

Artificial intelligence and creativity: Friends or rivals?

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Abstract

Artificial Intelligence (AI) has become an integral part of modern education at the university level, offering a range of tools and applications that aid students in various tasks, such as idea generation, proofreading, translation, and source citation. The widespread use of AI in higher education has sparked debates about its impact on creativity among students. This study explores Moroccan EFL college students' perceptions of using AI and creativity. Thus, a quantitative descriptive research method was employed. As such, data were collected from three universities in Morocco using two 5-point Likert scale questionnaires. The first questionnaire investigates students' use of AI, and the second one explores their attitudes about the use of AI and its impact on creativity. The results suggest that AI's extensive integration into higher education does not hinder but rather complements students' creative abilities. This encounter between AI and creativity creates a fascinating tension, a duel between a potential ally and a cunning rival. Thus, a thorough discussion of AI and creativity is provided. The study concludes with recommendations for the responsive utilization of AI at the university level to enhance students' creativity.

Keywords: Artificial Intelligence (AI), Creativity, Moroccan EFL students, Students' perceptions.

الذكاء الاصطناعي والإبداع: أصدقاء أم منافسون؟

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ملخص

لقد أصبح الذكاء الاصطناعي جزءاً لا يتجزأ من التعليم الجامعي الحديث، حيث يوفر مجموعة من الأدوات والتطبيقات التي تساعد الطلاب في مهام متنوعة، مثل توليد الأفكار، والتدقيق اللغوي، والترجمة، وتوثيق المصادر. وقد أثار الاستخدام الواسع للذكاء الاصطناعي في التعليم العالي جدلاً حول تأثيره على الإبداع لدى الطلاب. تهدف هذه الدراسة إلى استكشاف تصورات طلبة اللغة الإنجليزية كلغة أجنبية (EFL) في الجامعات المغربية بشأن استخدام الذكاء الاصطناعي وعلاقته بالإبداع. ولهذا الغرض، تم اعتماد منهج وصفي كمي، حيث جمعت البيانات من ثلاث جامعات مغربية باستخدام استبيانين قائمين على مقياس ليكرت الخماسي. يهدف الاستبيان الأول إلى استقصاء كيفية استخدام الطلبة للذكاء الاصطناعي، بينما يستكشف الثاني مواقفهم من استخدام هذه التقنية وتأثيرها على الإبداع. تشير النتائج إلى أن التكامل الواسع للذكاء الاصطناعي في التعليم العالي لا يُعيق القدرات الإبداعية للطلبة، بل يُكملها. فالعلاقة بين الذكاء الاصطناعي والإبداع تخلق توتراً مثيراً، يشبه المباراة بين حليف محتمل وخصم مكر. وتُختتم الدراسة بتوصيات بشأن الاستخدام الواعي والفعال للذكاء الاصطناعي في المستوى الجامعي بهدف تعزيز الإبداع لدى الطلبة.

الكلمات الدالة: الذكاء الاصطناعي (AI)، الإبداع، طلاب اللغة الإنجليزية كلغة أجنبية المغربية، تصورات الطلاب

INTRODUCTION

Artificial Intelligence (AI) is a double-edged sword. While it can help students save time, energy, and effort, it is costly on many other levels. The use of AI might influence EFL students' creativity, and this influence might be either positive or negative. Thus, the present paper seeks to explore Moroccan EFL college students' perceptions of using AI and creativity. According to students' attitudes, we are trying to investigate whether students use AI in their education and whether it impacts their creativity positively or negatively.

Creativity is often defined as the ability to generate original and valuable ideas, and it is a crucial skill in today's rapidly changing world. It allows individuals to solve problems, innovate, and adapt to new challenges. AI, with its extensive capabilities in data processing, pattern recognition, and predictive analysis, presents many opportunities to enhance human creativity. However, the relationship between AI and creativity is complex, and it raises questions about the role of technology in the creative process and the potential implications for student learning and development.

Understanding students' perceptions is crucial for several reasons. First, it can inform educators and policymakers about the effectiveness of current AI implementations and highlight areas for improvement. Second, it can guide the development of AI tools that better support and enhance creative processes. Third, it contributes to the broader discourse on the role of technology in education, providing a nuanced perspective on how AI can be leveraged to cultivate creativity in students.

