Artificial Intelligence in Business Schools: A Systematic Approach to Developing Disciplinary and Soft Skill

Laura Esther Zapata Cantú[1,†], Martha Elena Moreno Barbosa[2,*,†], Ana Gabriela Rodriguez Mendoza[1,†], Laura Patricia Aldape Valdés[1] and Myriam Villarreal Rodríguez[1]

1 Tecnológico de Monterrey, Av. Eugenio Garza Sada 2501 Sur, Tecnológico, 64700 Monterrey, N.L. Mexico.

2 Tecnológico de Monterrey, Av. Gral Ramón Corona No 2514, Colonia Nuevo México, 45201 Zapopan, Jal, México

Abstract

In the evolving landscape of education, the integration of Artificial Intelligence (AI) represents a transformative shift, stipulating a new era of learning and teaching methodologies. This study explores AI roles in modern education, focusing on the primacy of a learning and teaching methodology for a Mexican business school with a multicampus presence and a competences assessment as key for its educational model. The preliminary findings show that effectiveness in both technological acceptance and educational performance impact positively and higher than a course without AI methodology. The main contributions of this study are to provide business students with AI training, which is perceived to be highly relevant to students' future career and to have a specific methodology to incorporate AI the business school curriculum is critical to a multicampus deployment

Keywords

AI Integration in Curriculum, Business Education, Competency Development, Student-Centered Learning

1 Introduction

The introduction of AI in business schools transcends mere technological advancement and extends beyond traditional teaching methods, reshaping the educational experience. AI enhances educational processes and develops essential skills, challenging business schools when considering offering AI courses due to the lack of pedagogical resources. However, there is a misalignment and lack of clarity on how students can use this emergent technology to benefit from and avoid its pitfalls and shortcomings in their academic journey [15,19,8].

With typical teaching methods in management and business courses, such as case studies, students can't assimilate the impact of AI in organizations merely reading stories about how companies and organizations employ AI to help with decision-making and problem-solving. Business graduates will unlikely need to handle all the intricacies of AI algorithms and representations. AI training in business schools may not necessarily need programming assignments as in computing and engineering disciplines [25]. In business schools, the insertion of AI in the classroom requires a systematic approach to consider AI literacy, critical thinking, creativity, and ethics.

In this regard, examining the AI course incorporation implications, challenges, and opportunities in shaping the future of business education became critical. This integration requires a paradigm shift in how education is approached using AI, moving beyond traditional methods to embrace more dynamic, interactive, and student-centered learning environments [20].

Whereas previous papers have already hinted at the importance of recognizing the relevance of AI in the classroom and suggested preliminary frameworks [3], the present study entails a methodological proposal designed for a business school of a multi-campus university in Mexico.

The design of this proposal has evoked a discussion about the proper utilization of AI in terms of the necessary skill set applied and the incremental application and tool uses according to program levels, such as introductory, disciplinary, and specialized courses.

Together, this leads to a case study for an outlook on how a necessary skill set of AI use in the educational setting may be beneficially honed. Additionally, the university educational model based on competencies development requires considering how students not only apply AI in course activities but also allow them to apply and assess specific competencies defined to be developed in courses curricula.

Equally important is assessing student learning outcomes and perceptions, which can be used as an essential input or curriculum design and improvement. However, since AI courses have not been widely offered in business schools, there has been little research reporting student learning outcomes and their opinions toward various aspects of the curriculum, as well as their perceptions of the relevance of AI education to their future careers [25].

We present curricular decisions and findings regarding the overall design and various components of the methodology that we propose as relevant in this educational scenario, incorporating AI prevalence course objective and competencies assessment. Through this exploratory study, we intend to address several research questions: What additional activities could be essential to pursue course objectives when AI is incorporated as an educational technique? how do business school need to incorporate AI in the curricula in academic model based on competences development? Several scholars are calling for new studies on the broad understanding of AI impact on students and academics [2]. For instance, Kumar et al. (2024) [emphasis added]) argue that 'the exclusive research on the application of AI in business education is relatively novel than other fields and requires attention of researchers and academicians [11].

