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Artificial Intelligence Solutions and College Students' Assessment: Exploring Potential Influences on their Creative Thinking Skills

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ABSTRACT

Recently, many college students are using artificial intelligence (AI) applications intensively while preparing for assessment. AI applications provide students ready content and different formats. This technological behavior requires educators to study the possible influence of AI applications on college students' creative thinking skills. Hence, this study comes to investigate the influence of AI generative solutions used by college students in assessment on their creative thinking skills. It follows the descriptive research methodology that does not involve nor require college students to participate throughout the steps and procedures, because the data analysis, findings, and discussions of several relevant studies were systematically reviewed and analyzed by this study to shed the light on the potential influence. This study finds that generative AI applications are used in many ways, like: text, image, audio, video, and code. It shows that AI solutions significantly increase college students' creative thinking skills by improving their imagination and generating creative ideas in different formats. It proposed a well-prepared systematic framework of AI applications and their most effective practical techniques to increase college students' creative thinking skills. It recommends that instructors need to embed creative thinking skills strategies into the assessment to enable college students use AI applications creatively.

Keywords: Artificial intelligence, Solutions, College students, Assessment, Creative thinking skills

INTRODUCTION

The use of generative solutions like artificial intelligence (AI) tools, online services, and computer algorithms is quickly becoming regarded as an essential asset amongst college students. Generative solutions can facilitate learning, assistance in implementing the projects, and stimulate problem solving in different fields (Mahmoud, 2009). This is a quick outline of how college students now employ Generative solutions, and some of them are recent publications (Al-Mutawah et al., 2021). It has a positive impact on academic work as in the education field, generative solutions offer a lot of relief to the learners (Mahmoud & Taguines, 2025). Generative resources such as AI based writing tools assist learners especially in essay writing by providing content creation, content organization, and even feedback which boosts the writing capabilities of such students. Research conducted by Lee and Kim (2023), gives an insight on how the use of AI writing tools helps to reverse writer's block and promote a more creative approach in students as opposed to focusing on the structure of the writing in this case. It can be used while searching for information as the students can use these tools to do research as well through the help of AI and machine learning algorithms. As per Chen et al. (2023), students conducting research using generative AI report rapid ease of performing tasks and comprehending difficult subjects. It provides college students with supporting creative projects as in creative departments, generative solutions help students chart innovative courses of thinking and creating (Al-Mutawah et al, 2018). For instance, generative art software enables student within graphic design schools/college to reflect on visuals and sound and develop unique projects (Mahmoud, 2014). A study by Martinez and Wong (2022), discusses how students utilized generative design tools to create original works that combine technology and artistry, fostering a unique learning environment. It supports collaborative learning a generative AI can also be used in collaborative learning situations. According to a research article by Patel et al. (2023), the integration of collaborative

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AI tools in group projects led to improved communication and project outcomes (Mahmoud & Bawaneh, 2025). There are some ethical considerations that even though the condition is certainly beneficial, learners are also likely to agree to the fact that the employment of generative solutions has numerous ethical issues (Al-Mutawah et al., 2022). Prestigious of plagiarism and legitimacy of the content produced by AI is a major issue of interest (Mahmoud, 2015). A study by Turner and Reyes (2023), emphasizes the importance of teaching students about ethical AI use, ensuring they understand how to leverage these tools responsibly. It should be obvious that AI tools can be quite useful in facilitating education; however, problems relate to numerous of these tools present difficulties to students' evaluation. The following analyses seeks to explain this impact in light with literature that has been produced in recent years (Ma hmoud, 2023). This study provides a brief of how AI impacts creative learning among college students based on some of the studies conducted recently. While adopting AI software programs tools in academic endeavors, the following are important points taken into the consideration to ensure and promote a culture of ethic usage (Mahmoud & Hamdi, 2009). Further directions of AI learning environment are most certainly be discussed by providing considerations of AI in education (Mahmoud, 2023). Therefore, the current study is considered as an investigation of finding answers to the following questions: (1) What are the AI software programs that college students can get benefited from while they get assessed? (2) How AI software programs can influence college students' creative thinking skills? (3) What is the role of instructors when dealing with college students who are using AI software programs for assessment? Hence, this study has a significant importance as it shows college students and their instructors the best way to use AI programs for assessment in order to increase creative thinking skills. Its novelty comes from the systematic procedural way of presenting AI functions and exploring the techniques of generative solutions that college students use while they prepare for assessment. This study is interesting for the reader because it explores the potential influence of AI on creative thinking skills and shows how it can shape their ways of creativity. Namely, this study has a vital importance in terms of focusing on the generative solutions that offer significant possibilities for the learning improvement, creative and teamwork processes for college students and how instructors can take these considerations while they design assessment requirements.