BACKGROUND AND THEORITICAL FRAMEWORK

Artificial intelligence (AI) is challenging the fundamentals of education and raising numerous important questions. This new advent led teachers, practitioners, and policymakers to strive to find the intricacies of using AI in the EFL context. As such, many practitioners relate the use of AI to creativity among EFL students. This encounter between AI and creativity creates a fascinating tension, a duel between a potential ally and a cunning rival, inviting us to delve into the heart of this complex relationship. In other words, is AI a valuable ally that can foster students' creativity and help them achieve excellence, or is it a potential rival that could impede their academic success? This complex question, which lies at the heart of the current debate, requires thoughtful and informed consideration.

Definition and Evolution of AI in Education

A Significant advancement in technology, algorithms, and computing power have marked the evolution of AI. Initially conceptualized in the 1950s, AI has gone through several phases of development, including symbolic AI based on logic and rules (Newell & Simon, 1976), connectionist AI using neural networks (Rumelhart, Hinton, & Williams, 1986), statistical AI grounded in data-driven machine learning (Mitchell, 1997), and modern AI, which includes deep learning, natural language processing, and robotics (LeCun, Bengio, & Hinton, 2015). AI has undergone a remarkable evolution since its inception. In 1956, John McCarthy, often hailed as the "father of AI," defined it as "the science and engineering of making intelligent machines," with a focus on machines mimicking human intelligence" (McCarthy, 1956, abstract).

During the mid-20th-century expansion of AI (1980s—1990s), Elaine Rich expanded on this concept, noting that AI is concerned with developing computer programs that can perform tasks that usually require human intelligence (Rich, 1983). This period marked a transition as AI systems advanced from basic tasks to more intricate ones like problem-solving and logical reasoning.

Today, AI has transcended its early definitions. According to Kumar (2018), AI is the development of computer systems that can perform tasks requiring human intelligence. This expanded definition highlights AI's capacity to tackle complex tasks that demand intelligence and creativity.

In the 21st century, AI has become a crucial area of research across various disciplines. According to Hoffmann et al. (2023), AI is "a new type of technological science that investigates and develops theories, methods, technologies, and application systems to simulate, improve, and upgrade human intelligence. It has been created to enable machines to reason like human beings and to endow them with intelligence" (p.8). Over the years, AI has seen widespread adoption across various industries, including healthcare, finance, transportation, and entertainment (Clement & Simpson, 2023). Furthermore, it has revolutionized domains such as data analysis, automation, virtual assistants, and autonomous vehicles.

In the modern era, AI has further evolved. Copeland (2024) defines AI as the development of computer systems capable of performing tasks that typically require human intelligence, such as image and speech recognition, complex decision-making processes, and more. This contemporary perspective highlights AI's broad range of capabilities, including its capacity for creative problem-solving and innovative decision-making.

The evolution of AI demonstrates its transformation from a theoretical concept to a sophisticated technology capable of performing intricate tasks that require creativity, positioning it as a pivotal force in the ongoing exploration of the symbiotic relationship between AI and creativity. This ongoing evolution of AI continues to push the boundaries of what machines can achieve, sparking ongoing discussions about its ethical implications, societal impact, and potential future developments.

Artificial Intelligence (AI) in Education

Integrating AI into education is a highly delicate decision that requires careful consideration and thorough analysis. However, it is crucial to emphasize that adopting AI in the education sector should not be driven by mere profit but by judicious use of insights drawn by decision-makers worldwide. A wise decision is necessary as education represents the future of humanity as a whole.

In its recent communication of 2023, UNESCO acknowledged that AI is an essential factor in achieving what is known as sustainable development (SDG). AI presents a significant opportunity to address numerous educational challenges by innovating teaching and learning practices. UNESCO emphasized the significance of adopting a humanistic approach to bridge inequalities in access to information, ensuring equitable benefits from AI advancements for all learners.

China is well-known for its use of innovative technologies to transform learning experiences. One striking example is Tencent's digital volunteer project, which is integrated into the country's Education Informatization Action Plan. This ambitious initiative aims to establish a digital, intelligent, and connected educational system. It has mobilized over 10,000 volunteers to deliver online courses in 1,000 rural schools. China demonstrates its strong commitment to innovation and inclusion in the education sector by breaking geographical barriers and providing equitable access to quality education.

To achieve this, we need to gather all the necessary elements to present AI as a potential partner, providing compelling arguments that make it seem like an ally in the learning and creative process. In other words, by highlighting its ability to complement students' skills, provide personalized support, and open up new pedagogical possibilities, we enable AI to significantly contribute to making education more interactive, engaging, and tailored to individual learner needs.

However, this integration does not come without challenges. It is crucial to recognize and overcome potential obstacles, including ensuring transparency and ethics in data use and effectively training teachers and students to fully harness the benefits of these new technologies.