2   Literature review

Artificial Intelligence (AI) is revolutionizing higher education by offering tools and technologies that enhance the learning process and experiences [14]. AI systems, such as chatbots, can increase students' cognitive activity and reduce the gap between high- and low-performing students [13], empowering students to predict their learning outcomes and regulate their behavior strategically [1], identify gaps in learning and improve academic performance by linking with innovative assessment practices [14], and AI can positively influence academic performance and student satisfaction [16].

The integration of AI in business education is a growing area, with research exploring its benefits and challenges [25]. Recent research has focused on the adoption and use of AI as an educational and pedagogical technology to enhance the student's learning experience such as personalized tutoring systems, educational robots, and adaptive learning environments.

The learning experience research has also identified AI paradigms in education: "AI-direct, learner-as-recipient", where AI leads learning with a defined pathway for the student; "AI-supported, learner-as-collaborator", where AI optimizes interaction among students, information, and technology; and "AI-empowered, learner-as-leader", where AI enhances learners' intelligence through a complex system [16]. However, there are authors who ask for caution about the intrinsic limitations of AI, highlighting the importance of considering implications beyond AI's cognitive processes and calculations [4].

2.1   AI as a driving force for business schools

Despite the potential benefits and the growing enthusiasm, AI education in business schools faces more challenges than in engineering schools [18]. Among these challenges are faculty, course updating and pedagogical techniques.

Faculty pressure to haunting the HE ecosystem mainly because content created by GenAI cannot be reliably detected by conventional plagiarism mechanisms and not even the exact source can be indicated to show where the content was copied from (e.g. [6]). Adding complexity to this discussion is the identified 'behaviour' of GPTs generating false and misleading text. Van Dis et al. (2023) found that an article created by GenAI has fabricated convincing responses but with factual errors and wrong data interpretation. This scenario raises awareness of the 'thin line' that separates GenAI benefits and harm in the students' educational journey in HE [23].

The difficulty to teach introductory AI courses, even in engineering programs [18], because its complexity, encompassing many advanced topics and techniques. In addition, AI research and application is rapidly updating the body of knowledge related to AI, making the subject even more difficult to teach.

Finally, The scarcity of pedagogical resources and the lack of design principles and guidelines for curriculum development [25]. Disciplinary associations, such as the Association to Advance Collegiate Schools of Business (AACSB), have anticipated the potential impacts of AI on business education, but have not recommended a specific curricular model.

2.2   AI in Business Education and Curriculum Alignment

In business schools, AI is recognized as a transformative force, emerging trends in the industry move to the adaptation of academic programs, enabling students to graduate with relevant skills and be prepared to face the challenges of the labor market [9]. Integrating AI into curricula ensures that students acquire future-proof competencies and skills, enabling them to respond effectively to the demands of a constantly evolving business environment.

Furthermore, AI facilitates teaching innovation by enabling data-driven instructional design, simulation-based learning, and interactive content delivery [21]. These innovations are crucial in disciplines such as management, marketing, and finance, where digital transformation is reshaping industry norms.

In this regard, it becomes critical to explore how AI technologies are being embedded in undergraduate business programs, and what institutional strategies ensure that AI use aligns with pedagogical goals, ethical standards, and industry needs. The literature exposes some case studies conducted as a main exploratory research strategy. The main results are oriented to understand the experiences of students and professors in using AI. For instance, in this study in Brazil, 35 engineering and business students used GenAI tools to develop their activities in group projects. The results show that AI has improved collaboration among students and had a positive impact on their teamwork. Additionally, topics such as ethics, trust, and the human role in GenAI integration have been addressed [14].

Similar results are presented in a authors and references who conducted a study at a university in Romania. These authors investigated the knowledge and perception of students, professors, and entrepreneurs regarding the use of AI in business education. The survey revealed that, although many students had previously used AI, there was a widespread lack of preparedness to adopt AI in the educational process. The results showed that only 71.3% of students used AI in business education, and 46.8% stated they were not prepared for its adoption. Furthermore, it was found that professors were less prepared than students to integrate AI in business education. The study highlighted the importance of the role of professors in the effective implementation of adaptive technologies in the educational process and emphasized the need to improve knowledge and understanding of AI tools and their benefits to be better prepared in their entrepreneurial role.

