iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 12 **Issue:** V **Month of publication:** May 2024

DOI: https://doi.org/10.22214/ijraset.2024.60655

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 12 Issue V May 2024- Available at www.ijraset.com

Quantitative Exploration of High AI Usage, Self-Efficacy, Learning Performance, and Social Loafing Among Young Adults in Bangalore

Aimen Insha Mohd Vasi Ullah[1], Sreedevi J.[2]
Kristu Jayanti College

Abstract: ***The present paper examines the intricate interplay between self-efficacy, learning performance, social loafing, and AI usage within educational contexts. Key findings unveil moderate positive correlations between self-efficacy and learning performance, juxtaposed with a subtle negative correlation between self-efficacy and AI usage. Yet, a delicate positive correlation emerges between social loafing and AI usage, signaling potential implications for student engagement and collaborative practices. The implications of these findings extend to educators, policymakers, and researchers, underscoring the imperative of ethical and informed AI integration in education. Moreover, the paper advocates for continued exploration into the multifaceted impacts of AI on student learning, offering valuable insights for enhancing educational practices in the digital era.***
Keywords: Artificial Intelligence, Education, Self-efficacy, Learning performance, Social loafing, Student outcomes

I. INTRODUCTION

Generative AI represents a groundbreaking advancement in AI technology, characterized by its ability to autonomously generate human-like text, audio, and video content (Kasneci et al., 2023). Among the notable innovations in generative AI is ChatGPT, a large language model developed by OpenAI, which has garnered widespread attention for its transformative potential in various domains, including education (Strzelecki, 2023). The incorporation of AI, particularly generative AI tools like ChatGPT, into educational workflows has sparked discussions about its implications for teaching methodologies, learning experiences, and academic outcomes (Khalifa & Albadawy, 2024).

In exploring the multifaceted implications of AI integration in education, it is essential to delve into concepts such as learning performance, social loafing, and self-efficacy. Learning performance encompasses students' self-assessment of their efforts, knowledge gained, and skills acquired in comparison to other courses (Wajahat & Zia, 2022). It serves as a crucial indicator of academic achievement, influencing students' engagement in the learning process and their attitudes towards coursework and instructors. Understanding the factors influencing learning performance is essential for educators and policymakers seeking to optimize educational outcomes in AI-enabled learning environments.

Social loafing, a phenomenon characterized by individuals' tendency to exert less effort in group settings compared to individual tasks, presents challenges for collaborative learning and teamwork in educational settings (Hall & Buzwell, 2013). Factors such as group size, task difficulty, and accountability influence social loafing behavior, underscoring the need for pedagogical strategies to mitigate its impact. By promoting individual accountability and fostering a supportive learning environment, educators can encourage active participation and collaboration in group tasks, thereby enhancing learning outcomes.

Self-efficacy, a concept coined by Albert Bandura, plays a crucial role in shaping individuals' beliefs about their ability to effectively carry out specific tasks (Mustafa et al., 2019). Unlike broader personality traits such as self-confidence or self-esteem, self-efficacy is task-specific, making it easier to develop and apply. High self-efficacy is associated with greater effort, persistence, and strategizing in endeavors, leading to improved performance and well-being. Understanding the sources and measurement of self-efficacy is essential for educators seeking to cultivate students' confidence and motivation in AI-enabled learning environments.

The integration of AI technologies into educational settings presents opportunities to enhance teaching methodologies, facilitate personalized learning experiences, and improve academic outcomes. However, it also raises important ethical considerations regarding intellectual property, data privacy, and equitable access to resources (Kieslich et al., 2021). Addressing these challenges requires a collaborative effort from educators, policymakers, and stakeholders to ensure responsible AI usage and promote digital literacy among students.

©IJRASET: All Rights are Reserved

II. REVIEW OF LITERATURE

Artificial Intelligence (AI) has become increasingly prevalent in various fields, with education being no exception. As researchers delve deeper into the role of AI in reshaping educational practices, a nuanced understanding of its opportunities and challenges emerges. Cotton et al. (2023) provide a critical analysis of AI's impact in higher education, highlighting its potential to facilitate asynchronous communication, personalized assessments, and real-time feedback. However, concerns regarding academic dishonesty and plagiarism, particularly with tools like ChatGPT, underscore the need for educators to implement strategies such as clear assignment guidelines and plagiarism education to mitigate these risks.