OBJECTIVES

AI Potentials for College Students' Creative Thinking Skills while they Prepare for Assessment

With the advancement of technology these days, while preparing for assessments, students increasingly make use of AI all the way to the use of various tools to advance study processes and develop better writing qualities by hastening the pace of research efforts. While this creates a lot of efficient content, so to say, it also paves the way for creative thinking and building up analytical skills in the students. Recent research supports the following summary as to how students create content with AI (Al-Mutawah et al., 2019). The next part of the study overview general advantages of AI for college students during the assessment preparation based on the latest literature (Mahmoud & Hamdi, 2009). Personalized learning is one of the influences as the AI-featured platforms that learners want to learn with, they get to or can interact with; thus, can be modified to fit delivery depending on requirement/speed. Research by Liu et al. (2021), demonstrates that adaptive learning technologies enable students to focus on their specific weaknesses, leading to more effective study sessions and improved assessment performance. Ostensibly, AI is considered as enhanced study tools that can make the instructors' task much easier and especially the marking and flashcard applications of the AI. For instance, in a study by; Chen et al. (2022), students who use AI entertain and design the flashcards got better retention than conventional ways of learning. The use of spaced repetition algorithms helped reinforce knowledge effectively (Mahmoud & Bawaneh, 2025).

AI is an immediate response strategy that also mentions timely submission of notes as one of the key benefits of AI software in research training (Mahmoud & Taguines, 2025). AI can be used to test new exercise and fitness quizzes and tests and the results can be accurate in real time. An experiment using Huang and Zhao (2022), practical features reveal that real-time feedback from AI tools greatly enhances the accuracy of university students' content, and enables them to deliver actively monitor learning processes. AI is used to reduce test anxiety as it also reduces research anxiety through the use of simulation devices that mimic the experimental environment, in detail (Hung & Mahmoud, 2015). The study of Patel et al. (2023), suggests that scholars practicing AI-driven mock exams felt overprepared and not much, which definitely really affected their overall performance. College students' interaction and group activities can be handled by AI. According to one user of Johnson and Lee (2024), AI-driven systems that encourage peer-to-

peer communication and sharing of useful resources stimulate higher collective knowledge and problem-solving capabilities ahead. Gamification of learning done by AI can also game the learning process, making it very interactive and fun (Alon-Barkat & Busuioc, 2021; Chiu & Zhang, 2022; Wang & Chen, 2023). The gamified AI applications offer challenges and rewards that motivate students to engage themselves with the material (Kizilcec, Piech, & Schneider, 2021; Li & Zhou, 2022; Seidman & O'Donnell, 2023). This therefore means that the student is able to focus more on creative thinking and analysis than being stuck in writing. Summarization and research can be done by AI tools that can also become a big help for students in summarizing huge volumes of texts and making a synthesis of information from different sources. Liu and Wang (2021), summarize that AI summarization tools summarize complex materials into understandable chunks, which are easy to review for key concepts that one would want to retain for assessments, thus saving them much time and enhancing comprehension (Hung et al, 2015).

A study from Vassileva et al. (2021), showed that students who used AI-made quizzes remembered and understood the material better, because these quizzes were adjusted to their learning level. This hands-on way of studying helps students get more involved in their learning. Boosting creativity and idea development as AI tools can spark creativity by giving ideas and prompts for projects or papers. A study by Niu et al. (2022), found that students who used AI to come up with ideas saw a big increase in creativity, letting them look at assignments in new ways. This ability encourages students to think differently and find unique solutions. Ethical considerations and originality are important as while AI-generated material can be advantageous, it also involves ethical concerns, such as plagiarism and lack of originality. Pecorari and Tatum (2020), report on the significance of teaching students how to integrate AI tools effectively without compromising academic integrity. Instructors are advised to provide guidelines on the appropriate use of AI (Hunter et al., 2013). AI tools also help college students to create content more effectively as they study for tests (Kader, 2023; Brown & Smith, 2023). By offering writing aids, creating study books and videos for students to flip through the 'can do' options, these technologies contribute to student creativity (Lee, 20203). There is a lot of power in sentences for the ability to help college students at an undefined point in future research teaching (Mahmoud & Bawaneh, 2025). The result is that AI can help university students gain and subsequently use important features: personalized assessment, progress and improvement monitoring assistants, direct feedback on overall performance, and anxiety reduction (Hung et al, 2015).

