

ChatGPT and other AI Users: Innovative and Creative Utilitarian Value and Mindset Shift

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Abstract

AI chat models grow popularity among students because of its accessibility and convenience. Chat models are programmed to respond to context-specific prompts from different fields and discipline. AI in education offered opportunities for students to use AI chat models to assist with their academic tasks. This study analyzed the narratives from college students about their experiences in using AI chat models for their academic tasks. Sixteen (16) students participated in one-on-one interview from engineering- and computer-based programs. Thematic analysis indicated that AI chat models hold substantial utilitarian value for learners particularly in tasks that require innovation and creativity. AI models offer substantial feedback and immediate access to real-time information, effectively reducing the time spent on researching and searching for specific information. As a result, students can enhance their innovative and creative endeavors, as AI models assist them in conceptualizing their ideas and incorporating fresh perspectives. However, students were also worried about their overreliance to AI models which restrict them from being creative and innovative. Some students admitted that reliance to AI models pose threat in autonomy and decision-making. The convenience offered by AI models can lead to a change in mindset among students, where they may no longer feel the necessity to engage in thinking or conceptualization since AI can readily provide the information and ideas they need. This study is significant in providing perspectives on the utilitarian value and mindset shift raised by AI chat models in education.

Keywords: ChatGPT innovation, ChatGPT Creative, ChatGPT Utilitarian Value, ChatGPT Mindset Shift.

Introduction

With the advent of ChatGPT and other AI technologies, technology-based learners have gained access to a new tool that offers

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relief and support in their academic pursuits. ChatGPT, powered by OpenAI's language model, could generate ideas, provide information, and assist in various tasks. This research aims to explore the relief that ChatGPT provides to technology-based learners by examining its utilitarian value and its impact on enhancing innovative and creative skills. By understanding the benefits and limitations of ChatGPT, educators and learners can harness its potential to improve learning outcomes and navigate the challenges associated with AI integration in education.

In recent times, there has been a notable surge in the interest surrounding advanced large language models such as ChatGPT, with a particular emphasis on its popularity among students. The ongoing discourse surrounding ChatGPT within academic circles has garnered significant attention. However, it is imperative to further enhance the comprehension of lecturers and educators regarding the way students employ and perceive ChatGPT (Haensch et.al, 2023).

The adoption of the technological framework of ChatGPT and other GPT models presents an opportunity to augment learning analytic methodologies, produce designed scaffoldings, foster the development of ideas, and ultimately broaden the reach of educational opportunities and resources in the pursuit of social justice (Dai et.al, 2023). For instance, the potential for a revolutionary transformation in the field of medical education exists through the integration of AI, which has the potential to reshape how students acquire knowledge in biomedical sciences (Thakur et al., 2020).

The use of expansive language models, such as ChatGPT, holds promise in virtual education, as they can effectively function as teaching assistants. These models have the capacity to furnish students with comprehensive and pertinent information, and potentially even facilitate interactive simulations in the future. The potential of ChatGPT to augment student engagement and enrich student learning is a subject that calls for further investigation to substantiate its potential applications (Lee, 2023; Tian, 2023).

This study offered perspectives on the use of AI chat models in assisting students with their innovative and creative tasks. This study was inspired by how students could potentially use AI chat models in scientific approaches (e.g., Luckin & Cukurova, 2019) and in distance learning (e.g., Dogan et al., 2023). In this study, innovativeness involves activities that require students to present outputs with practical application and creativity generates new ideas that involves critical thinking and imagination. This study aimed at answering questions on what the utilitarian value of AI models were and how it could improve (or delimit) the innovativeness and creativity of students.

Chat models have critical challenges which include ethical concerns, data bias, discrimination, security issues, and impacted freedom. In addition, it has been observed that ChatGPT exhibits limitations in its ability to consistently execute mathematical operations, occasionally demonstrates conceptual misunderstandings, and generates

citations that may appear credible but contain inaccuracies in their content (Tyson, 2023).

Ray (2023) envisioned for the future of ChatGPT entails an extensive exploration of various avenues for further research and development. This includes a particular emphasis on the integration of ChatGPT with other cutting-edge technologies, enhancing the overall human-AI interaction, and effectively addressing the prevalent issue of the digital divide. Because of academic insecurities of students to digital competence and the cost of online connectivity, using a mixture of both traditional and online learning caters to the limited resources of indigent students. Schools should promote conversational curriculums in schools under the new normal. Teacher at the same time should be aware of these insecurities to fit in their strategies in teaching and learning principles (Chavez, 2020).

