

# TRANSFORMATIVE POTENTIAL OF GENERATIVE ARTIFICIAL INTELLIGENCE IN HIGHER EDUCATION

Mario Dumančić\*, Nataša Rogulja and Maja Homen

University of Zagreb, Faculty of Teacher Education  
Zagreb Croatia

DOI: 10.7906/indecs.23.6.4  
Regular article

*Received:* 16 March 2025.  
*Accepted:* 26 November 2025.

## ABSTRACT

This article explores the possible uses of generative artificial intelligence (GenAI), with a focus on the ChatGPT tool within higher education. Through a systematic review of the existing literature, examines the main benefits and drawbacks of using GenAI technology. This article discusses the transformative effects that GenAI can have on teaching and learning processes, including the personalization of educational content, student support through virtual tutoring, and administrative assistance. It also addresses ethical concerns and challenges such as data privacy and algorithmic bias. In conclusion, this article highlights the importance of further research and dialogue within the academic community regarding the co-evolution of GenAI and higher education and offers suggestions for future studies.

## KEY WORDS

generative artificial intelligence, GenAI, personalized learning, transformative effects, higher education

## CLASSIFICATION

APA: 3500, 3530, 4100, 4120

JEL: I21, I25

\*Corresponding author, *η*: [mario.dumancic@ufzg.hr](mailto:mario.dumancic@ufzg.hr); +385 1 6327 313  
Faculty of Teacher Education, Savska 77, HR – 10 000 Zagreb, Croatia

## **INTRODUCTION**

With the launch of its chatbot tool ChatGPT (Generative Pre-trained Transformer), which utilizes a deep neural network model, OpenAI has sparked a sort of revolution in artificial intelligence. We deeply believe it represents progress in human development, which some media consider to be as significant as the emergence of the Internet. Researchers and social media have actively engaged in discussions about the implications of generative artificial intelligence, particularly ChatGPT, examining its possibly advantageous uses and possible risks.

ChatGPT is a generative conversational AI interface that uses natural language to interact in a realistic manner, with the ability to answer follow-up questions, acknowledge its own mistakes, challenge incorrect premises, and reject inappropriate requests [1]. Specifically, GenAI tools can automatically generate output data such as text and images, synthesize speech and sound, create original video content, and generate datasets. This capability relies on large training datasets, neural networks, and deep learning architectures [2].

The development of various forms of artificial intelligence, especially GenAI models, LLMs, and other intelligent agent models, is a primary focus in AI communities today. The primary idea behind this research is to utilize the potential of LLMs for planning and solving complex modern challenges. To harness this potential, GenAI<sup>1</sup> models and LLMs are being integrated into various computer programs, search engines, and other tools, which is a logically expected step. Among other things, this integration has enabled the entry of GenAI into various fields of human activity [2, 3].

New possibilities offered by GenAI, such as the availability of ChatGPT under a free license, web-based accessibility, and ease of use, have opened the door to widespread access to innovative functionalities. The reaction from the higher education community was entirely expected, as many individuals embraced the use of ChatGPT. At the same time, however, a significant number of educators, researchers, and higher education leaders expressed concerns [4]. The capabilities of ChatGPT are focused on transforming the learning environment by impacting teaching, learning, and research experiences. GenAI, therefore, offers the potential to reshape learning environments [5]. Available studies reveal a growing interest among researchers in exploring the implications of artificial intelligence in education, as adaptive learning, smart campuses, teaching robots, virtual assistants, and generative AI models such as chatbots are increasingly being used both inside and outside the classroom [6, 7].

However, in previous research on the implications of artificial intelligence in higher education, we have noticed a lack of comprehensive and systematic reviews focused on the transformative elements that could impact higher education, as well as the co-evolution of higher education and GenAI technology. In this regard, a review of the available literature on this topic was conducted. Prior to that, we provided a short overview of the rise of GenAI and advanced language models, with an emphasis on education. The Methodology and Results Presentation sections outline the research process align with the corresponding findings. The qualitative part of the study explores the opportunities and challenges of GenAI in higher education through an analysis of its key advantages and disadvantages.