AI Challenges that Encounter College Students during Assessments

AI benefits college students prepare for exams as it also creates a number of hurdles that can affect their ability to learn efficiently (Al-Mutawah et al., 2022). Among these hurdles are technology dependence, cost concerns and fairness and security of personal data. Research has been one way to document some of the challenges associated with using AI to assist in studying for assessments. Relying much on AI tools leads to bothersome issue occurs when students begin depending on AI tools to assist them with their learning and problem solving as emphasized in a study by Alon Barkat and Busuioc (2021), as results of the research showed that students who heavily relied on AI faced difficulties in fostering their creative thinking and problem-solving skills, which hampered any learning intervention. Equity and access issues occur through disparities in learning opportunities as diversity of student populations and the range of AI technologies accessed by students can be very different. Quality of AI-generated content is a further concern that is raised over the variable quality of the materials that come from AI. Depending on the characteristics of these materials, students may get the wrong impression that the contents contain inaccurate or uneducated information. According to Li and Zhou (2022), AI can file processes; however, that does not guarantee reliability, aiding students get misperceptions of the intended information. These negative values have all the potential to take away some level of faith in the learning materials that students would like to get. Technology-induced anxiety and stress that is the uptake of AI in education can portend anxiety and stress for students. The context of technology combined with the pressure to keep abreast of advancements in technology, or to become obsolete, is a huge monkey on their backs.

Problem Statement and Study Questions

In the current intervention of generative solutions into education, there is a wide range of consensus of the problems college students face while using AI applications, along with the impacts of these problems on their creative thinking skills during assessment preparation (Van Laar, 2020). Historically, this phenomenon is followed through from previous interposition generations where native problems are consensual to fill in generative solutions within the

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domain of education resulting towards knowledge precision as well as finally, we have outcome regarding problems faced by college students while using AI applications and consequences of these problems on creative thinking ability during assessment preparation being validated (Duffy, 2021). Nowadays, there are thousands of AI software applications that provide assistance to college students in doing their assessment, but the significant concern that raise to the surface and makes college students hesitate is how to choose the best AI application for a specific task. They find themselves lost in this tremendous number of AI applications and a huge amount of time and effort were lost in the journey of searching (Johnson & Lee, 2024). So, this study provides a guideline to both college students and their instructors to find the best AI application for a specific task that it was designed for it. There is a big gap between the capabilities of these AI applications and the actual mastery level that college students already have while dealing with the available AI applications. This gab came from the fact that college students see AI applications as tools for doing the job not to increase and improve their creative thinking skills (Niu, 2022). This study shows the reader practical ways that enable college students to invest the AI applications in developing their problem-solving skills and maximizing their imaginations. This study is considered as a roadmap coming from the fact that college students are missing using the AI application in improving their curiosity and analysis while doing the assessment brainstorming. College students do not see the huge impact of AI on their questioning and creative thinking skills in their assessment (Ekins & Radivoyevitch, 2022). Hence, there is a need of focusing on using the AI application on making collaboration and communication among college students more effective and productive. Therefore, the current study has a significant and important potential to overcome the aforementioned challenges and limitations and to be productive in terms of helping instructors and college students to invest into their capabilities of implementing generative solutions like AI in expanding their creative thinking skills by suggesting premium AI software programs and practical techniques to use them in college learning environment. Hence, the current study is considered as an investigation of finding answers to the following questions: (1) What are the AI software programs that college students can get benefited from while they get assessed? (2) How AI software programs can influence college students' creative thinking skills? (3) What is the role of instructors when dealing with college students who are using AI software programs for assessment?

