The Negative Impacts of Artificial Intelligence Dependency on Creative Thinking, Problem Solving, and Decision Making: The Mediating Role of Information Overload

[1]Sireen
[2]Khadija Syed
[3]Fariha Ali Afridi
[4]Dr. Muhammad Kashif
[5]Anum Iqbal

[1]MPhil Psychology, Department of psychology, Abdul Wali Khan University Mardan, Pakistan.
[2]MPhil Psychology, Department of psychology, Abdul Wali Khan University Mardan, Pakistan.
[3]MPhil Scholar, Department of psychology, Abdul Wali Khan University Mardan, Pakistan.
[4]Professor of General Surgery, Bacha Khan Medical Complex Sawabi
[5]Lecturer Psychology Department of Business Administration Iqra National University Peshawar

[1]Alisireenawkum@gmail.com, [2]Syedkhadija316@gmail.com, [3]Afridireeha@gmail.com, [4]kashif9416505@gmail.com, [5]anumiqbal956@gmail.com

Abstract

The study investigates how dependence on Artificial Intelligence can reduce creativity, problem-solving, and decision-making, while considering information overload as the intervening factor. Even though AI is frequently considered a way to strengthen human abilities, this study brings attention to the fact that overusing AI could harm cognitive skills. The results demonstrate that a person's AI dependency strongly diminishes important cognitive processes. Negative correlations found were –0.337 for creative thinking, –0.246 for problem-solving, and –0.519 for decision-making. The results also propose that information overload serves as a mediator in these associations, with information overload explaining 40.4% of the effect on creative thinking, 41.2% of the effect on problem-solving, and 41.9% Our results show that relying on AI does not support human cognitive development, but actually contributes to diminished key mental skills. The report recommends reflecting on how AI influences cognitive performance, promoting mindful usage that shields individuals from cognitive exhaustion and supports core human skills like creativity, problem-solving, and decision-making.

Keywords: Artificial Intelligence, Creative Thinking, Problem Solving, Decision Making, Information Overload, AI Dependency.

Introduction

Artificial Intelligence has permanently transformed how people approach creative work and strategic problem-solving as well as decision-making through its broad adoption across human activity domains (Zhang et al., 2024). Artificial Intelligence shows notable interest because it enhances human capabilities in fields requiring creative abilities together with demanding cognitive tasks. Modern systems dependent on AI technologies require defining the nature of dependency specifically pertaining to the changes AI brings to basic cognitive functions. The numerous benefits of AI require close observation of its unintended effects on human mental capacities especially when analyzing human cognition and educational systems that teach people to use AI successfully (Gerlich, 2025). AI exceeds human ability to handle large datasets which enables it to offer both insightful information and action recommendations (Darwin et al., 2023). The convenience of accessible AI solutions creates a risk of human cognitive decline that hinders organic development of natural human skills for creative thought and problem resolution as well as decision processes (Stein et al., 2024). AI-generated outputs lead people to over-reliance which threatens their natural cognitive development (Frenkenberg & Hochman,2025). System dependency on AI algorithms culminates in reduced critical mental capacity when users simply follow AI outputs without validation thus creating task-related mistakes and impaired decision-making (Zhai et al., 2024).

Multiple research investigations demonstrate how AI transforms established creative operations while showing its various effects on creativity. Research investigations indicate that AI technologies produce both favorable and detrimental effects on genuine human creativity (Zailuddin et al., 2024). Research findings show that whether artificial intelligence stimulates or restricts unique idea production remains unclear which might affect how innovative creative results appear (Wen et al., 2022). Researchers need to study AI's effect on creativity since it determines the relationship between innovative value and practical usefulness in creative practices (Mukherjee & Chang, 2023). AI assistance now pervades multiple disciplines where it shapes both procedure and solution development for solving problems. The implementation of AI-based problem-solving methods remains unclear for maintaining human cognitive flexibility and critical thinking because research indicates a loss of human cognitive engagement (Vieriu & Petrea, 2025). AI has generated significant changes to decision-making processes within business industries together with healthcare organizations and technological domains. AI implementation in these fields requires evaluation because AI assistance for decision-making might have led users to depend too heavily thus diminishing human responsibility and decision-making capabilities. Different stakeholders actively utilize generative AI models for their purposes due to enhanced computational opportunities in the field. Computers running AI algorithms show abilities in creativity by developing advanced and sophisticated plans (Haase & Hanel, 2023).

The Impact of AI on Creative Thinking

The analysis of AI tools on creative processes continues to gain academic interest because researchers examine the effects of AI tools on conventional creative production (Lin & Qiu, 2024). AI has emerged in creative domains to deliver two possible scenarios by helping humans break mental barriers while creating innovative designs that deepen creative development (Elfa & Dawood, 2023). AI poses a threat to authentic expression by destroying the special aspects of human creativity (Bieser 2022; Wu et al. 2021). Artists employ AI algorithms to assist their work and create new compositions from existing images and to enhance accuracy and efficiency (Elfa & Dawood, 2023). Designers must continuously learn to effectively use AI tools

for their purposes while preserving respect for their own creative freedom because this skill serves as vital for design professionals (Chen et al., 2024). Discussions persist on what role AI plays in human creativity because it operates either as a support system or operates independently as a creative entity (Anantrasirichai & Bull, 2021). AI pattern identification along with its capability to produce new combinations leads to uncertainties regarding artistic originality and human creativity in artistic expression. AI designs and logical computation assessment follows convergent thinking methods for identifying best solutions to defined problems (Hubert et al., 2024). Many different applications use generative AI models extensively because their capabilities will expand at an unprecedented level. Scientific discussions about AI creativity study how AI systems affect the creative process regarding the relationship between discovering new ideas and achieving established accomplishments. AI creates new solutions and structures that AI experts use to boost and develop theories concerning creativity in people.