## **TRANSFORMATIVE EFFECTS OR CO-EVOLUTION OF HIGHER EDUCATION**

Higher education has experienced significant changes in recent decades, driven by countless social, technological, and economic factors. As globalization reshapes labour markets and societal expectations, the function and structure of higher education institutions are being increasingly examined and redefined [8]. These institutions are no longer isolated entities; instead, they are increasingly interconnected through international collaborations, exchanges, and the growing use of technology, making education more accessible and inclusive. The

integration of digital platforms has revolutionized access to education, promoting inclusivity and flexibility, thus enabling a more diverse student population to engage in academic activities. At the same time, higher education institutions have had to adapt their curricula to foster collaborative learning models that emphasize interdisciplinary knowledge [9].

The transformative potential of GenAI in higher education environments can develop primarily in two directions: changes related to pedagogical approaches and changes related to the administrative and organizational aspects of higher education. Considering that this innovative technology can offer new insights into personalized learning and teaching experiences, it fosters an environment where collaboration between students, teachers, and artificial intelligence can transform the higher education landscape [8, 10]. We agree that education is the fundamental starting point for all higher education institutions. The integration of GenAI technologies can become a potential for increasing the efficiency of higher education. Furthermore, the possibilities of using GenAI technology can serve as a catalyst for evolution within higher education, emphasizing the necessity of balancing artificial interactions with the human elements of teaching and learning [11]. Nonetheless, as institutions embrace this advancement, ethical considerations and the authenticity of these interactions cannot be overlooked. On the contrary, they occupy a significant place in the co-evolution within higher education [12].

Therefore, discussions and research studies within the academic world crucial for understanding the transformative potential as well as the starting points and significant challenges that could redefine the very essence of higher education.

## **METHODOLOGICAL APPROACH**

The methodology of this paper is based on a literature review aimed at exploring the integration of GenAI and related tools in higher education focusing on their transformative impacts on the field. This study employed the systematic literature review approach outlined by Tranfield [13]. The review consists of three main phases: planning, implementation, and presentation of results. In the planning phase, which includes formulating search queries and identifying possible data sources, this article chooses to search the IEEE Xplore and Wiley Online Library databases due to their broad coverage of important journals relevant to our topic. Given that the Scopus database is primarily of interest to researchers and has been well-covered in previous studies, it was also considered a significant source for future research [14-16].

We consider that these two databases also have a significant impact on higher education and GenAI, which is why we decided to cover these two databases in our research. When determining the time frame, we chose to analyse all papers published during the year 2024. Since ChatGPT emerged in 2022, which is a relatively new technology, we believe its effects on higher education can only be observed in papers published during 2024. After selecting the time frame, we proceeded to determine the key terms and concepts for the search that would best describe our topic. We analysed key terms that cover this area, such as: GenAI, AI, ChatGPT, Artificial Intelligence, Higher Education, Transformative AI, and Co-evolution. We selected English for the search language and the language of publications. When organizing the research process itself, we decided to focus on publications and journals, defining the scope of the search to include titles, abstracts, and keywords of the papers. Following the initial analysis, the most cited papers will be selected and analysed thematically and in terms of content.

This straightforward analysis aims to understand the current development and potential applications of GenAI in higher education through combined descriptions, thematic approaches, possible patterns, and applications. We are particularly interested in emerging trends and potential directions for future research.

To ensure consistency in the review, specific inclusion and exclusion criteria have been defined, which will serve as a reference in the process of selecting papers, Tables 1 and 2.