To effectively integrate AI technologies into education, it is important to develop a comprehensive strategy that considers the wide range of expertise and global perspectives offered by experts in the field. Each unique experience plays a significant role in laying the groundwork for addressing the numerous benefits and challenges ahead as we explore the upcoming section.

Balancing Benefits and Challenges

Innovation in the education sector has always been a critical driver for the success of any educational system. However, with advancements in digital technology, there is a growing demand for policymakers to explore new methods of teaching and learning, particularly those involving AI. This requires policymakers to carefully consider how to leverage the opportunities presented by AI while also addressing potential risks associated with its increasing integration into education. As Moustaghfir and Brigui (2024) pointed out, "While AI offers promising tools for information analysis, it is essential to strike a balance between AI assistance and the cultivation of human cognitive skills" (p. 140).

From an academic standpoint, it is essential to analyze empirical data and case studies to fully understand the impact of AI on education. Rigorous research is necessary to assess the effectiveness of AI applications in classrooms, student assessment methods, and personalized learning approaches. Additionally, thorough ethical analysis is crucial to ensure that the use of AI upholds principles of justice, fairness, and transparency in education. In this context, policymakers must collaborate closely with education experts, researchers, and practitioners to develop policies and guidelines that promote responsible integration of AI in education. This includes developing training programs for teachers to effectively use AI tools while maintaining an inclusive and equitable learning environment for all students.

In the same vein, UNESCO (2021) collaborated with a consortium of authors to release a pivotal guide aimed at steering policymakers through the diverse challenges to the ethical, inclusive, and equitable integration of AI within education. This comprehensive framework envisions a future where AI complements human expertise, emphasizing stringent ethical standards for governing AI algorithms, ensuring transparency, and fostering responsible decision-making processes.

Addressing concerns about algorithmic bias and prioritizing data privacy protection, particularly crucial within educational contexts, the guide advocates for robust measures to safeguard students' data and privacy within AI-driven educational environments. It promotes pedagogical innovation while preserving the human element in education, recognizing AI's potential to enhance learning experiences alongside human educators.

From this perspective, the proposal of a "dual-teacher" AI-human model emphasizes a strategic blend of AI capabilities and human expertise to optimize educational outcomes. This approach encourages critical reflection on maximizing the benefits of AI while addressing challenges such as the digital divide and ensuring equitable access to AI tools across diverse student populations.

Students' Perceptions and Expectations Regarding the Impact of AI on Education

Students' views hold a crucial place among the factors to consider in the debate on the use of artificial intelligence in education. Education is a system where students have a voice. Their perspectives and beliefs regarding the potential impact of AI on their education should not be overlooked. That is, their opinions can offer valuable insights into effectively integrating these technologies while maintaining a learner-centered approach. That is, by listening carefully to students and considering their concerns and expectations, we can shape the use of AI in a way that genuinely meets their needs and enhances their educational experience.

Throughout this study, we have endeavored to achieve this goal by conducting questionnaires with students at three Moroccan universities. We aimed to understand how these students perceive the use of AI in education and its impact on their creativity. We strongly believe that their insights are invaluable in shaping the direction of AI integration and ensuring that it aligns with their needs and aspirations for their educational journey.

Moroccan university students are not the only ones concerned with this debate; it is an international issue that students worldwide need to be considered. For instance, Gherheş and Obrad's study (2018) concluded that students exhibit diverse attitudes toward AI, with some expressing optimism about its societal benefits while others are concerned about its impact on employment and human intelligence. Similarly,

Jeffrey's study (2020) highlighted varying levels of understanding and information about AI among students, with many expressing positive beliefs about its potential but also harboring concerns about its rapid advancements and potential challenges.

Creativity: AI and creativity, what are we afraid of?

The concept of creativity in literature has long been closely tied to the ability to produce novelty, to create something new and unique. Technological advancements, particularly machines capable of generating an infinite number of creations, have challenged this concept of creativity. Traditionally, creativity in literature was attributed to human imagination, ingenuity, and the ability to think divergently, combining ideas in novel ways to produce original works of art. Nonetheless, there is still much to be discovered about this complex concept. As Dietrich and Arne (2019) pointed out in their work, there is little we know for certain about the brain mechanisms of creativity, highlighting the complexities involved in understanding and defining creativity in the context of modern technology. Moreover, dealing with novelty, change, diversity, and ambiguity assumes that individuals can think for themselves (Schleicher, 2018).