The Role of AI in Problem Solving

AI advances research in psychology by introducing new creative ways of handling challenges through program and data structure building. Its skill in studying huge collections of data and catching structures invisible to humans helps in making improved decisions for better solutions (Buschek et al., 2021; Chien et al., 2020). When we rely heavily on AI, people fear that reaction and thinking skills will decrease. Studies confirm that focusing too much on AI systems makes people less flexible thinking and weaker in trying to solve hard problems (Siau and Wang, 2018; Binns, 2018). Although AI helps make things faster and more precise, there should be better accountability and transparency in AI systems, especially where drivers are automated as the public must understand and feel secure about how AI makes these decisions (Goodall, 2014; Zeng et al., 2020).

It is better to consider AI as helping people do more than it is about replacing them. To make AI work well, it is necessary to fully understand the existing situation and the nature of problems, since humans are the main guiding force in AI (Carr, 2014; Lin et al., 2021). AI use standards should address healthcare, scientific research and legal concerns, so that issues about bias, privacy issues and intellectual property can be handled (O'Neil, 2016; Binns, 2018). To keep human judgment strong and support technological progress, AI relies on human opinions in judging what technology produces.

The Effect of AI on Decision Making

Decision systems across business healthcare technology and various other sectors have undergone substantial changes through AI implementation which results in better operational efficiency and effectiveness. Through their ability to analyze extensive data and identify subtle patterns AI systems provide strategic-quality decisions and fasten both planning speed and quality (Brynjolfsson & McAfee, 2014). Because AI affects the decision-making process, users have become concerned they may depend too much on warnings and suggestions from the technology and lose their important human thinking skills (Siau & Wang, 2018). AI systems for decision-making increase risks but also lower the amount of human decision-making due to algorithmic bias, data concerns and job loss (O'Neil, 2016). Between healthcare and education, AI systems run into ethical problems because they either widen existing social divides or are not good at making the right ethical decisions (Dastin, 2018; Eubanks, 2018). Without proper transparency and the limited sense of responsibility, many doubts fair decisions made by AI systems, leading to big ethical issues for public welfare (Binns 2018; Zeng et al. 2020).

Since today's AI systems must uphold ethical principles and support social aims, the main worry is responsible implementation of AI (Schultz & Seele, 2022). Developers should partner

with ethicists and policymakers and others in a team effort to ensure their AI solutions include strong accountability, transparency and fairness (Han et al., 2023). Society ought to have complete ethical guidelines that both guard people against the risks of AI and secure their liberties when they use AI systems (Zhou et al., 2020). If AI is to be installed properly, managers should be careful about social inequality and the loss of human skill for making decisions. It is important to keep researching and partnering with various specialties to set up protections for human decisions as well as the public interest but preserve their use in each sector.

Information Overload Working as a Mediator

This happens when people experience information overload which makes difficult to pay attention, remember or decide. Since information is plentiful, individuals need to organize it efficiently which prevents them from losing mental sharpness and reduces the tiredness that comes from making too many decisions (Eppler & Mengis, 2004). Artificial intelligence systems function to optimize data processing mechanisms while extracting vital knowledge from extensive datasets according to Sharma et al. (2021). The generation of too much data through AI systems creates information overwhelmed situations that prevent decision-makers from performing adequately (Schuhmacher et al., 2020). The decision-making process becomes more difficult due to AI-created voluminous datasets which exceed human cognitive capabilities when used in business and healthcare settings (Davenport et al., 2020).

AI systems operated for data analytics along with decision support feature insufficient configurations paired with specialized specifications that create predictions which do not match particular objectives or requirements (Schuhmacher et al., 2020). People maintain faith in AI systems beyond their usefulness levels thereby overusing AI even though human judgment could have been better (Buçinca et al., 2021). People tend to follow wrong AI suggestions and recommendations because they believe in the technological authority even though the decisions would have been superior based on their own judgment. Many suggest the integration of AI with human collaboration proves crucial for achieving optimal benefits from AI systems which help in decision making despite their negative effects on cognitive performance (Guan et al., 2022). Different sectors must implement strategies which enhance efficient data processing and faster decision-making and lower the cognitive workload from AI systems to make effective use of AI across their operations.