Wang et al. (2022) shed light on the influence of higher education institutes' AI capability on students' self-efficacy, creativity, and learning performance. Their findings indicate that AI resources, digital literacy, and the integration of AI in teaching significantly influence students' self-efficacy and creativity, subsequently mediating their impact on learning performance. Moreover, AI-based interventions, such as chatbots used in after-class review sessions, have shown promise in enhancing students' academic performance, self-efficacy, learning attitude, and motivation (Lee et al., 2023).

In exploring the broader integration of AI in educational practices, Holmes et al. (2023) categorize the relationship into four main areas: learning with AI, using AI to learn about learning, learning about AI, and preparing for AI. These categories encompass a spectrum of AI-driven tools and methodologies aimed at supporting learners directly, analyzing learning data, enhancing AI literacy among educators and students, and preparing individuals for the societal impacts of AI.

Wang et al. (2022) delve into student attitudes and behaviors towards AI learning, highlighting the complex interplay between AI learning anxiety, motivation, and self-efficacy. Meanwhile, Zhong (2023) explores the influence mechanism of AI technology learning anxiety within the context of human-computer collaboration, emphasizing the role of uncertainty avoidance and self-efficacy in mediating this relationship.

Oran (2023) conducts a comprehensive literature review on the correlation between AI literacy and teacher self-efficacy beliefs, advocating for the establishment of training programs to facilitate educators' adaptation to evolving AI systems. Such programs aim to enhance education quality by empowering educators to transfer AI knowledge to students effectively.

The phenomenon of social loafing in group tasks has been a topic of interest in social psychology research (Latané et al., 1979; Harkins & Petty, 1982; Williams et al., 1981). These studies highlight the importance of identifiability and personal involvement in mitigating social loafing tendencies and optimizing group performance.

A. *Need of the Study*

The integration of AI in education presents both opportunities and challenges. While AI holds the potential to enhance learning experiences and outcomes, addressing concerns related to academic integrity, student attitudes, and group dynamics is paramount. There arises a need to explore the multifaceted relationship between AI and education, striving to maximize its potential benefits while mitigating its risks in diverse educational contexts.

III. METHOD

A. *Research Question*

Does higher AI Usage reflect in lower self-efficacy and learning performance and higher social loafing tendencies among students?

B. *Aim*

To find out if there is a significant correlation between AI Usage, Self-Efficacy, Learning Performance and Social Loafing.

C. *Objectives*

To study the relationship between AI Usage, Self-Efficacy, Learning Performance and Social Loafing.

D. *Hypothesis*

Ho: There is no significant correlation between AI Usage and Self-Efficacy, Learning Performance and Social Loafing.

E. *Operational definition for Key Variables*

1) *AI Usage:* The degree of engagement individuals have with artificial intelligence tools in educational contexts, reflecting the frequency, nature and depth of interaction with AI-driven resources for learning purposes.

2) *Self-Efficacy:* Individuals' belief in their capacity to successfully perform tasks or achieve desired outcomes in education, influencing their motivation, effort, and performance in learning activities.
3) *Learning Performance:* Measurable outcomes of individuals' educational experiences, encompassing academic achievements, such as knowledge acquisition and skill development, as well as non-academic indicators like engagement and application of learning.
4) *Social Loafing:* The tendency of individuals to exert less effort or contribute less to group tasks compared to when working alone, resulting in decreased motivation, engagement, and performance within collaborative settings.

F. Study Design and Procedure

A quantitative study design was followed to understand the relationship between AI Usage, Self-Efficacy, Learning Performance and Social Loafing. The participants, who met the inclusion criteria, were provided with the questionnaires via Google forms where they filled in their socio-demographic details along with their responses to the three questionnaires.

G. Tools used

Three self-report questionnaires were used to measure Self-Efficacy, Learning Performance and Social Loafing Tendency (Scwarzer, R & Jerusalem, M., 1995; Young et al, 2003; Waletzko, Jade M., 2021).

H. Data Collection

Purposive Sampling Technique was used to recruit participants where the inclusion criteria were that the participants should be in the age range of 18 to 25, enrolled in an academic course, capable of understanding basic English and have been using Generative AI for their academic work. The exclusion criteria were that the participants should not be diagnosed with any intellectual or developmental disorder. With this procedure, 65 participants were taken into consideration for this study, making it the sample population.