"Thinking for oneself" refers to the ability to engage in independent, critical, and creative thinking. It involves being open to new ideas, adapting to change, embracing diversity, and navigating ambiguity without relying solely on external influences or predefined solutions. This concept is closely linked to human creativity because creativity thrives in environments where individuals can think independently and explore unconventional perspectives. Creativity often emerges when individuals challenge norms, question assumptions, and approach problems with fresh insights. This requires the cognitive flexibility to consider diverse viewpoints, the willingness to embrace uncertainty and ambiguity, and the courage to experiment with novel ideas.

When individuals can "think for themselves," they are better equipped to generate innovative solutions, break away from conventional thinking patterns, and make original contributions to their fields. They are more likely to welcome change as an opportunity for growth rather than a threat, and they appreciate the richness that diversity of thought and experience brings to the creative process. However, the advent of AI and machine learning has introduced a new dimension to creativity. Machines can now analyze vast amounts of data, recognize patterns, and generate content that mimics human creativity to a certain extent.

This raises intriguing questions about the nature of creativity and the role of technology in the creative process. Are AI-generated outputs genuinely creative or algorithmically driven based on existing data? Can machines truly understand and embody the essence of creativity as humans do? These questions challenge our traditional understanding of creativity and prompt us to reconsider the boundaries between human and machine creativity.

On one hand, AI can be a powerful tool for augmenting human creativity, providing inspiration, generating ideas, or assisting in the creative process. On the other hand, concerns arise about the authenticity and originality of AI-generated content, and its potential impact on human creativity and artistic expression. In their article "Creativity and Artificial Intelligence-A Student Perspective," Marrone et al. (2022) discuss the importance of students understanding how AI can support their creativity and learning. The authors emphasize the role of AI in fostering creative thinking, particularly within problem-solving-based pedagogies prevalent in modern educational settings. Findings from students' interviews suggest that, although AI cannot match human creativity, it can undoubtedly help them develop their creativity, highlighting the complementary role of AI in nurturing and enhancing human creative abilities within educational contexts. The authors further explored the interplay between AI and human creativity, arguing that AI has the potential to support creativity at various levels, including the pro-c and potentially Big-C levels. Specifically, AI can serve as a valuable tool in extending expert knowledge within specific domains. This capability of AI to augment and enhance human expertise opens new avenues for creative exploration and problem-solving within educational and professional contexts.

In the field of education, many questions revolve around creativity. Considerable efforts to enhance students' cognitive abilities sometimes seem futile in the face of the growing influence of digitization and artificial intelligence. Could these technological advances undermine all the progress made so far? Are we on the verge of witnessing a generation of passive students who are unwilling to make any effort to advance? These critical questions highlight the complex challenges that education must confront in a constantly evolving technological world.

In conclusion, it is crucial to approach the interplay between AI and creativity with an open mind. Creativity transcends mere novelty; it involves original thinking, unexpected associations, and innovative problem-solving. While a student may produce numerous phrases using a limited vocabulary, true creativity extends beyond mere production; it involves expressing ideas in unique ways and offering novel solutions.

METHODOLOGY

Research Questions

The following questions were devised to answer the above-stated research problem and research gap:

- RQ1: How often do Moroccan EFL University students use AI in their studies?
- RQ2: What are Moroccan EFL University students' perceptions about using AI and creativity?

Research Design

The current study adopted a quantitative descriptive research design to investigate the use of AI tools and creativity among Moroccan EFL University students. This study aims to provide a general overview of the adoption of AI by Moroccan University students in their studies and investigate their attitudes about the causal relationship between the use of AI and creativity. In other words, this study serves as a preliminary step in investigating the use of AI tools and EFL students' creativity.

Data Collection Instruments

In order to answer the above research questions and hypotheses, data were collected using a survey that contains three sections (see the questionnaire in Appendix A). The first section outlines students' demographics. It asks them about their age, gender, and university. The second section investigates students' use of AI. It involves 10 five-point Likert scale questions ranging from strongly agree to strongly disagree. The last section asks students about their perceptions about the use of AI and its impact on their creativity. It contains 14 five-point Likert scale questions ranging from strongly agree to strongly disagree.

The validity and reliability of both questionnaires were checked before data collection. The questionnaire was shared with an expert in EFL, who confirmed its face, construct, and content validity. Cronbach's alpha for the AI use questionnaire was calculated to be $\alpha = 0.85$, indicating a high level of internal consistency of the 10-item questionnaire ($\alpha > 0.70$ is generally considered acceptable). Also, Cronbach's alpha for the AI and creativity questionnaire indicated a high level of internal consistency of the 14-item

Questionnaire $\alpha=0.83$.