Theoretical Foundation

The study combines cognitive load theory and information processing theory together with extended mind theory to analyze how artificial intelligence dependency links to cognitive operations and information overload complexity. The cognitive load theory demonstrates human working memory boundaries alongside stress on reducing unneeded mental workload for successful learning (Steyvers and Kumar 2023) yet information processing theory deploys an examination of how people process and conserve information by focusing on memory retrieval and attention (Gerlich 2025). According to Extended mind theory brain-powered cognition expands into tools such as artificial intelligence because these instruments help but also potentially damage cognitive operations (Bunjak et al., 2021). People who depend heavily on AI systems face cognitive overload because the enormous amount of AI-generated data surpasses their personal ability to process information which undermines their decision-making and creative abilities (Frenkenberg & Hochman, 2025). The heavy dependence on AI might lead to decreased essential mental skills for individuals who are not subject experts (Dergaa et al., 2024); however, the long-term consequences of this phenomenon remain unclear (Huang et al., 2024). Since the Internet serves as a system for external memory

operations it transforms our information processing behavior and memory storage dynamics while creating difficulties in concentration and memory function (Firth et al., 2019; Marsh & Rajaram, 2019).

Conceptual Framework
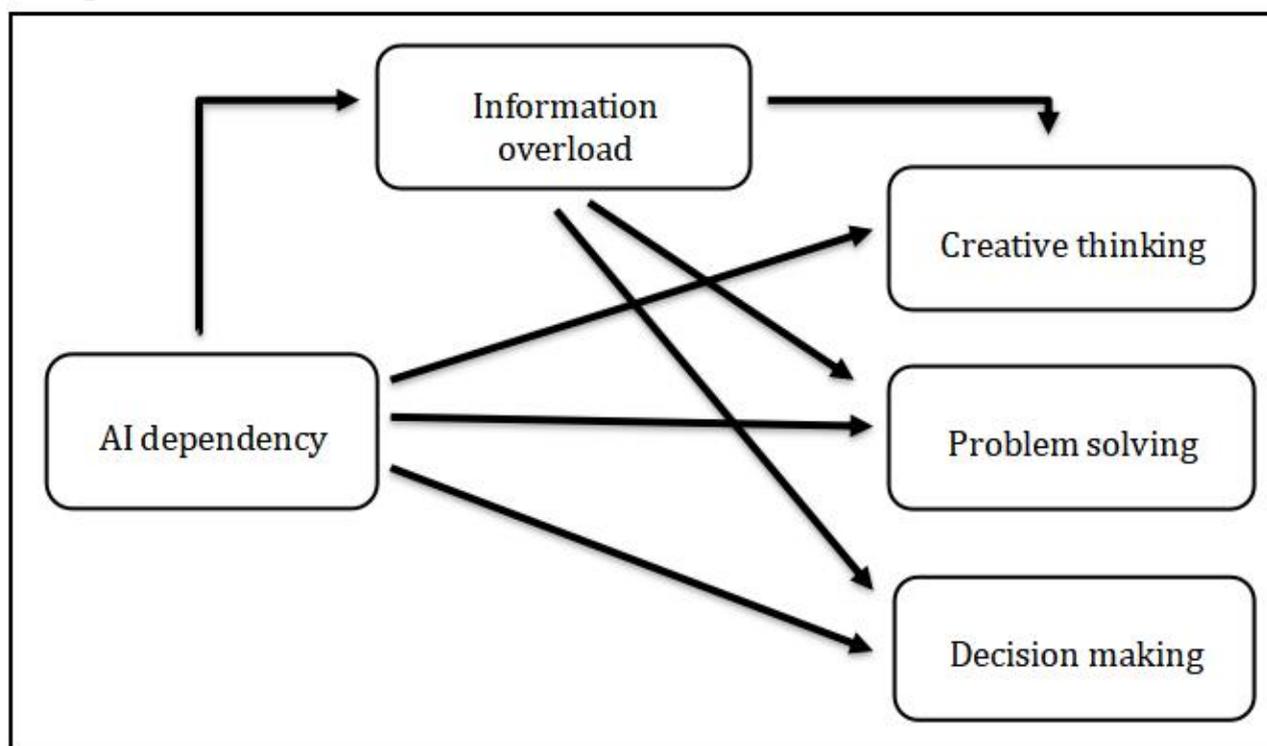
Hypotheses

- H1: Artificial intelligence dependency has a negative impact on the creative thinking ability of individuals.
- H2: Artificial intelligence dependence has a negative impact on problem solving abilities of an individual.
- H3: Artificial intelligence dependency has a negative influence on the decision-making abilities of an individual.
- H4: Artificial intelligence dependency has a positive influence on information overload.
- H5: Information overload has a negative impact on creative thinking.
- H6: Information overload has a negative influence on problem-solving ability.
- H7: Information overload has a negative influence on the quality of decision-making.
- H8: Information overload mediates the relationship between AI dependency and creative thinking.
- H9: Information overload mediates the relationship between AI dependency and problem-solving ability.
- H10: Information overload acts as a mediator in the relationship between AI dependency and decision-making ability.

Measures

The analysis collected data through distribution of an online survey to participants. A validated survey instrument contained scales and questionnaires to measure the constructs of AI Dependency and Creative Thinking along with Problem-Solving Skills and Decision-

Making Styles and Information Overload. The data of the age, gender, background of learning into the participants was collected in order to eliminate these factors in the result of the findings.