The goal of this study was to analyze how AI models can support students in making ideas and innovations and developing creative ideas. This study use narratives from college students on how they use AI models as an assistant for innovative and creative tasks e.g., academic writing, programming, designing. This study sought to understand the mechanisms that could aid the learning of students and determine potential mindset shift in frequent use of AI models.

Literature Review

Some empirical studies investigating the effects of these AI-based tools on the established practices of higher education institutions (HEIs) in terms of enhancing continuous learning. This is particularly true for undergraduate degree programs, where the literature and experimental evidence are limited.

For Rogers (1971 p. 27), innovativeness is "the degree to which an individual is relatively earlier in adopting an innovation than other members of his system." The concept of innovative activities in this study includes robotics, project development, research, and product development. This study covers the concept of innovativeness based on Rogers and Shomaker (1971). Creativity, on the other hand, involved the development of ideas to show or present something artistic.

The efficacy of the ChatGPT-generated assignments was assessed by subjecting them to rigorous evaluation using widely recognized plagiarism detection tools, such as Turnitin, GPTZero, and Copyleaks. These tools are renowned for their ability to identify instances of academic dishonesty and ensure the maintenance of academic integrity. The study presented an analysis of the model's constraints and emphasized the ramifications of the recently introduced AI-powered ChatGPT in the academic domain. This necessitates a reevaluation of the current monitoring methods employed by higher education institutions and regulatory bodies, as well as an enhancement of educational programs (Chaudhry et.al, 2023).

The advent of the groundbreaking online application ChatGPT has sparked significant apprehension in education. Foreign language educators, who heavily rely on written assessments experienced heightened levels of anxiety. This was further intensified by the extensive media coverage surrounding the exaggerated claims regarding the effectiveness of these models. (Hong, 2023).

Specifically, the performance of ChatGPT varies in different education disciplines. ChatGPT performs well in economic, good in programming, but unsatisfactory in mathematics (Lo, 2023). ChatGPT exhibits promising capabilities as an assistant for instructors, offering valuable support in tasks such as generating course materials and providing suggestions. Additionally, it serves as a virtual tutor for students, effectively addressing their queries and fostering collaborative efforts. However, it is important to acknowledge the challenges that arise from its utilization, including the potential generation of inaccurate or fabricated information, as well as the circumvention of plagiarism detection mechanisms (Lo, 2023; Vasconcelos & dos Santos, 2023).

Adaptation to challenges is an important starting point of learning, especially in the advent to distance learning (Chavez, 2020). ChatGPT and other Natural Language Processing (NLP) technologies holds promising prospects for augmenting the quality and efficiency of academic writing and research endeavors. Moreover, the utilization of such tools also gives rise to worries regarding their potential influence on the authenticity and reliability of scholarly endeavors (Chaudhry, et.al, 2023; Dergaa et.al, 2023; Safi & Naini, 2023).

Higher education calls to innovative thinking by engaging students to collaborative activities. According to the theoretical framework of experiential learning as proposed by Morris (2020), it is posited that students should actively participate, engage, and be fully immersed in the learning process (Garcia, 2023). Learners are situated within highly immersive learning environments that are designed to facilitate robust interactions and collaborations with fellow learners. The acquisition of experiences through physical, intellectual, and social engagement constitutes the fundamental essence of experiential learning (Garcia, 2023; Jordan et al., 2018).

The use of AI models in higher education opens opportunity for immersive learning. Students could use these resources to increase their learning efficiency. For instance, the introduction of new educational functions like learning performance prediction has been greatly aided by AI in education (Jiao et al., 2022; Liao et al., 2022). It is important to analyze the impact of AI models in the innovativeness and creativity of students and how it can influence their mindset. Limited studies had been conducted in these aspects (Gilson et al., 2023; Enago Academy, 2023; Kaltenbrunner et al., 2022).

Research Objectives

This study analyzed the narratives of college students on how AI models can improve (or delimit) their innovative and creativity. This study also analyzed how AI models potentially influence mindset shift among students. This perspective was a remarkable take on AI-assisted learning and ethical implications of excessive AI use in education. Below are the specific research objectives.