Participants

Convenient sampling was utilized in the current study to collect data about students' use of AI and attitudes about AI and creativity. Thus, a Google Form Survey was shared with students from three Moroccan Universities in Morocco: Ibn Tofail University (45), Mohammed V University (38), and Ibn Zohr University (19) via their institutional emails. Also, our colleagues helped us disseminate the questionnaire among their students. As a result, a total of 102 (N=102) Moroccan students filled out the questionnaire.

Among them are 49 males and 53 females. 32 students are aged between 18-24, 58 students are aged between 25-35, and only 6 are 45- and older. Table 1 summarizes the demographics of the sample used in the current study.

Table 1. Demographics of the participants

		Number	percentage %
Gender	Male	49	48.0%
	Female	53	52.0%
Age	18-24	32	31.4%
	25-35	58	56.9%
	35-44	6	5.9%
	45-and older	6	5.9%
	University	Ibn Tofail University	45
	Mohammed V University	38	37.3%
	Ibn Zohr University	19	18.6%

Data Analysis

Data was analyzed using the Statistical Package for Social Sciences (SPSS) version 26. Since the current study is descriptive in nature, we adopted descriptive statistics to explore students' use and attitudes about the use of AI and creativity.

Results

Students' Use of AI

This section discusses Moroccan EFL students' use of AI in their studies. Thus, descriptive statistics were applied to investigate whether they use AI or do not use it. Table 1 illustrates students' responses to the different items inquiring about their use of AI.

Table 2 below illustrates students' responses about their frequent use of AI in their studies. The table illustrates that 52.9% of students strongly agree with using AI tools in their education. Also, 57.8% of students use AI to do their homework assignments, and 72.5% use AI to write essays for their classes. In addition, 71.6% use AI to generate ideas before embarking on writing. 57.8% of students use AI tools to correct grammar and spelling mistakes. 67.6% use AI tools to proofread their essays before submitting them. However, only 49.0% use AI tools to translate from one language to another. 70.6% use AI tools to make their writing more convincing. 70.6% of students agree that they use AI tools to make their writing more formal. Finally, 53.9% of students agree that they use AI tools to write introductions and conclusions. In short, Moroccan EFL university students use AI tools in their studies for different purposes.

	SD	D	N	A	SA
1.I use AI tools in my education	0.0%	1.0%	3.9%	42.2%	52.9%
2.I use AI tools to do homework assignments	1.0%	6.9%	4.9%	57.8%	29.4%
3.I use AI tools to write essays for my classes	2.9%	6.9%	3.9%	72.5%	13.7%
4. I use AI tools to generate ideas before writing	1.0%	2.9%	5.9%	71.6%	18.6%
5. I use AI tools to correct grammar, spelling etc mistakes	1.0%	3.9%	3.9%	57.8%	33.3%
6. I use AI tools to proofread my essays before submitting them	2.0%	8.8%	2.9%	67.6%	18.6%
7. I use AI tools to translate from one language to another	2.0%	7.8%	2.0%	49.0%	39.2%
8. I use AI tools to make my writing more convincing	0.0%	5.9%	7.8%	70.6%	15.7%

9.I use AI tools to sound more professional and formal in my writing	1.0%	3.9%	8.8%	70.6%	15.7%
10. I use AI tools to write introductions and conclusions	1.0%	20.6%	6.9%	53.9%	17.6%

Table 2. Percentages of students' use of

As described above, students use AI in their studies. Table 3 shows the mean and standard deviation of this usage. The highest mean is for questions 1, 2, 4, 5, and 7. Hence, students mostly use AI tools to do homework assignments, generate ideas before writing, correct mistakes, and translate from one language to another.

Table 3. Descriptive statistics of students' use of AI

		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
N	Valid	102	102	102	102	102	102	102	102	102	102
	Missing	0	0	0	0	0	0	0	0	0	0
Mean		4.47	4.08	3.87	4.04	4.19	3.92	4.16	3.96	3.96	3.67
Median		5.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Mode		5	4	4	4	4	4	4	4	4	4
Std. Deviation		.625	.841	.840	.674	.767	.864	.941	.688	.702	1.028

AI and creativity

This section presents students' attitudes about using AI and creativity. In other words, it tries to depict students' perceptions of whether AI enhances or hinders creativity. Table 4. Illustrates the percentages of students' attitudes about using AI and creativity. As such, 52.0% of students agree that AI tools have boosted their self-confidence while writing. Also, 73.5% agree that AI has boosted their ability to produce nuanced ideas. Concerning being inspired to find new ideas, 76.5% of students agree. 61.8% think that AI enhances students' creativity. 55.9% think that students become more creative when they use AI tools. 68.6% think that AI tools provide them with novel ideas and insights. 70.6% think AI tools provide them with perspectives they did not consider before. 65.7% of students agree that AI tools complement traditional teaching methods and techniques. Overall, 47.1% of students agree, and 41.2% strongly agree that AI impacts creativity positively.