- The AI Dependency Scale (DAI): The scale on the artificial intelligence level applied by respondents was developed by Morales-Garc and colleagues (2024). As the results of both Exploratory and Confirmatory Factor Analyses indicate, the scale is shown to measure the same thing in women and men and it is highly reliable (Morales-Garcuna et al., 2024). To measure the opinions, the researchers involved the 5-point Likert scale in which 1 indicated Completely false to me, whereas 5 indicated Describes me perfectly.
- Creativity Orientation Scale (COS): The Creativity Orientation Scale (COS) enquired about perceptions of the participants towards creativity that were informed by the social identity theory. The job seekers in Thailand apply the five-point rating system on the scale of 1to 5 to complete the questionnaire (Leutner et al., 2016; Furtwengler, 2021).
- *Problem-Solving Inventory*: Thanks to Heppner and Petersen's (1982) Problem-Solving Inventory, people can figure out how well they solve different problems. People indicate their level of agreement with 35 questions that reflect typical reactions to difficulties (Heppner & Petersen, 1982).
- *General Decision-Making Style (GDMS):* The GDMS by Scott and Bruce (1995) used five types to describe choices: rational, intuitive, dependent, avoidant and spontaneous. The scale for part of the inventory gives respondents 3 options: 1 for False, 2 for Sometimes/Depends and 3 for True (Scott & Bruce, 1995).
- *Information Overload Scale (IOS)*: Information Overload Scale (IOS) developed by Williamson, Eaker and Lounsbury (2003) was used to measure how they reacted to too much information. Researchers use the 5-point Likert scale to improve or worsen the scale's scores. The scale is reliable in showing effects of psychological pressure that arise as people manage extensive information in the modern world (Williamson, E., Eaker, D., & Lounsbury, J., 2003*).

Results

Table 1 shows the Demographic Data Report

Category	Group	Count	Percentage
Age	20-25	340	85%
	26-30	48	12%
	31-35	12	3%
Education	BS	342	85.5%
	MPhil	58	14.5%
Gender	Male	133	33.25%
	Female	267	66.75%

A total of 85% of participants are between 20 and 25 years old, 12% are between 26 and 30 years old, and just 3% are aged 31 to 35. Consequently, the study population consists largely of young adults. Of the participants, 85.5% possess a Bachelor of Science (BS) degree, with the remainder, 14.5%, accomplished an MPhil qualification. Consequently, the findings indicate that all participants have reached at least the level of a bachelor's degree and comprise a highly educated group. There are 33.25% male and 66.75% female participants represented in the sample, so most are female.

The dominating groups within the sample are young adults (aged 20–25 years), who have a high educational attainment (most have a BS degree), while females are better represented than males.

Table 2 shows the Correlations Between AI Dependency, Creative thinking, Problem solving, decision making, and information overload

Table 2*Means, standard deviations, and correlations among study variables*

Variables	M	SD	1	2	3	4	5
1. AI Dependency	2.96	1.41	—				
2. Information Overload	3.12	0.62	.69***	—			
3. Creative Thinking	3.01	0.28	−.71***	−.64***	—		
4. Problem-Solving Ability	3.51	0.30	−.66***	−.59***	.41***	—	
5. Decision-Making Quality	2.02	0.22	−.78***	−.72***	.46***	.38***	—

Note. N = 400. ***$p < .001$.

The correlation analysis revealed that AI dependency had a significant positive relationship with perceived information overload (r =.69, p <.001) besides a significant negative relationship with creative thinking (r = -.71, p <.001), problem-solving ability (r = -.66, p <.001), and decision-making quality (r = -.78, p <.001). The perceived information overload also proved to have significant negative correlations with all the three cognitive outcomes and this implies that perfect perceived information overload has a negative correlation on cognitive performance. Also, there was a positive correlation between creative thinking, problem-solving capability, and decision-making quality, which denotes that the stronger the functioning of one of the cognitive domains, the better the functioning of the other cognitive domains.

Table 3 shows *Regression results showing the impact of AI dependency on cognitive outcomes*

Variable	Creative Thinking	Problem-Solving	Decision-Making	Information Overload
Constant	—	—	—	—
AI Dependency	−.71***	−.66***	−.78***	.69***
R^2	.504	.436	.608	.476
ΔR^2	.501	.432	.604	.472

Variable	Creative Thinking	Problem-Solving	Decision-Making	Information Overload
F	214.382	176.914	298.557	201.745

***p < .001

Regression showed all the outcomes of the study to rely heavily on AI dependency. In particular, AI dependency had a high negative impact on the ability to think creatively (β = -.71, p <.001) and solve problems (β = -.66, p <.001) and on the quality of the decisions made (β = -.78, p <.001), and a high positive impact on the perceived information overload (β =.69, p <.001). The models predicted large proportions of variance, 50.4% of the differences in creative thinking, 43.6% in problem solving, 60.8% in the decision-making and 47.6 percent of information overload, respectively. These results suggest that increased dependence on artificial intelligence does not just lower the higher-order cognitive functioning of people but also has a strong positive impact on the perception of information overload, thus, substantiating Hypotheses H1, H2, H3 and H4.

Table 4: *Regression results showing the effects of perceived information overload on cognitive outcomes*

Variable	Creative Thinking	Problem-Solving	Decision-Making
Constant	—	—	—
Information Overload	–.64***	–.59***	–.72***
R²	.410	.348	.518
ΔR²	.407	.344	.514
F	162.873	129.552	236.904

***p < .001

The regression analysis revealed that perceived information overload affected all three cognitive outcomes in negative ways significantly. In particular, information overload diminished the level of ability to think creatively (β = -.64, p <.001), solve problems (β = -.59, p <.001), and decide (β = -.72, p <.001) considerably. The models had a strong explanatory value, with 41%, 34.8%, and 51.8% of all the creative thinking, problem-solving ability, and quality of decision-making being explained by the models. These results show that increased information overload significantly affect the higher-order cognitive functioning of individuals, thus serving as adequate empirical evidence to support the Hypothesis H5, H6, and H7.