**Table 1.** Inclusion and exclusion criteria for selecting GenAI-related articles in higher education.

Phase One: Planning	<ul style="list-style-type: none"> <li>• <b>Key Search Terms and String:</b> ("Artificial Intelligence" OR "AI" OR "GenAI" OR "ChatGPT") AND ("higher education")</li> <li>• <b>Databases for Search:</b> Only IEEE Xplore and Wiley Online Library</li> <li>• <b>Scope of Sources for Search:</b> Titles, abstracts and keywords</li> <li>• <b>Publication Time Frame:</b> From January 1, 2024, to December 1, 2025</li> <li>• <b>Languages of Publications to Include:</b> Only publications in English</li> <li>• <b>Type of Publication:</b> Only peer-reviewed journal articles</li> </ul>
Phase Two: Implementation	<ul style="list-style-type: none"> <li>• <b>Searching for Publications in Defined Databases Using Search Keywords and Inclusion Criteria</b></li> <li>• <b>Refining the Found Publications and Removing Duplicates</b></li> <li>• <b>Checking Publications Against Inclusion and Exclusion Criteria</b></li> </ul>
Phase Three: Presentation of Results	<p><b>Presentation of Results in Two Parts:</b></p> <ul style="list-style-type: none"> <li>• <b>Descriptive Analysis</b></li> <li>• <b>Thematic Analysis</b></li> </ul>

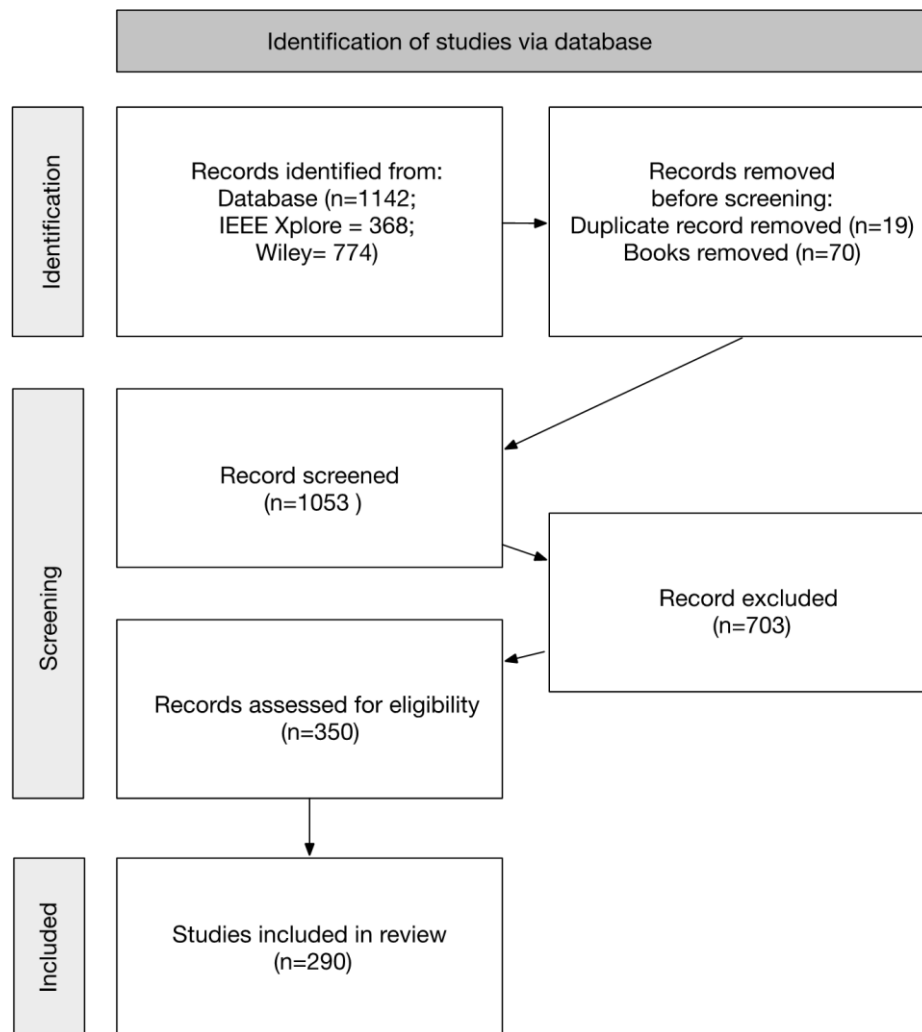
**Table 2.** Thematic classification categories for GenAI applications and challenges in higher education.