I. Data Analysis

After the data was collected, it was coded in Microsoft Excel 2019, and then transferred to Statistical Software for Social Sciences (SPSS) 20 for analysis using descriptive statistics, Pearson correlation coefficient, to test the hypotheses.

J. Ethical Considerations

In accordance with the ethical guidelines established by the American Psychological Association (APA), participants were required to give informed consent before participating in the study. Before gathering any data, participants were given thorough explanations about the study's objectives, how their data would be used for research purposes only, and their rights regarding withdrawal and confidentiality. Participants chose to participate voluntarily, without any coercion or incentives, and their verbal responses were recorded only after they had given their informed consent. Stringent protocols were implemented to safeguard the confidentiality and security of all data collected. Participants who expressed interest were provided with a complete copy of the research article.

IV. RESULTS AND DISCUSSION

Table 1: Descriptive Statistics

	Mean	Std. Deviation
SE	29.92	4.787
LP	22.14	3.432
SL	26.92	4.431
AI Usage	3.78	.838

The descriptive statistics presented in Table 1 offer a comprehensive overview of four key variables within the study: Self-Efficacy (SE) Total Score, Learning Performance (LP) Total Score, Social Loafing (SL), and AI usage in the sample population (n= 65). The mean SE of 29.92 suggests the average level of self-efficacy among the sample, with a moderate amount of variability indicated by the standard deviation of 4.787. Similarly, the mean LP of 22.14 signifies the average level of learning performance, with relatively less variability compared to self-efficacy, as indicated by the standard deviation of 3.432.

©IJRASET: All Rights are Reserved | SJ Impact Factor 7.538 | ISRA Journal Impact Factor 7.894 |

Moreover, the mean SL of 26.92 reflects the average level of social loafing among participants, with a moderate degree of variability shown by the standard deviation of 4.431. Additionally, the mean AI usage score of 3.78 indicates the average level of AI usage, with relatively low variability suggested by the standard deviation of 0.838.

Overall, these descriptive statistics provide valuable insights into the central tendencies and variability of self-efficacy, learning performance, social loafing, and AI usage within the sample population, laying the groundwork for further analysis and interpretation of their relationships.

Table 2: Correlation Table of Pearson Correlation Coefficients

	SE	LP	SL	AI Usage
SE	1	.510**	.280*	-.051
LP		1	.323**	.054
SL			1	.050
AI Usage				1

Note: $^{**}p < 0.01$

The findings from the correlation analysis shed light on the complex interplay between self-efficacy, learning performance, social loafing, and AI usage within the educational context. These results provide valuable insights that can inform discussions on the efficacy of AI integration in education and its impact on student outcomes. From the analysis, it was found that even though there were some correlations observed, there was no significant correlation between AI usage and Self-Efficacy, Learning Performance and Social Loafing. Thus the null hypothesis is accepted.

However, the moderate and positive correlations between self-efficacy and both learning performance and social loafing are consistent with previous research (Wang et al., 2022). This suggests that students with higher levels of self-efficacy tend to exhibit better learning performance while also potentially engaging in less social loafing behavior. This aligns with Bandura's social cognitive theory, which posits that individuals with high self-efficacy are more likely to exert effort and persevere in the face of challenges (Bandura, 2001).

Additionally, the positive correlation between learning performance and social loafing implies that students who perform well academically may still engage in social loafing behavior to some extent. This finding underscores the importance of addressing social loafing within educational settings to optimize student engagement and achievement (Karau & Williams, 1993).

Interestingly, the weak and negative correlation between self-efficacy and AI usage suggests that students with higher self-efficacy may not necessarily rely heavily on AI tools for learning. This finding contradicts the notion that AI usage inherently undermines students' confidence in their own abilities (Wang et al., 2022). Instead, it suggests that students with high self-efficacy may view AI as a supplementary tool rather than a replacement for their own skills and knowledge.

Moreover, the weak and positive correlation between social loafing and AI usage indicates that students who use AI tools may be slightly more prone to engaging in social loafing behavior. This raises important considerations regarding the role of AI in promoting active participation and collaboration among students (Michaelsen et al., 2023). Educators should be mindful of these dynamics when implementing AI-driven learning technologies and consider strategies to mitigate potential social loafing tendencies.