Table 5 shows Mediation Analysis of information overload

Hypothesis	Total Effect (c)	Direct Effect (c')	Indirect Effect (a*b)	p-value	Proportion Mediated (%)
AI Dependency → Information Overload → Creative Thinking	0.312	0.186	0.126	0.001	40.4%
AI Dependency → Information Overload → Problem Solving	0.284	0.167	0.117	0.001	41.2%
AI Dependency → Information Overload → Decision Making	0.298	0.173	0.125	0.001	41.9%

AI Dependency shows a total direct effect of 0.312 on Creative Thinking, with a direct effect of 0.186. The effect operated through Information Overload is 0.126. Because the p-value equals 0.001, the effects are statistically significant, and Information Overload accounts for 40.4% of the total effect. The results suggest that Artificial Intelligence Dependency directly impacts Creative Thinking, yet a considerable proportion of the effect is indirect, mediated by Information Overload.

According to the model, AI Dependency exerts a total effect of 0.284 on Problem Solving directly, at 0.167. The indirect effect amounts to 0.117, the p-value equals 0.001, and this result is statistically significant. Approximately 41.2% of the effect passes through Information Overload. It is clear that Information Overload is important for understanding how AI Dependency affects Problem Solving, as much of the effect works indirectly.

A total effect size of 0.298 was observed for Decision Making, and this includes a direct effect estimated as 0.173. Information Overload is responsible for an indirect effect of 0.125. Because the p-value is 0.001, the outcome is considered statistically significant. With 41.9% of the effect being mediated by Information Overload: The results support the view that Information Overload is an important mediator of the relationship between AI Dependency and Decision Making.

Discussion

The population structure of the respondents is that it was dominated by the young well-educated individuals with a clear majority of male respondents (females). The majority of the respondents (85 percent) were aged 20-25 years, with only a minor percentage of older age groups, which implies that the results were most likely a mirror of the experiences of young adults who are likely to use digital technologies frequently. In terms of education, most of them had a Bachelor of Science degree (85.5%), and the rest had an MPhil degree, which shows that the group of respondents has a high academic level (Gerlich, 2025). The prevalence of the gender was that females (66.75) were more largely represented than males (33.25%). The knowledge of this demographic composition is crucial as age, education level, and gender can determine the patterns of using digital technology, active cognition, and attitude to AI systems (Willeto et al., 2023).

The correlational analysis provided significant results regarding the dependence of AI, information overload, and cognitive results. AI dependency levels were highly correlated with perceived information overload and weaker creative thinking, problem-solving, and quality of decision-making skills, which is to say that overuse of AI tools might be related to less independent cognitive use. The results align with the previous studies which have implied that excessive dependence and automated systems may demoralize the adoption of analytic thinking and reduce the possibilities of using rather complicated cognitive processes (Zhang et al., 2024; Zhai et al., 2024). Simultaneously, the associated positive correlations of creative thinking, problem-solving, and decision-making point out that these cognitive abilities support each other, which stipulates the need to preserve a balanced cognitive activity despite the growing technological support (Frenkenberg and Hochman, 2025).

Regression tests also confirmed H1 through H4 by showing that AI dependency is a significant predictor of less creative thinking, less problem-solving, and low decision-making quality, and less information overload is at the same time perceived. These findings indicate that in the event that people are overly dependent on AI-based solutions, they can and will dedicate fewer efforts to thinking about a problem and providing higher-order reasoning, which causes progressive deterioration of higher-order cognitive functions. Furthermore, put differently, the fact that the values of AI dependency and information overload differ in a strong positive correlation means that frequent exposure to AI-generated outputs can lead to a person experiencing information overload that crosses their threshold, which causes cognitive stress (Olan et al., 2022; Hubert et al., 2024).

Hypotheses H5, H7 and H8 were both correct: perceived information overload negatively affected the creative thinking, problem-solving skill and quality of decision-making. Largely when people are subjected to overload of information, their cognitive resources are channeled towards information filtering and sorting instead of pursuing deeper reasoning activities. This is in line with cognitive load views, which state that there is less capacity to process mentally, and therefore, performance declines when people have to process more incoming information at once (Willeto et al., 2023). Subsequently, those with more information overload might need to be less influenced by automated products or heuristic decision making and, thus, worsen the quality of cognitive results.

Lastly, hypotheses H8-H10 were validated in the mediation analysis analysis which indicated that information overload partially mediated the relationship between AI dependency and the three cognitive outcomes. Further, 40 to 42 per cent of the overall impact of AI dependency on creative thinking, problem-solving, and decision-making was mediated by perceived information overload, which showed that AI dependency has both a direct and an indirect effect on cognition. These conclusions point to a twofold-directional process when the dependence on AI not only decreases active thinking but also raises the level of informational load further undermining cognition. Collectively, the findings suggest the need to boost both moderate and deliberate forms of AI use behaviors that would foster effective information manipulation in users instead of simply relying on the automatic processing of information systems.