Given the existing literature's suggestion of a lack of effective integration of Artificial Intelligence (AI) as a teaching-learning methodology in business schools, this proposal seeks to develop a comprehensive model that considers graduate competencies, the student's role, the importance of faculty, and the integration of AI in the curriculum. The objective is to foster the development of both soft and hard skills in students, as well as provide a deep understanding of the challenges and opportunities in the labor market.

3   Methodology

We use case study, as an exploratory research method, to understand the dynamics inside classroom professors, students and content as well as the main pedagogical processes such as evaluation and competences assessment. We use semi-structured interviews and results from two pilot projects based on artificial intelligent [26]. The study was conducted in a business school of a multi-campus private university in Mexico.

3.1   Case study: Multicampus private university

The university under study is a private institution with a strong international recognized for its innovative educational model, strong emphasis on technological education and research. It has 20 campuses in Mexico offering undergraduate, graduate, and executive education programs. The university serves approximately 60,000 students and is known for its commitment to innovation, close ties with industry and society.

In this institution, the use of GenAI has been regulated based on institutional guidelines. Like many other universities, this university has had significant challenges with finding an adequate response to the introduction of ChatGPT and other AI applications and its following adoption by students, professors, and academic collaborators. It was deemed important by the AI-Taskforce as well as the school's leadership that there was going to be a nuanced approach towards handling the new technology. Whereas some institutions banned LLMs right away, others embraced them wholeheartedly and barely enforced any restrictions in their use.

First, the institution wanted to enforce full transparency on how AI is used. Second, students should become keenly aware that they must stay critical towards an AI's output and must hence report on how students made sure that they did not fall prey to the classic AI problems (such as hallucinations) as well as to make sure that students' work made during classes was by their own.

Literature review exposes a clear understanding of crucial themes to be considered in the developing of an educational innovative model such as, a) Harnessing AI for enhanced academic performance, b) AI ethics and trust impact on learning, c) AI as a supplement to human work, d) ecosystem: main actors and their own actions and responsibilities.

In a new educational model, additional of these themes, it is needed to review and reinterpreted course and classroom dynamics. Critical thinking and ethical considerations became essential. Critical thinking, in the context of AI education, involves the ability to analyze information, evaluate different perspectives, and create reasoned arguments, all within the framework of AI-driven environments. This skill is increasingly important as AI becomes more prevalent in various aspects of life and work. In educational settings, AI can be used as a tool not just for delivering content, but also for encouraging students to question, analyze, and think deeply about the information they are presented with [22]. The use of AI in education offers unique opportunities to cultivate critical thinking.

Even when the integration of AI into education offers significant benefits, it also raises significant concerns. Scholars warn of risks such as data privacy violations, algorithmic biases, and the displacement of human educators [12]. Ensuring the ethical use of AI is critical. Classroom discussions are based on the recognition that AI is not omnipotent but has inherent limitations and weaknesses. Through direct experience of these limitations in practical tasks, students develop a greater appreciation for ethical considerations. Furthermore, they can analyze how the adoption of advanced AI technologies can generate significant and unprecedented risks to privacy, social equality, employment, public safety, and global sustainability [7].

Introducing ethics courses into academic training and building the capacity of AI development stakeholders can facilitate the integration of ethical values and the development of responsible AI [10]. The ethical implications of AI in education go beyond technical considerations and encompass broader societal impacts, such as privacy protection and social justice.

4 Educational model incorporating AI in a multicampus university

For The reason exposed above, a methodology to replicate in 20 campus was designed as well as the conformation of an AI expert task-force team which is integrated for one professor expert in each program discipline, Case Study International Center director, the faculty and academic deans. We call these team the AI apostles. Each disciplinary expert works hand-to-hand with national program directors and regional academic department chair. This cross-team work allows us to identify the courses with AI and assure the implementation of AI methodology in the 20 campi.

The methodology is composed of three elements: a Strategic Framework, the 5DIA Comprehensive Model, and the SABIA Pedagogical Technique.

