Creativity in Education in the Era of Emerging AI

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Abstract

The rapid advancement of AI, particularly through Large Language Models, is significantly influencing the fields of creativity and education. The term "artificial creativity"—defined as a form of pseudo-creativity— and the debate on whether AI can be considered creative and how it impacts human creativity are key topics of discussion within the scientific and educational community. At the same time, the integration of AI into the educational domain and its effects on student creativity are becoming a pressing concern for the educational community. Although the relevant discourse is still evolving, as the landscape of AI, its applications, and experimentation in educational settings continue to develop, the aim of this proposal is to suggest, based on empirical observations, implementation, and current bibliography, AI tools and applications that can enhance (rather than diminish) adolescent students' creativity: to this end, specific activities are proposed where AI tools/applications are employed in language-related subjects (Language, Literature, Creative Writing) to unleash creativity, serve as sources of inspiration, and ultimately contribute to the students' creative growth. Furthermore, the proposal seeks to lay the foundations for a healthy collaboration between humans and AI, foster a robust AI literacy, and strengthen students' self-regulated learning skills.

Keywords: *AI, Creativity, adolescent students*

1. Creativity and Artificial Intelligence

In the context of the 21st century, where technological evolution increasingly permeates every aspect of human activity, the educational landscape is undergoing profound transformation. The emergence and integration of artificial intelligence (AI) has brought to the forefront not only a need for technical competence but also a renewed emphasis on fundamental cognitive and creative skills. Algorithmic thinking, computing literacy, and AI literacy now stand alongside digital and media literacy as essential skill sets. However, the pedagogical community must also prioritize the cultivation of creativity, divergent and convergent thinking, and self-regulated learning –the capacities that allow learners to adapt, problem-solve, and thrive in an unpredictable future.

Creativity is a capacity of the human mind (Guilford, 1950, 1967; Sternberg, 1999). Creativity, as conceptualized by Runco (2023), comprises four core components: originality, effectiveness, authenticity, and intentionality –all framed within a meaningful context. It is widely recognized as a key 21st-century skill, both in education and beyond. Increasingly, scholars point to our entry into a new era of “assisted creativity,” in which AI acts not as an autonomous creator but as a collaborative agent capable of supporting human creative processes (Habib, Vogel, Anli & Thorne, 2024).

Creativity is not a monolithic construct. It spans a spectrum from positive and ethically meaningful creativity, which contributes to individual growth and collective well-being, to neutral and even malevolent forms of creative output. In positive creativity, elements such as self-actualization and authenticity are integral, reinforcing the notion that creativity is deeply tied to human values and moral intentions (Runco, 2022). Moreover, as Boden (1998) has proposed, creativity can take various cognitive forms: combinational creativity, which involves novel combinations of familiar ideas; exploratory creativity, which engages with established conceptual spaces in new ways; and transformational creativity, which involves altering the very dimensions of those conceptual spaces.

The distinction between psychological (P-creativity) and historical (H-creativity) further refines our understanding of novelty in creative output. While the former is concerned with ideas that are new to the individual, the latter reflects innovations that are unprecedented in a broader historical sense. Complementing this view, Kaufman and Beghetto’s (2009) 4C model presents four distinct levels of creativity: mini-c, little-c, Pro-C, and Big-C. These range from personal, developmental creativity –often observed in classroom contexts– to everyday creativity, professional-level expertise, and legendary or iconic creative achievements. AI, in this spectrum, appears capable of enhancing Pro-C

and Big-C levels, particularly by aiding in the production and transformation of ideas. However, it cannot replicate the inherently personal and experiential nature of mini-c and little-c creativity, which are more concerned with the process of self-discovery than with the final product (Markauskaite et al., 2022).

The role of AI in creative practice must therefore be approached with nuance. Vinchon et al. (2023) underscore the potential for collaborative co-creation between humans and machines, while also warning of the dangers of diminishing individuals' creative self-perception. Runco (2023) argues persuasively against the use of the term "creative AI," noting that AI, though capable of producing outputs that are original and effective, fundamentally lacks the intrinsic motivation, intentionality, and authenticity that underpin human creativity. He coins the term "pseudo-creativity". The ability to identify problems –a key element in the creative process– is also missing. Surprise or novelty, while intriguing, is insufficient on its own to qualify an AI-generated idea as truly creative. According to Boden (2004), computers and creativity can be interesting partners in two ways: for understanding human creativity and for producing computational creativity.