Limitations and Future Suggestions

Although the current research has significant implications on the connection between AI dependency, information overload and cognitive outcomes, it has a number of limitations that must be taken into account when interpreting the results. To begin with, the research was based on a cross-sectional research design, which makes the determination of the causality between the variables impossible. Though the regression and mediation analyses show

predictive relationships, longitudinal or experimental research design would be more suitable in establishing the effect of long-term AI dependency in causing long-term changes in cognitive functioning.

Second, AI dependency, perceived information of the study measured using self-report measures and cognitive abilities. The respondent data could be influenced by these response biases like social desirability, recall errors, or differences in subjective perceptions and affect the accuracy of the results. The objectives should be added to the investigation in future research with objective cognitive performance tests, behavioral testing, or experimental work to offer more solid support of the known relationships.

Third, the sample demographic narrows the extent of generalization of the results. The respondents were mainly young adults that were relatively well educated, and the females were more heavily represented when compared to the male respondents. Consequently, the older age groups, lower educated population, and more varied populations in terms of occupations might not be fully represented. Further studies need more diversified samples in the age, educational, occupation and cultural setting to enhance the external validity of the findings.

Fourth, the mediating variable that the study primarily addressed is information overload but the other possible mediating variables such as other psychological variables were not investigated. Automation bias, decreased cognitive effort, digital literacy, self-regulation skills, and ability to think critically are other factors that can be considered to affect the implications of AI dependence to cognitive functioning. Further research should focus on the investigation of multiple mediators and moderators at the same time to create a more important theoretical framework of the explanation of the cognitive implications of AI use.

Lastly, future studies ought to investigate intervention-based methods that will help decrease over dependence on AI and the ability to process information overload. Educational interventions fostering digital self-control, critically assessing AI-generated products, strategies of balanced approach to using technology can assist people to enjoy AI tools at the cost of not losing a higher-order cognitive activity. The longitudinal and experimental intervention research would be especially helpful in the context of defining whether the negative cognitive outcome of the proposed study can be counteracted by structured AI-use training.

Conclusion

This article shows that as we use more AI, important abilities like creative thinking, solving problems and making choices get less important due to the large amount of data we deal with now. The data also suggests that using AI more frequently leads to a lessening of independent mental activity and even more information, making things difficult for many. Using AI too much might weakens certain important parts of our job. Scientists are urging that AI should enhance human thinking, rather than replace it. These groups should come together to talk about using AI wisely so it benefits thought, rather than causes harm.

References

1. Anantrasirichai, N., & Bull, D. (2021). Artificial intelligence in the creative industries: a review [Review of Artificial intelligence in the creative industries: a review]. *Artificial Intelligence Review*, 55(1), 589. Springer Science+Business Media. https://doi.org/10.1007/s10462-021-10039-7
2. Bieser, J. (2022). Creative through AI – How artificial intelligence can support the development of new ideas. https://doi.org/10.59986/ccha2271
3. Blessing, M. (2025). Omnichannel Sales Strategies with Automation.

4. Buçinca, Z., Malaya, M. B., & Gajos, K. Z. (2021). To Trust or to Think. *Proceedings of the ACM on Human-Computer Interaction*, 5, 1. https://doi.org/10.1145/3449287

5. Bunjak, A., Černe, M., & Popovič, A. (2021). Absorbed in technology but digitally overloaded: Interplay effects on gig workers' burnout and creativity. *Information & Management*, 58(8), 103533. https://doi.org/10.1016/j.im.2021.103533

6. Buschek, D., Mecke, L., Lehmann, F., & Dang, H. (2021). Nine Potential Pitfalls when Designing Human-AI Co-Creative Systems. *arXiv (Cornell University)*. https://doi.org/10.48550/arxiv.2104.00358

7. Chan, C. K. Y., & Hu, W. (2023). Students' voices on generative AI: perceptions, benefits, and challenges in higher education. *International Journal of Educational Technology in Higher Education*, 20(1). https://doi.org/10.1186/s41239-023-00411-8

8. Chen, J.-F., Ni, C.-C., Lin, P.-H., & Lin, R. (2024). Designing the Future: A Case Study on Human-AI Co-Innovation. *Creative Education*, 15(3), 474. https://doi.org/10.4236/ce.2024.153028

9. Dacre, N., Kockum, F., & Senyo, P. (2020). Transient Information Adaptation of Artificial Intelligence: Towards Sustainable Data Processes in Complex Projects. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3813559

10. Dergaa, I., Saad, H. B., Glenn, J. M., Amamou, B., Aissa, M. B., Guelmami, N., Fekih-Romdhane, F., & Chamari, K. (2024). From tools to threats: a reflection on the impact of artificial-intelligence chatbots on cognitive health. *Frontiers in Psychology*, 15. https://doi.org/10.3389/fpsyg.2024.1259845

11. Darwin, D., Rusdin, D., Mukminatien, N., Suryati, N., Laksmi, E. D., & Marzuki, M. (2023). Critical thinking in the AI era: An exploration of EFL students' perceptions, benefits, and limitations. *Cogent Education*, 11(1). https://doi.org/10.1080/2331186x.2023.2290342

12. Elfa, M. A. A., & Dawood, M. E. T. (2023). Using Artificial Intelligence for enhancing Human Creativity. *Deleted Journal*, 2(2). https://doi.org/10.55554/2785-9649.1017