4.1 Strategic Framework

The framework encompasses the integration of key elements for the use of AI in educational settings: the student's disciplinary and cross-curricular competencies, the level of difficulty associated with these competencies, and the student's academic journey throughout their academic program in the different disciplines of the Business School.

Each or the eight programs is comprised in three levels along the eight semester curricula: exploratory from 1 to 3 semester, disciplinary in 4, 5 and 8 semesters; and specialization for 6 and 7 semesters. Each level its aligned to cognitive development and has its own degree of competence development and AI depth incorporation. In that sense, we designed the following figure (figure 1) to differentiate the scope and depth of AI activities for each course.
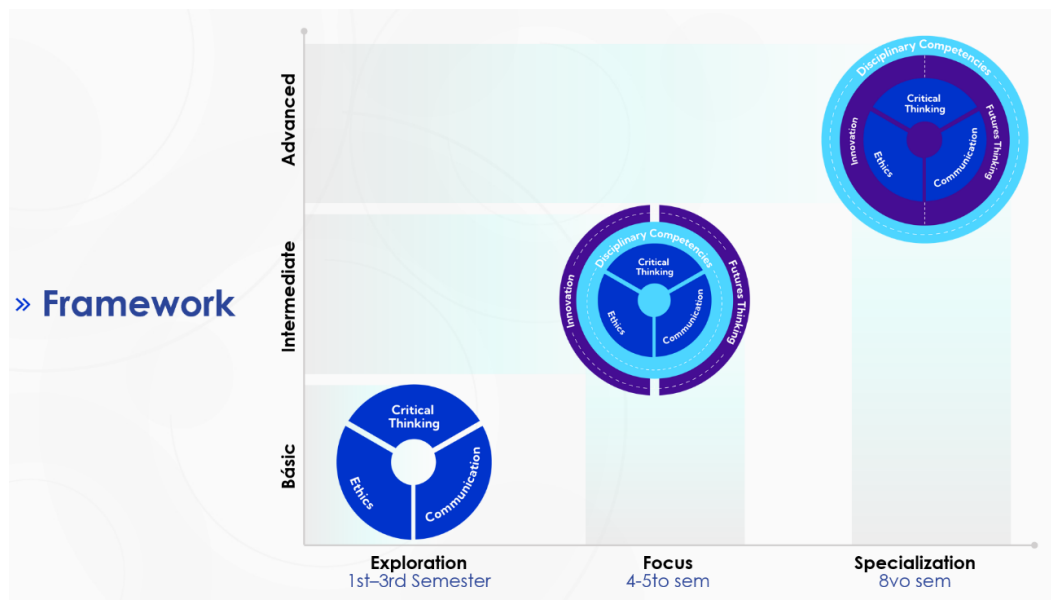

Figure 1: Framework model-3 circles

4.2 5DIA Comprehensive Model

Taking in count both concerns, we define an exclusive educational model to implement AI activities along business school disciplinaries courses in 20 campuses, we call this model 5DIA.

The 5DIA Comprehensive Model provides a structured guide from a teaching perspective for the implementation of learning experiences mediated by artificial intelligence. The 5DIA methodology offers a structured guide from the teacher's perspective for implementing AI-enabled learning experiences with pedagogical intent. It begins with the Diagnosis, which identifies the context and relevant content. In the Design phase, the teaching resource is developed, and the learning experience is articulated using the SABIA learning methodology to ensure consistency between the benefits for companies, the disciplinary competencies for each program, and the meaningful use of AI. Deployment corresponds to the implementation and evaluation of the experience. In the Discovery phase, the results are analyzed to generate learning and improvements. Finally, Dissemination allows for sharing findings and promoting feedback.

4.3   SABIA pedagogical technique

The SABIA sequence constitutes the methodological structure that guides teachers in the design of learning experiences that incorporate the use of artificial intelligence tools for pedagogical purposes. It begins with the activity statement, which defines the topic, learning objectives, expected deliverables, and how AI will be integrated. The activity development phase can contemplate the use of AI exclusively or optionally include a preliminary stage without AI, allowing for a formative contrast between the two approaches. Additionally, a "what if" analysis can be incorporated, introducing a hypothetical situation or a complementary trigger to the initial one, with the purpose of fostering critical thinking or verifying the strengthening of the proposed competencies. A fourth, optional component is group reflection, which seeks to promote the exchange of learning in the classroom. Finally, the argumentation stage allows students to demonstrate what they have learned through the presentation and justification of their decisions, promoting a deeper understanding of the content.