Criteria for Inclusion:	<ul style="list-style-type: none"> <li>• Peer-reviewed journal articles with open access</li> <li>• English language</li> <li>• Published during 2024</li> <li>• AI and GenAI as the main focus of the paper</li> <li>• AI and GenAI in the context of higher education</li> </ul>
Criteria Not Considered:	<ul style="list-style-type: none"> <li>• Books, conference papers, non-peer-reviewed scientific articles, theses</li> <li>• Systematic literature reviews and bibliometric analyses</li> <li>• AI is not the main focus of the paper</li> <li>• AI outside the context of higher education</li> </ul>

To conduct the thematic classification, we decided to use the previously described advantages and disadvantages as the core elements of classification, which we will address in the thematic section of the review of paper abstracts. The classification elements include: GenAI in higher education, Personalized assessment and self-assessment, Virtual teacher and virtual tutoring (Intelligent tutoring systems), Enhanced inclusive accessibility, Administrative support for students and teachers, Ethical challenges of using GenAI technology. In cases where we had uncertainties in selecting the appropriate category, both researchers discussed, expressed their opinions, and made a decision.

## **PRESENTATION OF RESULTS**

As shown in Figure 1, the number of papers included in the study is 290. This number represents almost the same number of publications published in 2023 compared to the results of the review by Alateyyat and Soltan [14], which show that the number of publications in 2023 was 295.



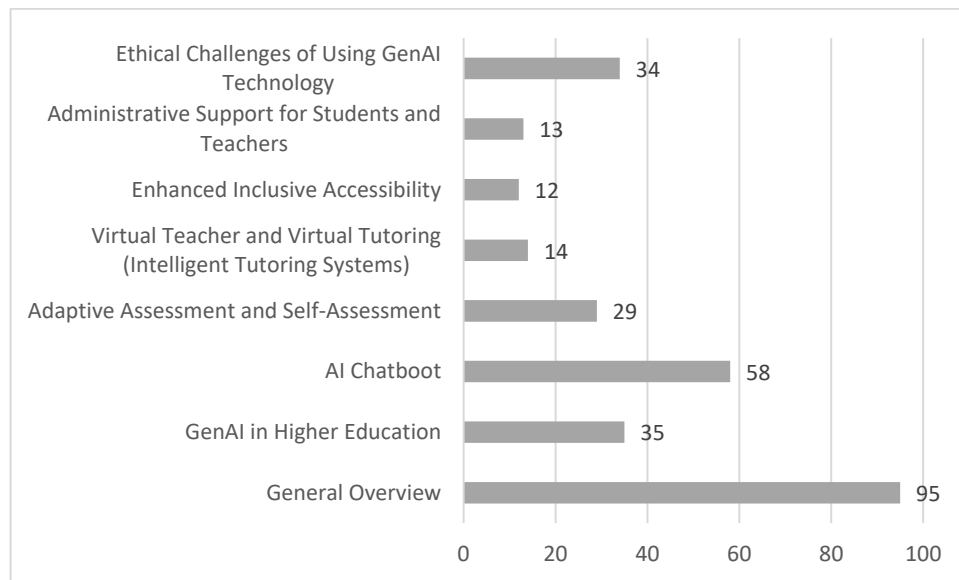
**Figure 1.** Number of GenAI-related articles in higher education included in the review ( $n = 290$ ).

It is important to highlight that the mentioned results cannot be entirely compared as they cover different databases. However, researchers are equally active in all databases, and when viewed from the perspective of the topic, the results are comparable.

Despite the initially large number of publications in the two observed databases, a large portion of the papers covers the field of higher education. Interestingly, many of the papers focused on higher education in the field of Medical Sciences, which suggests that researchers in this area have recognized the potential applications of GenAI in this specific form of education and have directed their research in that direction. We expected the highest number of articles to focus on a general overview of the GenAI field, Figure 2, which turned out to be the case, with most papers (95) addressing the issue of GenAI in various areas of higher education. Considering that majority of authors in as many as 58 papers explore the possibilities or describe experiences of using chatbots, these experiences are focused on supporting studying, as communication is available 24/7 and tailored to the student.