METHODS

Context of Using AI in Improving College Students' Creative Thinking during Assessment

The current study sheds the light on the using generative solutions by college students in preparing for assessment by exploring the potential influence of artificial intelligence on their creative thinking skills in Bahrain. It suggests several AI applications and provides details on the functions that can help college students preparing for their assessment and increasing their creative thinking skills. It shows a cohesive systematic framework of using different AI applications according to their benefits in a practical way for college students and their instructors, that the researcher is considered as an expert and professional in terms of high qualifications and intensive work experience. Therefore, the current study follows the descriptive research methodology and it does not involve nor present college students throughout the steps and procedures. This study systematically reviewed the data analysis, findings, results, discussions, and recommendations of several relevant studies to shed the light on the potential influence. The reviewed studies were used to shed the light on the practical creative applications and suggest to the readers and instructor a very detailed discussion of the suitable AI for college students to increase their creativity and solve the assessments, along with a well-prepared systematic framework of AI applications and their most effective and suitable practical techniques. The aforementioned suggested systematic practical AI framework conveys a significant and vital potentials when it is used by college students while they prepare for their assessment, as well as for college instructors, professionals, researchers, and educators. In addition to that, the expected results of applying this systematic AI framework may not be identical when it is applied by different college students, instructors or other education levels or courses. This difference in results can be referred to the different characteristics of college students creative thinking skills and capabilities. The college course outlines of different majors can be applied or modified when applying the suggested systematic AI framework for creative thinking skills from the current study. The college courses from different majors and specializations can be involved due to the courses' natures and the topics themselves, including: technological knowledge background, mastery level, timeframe, attitudes, and educational policies.

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Systematic Framework of AI Applications for Improving Creative Thinking Skills of College Students

Current college students are living in a rapidly changing educational technological environment. It is crucial for college students to embrace generative AI as a tool for enhancing their creative thinking skills while working on college assessment preparation. Through the systematic and practical application of generative AI application, college students can successfully improve their creative thinking skills and perform meaningfully in their educational assessments that measure students' learning outcomes and achievement. The current study suggests a systematic framework (TIAVC) consist of 5 generating stages, including: text, image, audio, video, and code, as shown in Figure 1. It shows a systematic design of the suggested AI framework connecting all 5 stages together. Each stage has several tasks to be conducted and targets a series of creative thinking skills based on the reviewed theoretical background and practical techniques.

Figure 1. Suggested systematic framework of AI applications for improving creative thinking skills of college students.

According to the modern technological practice that college students need, the current study suggests a systematic framework of AI applications for improving creative thinking skills of college students. The selected AI applications were chosen based on a list of certain criteria that consider applying a holistic overview and meet the necessary requirements. The suggested AI applications have high quality of generated data content preparation. They have frequent versions updates that fixes the bugs and other technical issues. They have easy to use interface that provide users a friendly usage. They have the cost affordability because they offer several packages with different prices starting from free versions to the upgraded paid ones. They have customized support and available technical support services to help users solve the technical issues in a short time. They consider the global ethical values and proper moral considerations. They provide the user with the privacy terms and conditions and make them available. Each AI application fit to the targeted need and shows a high level of adaptability. It is recommended to start with the text AI application, such as ChatGPT, as it enables students to improve their creative thinking skills by providing them with diverse perspectives, instant feedback, brainstorming, writing innovation, and different writing styles (Liu & Wang, 2021). Then, college students can move to the image AI applications, such as: DALL-E, as it maximizes their creative thinking skills through visualize abstract concepts, different artistic styles and themes, and creative designs (Smith & Taylor, 2024; Lee & Kim, 2024). After that, college students can proceed to the audio AI applications, like: Amper Music, because it influences their creative thinking skills by simplifying music composition process, exploring soundscapes, musical structures, and greater musical creativity (Patel & Nguyen, 2024). Then, it is the time for them to use the video AI applications, such as: Runway, as it can impact their creativity by streamlining the video creation process, storytelling and artistic expression, and innovative video projects (Thompson & Brown, 2024). At the advanced level, college students can deal with code AI applications, like: GitHub Copilot because it has a great impact on their creative thinking skills through providing them with instant coding suggestions, rapid prototyping, free coding ideas, problem-solving, and programming skills (Smith & Taylor, 2024). Therefore, the proposed AI systematic framework focuses of the procedural and practical sequence that makes generative solutions like AI application improve college students creative thinking skills through their working on college assessment.