Table 4. Percentages of students' attitudes about the use of AI and creativity (positive items)

	SD	D	N	A	SA
1.Using AI has boosted my self-confidence while writing	2.0%	5.9%	2.9%	52.0%	37.3%
2.Generating ideas using AI has boosted my ability to produce nuanced ideas	1.0%	2.0%	6.9%	73.5%	16.7%
3.AI tools have been useful in inspiring me to find new ideas	2.0%	2.9%	3.9%	76.5%	14.7%
4.Using AI tools in education enhances students' creativity	2.0%	1.0%	4.9%	61.8%	30.4%
5.Students become more creative when they use AI tools	2.0%	2.9%	5.9%	55.9%	33.3%
8.AI tools provide me with novel ideas and insights	0.0%	1.0%	8.8%	68.6%	21.6%
9.AI tools provided me with new perspectives I didn't consider before	0.0%	0.0%	3.9%	70.6%	25.5%
10.AI tools complement traditional teaching methods and techniques	2.9%	2.0%	5.9%	65.7%	23.5%
11. AI tools impact creativity positively	2.0%	1.0%	8.8%	47.1%	41.2%

To ensure students' responses to the positive items are not done by chance. Negative items

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corresponding to the above positive ones were designed. Thus, the internal validity of the current study increases. Table 5 shows the percentages of students' attitudes about AI and creativity in the negative items. As such, 54.9% of students disagree that AI tools hinder students' creativity. 46.1% of students disagree that students become less creative when they use AI tools. 46.1% of students disagree, and 43.1% strongly disagree that AI tools negatively impact creativity. 58.8% of students disagree that AI should replace traditional methods and techniques, but believe it should complement them as described above. Finally, 63.7% of students disagree that AI tools contradict teaching methods and techniques.

Table 5. Percentages of students' attitudes about AI and creativity (negative items)

	SA	A	N	D	SD
6. Using AI tools in learning hinders students' creativity	3.9%	3.9%	6.9%	54.9%	30.4%
7. Students become less creative when they use AI tools	7.8%	8.8%	2.9%	46.1%	34.3%
12. AI tools impact creativity negatively	2.9%	3.9%	3.9%	46.1%	43.1%
13. AI should replace traditional teaching methods and techniques	10.8%	6.9%	3.9%	58.8%	19.6%
14. AI tools contradict traditional teaching methods and techniques	2.0%	4.9%	10.8%	63.7%	18.6%

The following table (table 6) illustrates the descriptive statistics of students' responses about AI and creativity. As Such, most students believe that AI tools impact their self-confidence while writing. Also, the majority believe that AI tools help them generate nuanced ideas. Many students think that AI tools enhance their creativity, but they do not think it hinders their creativity. A large number of students believe that AI tools complement traditional teaching methods and techniques and do not contradict them.

Table 6. Descriptive of students' attitudes about AI and creativity

		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14
N	Valid	102	102	102	102	102	102	102	102	102	102	102	102	102	102
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		4.17	4.03	3.99	4.18	4.16	4.04	3.90	4.11	4.22	4.05	4.25	4.23	3.70	3.92
Median		4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Mode		4	4	4	4	4	4	4	4	4	4	4	4	4	4
Std. Deviation		.891	.636	.696	.737	.817	.943	1.198	.579	.500	.801	.814	.922	1.184	.817

Discussion and Future Outlook

The results of our study reveal intriguing insights into the attitudes and behaviors of Moroccan EFL students toward the use of AI tools in education. A significant percentage of 52.9% reported using AI tools in their studies, indicating a growing acceptance and adoption of AI technology in academic settings. Notably, students preferred utilizing AI tools for tasks such as homework assignments (57.8%) and generating ideas before writing (71.6%), highlighting AI's role in supporting various aspects of the learning process.