13. Firth, J., Torous, J., Stubbs, B., Firth, J. A., Steiner, G. Z., Smith, L., Álvarez-Jiménez, M., Gleeson, J., Vancampfort, D., Armitage, C. J., & Sarris, J. (2019). The "online brain": how the Internet may be changing our cognition. *World Psychiatry*, 18(2), 119. https://doi.org/10.1002/wps.20617

14. Frenkenberg, A., & Hochman, G. (2025). It's Scary to Use It, It's Scary to Refuse It: The Psychological Dimensions of AI Adoption—Anxiety, Motives, and Dependency. *Systems*, 13(2), 82. https://doi.org/10.3390/systems13020082

15. Furtwengler, S. R. (2021). Development of a creativity orientation scale using EFA. *Journal of Intelligence*, 1(1), 1–10. https://doi.org/10.1016/j.jintell.2021.10.001

16. Gerlich, M. (2025a). The Human Factor of AI: Implications for Critical Thinking and Societal Anxieties. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.5085897

17. Gerlich, M. (2025b). AI Tools in Society: Impacts on Cognitive Offloading and the Future of Critical Thinking. *Societies*, 15(1), 6. https://doi.org/10.3390/soc15010006

18. Guan, H., Dong, L., & Zhao, A. (2022). Ethical Risk Factors and Mechanisms in Artificial Intelligence Decision Making. *Behavioral Sciences*, 12(9), 343. https://doi.org/10.3390/bs12090343

19. Haase, J., & Hanel, P. H. P. (2023). Artificial muses: Generative Artificial Intelligence Chatbots Have Risen to Human-Level Creativity. *arXiv (Cornell University)*. https://doi.org/10.48550/arxiv.2303.12003

20. Han, Y., Chen, J., Dou, M., Wang, J., & Feng, K. (2023). The Impact of Artificial Intelligence on the Financial Services Industry. *Deleted Journal*, 2(3), 83. https://doi.org/10.54097/ajmss.v2i3.8741

21. Heppner, P. P., & Petersen, C. H. (1982). The development and implications of a personal problem-solving inventory. *Journal of Counseling Psychology*, 29(1), 66–75. https://doi.org/10.1037/0022-0167.29.1.66

22. Huang, S., Lai, X., Ke, L., Li, Y., Wang, H., Zhao, X., Dai, X., & Wang, Y. (2024). AI Technology panic—is AI Dependence Bad for Mental Health? A Cross-Lagged Panel Model and the Mediating Roles of Motivations for AI Use Among Adolescents. *Psychology Research and Behavior Management*, 1087. https://doi.org/10.2147/prbm.s440889

23. Hubert, K., Awa, K. N., & Zabelina, D. L. (2024). The current state of artificial intelligence generative language models is more creative than humans on divergent thinking tasks. *Scientific Reports*, 14(1). https://doi.org/10.1038/s41598-024-53303-w

24. Jeong, J., Kim, B., & Lee, J. (2024). Navigating AI transitions: how coaching leadership buffers against job stress and protects employee physical health. *Frontiers in Public Health*, 12. https://doi.org/10.3389/fpubh.2024.1343932

25. Jetter, J., Eimecke, J., & Rese, A. (2018). Augmented reality tools for industrial applications: What are potential key performance indicators and who benefits? Computers in Human Behavior, 87, 18. https://doi.org/10.1016/j.chb.2018.04.054

26. Knopp, M., Warm, E. J., Weber, D., Kelleher, M., Kinnear, B., Schumacher, D. J., Santen, S. A., Mendonça, E. A., & Turner, L. (2023). AI-Enabled Medical Education: Threads of Change, Promising Futures, and Risky Realities Across Four Potential Future Worlds. *JMIR Medical Education*, 9. https://doi.org/10.2196/50373

27. Korobenko, D., Nikiforova, A., & Sharma, R. (2024). Towards a Privacy and Security-Aware Framework for Ethical AI: Guiding the Development and Assessment of AI Systems. 740. https://doi.org/10.1145/3657054.3657141

28. Léonard, N. (2021). EMERGING ARTIFICIAL INTELLIGENCE, ART AND PEDAGOGY: EXPLORING DISCUSSIONS OF CREATIVE ALGORITHMS AND MACHINES FOR ART EDUCATION. *DOAJ (DOAJ: Directory of Open Access Journals)*. https://doaj.org/article/5e56f08c49ac4c54a0ccb78d32c4dcb6

29. Leutner, D., Fleischer, J., & Bensch, D. (2016). The Creativity Orientation Scale: Measuring creative attitudes and behaviors. *Journal of Creative Behavior*, 50(4), 351-366. https://doi.org/10.1002/jocb.153

30. Lin, H., & Qiu, C. (2024). Artificial intelligence (AI)-integrated educational applications and college students' creativity and academic emotions: students and teachers' perceptions and attitudes. *BMC Psychology*, 12(1). https://doi.org/10.1186/s40359-024-01979-0

31. Loh, K. K., & Kanai, R. (2015). How Has the Internet Reshaped Human Cognition? *[Review of How Has the Internet Reshaped Human Cognition?]. The Neuroscientist*, 22(5), 506. SAGE Publishing. https://doi.org/10.1177/1073858415595005