The success of the proposed framework implementation can be evaluated by using a group of checklist criteria. It is important to check the level of its applicability and accessibility as students and instructors need to consider many AI applications while they work. Also, the suitability of the suggested framework with the educational system and policy, as some educational systems does not allow, in some levels, using some AI applications. The productivity of suggested AI applications with some subjects needs to be checked to make sure that these AI applications have the homogenous and can work together in different subjects. Finally, evaluate the expected level of creativity improvement that has been met or not according to the predetermined standards. All these criteria need to be evaluated to determine the success level of the suggested framework and to state the needed improvement if any.

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RESULTS AND DISCUSSION

The current study investigates and discusses in more specific details the practical techniques that college students can use AI applications to improve their creative thinking skills while they are working on their assessments. As it finds that using AI increases college students' creativity, AI in learning surroundings has a positive impact on increasing college students' readiness for examination. The findings show that AI tools have a significant impact on learning and enhances study practices and thirdly. These powerful tools provide the students with the help they need to reflect on their learning achievement (Lee, 2023). The current study focusses on a carefully selected list of AI applications tailored to college students preparing for examinations, assignments or other types of assessment that outline their key functions, challenges and solutions, and the implications of creative thinking. This study found that ChatGPT's main function is to provide a conversational partner through brainstorming, answering questions, and giving writing-related suggestions. It has some challenges as the growing tendency of students to rely on AI prevents them from developing their original creativity (Smith & Taylor, 2024). To prevent intellectual independence from being replaced by passive ideas, educators should promote ChatGPT as a tool for stimulating thoughts. ChatGPT is a disruptive technology as it pushes students to think outside the box by asking them thought-provoking questions and looking at problems from diverse angles. This study found that Canva is an online graphic design tool that provides users with templates, images, and design suggestions for creating various types of visuals and presentations. It has some challenges as in the case of college students, the main problem is that the students may not be able to use the advanced features to the fullest, resulting in the designs having a common look (Lee & Kim, 2024). The suggested solutions can be through training sessions on Canva, college students can be guided to more creatively exploit its features. Canva has significant influences on creative thinking as it enables the development of visual creativity such as by letting students focus on the content while sharpening their design skills (Zawacki-Richter et al., 2020). The current study found that MindMeister is a digital mind map application that allows for students to organize their thoughts and ideas in a visual way. It has some challenges as there are some college students who might find the task of making a comprehensive mind map to be difficult (Brown & Smith, 2023). As a solution for that, providing templates and examples can assist students in the right direction and thus be in the effective usage of the tool. It influences creative thinking as it makes the links between the ideas, which then contributes to the improvement of the problem-solving skills in a creative manner. This study found that DALL-E is a vision-based system that creates visual art by means of verbal descriptions thereby allowing students to come up with unique images. It has some challenges in thoughtful guidance of students in prompt writing may cause the production of too weak prompts that may have a negative impact on the outcome (Kizilcec, 2021). Solutions like making the workshops on effective prompt formulation can act as a great instrument for the students in order to maximize the benefits they get from DALL-E. It can influence creative thinking as this tool enables the students to visualize the abstract concepts and therefore become artistically inspired. This study recommends that Amper Music is beneficial as with the help of Amper Music, the college students have the chance to create an original music piece that is highly tailored to their project. It has some challenges as college students may have some problems with this issue, a lack of harmony between the project and the sound piece which is the music, might be such a problem (Patel & Nguyen, 2024). It is suggested as a solution, giving the information about the motifs of music theory can help the students to learn the composition practically. It has influences on creative thinking as music education moves the attention from one subject to another, apart from the different sounds and feelings that the students experience (Chen et al., 2022).

