THE ROLE OF ARTIFICIAL INTELLIGENCE IN FOSTERING CREATIVE THINKING: A STUDY OF TEACHERS' AND STUDENTS' EXPERIENCE

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Annotation. This thesis examines the role of artificial intelligence in fostering creative thinking among teachers and students. The study explores how AI tools such as chatbots, interactive learning platforms, and data-driven applications enhance creativity, problem-solving skills, and innovative approaches in the educational process. Findings indicate that the integration of AI encourages both teachers and students to think critically, generate original ideas, and apply creative strategies to real-world problems. Furthermore, teachers' effective use of AI technologies supports personalized learning and promotes an interactive environment that nurtures curiosity and imagination. The research highlights that artificial intelligence is not only a technological innovation but also a pedagogical instrument that transforms traditional education into a more dynamic, creative, and learner-centered process.

Introduction. In the rapidly evolving landscape of modern education, artificial intelligence (AI) has emerged as one of the most transformative forces shaping teaching and learning practices. Its integration into the educational process has redefined how knowledge is delivered, how students engage with information, and how creativity is fostered within the classroom. Creative thinking, regarded as one of the key competencies of the 21st century, enables learners to approach problems from multiple perspectives, generate innovative solutions, and adapt to new and complex situations. As such, the development of creative thinking is no longer an optional skill but a fundamental educational goal. However, traditional teaching methods often prioritize memorization and standardized testing over creative exploration and problem-solving, limiting students' ability to think independently and imaginatively. In this context, artificial intelligence offers new opportunities to overcome these limitations by creating interactive, adaptive, and stimulating learning environments. AI-based technologies, including intelligent tutoring systems, content generation tools, chatbots, and machine learning algorithms, have the potential to personalize learning experiences and inspire creativity by providing real-time feedback, new perspectives, and dynamic problem-solving scenarios. Through AI, students are encouraged to explore ideas beyond conventional boundaries, experiment with new

concepts, and engage in creative collaboration. For teachers, AI serves as both a supportive and innovative pedagogical tool, helping them to design personalized lessons, assess learners' progress more effectively, and create digital spaces that promote curiosity and innovation. Moreover, the collaboration between human intelligence and artificial intelligence fosters a symbiotic relationship where creativity becomes a shared process — the teacher and technology work together to stimulate imagination and critical thought. The integration of AI into education also requires a shift in mindset, where educators become facilitators of learning rather than mere transmitters of knowledge. This new paradigm emphasizes inquiry, experimentation, and reflection, which are essential conditions for developing creativity. Furthermore, the use of AI in creative education supports inclusivity by catering to diverse learning styles and abilities, ensuring that every student can express their creative potential in unique ways.

Literature review. The integration of artificial intelligence in education has been increasingly recognized as a catalyst for enhancing creativity, critical thinking, and problem-solving abilities among learners. According to [1], AI-driven learning environments encourage students to engage in exploration and experimentation by adapting to their individual learning styles and cognitive patterns, thereby fostering higher-order thinking skills. The author emphasizes that creativity in education is most effectively developed when learners are exposed to open-ended, technology-supported problem scenarios that stimulate curiosity and innovation. In a similar vein, [2] highlights that AI tools such as intelligent tutoring systems and virtual assistants provide personalized learning experiences that not only improve academic performance but also enhance students' creative engagement by offering real-time feedback and adaptive challenges. These tools empower learners to take ownership of their learning process, which is a critical condition for the development of creativity. Research conducted by [3] suggests that teachers play a vital role in facilitating AI-supported creative learning by integrating digital technologies into classroom practices in meaningful ways. The study reveals that when educators employ AI tools to design project-based and inquiry-based learning activities, students demonstrate greater originality, flexibility, and imagination in their work. Furthermore, [4] explores the psychological and pedagogical aspects of creativity in AI-supported education, noting that the interaction between human cognition and machine intelligence promotes a hybrid form of creative thinking that blends analytical reasoning with imaginative problem-solving. This synergy enables learners to transcend traditional cognitive boundaries and approach challenges from innovative perspectives. Finally, [5] argues that the successful implementation of AI in fostering creativity depends not only on technological infrastructure but also on the readiness of educators to adopt new pedagogical models that prioritize creativity, collaboration, and critical inquiry. Collectively, the reviewed literature underscores that artificial intelligence, when thoughtfully integrated into education, serves as a powerful enabler of creative thinking by transforming both teaching methodologies and students' cognitive engagement with knowledge.

Research methodology. This study employed a mixed-methods research design combining both qualitative and quantitative approaches to investigate the role of artificial intelligence in fostering creative thinking among teachers and students. The research was conducted at the International Nordic University and three partner secondary schools, involving 50 teachers and 120 students from different academic disciplines. The participants were selected using purposive sampling to ensure the inclusion of individuals actively engaged in using AI tools within the learning process. The research was structured into three main phases: diagnostic, implementation, and evaluative. During the diagnostic phase, the initial level of creative thinking among participants was assessed using the Torrance Test of Creative Thinking and an AI literacy questionnaire. These instruments measured key indicators such as originality, fluency, flexibility, and elaboration in problem-solving, as well as participants' familiarity with AI technologies. The results of this phase provided a baseline understanding of how AI was currently perceived and utilized in the educational context. The implementation phase focused on integrating AI-based learning tools into teaching and learning activities. Participants engaged in a six-week program that incorporated various AI applications, including ChatGPT for idea generation, Canva AI and DALL·E for creative visual design, and adaptive learning platforms such as Google Bard and Socratic for personalized problem-solving. Teachers were trained to use these tools to create project-based lessons, while students applied them to develop innovative presentations, essays, and digital artworks. The learning process emphasized creativity, collaboration, and independent exploration. Regular workshops and feedback sessions were conducted to monitor participants' engagement, challenges, and progress. In the evaluative phase, both quantitative and qualitative data were collected to determine the impact of AI integration on creative thinking. Pre- and post-tests were administered to measure improvement in creative performance, while semi-structured interviews and reflective journals provided insights into participants' experiences, perceptions, and emotional responses to AI-supported learning. Quantitative data were analyzed using descriptive and comparative statistics, while qualitative data underwent thematic analysis to identify emerging patterns and themes related to creativity enhancement.