V. CONCLUSION

The findings of this study provide valuable insights into the complex relationship between self-efficacy, learning performance, social loafing, and AI usage in educational contexts. The moderate positive correlations between self-efficacy and learning performance, as well as the weak negative correlation between self-efficacy and AI usage, suggest that students with higher self-efficacy tend to perform better academically and may not heavily rely on AI tools for learning. However, the weak positive correlation between social loafing and AI usage raises concerns about the potential impact of AI on student engagement and collaboration. These findings underscore the importance of thoughtful integration and consideration of AI in educational practices to ensure that it complements rather than undermines students' self-efficacy and learning experiences.

Implications of these findings extend to educators, policymakers, and researchers in the field of education. Educators should strive to create learning environments that empower students to develop and maintain high levels of self-efficacy while leveraging AI technologies to enhance learning outcomes. This may involve providing opportunities for students to engage with AI tools in ways that promote active learning, critical thinking, and collaboration. Policymakers play a role in supporting the responsible and ethical use of AI in education, including the development of guidelines and standards for AI integration in curricula and assessments. Additionally, researchers should continue to explore the mechanisms underlying the relationship between self-efficacy, learning performance, social loafing, and AI usage, as well as investigate additional factors that may influence students' attitudes and behaviors towards AI in education.

Despite the insights gained from this study, there are several limitations that warrant consideration. Firstly, the correlational nature of the study design precludes causal inference, and further experimental research is needed to establish causality between variables. Additionally, the study sample was limited to a specific demographic and educational context, which may limit the generalizability of the findings. Future research should aim to replicate these findings in diverse populations and educational settings to ensure their robustness and applicability.

While this study focused on self-efficacy, learning performance, social loafing, and AI usage, there are other relevant variables and factors that may influence students' experiences and outcomes in education. Future research could explore the role of factors such as motivation, cognitive load, and socio-economic status in shaping students' attitudes and behaviors towards AI in education.

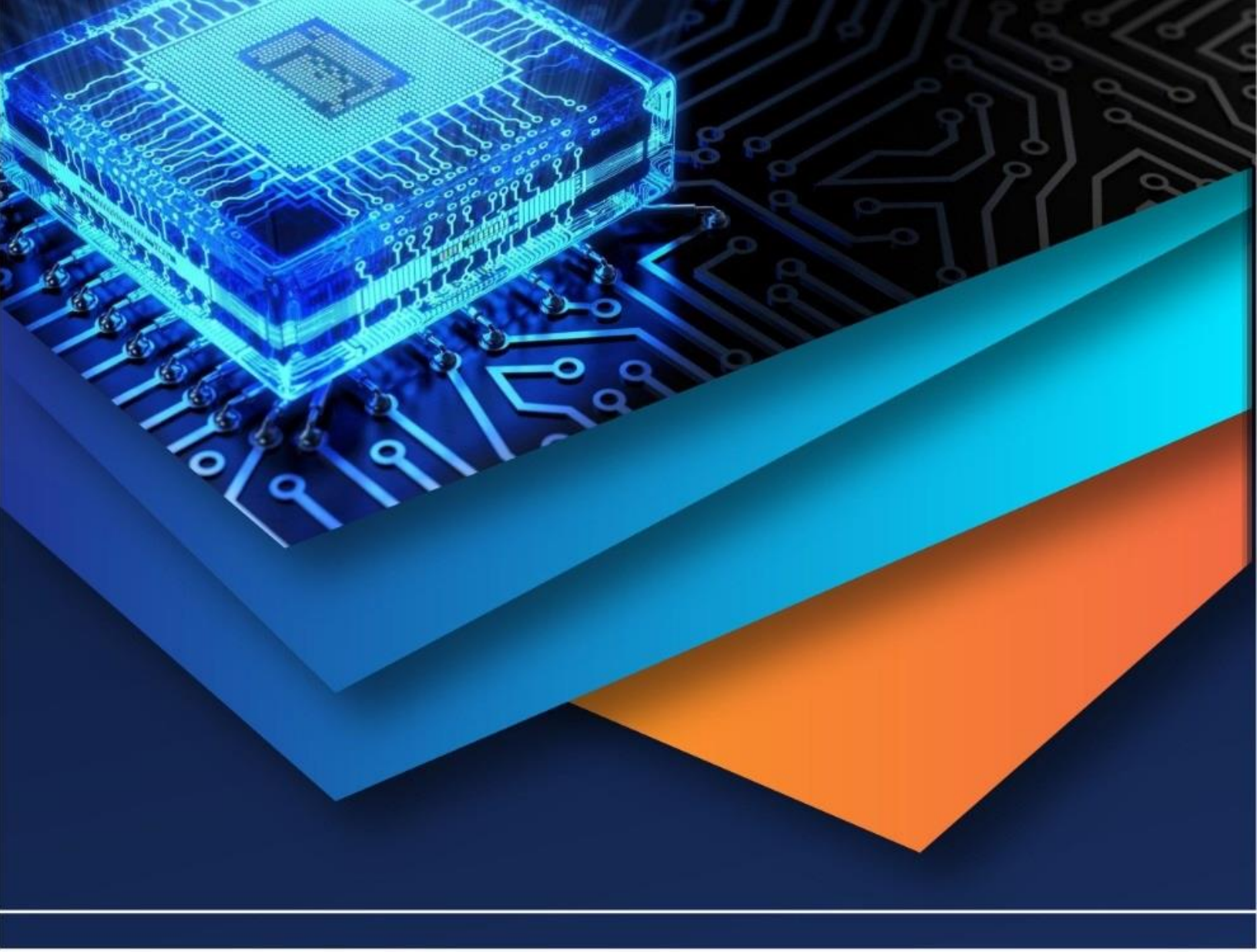
The present study contributes to our understanding of the complex interplay between self-efficacy, learning performance, social loafing, and AI usage in education. By addressing the implications, limitations, and suggestions for future research outlined in this conclusion, educators, policymakers, and researchers can work together to harness the full potential of AI to support student learning and success in the digital age.