1. *Determine the utilitarian value of ChatGPT and AIs to technology-based learners on their innovative- and creative-oriented task.*
2. *Determine the change of mindset of technology-based learners in using ChatGPT and AI tasks.*

These objectives shed light on what aspects AI models helped students with their innovative and creative tasks and to what extent it caused students to shift their mindset in learning. Such analysis opened new questions on strategies to develop a well-organized guided learning in higher education.

Methods

This study explored the innovative and creative utilitarian value of AI models based on the experiences of students. This study also analyzed the mindset shift that the AI models caused to them. This study developed an in-depth analytical process on how AI models influenced the academic life and learning of students in higher education. Qualitative analysis provided understanding on how students use AI models for creative and innovative tasks.

Research Design

The research design employed for this study was qualitative in nature, aiming to explore and analyze the innovative and creative utilitarian value of AI models and the mindset shift experienced by college students. Specifically, exploratory design was used to extract relevant narratives from the participants through theme development and guided analytical process. Exploratory design is useful in preliminary studies as this design helps in determining remarkable ideas, relations, and narratives. These insights can be used in developing study concepts and be the foundation of complex quantitative analysis and theoretical analysis.

Qualitative research allowed for an extensive understanding of the students' experiences and perspectives regarding the use of AI models in their academic life and learning. Qualitative research can be considered humanistic in character due to its emphasis on exploring the personal, subjective, and experiential aspects that underlie knowledge and practice (Leavy, 2014). Exploratory design is often qualitative to facilitate an expanded understanding of a specific subject matter that captures the interest and establish connections between ideas, thereby enhancing

familiarity of the foundational aspects of analysis (George, 2022). Exploratory design was used in this study to analyze the narratives of the participants and develop connections of themes.

Population and Sampling Technique

The sampling technique utilized in this study was purposive sampling, which is a non-probability sampling method frequently employed in qualitative studies. The technique entails a planned and organized selection of participants with established parameters that closely align with the research objectives (Nikolopoulou, 2022). Researchers purposefully select individuals who have the essential knowledge and competence to provide significant insights and information relevant to the specific topic under investigation.

In this study, the participants were college students from engineering and computer-based programs. The students were selected based on specific criteria *e.g.*, frequent AI use, use of AI for academic tasks (innovative activities, research and development), programming. The participants were initially asked about how they use AI models in their academic tasks for innovative activities. Below is the basic information of the participants.

Table 1.0 Basic Information of Participants

<i>Code</i>	<i>Name</i>	<i>Gender</i>	<i>Age</i>	<i>Demographic</i>	<i>AI used</i>
Student 1	Steve	Male	19	Engineering student	ChatGPT & Bard
Student 2	Lyka	Female	18	Computer Science student	ChatGPT
Student 3	Yen	Female	17	Engineering student	ChatGPT
Student 4	Andrew	Male	23	Engineering student	ChatGPT
Student 5	Von	Female	24	Computer Science student	ChatGPT & Bard
Student 6	Jenny	Female	22	Engineering student	ChatGPT
Student 7	Andrei	Male	21	Computer Science student	ChatGPT
Student 8	Alex	Male	20	Computer Science student	ChatGPT
Student 9	Samantha	Female	19	Engineering student	ChatGPT & Bard
Student 10	Bryan	Male	21	Computer Science student	ChatGPT & Bard
Student 11	Anna	Female	20	Engineering student	ChatGPT
Student 12	Matt	Male	21	Computer Science student	ChatGPT
Student 13	April	Female	23	Computer Science student	ChatGPT & Bard
Student 14	Scott	Male	19	Engineering student	ChatGPT
Student 15	Stacey	Female	18	Computer Science student	ChatGPT
Student 16	Chester	Male	20	Engineering student	ChatGPT

Research Instrument

This study developed a guide question for one-on-one interview. The research instrument was designed to extract insights from the participants. Designing a research interview guide should foster an environment that promotes participants' autonomy in expressing their experiences authentically and without the influence of predetermined groups or categories imposed by the interviewer (Magnusson & Marecek, 2015).