32. Marsh, E. J., & Rajaram, S. (2019). The digital expansion of the mind: Implications of internet usage for memory and cognition. *Journal of Applied Research in Memory and Cognition*, 8(1), 1. https://doi.org/10.1016/j.jarmac.2018.11.001

33. Morales-García, W. C., Sairitupa-Sanchez, L. Z., Morales-García, S. B., & Morales-García, M. (2024). Development and validation of a scale for dependence on artificial intelligence in university students. *Frontiers in Education*, 9, Article 1323898. https://doi.org/10.3389/feduc.2024.1323898

34. Mukherjee, A., & Chang, H. H. (2023). The Creative Frontier of Generative AI: Managing the Novelty-Usefulness Tradeoff. *arXiv (Cornell University)*. https://doi.org/10.48550/arxiv.2306.03601

35. Olan, F., Arakpogun, E. O., Suklan, J., Nakpodia, F., Damij, N., & Jayawickrama, U. (2022). Artificial intelligence and knowledge sharing: Contributing factors to organizational performance. Journal of Business Research, 145, 605. https://doi.org/10.1016/j.jbusres.2022.03.008

36. Peng, M., Chen, X., Zhao, Q., & Zhou, Z. (2018). Attentional scope is reduced by Internet use: A behavior and ERP study. *PLoS ONE*, 13(6). https://doi.org/10.1371/journal.pone.0198543

37. Schuhmacher, A., Gatto, A., Hinder, M., Kuss, M., & Gassmann, O. (2020). The upside of being a digital pharma player. *Drug Discovery Today*, 25(9), 1569. https://doi.org/10.1016/j.drudis.2020.06.002

38. Schultz, M. D., & Seele, P. (2022). Towards AI ethics' institutionalization: knowledge bridges from business ethics to advance organizational AI ethics. *AI and Ethics*, 3(1), 99. https://doi.org/10.1007/s43681-022-00150-y

39. Scott, S. G., & Bruce, R. A. (1995). Decision-making style: The development and assessment of a new measure. *Educational and Psychological Measurement, 55*(5), 818–831. https://doi.org/10.1177/0013164495055005008

40. Steyvers, M., & Kumar, A. (2023). Three Challenges for AI-Assisted Decision-Making. *Perspectives on Psychological Science*, 19(5), 722. https://doi.org/10.1177/17456916231181102

41. Vieriu, A. M., & Petrea, G. (2025). The Impact of Artificial Intelligence (AI) on Students' Academic Development. *Education Sciences*, 15(3), 343. https://doi.org/10.3390/educsci15030343

42. Voinea, C., Vică, C., Mihailov, E., & Savulescu, J. (2020). The Internet as Cognitive Enhancement. *[Review of The Internet as Cognitive Enhancement]. Science and Engineering Ethics*, 26(4), 2345. Springer Science+Business Media. https://doi.org/10.1007/s11948-020-00210-8

43. Wen, H., Zhang, L., Sheng, A., Li, M., & Guo, B. (2022). From "Human-to-Human" to "Human-to-Non-human" – Influence Factors of Artificial Intelligence-Enabled Consumer Value Co-creation Behavior. *Frontiers in Psychology*, 13. https://doi.org/10.3389/fpsyg.2022.863313

44. Willeto, A. A. A., Sanderson, P. R., Barger, S. D., & Teufel-Shone, N. I. (2023). "If you're down, you know, get up, be proud of yourself, go forward": Exploring Urban Southwest American Indian Individual Resilience. American Indian and Alaska Native Mental Health Research, 30(1). https://doi.org/10.5820/aian.3001.2023.53

45. Williamson, E., Eaker, D., & Lounsbury, J. (2003). Information overload: A meta-analysis of the literature. *Journal of Applied Psychology, 88*(5), 1041–1051. https://doi.org/10.1037/0021-9010.88.5.1041

46. Wu, Z., Ji, D., Yu, K., Zeng, X., Wu, D., & Shidujaman, M. (2021). AI Creativity and the Human-AI Co-creation Model. In *Lecture notes in computer science* (p. 171). Springer Science+Business Media. https://doi.org/10.1007/978-3-030-78462-1_13

47. Zailuddin, M. F. N. O., Harun, N. A. N., Rahim, H. A. A., Kamaruzaman, A. F., Berahim, M. H., Harun, M. H., & Ibrahim, Y. (2024). Redefining creative education: a case study analysis of AI in design courses. *Journal of Research in Innovative Teaching & Learning*, 17(2), 282. https://doi.org/10.1108/jrit-01-2024-0019

48. Zhai, C., Wibowo, S., & Li, L. D. (2024). The effects of over-reliance on AI dialogue systems on students' cognitive abilities: a systematic review [Review of The effects of over-reliance on AI dialogue systems on students' cognitive abilities: a systematic review]. *Smart Learning Environments*, 11(1). Springer Nature. https://doi.org/10.1186/s40561-024-00316-7

49. Zhang, S., Zhao, X., Zhou, T., & Kim, J. H. (2024). Do you have AI dependency? The roles of academic self-efficacy, academic stress, and performance expectations on problematic AI usage behavior. *International Journal of Educational Technology in Higher Education*, 21(1). https://doi.org/10.1186/s41239-024-00467-0