A significant number of these papers is focused on the communication aspect between the student and the “system”. It is important to note the term “system” since the communication is designed to aid the students in their studies, supporting personalized learning, and helping the students navigate within higher education administrative frameworks.

Thirty-four papers address the ethical considerations of using GenAI in the higher education environment. This indicates that researchers are questioning and seeking solutions for answers to ethical concerns that have arisen in the use of GenAI, such as authorship, plagiarism, and bias.



**Figure 2.** Thematic distribution of reviewed GenAI-related articles across GenAI focus areas in higher education.

Thirty-five papers explore GenAI in higher education, indicating a considerable volume of research. These studies encourage our exploration of the use of GenAI in higher education. It is particularly important that they address various aspects of its application, from the organization of studying to direct assistance to students and teachers. The focus on the assessment area is particularly emphasized, which is expected. Throughout the history of using digital systems in education, the issue of unbiased assessment has consistently been of great significance. The classification elements – GenAI in higher education, personalized assessment and self-assessment, virtual teacher and virtual tutoring (intelligent tutoring systems), improved inclusive accessibility, administrative support for students and teachers, and ethical challenges of using GenAI technology – proved to be a good choice, as most of the papers covered these topics.

What is surprising is that our research did not find any publications that mention the transformative possibilities of GenAI or co-evolution in higher education in their abstracts.

## **POSSIBILITIES AND LIMITATIONS OF GENAI IN HIGHER EDUCATION**

ChatGPT, as the first tool developed by OpenAI based on deep LLMs, has the capacity to provide students with personalized feedback and explanations, as well as realistic virtual simulations for practical learning, thus promoting individualized and effective learning experiences. By analysing the potential of GenAI technology in higher education, we identify the following possibilities for the application of GenAI technology:

### **GENAI IN HIGHER EDUCATION – PERSONALIZED FORMS OF STUDYING**

GenAI tools can customize teaching materials to individual learning styles for each student. Adaptation is possible based on students' interests by enhancing the study experience through the creation of various tailored exercises, explanations, or learning resources. In previous adaptations of learning and teaching environments, an approximate student model was created to provide information to various Smart Education systems regarding students, enabling personalized studying for students [17, 18].

Based on the previously described GenAI capabilities, the potential to build a high-quality student model is evident. This model will include, among other things, various academic

elements such as educational background, tests performance, knowledge and skill exams, answer accuracy, and error analysis to identify areas where improvement is needed, or a different approach is required. Specific algorithms emerge here as a transformative approach by analysing large amounts of data in real time. Additionally, the collected information may also be important for the teacher, enabling them to better understand the student within the higher education environment. Furthermore, the construction of the student model must support preferences for a multimodal approach tailored to each student [19].

### **CUSTOMIZED ASSESSMENT AND SELF-ASSESSMENT**

GenAI, functioning as a language model, primarily has the ability to quickly analyse large amounts of various materials such as student essays, projects, or responses to questions, evaluating grammatical accuracy, structure, and content. This creates the opportunity for a high-quality, individualized method of evaluation. Similarly, it can generate customized feedback with recommendations for further work in real time. This form of self-assessment can assist students in better preparing for various knowledge tests, and it can also aid teachers in preparing different forms of learning outcomes such as knowledge, skills, and attitudes. What we can expect in the future from GenAI is an unbiased, continuous approach to both assessment and self-assessment [20, 21]. Artificial intelligence models used in adaptive assessments must be trained and rigorously tested to mitigate bias and ensure fairness in evaluation [6]. Bias in artificial intelligence models can result in inequality in evaluation outcomes. The use of technology in assessment may pose challenges regarding accessibility for inclusive students, but it can also significantly improve and adapt it [20].