Despite these limitations or contradictions, AI's contribution to divergent thinking is well-documented. It can facilitate the rapid generation of ideas and provide inspiration in the brainstorming phase. However, its weakness lies in convergent thinking: the ability to select and refine the most viable or valuable ideas. This remains an inherently human task, grounded in judgment, critical reflection, and domain expertise (Rodrigues et al., 2023; Ivcevic & Grandinetti, 2024; Cropley et al., 2023).

1.1. Empirical Studies

Recent empirical studies with university students shed further light on the nuanced relationship between AI and creativity. Habib et al. (2024) found that students who used ChatGPT during creative writing tasks exhibited increased fluency –that is, a broader range of ideas– as well as enhanced elaboration and narrative development. Yet, the same participants reported diminished confidence in their own creative abilities and anxiety over potential overreliance on AI. These findings suggest that while AI may scaffold creativity, it may also risk displacing students' intrinsic motivation and weakening their sense of authorship.

Other studies, such as that of de Vicente-Yagüe-Jara et al. (2023), explored tasks involving alternative uses of common objects and responses to hypothetical questions. The results again confirmed that AI tools such as ChatGPT could support divergent thinking –especially in students with lower baseline creative skills. Doshi and Hauser (2023) similarly observed that storytelling tasks completed with AI assistance resulted in more publishable narratives, especially among less creatively confident individuals. These findings underscore the value of AI as a supportive tool –not a replacement for human imagination.

Wieland et al. (2022) extended this conversation to brainstorming, observing that AI-based chatbots served as non-judgmental partners, lowering students' fear of negative evaluation and increasing the quantity and variety of ideas generated. However, these benefits must be weighed against AI's inability to adapt meaningfully to unfamiliar contexts (Bonami et al., 2020) and its limitations in written expression, where it may produce off-topic or generic responses requiring significant revision (Fyfe, 2022). Moreover, as concerns about plagiarism and content authenticity grow, the need for ethical and transparent AI use becomes ever more pressing.

In educational contexts, these developments call for a comprehensive approach. Students must be trained not only in how to use AI effectively but also in how to critically assess its contributions. This involves the development of self-regulated learning (SRL) skills –including goal-setting, self-monitoring, and adaptive thinking– as well as fostering creative confidence and metacognitive awareness (Markauskaite et al., 2022). Educators, in turn, must cultivate a pedagogical framework that balances innovation with discernment, integrating AI tools in ways that amplify, rather than undermine, human creativity.

2. Proposed Applications of Artificial Intelligence in Language Arts Courses (Modern Greek Language and Literature) in Greek High Schools

The following includes both applied and theoretical proposals for integrating Artificial Intelligence (AI) into language arts education –specifically Modern Greek Language and Literature– in Greek high schools. All proposed activities, whether implemented or not, were designed with the intention of

strengthening students' creative abilities and critical thinking skills through the meaningful use of AI tools.
Given that high school students are increasingly turning to AI –especially ChatGPT– for text generation, these interventions aim to help students recognize the limitations of such tools (e.g., inaccuracies, structural flaws), develop a critical stance toward AI outputs, adopt the role of evaluator of AI-generated texts, and explore other AI tools that can foster their creative and critical capacities. Avoiding the so-called "creative mortification" (Beghetto, 2014) and nurturing students' critical faculties are vital goals in today's AI-enhanced educational reality. It is worth noting that all AI tools referenced in this proposal were used in their free, non-subscription versions.

2.1. Use of ChatGPT to Support Mastery of Specific Text Genres (Text Summarization and Interpretive Commentary)

ChatGPT can produce text condensations and brief analyses of literary passages –what the Greek educational system refers to as *interpretive commentary*, a task required alongside summarization in the nationwide Panhellenic Exams for entrance into public universities in Greece. In the following proposed activity, students prompt ChatGPT to generate a summary of a given text. Many students habitually use ChatGPT to quickly produce summaries, which undermines their practice of essential summarization strategies and conditions them to passively accept AI responses.
However, the summaries produced by ChatGPT are often incorrect or fail to follow the conventions that align with high-scoring responses in national exams (where the summary task alone accounts for 20% of the total grade). In this exercise, students are asked to revise ChatGPT's summary in terms of content, language clarity, and coherence devices. This activity fosters critical thinking and helps students internalize the structural and stylistic mechanisms of a strong or even excellent summary. At the same time, they learn to interact with AI critically rather than passively.
Similarly, when it comes to interpretive commentary –where students must respond to a focused question on a literary text (e.g., identifying the central theme of a poem, or describing the narrator's stance and justifying their analysis with textual evidence and personal opinion) – students may again be tempted to accept ChatGPT's answer uncritically. This task, which carries 15% of the total exam score, requires a high level of textual understanding and argumentation. In this case as well, students are asked to critique and revise the AI's response. By doing so, they practice the interpretive strategies needed to analyze literary texts and formulate personal responses, thereby sharpening their critical faculties.
These activities can also be adapted to work with other Large Language Models (LLMs).