Table 2.0 Interview Guide Questions

Objectives	Interview Questions	N
1. Determine the utilitarian value of ChatGPT and AIs to technology-based learners on their innovative and creative-oriented tasks?	a. Given your technology-based course, what is the use or importance of ChatGPT and AI in your innovative and creative subjects?	16
2. Determine the change of mindset of technology-based learners in using ChatGPT and AIs tasks in terms of	a. Having taken a technology-based course, do you think ChatGPT or AI enhances your innovative and creative skills?	16
a. Enhancing their innovative and creative skills	b. Having taken a technology-based course, do you think ChatGPT or AI limits your innovative and creative skills?	
b. Limiting their innovative and creative skills	c. Have you become dependent on ChatGPT or AI for your innovative and creative tasks in school?	
c. Becoming dependent		

Data Gathering Procedure

One-on-one interview was conducted to collect narratives from the participants. In-depth interviews were conducted with the selected college students to capture their experiences, insights, and perceptions (Chavez, 2022) regarding the innovative and creative utilitarian value of AI models and the mindset shift caused by their usage. The interviews were systematically carried out, employing a structured approach that involved the use of open-ended questions.

The researchers requested permission from the school administration to carry out the study. A formal request was made, including the research's objectives, methods, and ethical considerations. Any necessary permissions and protocols required by the school were followed to ensure compliance and ethical standards.

The participants were given a written document that provides explanation of the study's goal and objectives by the researchers. It also emphasized the voluntary nature of participation and ensured that the participants understood their rights, including the option to withdraw from the study at any point. Informed permission forms were provided and collected from individuals who exhibited an interest in participating, ensuring that participants understood the research process and their engagement completely.

The interview was carried out through phone calls whenever it was convenient for the participants. The data gathering procedure was conducted from June 2023 to July 2023.

Data Analysis

The primary data in this study were the narratives from one-on-one interview. Key themes and narrative patterns were found by going over and categorizing the transcriptions. The data were thoroughly analyzed using thematic analysis to find recurring themes and answers. The results were contrasted with other opinions.

This study used the thematic analysis guide from Kiger & Varpio (2020) that follows familiarization, generation of initial codes, searching for themes, reviewing themes, defining and naming themes, reporting. Thematic analysis in this study provided context-specific narratives on the utilitarian aspects and mindset change in using the AI models.

Results

Objective 1. *Determine the utilitarian value of ChatGPT and AIs to technology-based learners on their innovative and creative-oriented tasks.*

Based on the responses of the participants, the use of ChatGPT and AIs to technology-based learnings have seen variety of benefits towards innovative and creative-oriented tasks. However, it also became the way of reducing the ability to construct logical contents without depending on ChatGPT and AIs. One participant highlighted that the use of ChatGPT helps him to generate ideas and at the same using credible sources without wasting time on reading articles in Google Scholar. The data gathered indicated that the use of ChatGPT and AIs provides an advantage to students in terms of generating contents for class works and submitting innovative and creative-oriented tasks.

“For innovativeness in terms of primarily using, if you want quick responses to the information you ask. I mean, in some credible sources like for Google Scholar, you cannot directly find your answer for some literature because you have to read all the articles or read the entire article to get what you want.” [Student 16]

“Creative, I think, it can help you when you are constructing your ideas. So, I'm actually doing my thesis. I'm starting to construct my thesis for fourth year because using ChatGPT can help you construct and extract more ideas from what you want to do in your research.” [Student 3]

“So, maybe, of course a person has limitations especially when thinking new ideas. I think, when it comes to the point that AI models provide new ideas based on your inputs, it gives you new ideas

that you can incorporate. This is I think how AI models can help.” [Student 10]

“For me, using AI models in tasks like research or thesis could help you make creative ideas. I think, it can bring the best versions of your ideas.” [Student 8]

Objective 2. Determine the change of mindset of technology-based learners in using ChatGPT and AIs.

2.1 Enhancing their innovative and creative skills

Twenty (20) respondents agreed that usage of ChatGPT and AIs on accomplishing task provides them the opportunity to enhance their innovative and creative skills. Five participants said that ChatGPT broaden their knowledge to a specific topic and enhances their skills on generating ideas and formulating sentences. Furthermore, one major effect of using ChatGPT and AIs, is it gives the learners the ability to enhance their innovative and creative skills on accomplishing task. The data shows that the usage of ChatGPT and AIs helps technology-based learners on submitting task and at the same time enhancing their innovative and creative skills.