### **VIRTUAL TEACHER AND VIRTUAL TUTORING (INTELLIGENT TUTORING SYSTEMS)**

Various GenAI-based chatbots provide real-time responses to students' questions, primarily related to lectures, course content, deadlines, or organization of student life, with assistance accessible around the clock. Students can inquire at any time about their rights, obligations, and other issues, enabling easier access to studying and improving administrative efficiency [22]. This virtual teacher or assistant, through its communicative approach, can also include various simulations and adapt to the student. It can also generate ideas for research topics, academic papers, or assist in data analysis and processing, all aimed at fostering promoting improved academic guidance and active learning. Many researchers believe that ChatGPT algorithms face issues with bias, stereotypes, and occasional hallucinations, which may affect the quality of the service provided [23].

It is particularly important to note the challenges faced by researchers and students regarding the use of GenAI in education. The most frequently cited issues are related to ethical concerns. Privacy and data security are very sensitive areas, especially when employing GenAI algorithms. The algorithms used should manage student data, which makes it crucial to ensure the protection of student information and to limit its use solely for educational purposes related to the personalization of learning.

### **IMPROVED ACCESSIBILITY**

One of the significant aids for adaptation can be crucial for various inclusive characteristics of students, helping them simplify complex topics, translations, or the reading of teaching materials, etc. [24]. It can also enhance communication for students with speech difficulties. In this context, GenAI can depend on other existing technologies that are used by inclusive students [25].

## **ADMINISTRATIVE SUPPORT**

Automating administrative tasks is an area where GenAI systems can significantly assist and impact the education process in higher education institutions. GenAI tools can help teachers and administrative staff to simplify tasks such as scheduling, tracking attendance, coordinating lessons and projects, as well as managing scientific and teaching activities. By automating these time-consuming tasks, teachers and administrative personnel can focus more on planning course content, projects, student life, and encouraging greater student engagement.

Nonetheless, it is essential to consider the limitations of GenAI. Since generative GenAI systems rely on the data they are trained on, they have the potential to create and spread false or ethically questionable information, as well as to promote biases. Ethical concerns are critical and are rightly being questioned within higher education communities, particularly those related to the unethical or unfair use of GenAI [26]. Analysing articles in this field, most authors highlight the issue of plagiarism in various student works, “hallucination” or the generation of inaccurate, false or misleading information, and violations of copyright [27].

The literature includes multiple strategies that educators can employ to address these challenges, such as giving clear and detailed assignments to students, structuring tasks, or creating new types of assignments that require student responses without using different GenAI tools. Furthermore, it is essential to educate students about utilizing GenAI tools, and understanding plagiarism (clarifying why it is inappropriate), among other topics. This task is not simple, which is why higher education institutions have generally introduced Ethical Guidelines for the use of GenAI tools, which they regularly update.

## **CONCLUSION**

The future of education is undoubtedly about pushing the boundaries of traditional learning by encouraging personalized approaches and adaptive teaching, for which GenAI has potential. Dai and Liu state that the path “From personalized content generation to conducting adaptive assessments, virtual mentors, personalized learning pathways, domain-specific learning, project-based learning, and continuous improvement in learning, the role of generative artificial intelligence in education is multifaceted and promising” [28]. We can agree that GenAI has the potential to empower students in their efforts, as well as assist teachers in the newly emerging environments of higher education communities, which are inevitably changing with new technologies. It should be noted that labour markets anticipate that students who complete their education to possess systematic knowledge for using various GenAI tools in their future workplaces, which is crucial for competitiveness in the job market.

To develop new, more efficient processes and organizations using GenAI, it is important for leaders of higher education institutions to understand the potential of GenAI technology and encourage its integration into various processes. GenAI, in combination with traditional machine learning, can effectively process, analyse, and summarize different content and large datasets in order to identify various causes and insights across all business operations. This can include generating reports, analysing the study process itself, and even predicting student success or future college enrolments.

It is important to note that human judgment is essential for processes involving social content, especially those that require adaptation, social empathy, and ethical approaches.

