example: Childcare and Education Pedagogy integrated with Artistic Pedagogy and AI. (Pedagogium. Wyższa Szkoła Nauk Społecznych 2025).

Conclusion

Research has shown that language models can improve the quality of education. In terms of material articulation, these tools are functional tools that have both advantages and disadvantages. This technology leads to the personalization of learning, acting as a virtual teacher available 24 hours a day. Language models can improve learning efficiency by adjusting the level of learning to the student and identifying their weak points, allowing the student to better tackle specific material. The application of these tools in education is vast: they can create tests, check essays, and assist in language learning. In this context, it is worth referring to the OECD report, which also highlights that the development of artificial intelligence can support students with special needs by providing inclusive access to education (Vincent-Lancrin and Van der Vlies 2020). However, there are also many risks associated with the improper use of this technology in education. These include the possibility of hallucination, i.e., providing false answers, as well as the risk of generating ready-made works, effectively replacing the work of students, which contradicts ethics. Moreover, the use of language models in education brings the discussion about cybersecurity risks, technology addiction, and privacy policies back to the forefront (Podkowińska 2024).

Language models also change the way we think about education (symbolic articulation). The use of this technology in education leads to a shift toward a more interactive teaching model. They also change the roles of the teacher and the student. In a situation where such tools exist, the teacher stops being the person who delivers knowledge. Instead, they should become a mentor who accompanies the student in the process of acquiring knowledge and controls this process to minimize risks. However, this is an ideal situation that does not always take place. Moreover, improper use of language models in the educational process by students can result in the decline of critical thinking skills and lead to the dehumanization

of the traditional teaching process. There is also a risk that learning will cease to be a process of acquiring knowledge and instead become a product that the student can receive on demand.

The identified risks can be minimized by introducing clear pedagogical guidelines and educational programs regarding the use of technology in education, as well as educating students in the direction of critical thinking skills and conscious use of AI in education (Franczyk and Rajchel 2024, 99). This requires a balanced approach, in which technology supports but does not replace the traditional teaching process. According to the guidelines from the Academy of Special Pedagogy, a teacher preparing lessons using AI should aim for the student to demonstrate critical thinking (e.g., reviewing content generated by AI), creativity (learning how to write prompts, set tasks for AI), and teamwork skills (group tasks, group discussions, Oxford debates) (Akademia Pedagogiki Specjalnej im. Marii Grzegorzewskiej 2025).

There is also a need for tools that can recognize which content was generated by technology, which will minimize ethical challenges. It seems necessary to also develop appropriate legal regulations, as the existing ones are not keeping up with the rapidly advancing field of artificial intelligence. Although ministerial reports have been created regarding the use of language models in education, it seems that there is a need for more practical materials that focus on specific educational solutions and take into account the latest scientific research, as well as regulations and best practices applied in other countries.

Considering the presence of language models in educational systems, it becomes crucial to begin a discussion about changing the teaching model and redefining the uniform education system based on the Prussian model of education (Baszyński 2020, 81-82). This system is characterized by standardization in the transmission of knowledge, which does not align with the realities of the 21st century. In contrast, language models adapt individually to each student and support a flexible approach to the education process, thereby improving the effectiveness of learning. Thus, it seems that in the near future, more and more educational institutions will offer a hybrid educational model (blended learning) (Tayebinik and Puteh 2012) that combines traditional approaches with online learning and modern technologies.

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