“Through that AI models, it gives you knowledge, it can open someone’s mind to have new ideas and broaden some concepts.” [Student 2]

“AI models can enhance your innovative and creative skills. Even if it gives you new ideas, it’s still information. So nonetheless, even if you seek information from other sources, it’s still information. So the bottom line, what AI models give is still information which you can use.” [Student 4]

“My idea about the use of AI is you can feed something in it like your initial draft. Then after that, it can give you something new which you can incorporate in your final draft.” [Participant 6]

Furthermore, twelve (12) respondents stated that AIs platforms helps them to be more creative and innovative, since it helps them generate ideas and formulate sentences that is grammatically correct and well-constructed. One participant also highlighted that AI models can generate new ideas from what you search in it, and you will also realize which aspects you can integrate your ideas.

“I think, AI models can improve the innovative and creative minds of a person, that is what I was able to build for myself. I was able to find ideas about

building sentences and wordy phrases.”

[Student 7]

“I became more creative because of the help of AI like ChatGPT. Sometimes, I have idea that I think is okay, but when I search it in through AIs, I also realized, this could be possible, and this is not. I think, we are dependent on it, but it can still enhance your creativity.”

[Student 13]

2.2 Limiting their innovative and creative skills

All respondents agreed that although the usage of ChatGPT provides them the advantages, it also limits their ability in terms of innovative and creative skills. One reason is they became reliant on using this platform to the point that they forgot to generate ideas on their own. In addition, ten (10) respondents highlighted that when you heavily rely on AIs is not advisable, since it doesn't provide absolute information for your references in your academic text. The data gathered shows that using AI platforms will not give the assurance that it will provide the exact information that you need and can be a risk in terms of plagiarism.

“When you heavily rely on AI, as I've said, the AI or the information that the AI gives you is not the absolute information that you'll be putting in your references or in your academic text or academic works.”

[Student 15]

“One reason might be because students could be very reliant on them. What the ChatGPT gives, they will use it. It affects your creativity because you'll think, *oh AI can give me whatever I ask it, so I can use it as my own*. This is I think one of the limiting effects of AI because it could encourage students to be less creative.”

[Student 14]

“In my case, I use AI to develop ideas. But sometimes, it also caused me to be less creative. When I'm using AI, it makes me feel guilty that I am not able to think what it was able to give me. It delimits someone to be creative because when you use it, it gives you comfort that *you don't need to think new ideas anymore*.”

[Student 1]

“I also agree on the idea that AI models make you lazy. I believe, using AI models tricks us to use it even more causing us to

forget that we should, at the very least, rely on our own creativity and skills.”
[Student 15]

2.3 Becoming dependent

The use of AIs platform became a relevant tool for learners to find solution on their academic tasks. However, it also became a source of laziness and being reliable on the benefits of ChatGPT and AIs. All twenty (20) respondents said that AIs platforms helps them to be creative and innovative on accomplishing school woks. Moreover, learners became intensively dependent since AIs became a convenient tool on creating tasks to the point that learners don’t research deeply on their academic topics.

“It is very convenient in a way that, *why will I think if GPT can give me ideas*. It’s based on how you control yourself on how you use it, how you extract ideas from AI and use it.” [Student 12]

“I can say somehow, I am dependent on AI. Sometimes, when I’m feeling lazy of doing something or when I have urgent deadlines, I use AI to do my tasks. So, I think, that is the time when someone is reliant or dependent on AI.” [Student 5]

“I think, it is also true that students are becoming dependent to AI models. It’s very convenient which made them reliant to it. This is the problem in using AI models because it could discourage you to be creative and just rely on what it gives to you.” [Student 9]

“AI is very popular among students. Sometimes we are making jokes like, ‘*Are you having trouble with the tasks? Just use ChatGPT.*’ At some point, I also realize students rely on AI that every activity given to them, they’ll always use AI to do it.” [Student 11]

Discussion

Objective 1. *Determine the utilitarian value of ChatGPT and AIs to technology-based learners on their innovative- and creative-oriented task.*

This study indicated that AI chat models were used by college students in dealing with academic tasks *e.g.*, writing, programming, and conceptualizing ideas. Students adapt to the changes in technology and use AI models to develop ideas for their tasks. This represents the

potential of AI chat models in extracting new ideas and suggesting options that students could follow.

Because of the nature of AI chat models in giving quick feedbacks to students, it enabled them to access information that they need oftentimes, real-time. As one student said, students often use AI chat models *“if [they] want quick responses to the information they ask” [Student 16]* and that using AI saves time in researching for ideas. This provided an initial understanding on why students frequently use AI models to assist with their innovative and creative-oriented tasks.