## **REMARK**

<sup>1</sup>Generative AI (GAI) is the name given to a subset of AI machine learning technologies that have recently developed the ability to rapidly create content in response to text prompts, which

can range from short and simple to very long and complex (<https://www.oracle.com/artificial-intelligence/generative-ai/what-is-generative-ai>).

## REFERENCES

- [1] Mhlanga, D.: *Open AI in Education, the Responsible and Ethical Use of ChatGPT Towards Lifelong Learning*. SSRN Electronic Journal, 2023, <http://dx.doi.org/10.2139/ssrn.4354422>,
- [2] Lang, V.: *Digital Fluency*. Apress Berkeley, 2021, <http://dx.doi.org/10.1007/978-1-4842-6774-5>,
- [3] Buchanan, B.G.: *A (Very) Brief History of Artificial Intelligence*. AI Magazine **26**(4), 53-60, 2025, <http://dx.doi.org/10.1609/aimag.v26i4.1848>,
- [4] Simaremare, M.E.S.; Pardede, C.; Tampubolon, I.N.I.; Simangunsong, D.A. and Manurung, P.E.: *The Penetration of Generative AI in Higher Education: A Survey*. 2024. In: IEEE Integrated STEM Education Conference (ISEC). Princeton, 2024, <http://dx.doi.org/10.1109/ISEC61299.2024.10664825>,
- [5] Lahby, M.: *Empowering Digital Education with ChatGPT: From Theoretical to Practical Applications*. Chapman and Hall/CRC, New York, 2024, <http://dx.doi.org/10.1201/9781032716350>,
- [6] Alam, A. and Mohanty, A.: *Foundation for the Future of Higher Education or 'Misplaced Optimism'? Being Human in the Age of Artificial Intelligence*. In: Panda, M., et al., eds.: *Innovations in Intelligent Computing and Communication* **1737**. Springer International Publishing, pp.17-29, 2022, [http://dx.doi.org/10.1007/978-3-031-23233-6\\_2](http://dx.doi.org/10.1007/978-3-031-23233-6_2),
- [7] Livvarcin, D.O. and Traoré, Y.: *Understanding and Using AI: A Resource for Nonprofit Leaders*. Business Expert Press, 2024,
- [8] Ifenthaler, D.; Hofhues, S.; Egloffstein, M. and Helbig, C.: *Digital Transformation of Learning Organizations*. Springer, Cham, 2021, <http://dx.doi.org/10.1007/978-3-030-55878-9>,
- [9] Baidoo-Anu, D. and Ansah, L.: *Education in the Era of Generative Artificial Intelligence (AI): Understanding the Potential Benefits of ChatGPT in Promoting Teaching and Learning*. Journal of AI **7**(1), 52-62, 2023, <http://dx.doi.org/10.61969/jai.1337500>,
- [10] Levi, G.: *Transforming Education in the Generative AI Era [an introduction]*. <https://medium.com/@guylevi.57/transforming-education-in-the-generative-ai-era-4c7e177a8415>,
- [11] Browning, J.W.; Bustard, J.; Anderson, N. and Galway, L.: *A Data Science Course Utilizing GenAI*. In: 2024 IEEE Frontiers in Education Conference (FIE). Washington, 2024, <http://dx.doi.org/10.1109/FIE61694.2024.10893452>,
- [12] Yiling, H.; Zihong, Z. and Fang, W.: *Research on the Co-evolution Model of AI Education Ecosystem: The Perspective of Complex System*. Journal of East China Normal University (Educational Sciences) **40**(9), 118-126, 2022, <http://dx.doi.org/10.16382/j.cnki.1000-5560.2022.09.011>,
- [13] Tranfield, D.; Denyer, D. and Smart, P.: *Towards a Methodology for Developing Evidence-Informed Management Knowledge by Means of Systematic Review*. British Journal of Management **14**(3), 207-222, 2003, <http://dx.doi.org/10.1111/1467-8551.00375>,