5 Preliminary findings

With the methodology explained above, the AI task-force team started to identify faculty profile regarding AI uses. In December 2024, a questionnaire was administered to a sample of 382 professors at Tecnológico de Monterrey, being 100 from the School of Business.

The results showed that 89% of the professors from the School of Business mentioned ChatGPT when thinking about Artificial Intelligence (AI). Among the professors who know and apply AI (n=89), 56% promote the use of AI in their classes. However, there are concerns about the use of AI in the classroom, highlighting three main aspects: (1) promoting a culture of little effort; (2) errors in decision-making, and (3) dependence on technology.   Despite these concerns, the potential of AI stands out for its ability to automate administrative tasks, improve efficiency in feedback and evaluation, benefiting both those who know it and those who do not.

Additionally, a pilot was conducted to implement SABIA. The GreenFlags Crafts project introduces an innovative approach to hyper-personalized learning by combining virtual reality and AI. Students are immersed in a digital environment where they explore the GreenFlags Crafts company, identify issues, and develop proposals based on the ISO 26000 standard. Guided by a pre-trained AI avatar, an expert in Corporate Social Responsibility, students successfully connect theory and practice, enhancing meaningful learning.

The application of the AI-SABIA sequence in this educational experience is described below:
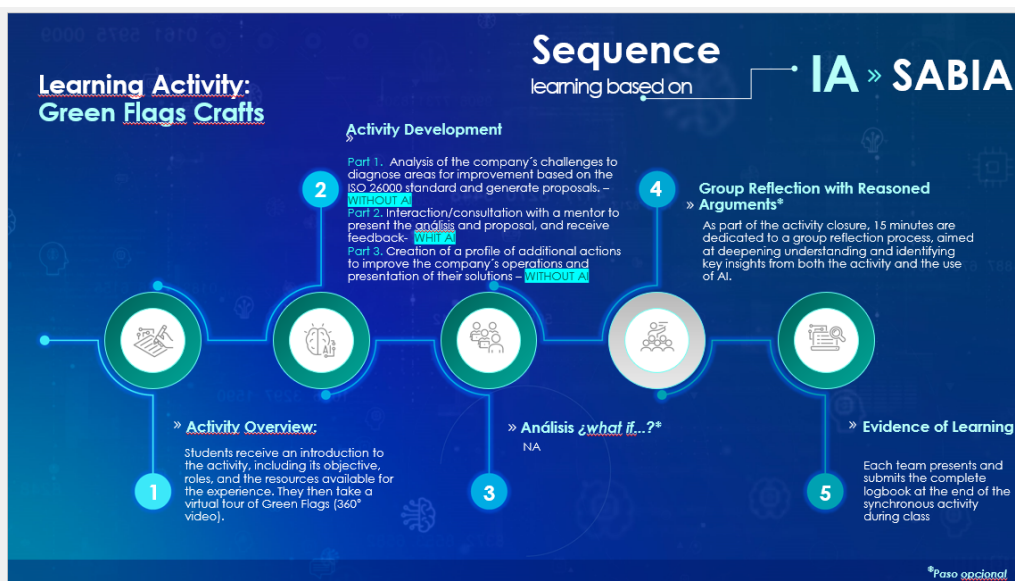
Figure 2: Example. AI-SABIA sequence in GreenFlags Crafts educational experience

For the measurement, an instrument based on Davis's (1989) TAM (Technology Acceptance Model) was used. This allowed for the evaluation of five dimensions: perceived usefulness, perceived ease of use (Enjoyment), and attitude and enjoyment toward using the technology (Engagement). Complementary dimensions such as meaningful learning and usability were evaluated.