A revealed indicated that college students often use AI models because *“collects specific information which saves time in researching”* (McKenzie, 2023). This was also consistent in this study as one student noted comparing AI models and researching, *“in some credible sources...you cannot directly find your answer...because you have to read all the articles or read the entire article to get what you want” [Student 16]*. This was the prominent reason why students used AI models to assist with their activities and tasks.

Chatbots and other algorithms could replicate human interactions and produce text that closely resembles human language, all through the utilization of natural language input (Adiguzel, 2023). For instance, ChatGPT could shape the future of education as it helps in language acquisition, coding instruction, writing assistance, brainstorming facilitation, and accessing helpful resources (Dragidella, 2022). In this study, students revealed that AI models *“constructing your ideas” [Student 5]* and *“provide new ideas based on your inputs” [Student 10]*. In students' perspectives, AI models helped them in developing their ideas and improving their initial thoughts on something.

Previous studies also had similar representations of utilitarian value of AI models in learning. The ChatGPT has the capability to offer a framework for discussions, immediate feedback, and customized assistance to enhance collaborative discussions and conversations (Kasneci, 2023). Students can leverage ChatGPT as a scaffolding instrument to aid in drafting their preliminary ideas. Subsequently, they can enhance these drafts by rectifying any errors and incorporating appropriate references into the ultimate repetitions of their written assignments (Choi, 2023; Hargreaves, 2023).

Although it is known that AI models could support learning, this study provided concept on how it could support students in tasks that require innovative and creativeness. One student revealed that *“ChatGPT can help you construct and extract more ideas from what you want to do in your research” [Student 3]*. Some students used AI models to construct their research paper drafts by inputting their initial ideas. ChatGPT produces new papers for academic purposes based on previous works and the demands of the researchers (Lund et al., 2023). In creativity perspective, one student said, AI *“can bring the best versions of your ideas” [Student 8]*. The emergence of AI has unveiled its capacity to potentially substitute or partially substitute creative tasks traditionally

done by proficient experts, covering areas like academic writing, coding, and the arts (Li et al., 2022; Zhai, 2022).

Narrative analysis indicated that the utilitarian value of AI models involves its accessibility, simplicity, and usability for different innovative or creative tasks. Some students used AI models for creative writing, computer programming, and academic writing. Students used AI models to develop their ideas and improve their initial insights. This was an important take on utilitarian value of AI models because it could improve students' outputs, user efficiency and work productivity.

Objective 2. Determine the change of mindset of technology-based learners in using ChatGPT and AI tasks.

Mindset shift in technology use had varying contexts *e.g., skill development, reinforcement, reliance*, that worth noting for when discussing AI models use. Analysis indicated that AI models had potential in improving the innovativeness or creativity of a student but could also delimit students to think critically. Essentially, there was an underlying psychological representation in this aspect.

Initially, AI models were thought to have utilitarian value in innovative and creative tasks as they could improve how students develop their ideas through human-generated outputs that provide suggestions and concept explanations. Students saw an opportunity for them to enhance their outputs or have an AI-assisted research development. This opened questions on how AI models could delimit the students to think creatively without relying on AI outputs.

2.1 Enhancing their innovative and creative skills

In terms of enhancing skills, AI models could assist students in different innovative and creative tasks. For instance, one student said that *"it gives you knowledge, it can open someone's mind to have new ideas and broaden some concepts"* [Student 2]. Students used AI models to improve their ideas and extend some concepts that they need to integrate their minds into. Students use AI responses to expand their ideas and it encourage them to think creatively. The initial response from ChatGPT might elicit more inquiries and inspire students to use their knowledge and make deductive reasoning (Gilson et al., 2023). Student 13 revealed that *"I have idea that I think is okay, but when I search it in through AIs, I also realized, this could be possible, and this is not."*

AI models enabled the students to acquire ideas, which they did not thought of in the first conceptualization. Because of its ability to process information, it can be utilized in research such as outlining, summarizing, and highlighting important results (Khan et al., 2023). This was significant to students because *"what AI models give is still information which you can use"* [Student 4] and *"it can give you something new which you can incorporate in your final draft"* [Student 6]. Students were able to think critically and be innovative in making their tasks with the assistance from AI models. It helped them in extracting information

that they were not able to think of initially and using AI models enabled them to cover new ideas.