- [14] Alateyyat, S. and Soltan, M.: *Utilizing Artificial Intelligence in Higher Education: A Systematic Review*.  
In: 2024 ASU International Conference in Emerging Technologies for Sustainability and Intelligent Systems (ICETISIS). Manama, pp.371-374, 2024,  
<http://dx.doi.org/10.1109/ICETISIS61505.2024.10459629>,
- [15] Crompton, H. and Burke, D.: *Artificial intelligence in higher education: The state of the field*.  
International Journal of Educational Technology in Higher Education **20**(1), No. 22, 2023,  
<http://dx.doi.org/10.1186/s41239-023-00392-8>,
- [16] Ogunleye, B.; Zakariyyah, K.I.; Ajao, O.; Olayinka, O. and Sharma, H.: *A Systematic Review of Generative AI for Teaching and Learning Practice*.  
Education Sciences **14**(6), No. 636, 2024,  
<http://dx.doi.org/10.3390/educsci14060636>,
- [17] Chang, M. and Li, Y., eds.: *Smart Learning Environments*.  
Lecture Notes in Educational Technology. Springer, Berlin & Heidelberg, 2015,  
<http://dx.doi.org/10.1007/978-3-662-44447-4>,
- [18] Dumančić, M.: *Smart education in Smart City and Student model*.  
In: *Proceedings of the 19<sup>th</sup> International Scientific Conference “eLearning and Software for Education”*. Vol. 2. ADL Romania, Bucharest, pp.64-71, 2019,  
<http://dx.doi.org/10.12753/2066-026x-19-077>,
- [19] Shah, P.: *AI and the future of education: Teaching in the age of artificial intelligence*.  
John Wiley & Sons, Inc., 2023,
- [20] Dumitru, C.: *ChatGPT for Personalized Learning in Higher Education*.  
In: Lahby, M., ed.: *Empowering Digital Education with ChatGPT*. Chapman and Hall/CRC, New York, pp.98-110, 2024,  
<http://dx.doi.org/10.1201/9781032716350-7>,
- [21] Salinas-Navarro, D.E.; Vilalta-Perdomo, E.; Michel-Villarreal, R. and Montesinos, L.: *Designing experiential learning activities with generative artificial intelligence tools for authentic assessment*.  
Interactive Technology and Smart Education **21**(4), 708-734, 2024,  
<http://dx.doi.org/10.1108/ITSE-12-2023-0236>,
- [22] Giannakos, M., et al.: *The promise and challenges of generative AI in education*.  
Behaviour & Information Technology **44**(11), 2518-2544, 2025,  
<http://dx.doi.org/10.1080/0144929X.2024.2394886>,
- [23] Singh, R., et al.: *Introduction to Generative Artificial Intelligence*.  
Archives of Pathology and Laboratory Medicine **149**(2), 112-122, 2025,  
<http://dx.doi.org/10.5858/arpa.2024-0221-RA>,
- [24] –: *Artificial Intelligence in action: Advancing inclusive education for learners with disabilities and special needs*.  
<https://easped.eu/news-detail/artificial-intelligence-in-action-advancing-inclusive-education-for-learners-with-disabilities-and-special-needs>,
- [25] –: *AI and Accessibility: Leveraging AI for Inclusive Education*.  
<https://support.park.edu/support/solutions/articles/6000275009-ai-and-accessibility-leveraging-ai-for-inclusive-education>, accessed 10<sup>th</sup> March 2025,
- [26] Dickey, E. and Bejarano, A.: *GAIDE: A Framework for Using Generative AI to Assist in Course Content Development*.  
In: 2024 IEEE Frontiers in Education Conference (FIE). Washington, pp.1-9, 2024,  
<http://dx.doi.org/10.1109/FIE61694.2024.10893132>,
- [27] –: *AI Tools in Teaching and Learning: Teaching Commons*.  
<https://teachingcommons.stanford.edu/news/ai-tools-teaching-and-learning>,
- [28] Dai, Y.; Liu, A. and Lim, C.P.: *Reconceptualizing ChatGPT and generative AI as a student-driven innovation in higher education*.  
Procedia CIRP **119**, 84-90, 2023,  
<http://dx.doi.org/10.1016/j.procir.2023.05.002>.