This study found that Quillionz function, quizzes and study materials are created using the provided texts which makes learning personalized. It has some challenges as the AI-generated questions may not necessarily align with particular learning objectives (Lee & Kim, 2023; Patel, 2023). Solutions can be done by instructors who can evaluate and edit AI content to make sure it is relevant to the curriculum. It influences creative thinking as Quillionz makes students deal with the material more critically giving them more alternatives of study. This study suggest that college students are recommended to use Jasper, the writing tool, is a good assistant for content creation by suggesting writing prompts and refining essays (Seidman & O'Donnell, 2023). It has some challenges as come college students might be too much depending on Jasper thereby limiting their personal creativity (McNaughton et al., 2020). As a solution, instructors can get college students to use Jasper for brainstorming but they should still develop their own writing style. It can influence creative thinking as Jasper is a catalyst for different writing styles which, in turn, helps students develop their own style (Brown & Smith, 2023). The current study found that Miro is an online whiteboard

that enables students to share and develop their ideas in a virtual environment (Kim & Zhao, 2023). It is suggested as a solution that direct instruction in powerful search techniques to assist students better understand how to research. It has an impact on creative thinking as reading a variety of literature leads students to see the big picture from multiple angles thereby aiding them in their creativity (McNaughton et al., 2023). This study found that Scribblar has core features as too often in other digital tools those rich media are only be shared to a limited degree, but with Scribblar the students and instructors can collaborate on their work in real-time. It has some challenges as technical difficulties can interrupt communication and disrupt the creative flow (Brown & Smith, 2023). Solutions can be done by giving users the tools to self-troubleshoot to help mitigate outages and optimize user satisfaction. It has a clear impact on creative thinking as it promotes collaborative brainstorming and intuition visualization through the interactive environment (Lee, 2023). These AI tools impact college students' creative thinking skills as they prepare for their assessment. Despite the challenges, targeted solutions can help increase the value of these tools.

This study provides the educational professionals with several practical implications of its findings for educational practice and policy. It finds that using the AI enables instructors to personalize learning and assessment based on their skills. This finding is aligned with what Johnson and Lee (2024) and Patel and Nguyen (2024) found as students use AI applications differently based on their preference and abilities in solving their assignments. The finding emphasizes on the fact that AI helps college students in making decisions and come up with creative solutions for the problems. Nguyen and Smith (2023) and Liu and Wang (2021) support this finding as they found in their studies that AI applications enable students to transfer knowledge in different situations and make better decisions to save their time and effort. This study finds that AI is an effective tool in automating some instructors' administrative tasks, so they can give more focus on designing assessment that requires more creative skills by students. This finding intersects with a study done by Duffy (2021) that found students prefer to use the same registration information but different login details to protect their privacy and increase their accounts security. The current study finds that important for policymakers to develop AI professional development standards to ensure that all instructors are updated.

CONCLUSION

As a holistic view, the current study discusses, analyzes, and presents an overview of the reviewed findings and results of several researches and studies that focus on the use of generative solutions like AI applications and the impact of that usage on human creativity, particularly college students. It is worthwhile to identify the beneficial AI applications in a detailed and professional way that makes college students easily choose the best AI application that fits to their needs. This study focusses, in more detail, on the most suitable AI applications and their functions. It discusses the impacts of these AI applications on college students creative thinking skills and suggests a systematic AI framework to be used in ordered to maximize their creativity while preparing their assessment using the AI applications. Hence, this study professionally provides the college instructors with the needed tips and considerations to be taken while designing the assessment in a way that allows college students to use AI application creatively.

In a conclusion, this study recommends that using AI applications in college assessment needs to be done in a systematic way to improve college students creative thinking skills. This AI integration can represent a major leap ahead in higher education system and human creativity. This study suggests that enabling college students and instructors to master the necessary technical and practical mastery level enables them to use these generative solutions professionally that improves creative thinking capabilities. It recommends instructors to design their assessments in a way that allow AI personalized learning and creative solving problems to take a place. Also, instructors are strongly recommended to be careful while they design the assessment for their college courses by considering the practical techniques that were presented and discussed in this study in order to maintain college students' creativity and maximize the sustainability of using the AI application in education. It recommends students to carefully read the AI application's privacy conditions and terms to avoid any unpreferable data collection by AI algorithms. It recommends educational institutions to develop their AI guidelines and regulations to organize the AI usage and minimize relevant misusage issues. It encourages educational policymakers to develop professional development guidelines to encourage instructors to gain more AI practical updates for their career development. The current study opens the door widely to extend further research to investigate the most suitable AI applications for according to different courses and subjects. It recommends that conducting more specialized researches in terms of

the adopting new AI applications as we move into a brand-new technology in our global and local educational systems. Based on the aforementioned findings, suggestions, and recommendations, more further studies can discuss and address more AI applications and provide the proper strategies and frameworks to enhance students' creative thinking skills in college level.

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