2.2. Using AI Tools in Creative Writing Activities

To help students understand how language choices shape a text's style –particularly as style identification or transformation is a key part of the curriculum– students used the Hemingway Editor. This tool, though it occasionally returned responses in English, allowed students to explore a technology-enhanced version of Raymond Queneau's *Exercises in Style*. Through its functions, students became more aware of how stylistic variation is created –whether dramatic, neutral, serious, ironic, or humorous– by manipulating linguistic elements.
In activities centered on whole-text literary interpretation, other AI tools were introduced, including MyHeritage, Vidnoz, SUNO, genmo, Canva's Dream Lab, and Pictory. These tools were used to stimulate student creativity and help them realize creative projects that might otherwise have been out of reach.
For instance, in approaching particular literary works, students were asked to "bring to life" a literary character using MyHeritage or Vidnoz, giving them both voice and face. Before using the AI tools, students composed the character's monologue in class, without AI assistance, basing their text on the literary traits and context established by the author. The written texts were then transformed into audiovisual presentations via the tools. This process fostered students' motivation toward writing and deepened their analytical skills in character development.
Using genmo, students generated animations of literary characters –especially from non-illustrated texts– by prompting the AI with key details such as setting, era, and the character's traits. This activity exercised their imagination and addressed a lack of visual engagement (optical poverty) often observed in literary reading (Iser, 1980). Similarly, Canva's Dream Lab allowed students to give visual form to poetic or narrative elements or even create full illustrations of literary texts. Through the SUNO tool, students were able to experiment with possible musical adaptations of the poems they wrote as

part of their engagement with creative writing and creative imitation.Finally, Pictory was used to help students transform their own creative writing –often inspired by Greek poetry studied in class (poems by C.P. Cavafy, M. Anagnostakis, K. Dimoula, K. Aggelaki-Rouk, T. Patrikios, among others)– into audiovisual texts.
In these cases, the AI tools acted as creativity multipliers, enhancing students' motivation and enabling them to externalize and amplify their imaginative processes.

3. Conclusions and Pedagogical Implications

"We can use AI to help us develop our human intelligence beyond the ways in which our AI technology can develop its own intelligence." (Luckin, 2018:133)

Contemporary research on the integration of Artificial Intelligence (AI) in education increasingly emphasizes the need for a careful and thoughtful approach to this endeavor (Habib et al., 2024). Even though AI appears to have the potential to significantly enhance creative thinking, it may also undermine adolescent creativity. Therefore, the introduction of AI into the creative and critical teaching process must be carried out with deliberate planning and clearly defined objectives. Ensuring a fruitful coexistence between human creative and critical thinking abilities and AI is emerging as an urgent need. This can be achieved through a blended teaching approach, which avoids rejecting AI entirely but instead embraces its targeted and critical use (Habib et al., 2024). The goal is to strike a balance that fosters human creativity while leveraging the capabilities of AI.
In conclusion, the integration of AI into education offers both opportunities and challenges. AI has the capacity to augment creativity, particularly at higher levels of expertise. However, it must be used thoughtfully to avoid undermining the core human qualities that make creativity meaningful. Teachers should be empowered through AI literacy and ethics training (UNESCO, 2022), while students should be supported in building their creative capacities through intentional, reflective, and collaborative practice. Creativity is fostered when students are given opportunities to explore new problem-solving paths in environments that support experimentation and growth. Especially in education, mini-c and little-c creativity are central to the development of personal identity and a sense of achievement – outcomes that no machine, however powerful, can replicate. Thus, focused pedagogical strategies are required –strategies that carefully integrate AI tools with traditional instructional methods, in order to reinforce students' creative confidence and strengthen their divergent and convergent thinking skills. This paper aspires to contribute in this direction.

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