2.2 Limiting the innovative and creative skills

Given the use of AI models and how it improved the innovative skills of students, narratives on its limitations were also prominent. As one student argued that *“one of the limiting effects of AI because it could encourage students to be less creative”* [Student 14] explaining overreliance to AI could cause students to be less creative and innovative. An article published at Modern Diplomacy (2023) explained that students could become excessively reliant on technology that provide information and answers, which *“can hinder their ability to think critically and problem-solve independently”* (Hamdan, 2023). The extensive use of AI models in academic writing could potentially exacerbate innovativeness and academic practices (Enago Academy, 2023; Kaltenbrunner et al., 2022). The potential consequences of this phenomenon may manifest in a decline in critical thinking abilities and a decrease in innovative thinking among both students and teachers, ultimately resulting in a potential deterioration of the overall educational standards (Ahmad et al., 2023).

One student admitted that using AI *“also caused me to be less creative”* [Student 1]. In some instances, AI models restrict student's capacity to use their own original creative expression in their work (Trust et al., 2023). Student explained that *“it gives you comfort that you don't need to think new ideas anymore.”* Reliance on AI language models may compromise analytical and critical thinking and result in an absence of intellectual curiosity and independent thinking (The Learning Network, 2023). Students were worried on how AI models could impact their creative skills and their academic writing competence *e.g., reliable referencing*. Generally, students might change their mindset when using AI models because *“you'll think, oh AI can give me whatever I ask it, so I can use it as my own”* [Student 14]. AI models could delimit students to be creative because it encourages them to exploit information from them without integrating this information into their own creative concepts.

2.3 Becoming dependent

Sometimes, AI models cause students to be dependent on its outputs. One student admitted that *“I am dependent on AI”* [Student 5] explaining being dependent relies on the person himself. The application of predictive systems, driven by algorithms, poses a potential threat to the autonomy of both students and teachers, as well as their capacity to independently govern their own lives (Akgun & Greenhow, 2021; Lo Piano, 2020; Regan & Jesse, 2019). Similarly, the capacity of AI systems to effectively process massive amounts of data and generate accurate predictions has raised concerns regarding the potential for excessive dependence on AI in decision-making (Ahmad et al., 2023). This was the main driving force of ineffective use of AI models in education because of its capacity to provide outputs to students' chat prompt.

As one student explained *“Sometimes, when I’m feeling lazy of doing something or when I have urgent deadlines, I use AI to do my tasks... that is the time when someone is reliant or dependent on AI”* [Student 5]. It would cause students to change their mindset in making tasks because students would choose to exploit the information from AI models and use these as their own. Student 12 thought that frequent use of AI models could cause students to perceive *“why will I think if GPT can give me ideas.”* This was remarkable because previous literatures are not able to determine the extent of dependence to AI models. This study hypothesized that some students used AI models because it gives them ideas and they are no longer spend time in thinking or conceptualizing because AI models can give what they need. At the same time, convenience could be the initial driving force for this mindset shift.

Conclusion

AI chat models have significant utilitarian value for technology-based learners on innovative- and creative-oriented tasks. The study indicated that college students use AI chat models for various academic tasks, including writing, programming, and conceptualizing ideas. AI models provided quick feedback and access to real-time information, saving students time in researching and finding specific information. This assisted students in their innovative and creative tasks because AI models helped them conceptualize their ideas and integrate some novel concepts.

The utilitarian value of AI models lies in their accessibility, simplicity, and usability for different tasks, enhancing students' outputs, efficiency, and productivity. AI models can facilitate language acquisition, coding instruction, writing assistance, brainstorming, and accessing helpful resources in education. AI models have the potential to replicate human interactions and generate text that closely resembles human language, benefiting learners in various ways.

Students expressed concerns that overreliance on AI could discourage creativity and hinder critical thinking and problem-solving abilities. The extensive use of AI models in academic writing may lead to a decline in innovative thinking and intellectual curiosity, potentially affecting overall educational standards. Students noted that using AI models can make them less creative and restrict their original expression in their work. There is a risk of becoming dependent on AI outputs, where students rely on AI to complete tasks and make decisions, particularly when facing urgent deadlines or feeling lazy.

Future studies should analyze how dependence on AI can compromise autonomy and the capacity for independent thinking and decision-making. The convenience provided by AI models may contribute to a mindset shift where students no longer feel the need to think or conceptualize because AI can provide the necessary information and ideas. While AI models offer benefits, there is a need for caution to ensure

that they do not hinder creativity, critical thinking, and independent learning.

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