During the first phase (February-June 2022), an exploratory test was conducted with two groups of 22 students (control and experimental), focused on validating technical feasibility, virtual reality design, and interaction with an artificial intelligence avatar. The experimental group showed greater technological acceptance and better academic performance, with an overall GPA of 9.27 versus 7.75, which supports the effectiveness of the implemented methodology.

These findings confirm its effectiveness in both technological acceptance and educational performance. Green Flags is an example of the future of effective, hyper-personalized education powered by AI. In the second phase (August-December 2024), the project was implemented on a larger scale (441 students) to evaluate its impact with a more representative sample. The results remained consistent, with an average of 9.22 compared to the previous 9.27, confirming the robustness and replicability of the intervention.

5.1 Continuity of the study

With the pilot results, AI task force team has identified courses to be implemented SABIA technique during August-December 2025 semester. The results will allow us to validate the relevance of AI activities in disciplinary courses integrating critical thinking and ethics considerations.

Additionally, we would like to confirm the speed in which professors are familiarizing with AI tools to reinforce disciplinary content and how students identify the value added when technology is needed to understand how business future will work.

6 Concluding remarks

The contribution of our work presented here is threefold: First, this exploratory study shows the possibility to provide business students with AI training, which is perceived to be highly relevant to students' future careers. Second, by presenting the methodology to incorporate AI the business school curriculum demonstrating what a framework may cover in term of course level and disciplinary scope a specific methodology and pedagogical technique may effectively facilitate students' learning. Third, we offer several practical guidelines for incorporate AI into the curriculum that other business educators may adopt in their courses.

Our study has several limitations. First, our exploratory study is based on a single business school and there are still preliminary findings which may not be generalizable to other institutions. Second, we could not draw any statistical conclusions regarding factors affecting learning outcomes because of the pilot stage of the study. As a result, our research is merely a case study, and our findings may have limited applicability. Our future studies will seek to address the research questions in a large course sample. With continued application of 5DIA methodology and SABIA technique we will curriculum design based on student feedback, we hope we will be able to gather more data and insights into the pedagogy of AI in business schools.

Finally, AI usage in higher education is in its infancy but growing at a fast pace, institutional support will be essential to ensure its sustainable and ethical use. Professional development should go beyond technical skills to include ethical considerations and strategies for enhancing learning. Additionally, collaborative communities will be vital for educators to share experiences and innovate collectively to enable GenAI's effective and meaningful integration.

Declaration on Generative AI

During the preparation of this work, the author(s) used GPT-4 in order to: Grammar and spelling check. After using these tool(s)/service(s), the author(s) reviewed and edited the content as needed and take(s) full responsibility for the publication's content.

References

[1] Almasri, F, Exploring the Impact of Artificial Intelligence in Teaching and Learning of Science: A Systematic Review of Empirical Research. Res Sci Educ (2024) 54, pp. 977–997 (2024). doi:10.1007/s11165-024-10176-3

[2] Shum, S. B., & Luckin, R, Learning analytics and AI: Politics, pedagogy and practices. British Journal of Educational Technology, (2019), 50(6), pp. 2785-2793, doi:10.1111/bjet.12880

[3] Chan, C.K.Y, A comprehensive AI policy education framework for university teaching and learning. Int J Educ Technol High Educ (2023), pp. 20, 38. doi:10.1186/s41239-023-00408-3.

[4] Cope, B., Kalantzis, M., & Searsmith, D, Artificial intelligence for education: Knowledge and its assessment in AI-enabled learning ecologies. Educational philosophy and theory, (2021), volume 53(12), pp. 1229-1245.

[5] Davis, F. D, Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS quarterly, (1989), pp. 319-340. doi: 10.2307/249008

[6] Farrelly, T., & Baker, N, Generative artificial intelligence: Implications and considerations for higher education practice. Education Sciences, (2023). volume 13(11), doi: 10.3390/educsci13111109

[7] Goralski, M. A., & Tan, T. K, Artificial intelligence and sustainable development. The International Journal of Management Education, (2020), volume 18(1), doi: 10.1016/j.ijme.2019.100330

[8] Guha, A., Grewal, D., & Atlas, S, Generative AI and Marketing Education: What the Future Holds. Journal of Marketing Education, (2023), 46(1), pp. 6-17. doi: 10.1177/02734753231215436 (Original work published 2024)