1-Table. Comparison of creative thinking indicators before and after ai integration

Indicators of Creative Thinking	Pre-Experiment Mean Score	Post-Experiment Mean Score	Percentage of Improvement (%)
Originality	62.4	84.7	35.7
Fluency	58.2	80.1	37.6
Flexibility	60.8	82.3	35.3
Elaboration	55.9	78.5	40.5
Creative Confidence	59.5	85.2	43.2

The table illustrates the results of the experimental study measuring the impact of artificial intelligence tools on the development of creative thinking among participants. It shows significant improvement across all indicators after the integration of AI-supported educational technologies. The most notable increase was observed in creative confidence and elaboration, highlighting that AI-based learning environments enhance both cognitive and emotional aspects of creativity in education.

Research discussion. The findings of this study revealed that the integration of artificial intelligence (AI) into the teaching and learning process significantly enhanced creative thinking among both teachers and students. The pre-test results indicated that while participants generally demonstrated an understanding of creativity as an educational concept, their ability to apply creative thinking in practice was limited by traditional learning structures and a lack of exposure to AI-based tools. After the six-week intervention, notable improvements were observed in key dimensions of creativity, including originality, flexibility, fluency, and elaboration. Students who previously relied on rote learning began to approach tasks with greater independence, curiosity, and imagination. For instance, through the use of AI applications such as ChatGPT and Canva AI, they were able to generate new ideas, visualize abstract concepts, and design innovative projects that reflected deeper analytical and creative engagement. Teachers also reported an increased ability to facilitate creative learning by incorporating AI-driven lesson plans, adaptive feedback systems, and collaborative problem-solving activities. This shift in pedagogical practice transformed the learning environment into a more interactive, student-centered space that encouraged experimentation and reflection. Qualitative data from reflective journals and interviews further confirmed that AI served as both a motivator and a cognitive partner in the creative process. Students expressed that AI tools helped them overcome creative blocks by offering inspiration and alternative viewpoints while still allowing them to retain control over the final creative output. Teachers noted that AI-supported learning encouraged students to take intellectual risks and to explore unconventional solutions without the fear of failure. This finding aligns with previous research emphasizing that creativity flourishes in environments where learners feel supported, autonomous, and intellectually challenged. Moreover, the interaction between human cognition and machine intelligence appeared to stimulate higher-order thinking processes. Participants demonstrated improved metacognitive awareness as they reflected on how AI influenced their thought patterns and creative decision-making. The combination of data-driven insights provided by AI and human intuition fostered a balanced approach to creativity that merged analytical precision with imaginative exploration. Interestingly, some participants initially expressed skepticism about the potential of AI to promote genuine creativity, fearing that overreliance on algorithms might lead to uniformity or dependency. However, as the study progressed, their perceptions evolved — they came to view AI not as a replacement for human creativity but as a powerful tool that amplifies it. The comparative analysis between pre- and post-tests showed a measurable increase of

22–28% in creative thinking scores across all indicators, confirming that the use of AI significantly contributes to creativity development in education.

Conclusion. The study concludes that artificial intelligence plays a transformative role in enhancing creative thinking among both teachers and students. The integration of AI-based tools into the educational process encourages learners to move beyond traditional thinking patterns and engage in innovative, flexible, and reflective problem-solving. Findings revealed that when AI is used as a supportive partner rather than a substitute for human intelligence, it fosters deeper levels of originality, fluency, and collaboration in learning. Teachers became more effective in designing adaptive, student-centered lessons, while students demonstrated improved motivation, confidence, and creative expression. The use of AI applications such as ChatGPT, Canva AI, and other intelligent platforms provided opportunities for learners to visualize complex ideas, generate novel solutions, and express creativity in diverse forms. The research also emphasizes that the success of AI integration depends on educators' digital literacy and ethical awareness to ensure that technology remains a tool for empowerment rather than dependency. In summary, artificial intelligence, when applied thoughtfully in education, not only enhances creative thinking but also cultivates an environment of curiosity, innovation, and lifelong learning. This synergy between human creativity and machine intelligence marks a significant step toward shaping a more dynamic, inclusive, and forward-thinking educational landscape.

References

1. Amabile, T. M. (2018). Creativity in Context: Update to the Social Psychology of Creativity. Westview Press.
2. Craft, A. (2019). Teaching Creativity: The Role of Imagination and Innovation in Learning. Routledge.
3. Luckin, R., Holmes, W., Griffiths, M., & Forcier, L. B. (2022). Intelligence Unleashed: An Argument for AI in Education. Pearson Education.
4. Sawyer, R. K. (2020). Explaining Creativity: The Science of Human Innovation. Oxford University Press.
5. Sternberg, R. J., & Kaufman, J. C. (2021). The Nature of Human Creativity. Cambridge University Press.
6. Zhang, W., & Aslan, A. B. (2021). AI technologies and their influence on students' creative learning. Computers and Education, 172, 104-260.
7. Holmes, W., Bialik, M., & Fadel, C. (2020). Artificial Intelligence in Education: Promises and Implications for Teaching and Learning. Center for Curriculum Redesign.