REFERENCES

[1] Bandura, A. (1978) 'Reflections on self-efficacy', Advances in Behaviour Research and Therapy, 1(4), pp. 237–269. doi:10.1016/0146-6402(78)90012-7.
[2] Bandura, A. (2001). Social cognitive theory: An agentic perspective. Annual Review of Psychology, 52(1), 1–26.
[3] Cotton, D. R. E., Cotton, P. A., & Shipway, J. R. (2023). Chatting and cheating: Ensuring academic integrity in the era of ChatGPT. Innovations in Education and Teaching
[4] Dwivedi, Y. K., Hughes, L., Ismagilova, E., Aarts, G., Coombs, C., Crick, T., Duan, Y., Dwivedi, R., Edwards, J., Eirug, A., Galanos, V., Ilavarasan, P. V., Janssen, M., Jones, P., Kar, A. K., Kizgin, H., Kronemann, B., Lal, B., Lucini, B., & Medaglia, R. (2021). Artificial Intelligence (AI): Multidisciplinary Perspectives on Emerging challenges, opportunities, and Agenda for research, Practice and Policy. International Journal of Information Management, 57(101994). https://www.sciencedirect.com/science/article/pii/S026840121930917X
[5] Holmes, W., Persson, J., Chounta, I.-A., Wasson, B., & Dimitrova, V. (2022). ARTIFICIAL INTELLIGENCE AND EDUCATION A critical view through the lens of human rights, democracy and the rule of law. https://rm.coe.int/artificial-intelligence-and-education-a-critical-view-through-the-lens/1680a886bd
[6] Kasneci, E., Sessler, K., Küchemann, S., Bannert, M., Dementieva, D., Fischer, F., Gasser, U., Groh, G., Günnemann, S., Hüllermeier, E., Krusche, S., Kutyniok, G., Michaeli, T., Nerdel, C., Pfeffer, J., Poquet, O., Sailer, M., Schmidt, A., Seidel, T., & Stadler, M. (2023). ChatGPT for good? On opportunities and challenges of large language models for education. Learning and Individual Differences, 103(102274). https://doi.org/10.1016/j.lindif.2023.102274
[7] Khalifa, M., & Albadawy, M. (2024). Using Artificial Intelligence in Academic Writing and Research: An Essential Productivity Tool. Computer Methods and Programs in Biomedicine Update, 100145–100145. https://doi.org/10.1016/j.cmpbup.2024.100145
[8] Kieslich, K., Lünich, M., & Marcinkowski, F. (2021). The Threats of Artificial Intelligence Scale (TAI). International Journal of Social Robotics. https://doi.org/10.1007/s12369-020-00734-w
[9] Kieslich, K., Lünich, M. & Marcinkowski, F. (2021) 'The threats of Artificial Intelligence Scale (TAI)', International Journal of Social Robotics, 13(7), pp. 1563–1577. doi:10.1007/s12369-020-00734-w.
[10] Kravitz, D. (1986). Ringelmann rediscovered: The original article. Journal of Personality and Social Psychology, 50(5). https://doi.org/10.1037/0022-3514.50.5.936
[11] Kuo, Y.-K., Wang, J.-H., Kuo, T.-H., & Ho, L.-A. (2021). Leisure Satisfaction Influences Learning Performance Among Community College Students. SAGE Open, 11(4), 215824402110672. https://doi.org/10.1177/21582440211067238
[12] Latané, B., Williams, K., & Harkins, S. (1979). Many hands make light the work: The causes and consequences of social loafing. Journal of personality and social psychology, 37(6), 822.
[13] Laurent Moccozet. (2012). Introducing Learning Performance in Personal Learning Environments. Conference: International Conference on Advanced Learning Technologies 2012. https://doi.org/10.1109/icalt.2012.75
[14] Lee, Y.-F., Hwang, G.-J., & Chen, P.-Y. (2022). Impacts of an AI-based chabot on college students' after-class review, academic performance, self-efficacy, learning attitude, and motivation. Educational Technology Research and Development, 70(5). https://doi.org/10.1007/s11423-022-10142-8
[15] Michaelsen, L. K., Franchini, B., Sibley, J., Ostafichuk, P., & Roberson, B. (2023). Getting Started With Team-Based Learning. In Routledge eBooks. Informa. https://doi.org/10.4324/9781003445012
[16] Strzelecki, A. (2023). To use or not to use ChatGPT in higher education? A study of students' acceptance and use of technology. Interactive Learning Environments, 1–14. https://doi.org/10.1080/10494820.2023.2209881
[17] Wajahat, A., & Zia, S. (2022). The Moderating Role of Learning Performance on Teaching Competencies and Student Satisfaction | Reviews of Management Sciences. Www.rmsjournal.com. https://www.rmsjournal.com/index.php/admin/article/view/94