[9] Harry, A., & Sayudin, S, Role of AI in Education. Injuruty: Interdisciplinary Journal and Humanity,(2023) Volumen 2 (3), pp. 260–268. doi: 10.58631/injurity.v2i3.52

[10] Kiemde, S.M.A., Kora, A.D. Towards an ethics of AI in Africa: rule of education. AI Ethics 2, 35–40 (2022). doi: 10.1007/s43681-021-00106-8

[11] Kumar, V., Ashraf, A. R., & Nadeem, W, AI-powered marketing: What, where, and how?. International Journal of Information Management, 77, (2024) doi: 10.1016/j.ijinfomgt.2024.102783

[12] Lampou, R, The integration of artificial intelligence in education: Opportunities and challenges. Review of Artificial Intelligence in Education, 4, (2023), e15-e15. doi: 0.37497/rev.artif.intell.educ.v4i00.15

[13] Lee, M. C., Scheepers, H., Lui, A. K., & Ngai, E. W, The implementation of artificial intelligence in organizations: A systematic literature review. Information & Management, (2023), volume 60(5), doi: 103816.

[14] Leite, H, Artificial intelligence in higher education: Research notes from a longitudinal study. Technological Forecasting and Social Change, (2025), pp. 215, doi; 124115.

[15] O'Connor, S, Open Artificial Intelligence Platforms in Nursing Education: Tools for Academic Progress or Abuse? Nurse Education in Practice, (2023), pp 66, doi:103537.

[16] Ouyang, F., & Jiao, P, Artificial intelligence in education: The three paradigms. Computers and Education: Artificial Intelligence, (2021), 2, doi:100020.

[17] Ouyang, F., Zheng, L., & Jiao, P,. Artificial intelligence in online higher education: A systematic review of empirical research from 2011 to 2020. Education and Information Technologies, (2022), volume 27(6), pp- 7893-7925, doi: 10.1007/s10639-022-10925-9

[18] Stine, J., Trumbore, A., Woll, T., & Sambucetti, H, Implications of artificial intelligence on business schools and lifelong learning. Final Report at Academic Leadership Group, (2019) volume 19-2.

[19] Tlili, A., Shehata, B., Adarkwah, M.A. et al. What if the devil is my guardian angel: ChatGPT as a case study of using chatbots in education. Smart Learn. Environ. 10, 15 (2023). doi:10.1186/s40561-023-00237-xTominc,

[20] Thomas K.F. Chiu, Qi Xia, Xinyan Zhou, Ching Sing Chai, Miaoting Cheng, Systematic literature review on opportunities, challenges, and future research recommendations of artificial intelligence in education, Computers and Education: Artificial Intelligence, Volume 4,202 doi:10.1016/j.caeai.2022.100118..

[21] P., & Rožman, M, Artificial intelligence and business studies: study cycle differences regarding the perceptions of the key future competences. Education Sciences, (2023), volume 13(6), pp. 580. doi: 10.3390/educsci13060580

[22] Van den Berg, G., & du Plessis, E, ChatGPT and generative AI: Possibilities for its contribution to lesson planning, critical thinking and openness in teacher education. Education Sciences, (2023), volume 13(10), pp. 998. doi: 10.3390/educsci13100998

[23] Van Dis, E. A., Bollen, J., Zuidema, W., Van Rooij, R., & Bockting, C, ChatGPT: five priorities for research. Nature, (2023), volume 614(7947), pp. 224-226, doi: 10.1038/d41586-023-00288-7

[24] Walter, Y. Embracing the future of Artificial Intelligence in the classroom: the relevance of AI literacy, prompt engineering, and critical thinking in modern education. Int J Educ Technol High Educ volume 21, 15 (2024). doi: 10.1186/s41239-024-00448-3

[25] Xu, J. J., & Babaian, T. Artificial intelligence in business curriculum: The pedagogy and learning outcomes. The International Journal of Management Education, (2021), volume 19(3), doi:100550.

[26] Yin, R. K. (2009). Case study research: Design and methods. Sage. doi: 10.33524/cjar.v14i1.73