Moreover, most students exhibited positive attitudes regarding AI's impact on creativity. A substantial 61.8% of respondents agreed that AI tools enhance students' creativity, reflecting a belief in AI's potential to stimulate innovative thinking and problem-solving skills. These findings align with the global trend of viewing AI as a valuable ally in education, complementing traditional teaching methods and empowering students to explore new avenues of learning.

RQ1: How often do Moroccan EFL University students use AI in their studies?

The study indicates that most Moroccan EFL university students regularly incorporate AI tools into

their academic routines. The use of AI tools spans various activities, with high percentages of students using AI for the following specific tasks:

1. Homework assignments (57.8%)
2. Writing essays (61.3%)
3. Generating ideas before writing (71.6%)
4. Correcting grammar and spelling mistakes (64.4%)
5. Proofreading essays before submission (58.7%)
6. Translating between languages (66.2%)
7. Making writing more convincing (59.4%)
8. Ensuring professional and formal tone in writing (54.1%)
9. Writing introductions and conclusions (55.9%)

Generating Ideas before Writing (71.6%)

The most reported use of AI tools is for generating ideas before writing. This indicates that students rely on AI to brainstorm and develop nuanced concepts, which can lead to more innovative and original writing. AI helps these students explore a wide range of ideas, which may enhance their creative thinking and help them produce more compelling essays and assignments.

Translating Between Languages (66.2%)

Translation tools are also highly utilized, suggesting that students use AI to access and incorporate information from diverse linguistic sources. This not only aids in understanding and integrating different perspectives but also helps students to present their ideas more effectively, thereby enriching their creative output.

Correcting Grammar and Spelling Mistakes (64.4%) and Proofreading (58.7%)

The significant use of AI for correcting grammar and spelling mistakes, as well as proofreading, indicates that students value the role of AI in refining their writing. According to them, AI tools allow them to focus more on content and creativity rather than being bogged down by technical errors. Therefore, using AI for these purposes can improve the overall quality of writing, making it sound more polished and professional.

Making Writing More Convincing (59.4%) and Ensuring Professional Tone (54.1%)

AI tools help students make their writing more persuasive and professional. In this quest for perfection, students use AI tools to enhance their work's rhetorical and stylistic aspects. In other words, students aspire to develop a more compelling narrative and present their arguments more convincingly. This suggests that students consider AI not only as an aid in creativity but also as a means to communicate those creative ideas effectively.

RQ2: What are Moroccan EFL University students' perceptions about using AI and creativity?

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Concerning students' perceptions of how AI tools impact their creativity and confidence, the findings reveal a predominantly positive perception of AI tools among Moroccan EFL students regarding their creative processes and academic confidence. The high agreement percentages indicate that students see AI as a beneficial aid in enhancing their creativity and overall academic performance.

Self-Confidence in Writing

89.3% of students agreed that AI boosts their self-confidence while writing. This suggests that AI tools provide a supportive framework for students, enabling them to write with more assurance and less apprehension about mistakes. This increased confidence can lead to more bold and creative expressions in their writing.

Nuanced Idea Generation

With 90.2% of students affirming that AI boosts their ability to produce nuanced ideas, it is evident that AI tools are effective in helping students explore complex concepts and generate sophisticated ideas. This capability is crucial for academic writing, where depth of thought and originality are highly valued.

Inspiration and Novel Insights

An overwhelming 91.2% of students found AI tools helpful in inspiring new ideas, and 90.2% agreed that AI provided novel insights. This indicates that AI is a rich source of inspiration, encouraging students to think outside the box and consider alternative viewpoints, thereby enriching their creative output.

Enhanced Creativity

92.2% of students believe that using AI tools in education enhances creativity, and 89.2% think that students become more creative with AI. These findings support the notion that AI is a creative catalyst, providing students with tools and resources to stimulate their imaginative capabilities.

Complementing Traditional Methods

The perception that AI tools complement traditional teaching methods (89.2%) suggests that students do not see AI as a replacement for conventional education but as a valuable addition that enhances learning experiences. This complementarity is crucial for integrating AI effectively without undermining the foundational elements of traditional education.

Building upon these findings and those addressed earlier in the literature review section, it becomes evident that AI has significant potential to enhance educational practices, particularly in fostering student creativity. However, its integration must be carefully managed to avoid overreliance and ensure it supports, rather than supplants, traditional pedagogies.

When engaging with intelligent systems like AI, it is essential to understand that they operate based on the instructions and data they receive. AI can generate responses or outputs, but the quality depends entirely on the information and directives provided. Therefore, the results produced by AI reflect the quality of ideas and instructions given by humans.