[18] Wang, S., Sun, Z., & Chen, Y. (2022). Effects of higher education institutes' artificial intelligence capability on students' self-efficacy, creativity and learning performance. Education and Information Technologies, 28. https://doi.org/10.1007/s10639-022-11338-4
[19] Wang, T. (2023) 'Artificial Intelligence: A help or threat to contemporary education. should students be forced to think and do their tasks independently?', Education and Information Technologies [Preprint]. doi:10.1007/s10639-023-11947-7.
[20] Wang, Y. et al., (2022). What drives students' AI learning behavior: a perspective of AI anxiety. Interactive Learning Environments, 1-17. doi: 10.1080/10494820.2022.2153147
[21] Wang, Y.-M., Chiou, C.-C., Wang, W.-C., & Chen, C.-J. (2021). Developing an Instrument for Assessing Self-Efficacy in Data Mining and Analysis. Frontiers in Psychology, 11. https://doi.org/10.3389/fpsyg.2020.614460
[22] Williams, K., Harkins, S. G., & Latané, B. (1981). Identifiability as a deterrant to social loafing: Twocheering experiments. Journal of Personality and Social Psychology, 40(2), 303-311.doi:http://dx.doi.org/10.1037/0022-3514.40.2.303
[23] Xie, X., & Wang, T. (2023). Artificial Intelligence: A help or threat to contemporary education. Should students be forced to think and do their tasks independently? Education and Information Technologies. https://doi.org/10.1007/s10639-023-11947-7
[24] Young, M. R., Klemz, B. R., & Murphy, J. W. (2003). Enhancing Learning Outcomes: The Effects of Instructional Technology, Learning Styles, Instructional Methods, and Student Behavior. Journal of Marketing Education, 25(2), 130–142. https://doi.org/10.1177/0273475303254004
[25] Zhong, G. (2023). The Influence Mechanism Of Ai Technology Learning Anxiety In The Human-Computer Collaboration Context: The Moderating Effect Of Uncertainty Avoidance And The Mediating Effect Of Self-Efficacy. The EUrASEANs : Journal on Global Socio-Economic Dynamics, 6(43), 170–180. https://doi.org/10.35678/2539-5645.6(43).2023.170-180

©IJRASET: All Rights are Reserved | SJ Impact Factor 7.538 | ISRA Journal Impact Factor 7.894 |



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089 (24*7 Support on Whatsapp)