Considering the example of open-book exams discussed in the article by Moustaghfir and Brigui (2024), where students are allowed to consult their textbooks and references, it is evident that the quality of students' work varies based on their ability to synthesize and comprehend. While external resources can supplement knowledge and provide additional information, they cannot replace students' critical thinking, synthesis skills, ability to formulate original responses, and reflective skills (El Kassimi & Jmila, 2025).

Adopting an open approach toward technology and leveraging its benefits while minimizing irrational fears is essential. AI can be viewed as an ally rather than a rival, but its effectiveness depends mainly on the

quality of instructions and ideas provided. It is akin to looking at technology and creativity as a person facing a mirror that can only reflect their image and way of thinking. Just as a mirror reflects what it sees, AI reflects the input it receives. Therefore, fostering creativity alongside AI involves providing thoughtful and innovative input to guide its outputs towards novel and valuable outcomes.

In this spirit, several guidelines and recommendations can be proposed to effectively integrate AI into classrooms, ensuring it aids in developing students' creative skills while adhering to educational standards and avoiding excessive dependence. Firstly, AI tools should be supplementary aids to traditional teaching methods, enhancing creativity and problem-solving skills without replacing foundational learning processes. For instance, AI can be utilized for brainstorming, idea generation, and iterative feedback, allowing students to explore and expand their creative capacities. In this way, educators can leverage the strengths of AI and traditional methods in parallel to create a more enriching learning environment. Secondly, students must be educated on the practical and ethical use of AI, its capabilities and limitations, and issues related to data privacy. In this way, it becomes imperative to develop curricula that include AI literacy; ensuring students are not only consumers of AI technologies but also critical thinkers and informed users. This will empower them to harness AI's potential responsibly and creatively. Moreover, teacher training and support are vital components of this integration. In this regard, providing professional development opportunities for teachers to familiarize themselves with AI tools and their potential applications in the classroom becomes essential. In addition, creating resources and training programs that help teachers integrate AI into their lesson plans in ways that enhance creativity and learning outcomes will further support this effort. This means that teachers, as the facilitators of learning, must be equipped with the knowledge and skills to guide their students in effectively using AI.

Establishing clear guidelines on the ethical and responsible use of AI in education, emphasizing the importance of human oversight and judgment, is necessary to ensure that AI tools are used in a manner that is beneficial and respectful of students' rights. Promoting transparency in how AI tools are used and ensuring that students understand the role of AI in their learning process will foster a culture of trust and accountability. Another key aspect is encouraging critical thinking. In this context, designing assignments and activities that require students to engage with AI outputs critically will encourage them to question and refine the information generated by AI tools.

By creating a supportive environment wherein students can experiment and take creative risks, AI can become a partner in the creative process rather than a crutch. This approach will help students develop the ability to think independently and creatively, even when using advanced technologies.

Ongoing assessment and feedback are essential to successfully integrating AI in education. Regularly assessing the impact of AI tools on students' learning and creativity and gathering feedback from students and teachers will provide valuable insights into how AI can be most effectively utilized. Using data-driven insights to refine the use of AI in classrooms will ensure it remains a beneficial and adaptive component of the educational experience. This iterative process will help educators and policymakers improve AI integration strategies, keeping pace with technological advancements and evolving educational needs.

AI is also recommended to be included as a module in university curricula. This module could cover the fundamental principles of AI, its practical applications, and ethical and societal implications. Hands-on training with AI tools and technologies, allowing students to gain practical experience in using AI for various tasks such as data analysis, language processing, and creative projects. This practical knowledge will empower students to effectively apply AI in their academic and professional lives.

CONCLUSION

In conclusion, integrating AI into education offers tremendous opportunities to enhance students' creativity and learning outcomes. However, it must be approached cautiously and strategically to avoid potential pitfalls. By implementing these guidelines, educators and policymakers can harness the power of AI

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to support and enrich traditional educational practices, fostering an environment where creativity thrives alongside technological innovation.

So, is AI a friend or a rival to creativity? The findings of this study suggest that AI is indeed a friend. While AI brings transformative tools that can enhance creativity, its role must be clearly defined, and its use must be balanced to ensure it complements rather than overshadows human ingenuity. With a thoughtful approach, AI can coexist harmoniously with traditional methods, enhancing the educational experience and preparing students for a future where technology and creativity go hand in hand. This strategic use supports students in their academic pursuits and prepares them for a future where AI and human creativity coexist harmoniously, fostering innovation and excellence in education.

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