

# ATTITUDE TOWARDS ARTIFICIAL INTELLIGENCE AS PREDICTOR OF ARTIFICIAL INTELLIGENCE LITERACY AND ACADEMIC ACHIEVEMENT AMONG UNIVERSITY STUDENTS

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## ABSTRACT

*The study aims at attitude towards artificial intelligence as predictor of artificial intelligence literacy and academic achievement among university students. The research design used for the study was a cross-sectional survey. Three hundred university students from all throughout Pakistan participated. The study included 150 male and 150 female participants. The convenient sampling strategy was used to gather data. The General Attitude Towards Artificial Intelligence Scale (Astrid & Paul, 2020) and the Literacy AI subscale of the Artificial Intelligence Student Survey (Dai et al., 2020) were two self-report measures that were employed. Frequency and percentage, correlation analysis, and independent sample t-test were applied for testing the assumptions. The findings revealed that positive attitude towards artificial intelligence was positively related to artificial intelligence literacy and academic achievement whereas negative attitude towards artificial intelligence was negatively related to artificial intelligence literacy among university students. Gender differences revealed that male university students were higher on artificial intelligence literacy as compared to female university students.*

## INTRODUCTION

Artificial intelligence today has become a new topic in the field of digital cognitive science. However, since the study of intelligence in early childhood has only been developed in recent years, there is a lack of research in early childhood education. This discussion on the use of AI knowledge in early childhood education can help inform teachers and researchers who design interventions to engage children in AI education. AI education can lead students to learn and support their AI in intellectual concepts, applications, and thinking (Luckin & Holmes, 2016). Artificial Intelligence has become an important part of our lives, such as social media platforms, smart devices, and global logistics systems. At the same time, research on the public acceptance of AI

shows that many people feel quite worried about the newly emerging technologies of AI. People have different feelings and thoughts about AI. Some people think AI is great and will improve our lives, while others are worried about its impact. These feelings and attitudes are called attitude towards AI. Some people have very open-minded view about AI products and acknowledge their benefits for humans. But on the other hand, some people do not have such view about AI. Attitude towards AI can be positive (excited and hopeful), negative (worried), or neutral (not sure or don't care) (Shank et al., 2019).

It is crucial to look at a number of issues and create plans to lessen the impact of artificial intelligence in order to properly address the fear of this technology. This

involves promoting AI literacy to help people comprehend the advantages, disadvantages, and operation of AI systems (Li & Huang, 2020). By giving people, a comprehensive grasp of artificial intelligence (AI), its applications, and its drawbacks, educational programs enable people to interact with AI technology more safely and effectively. People may better comprehend artificial intelligence (AI), lessen their fear of it, and foster good and knowledgeable interactions with this cutting-edge technology by promoting its importance through education. Building strong ethical standards, codes of behavior, and privacy protections can allay worries and boost trust in AI systems (Williamson & Prybutok, 2024).

The artificial intelligence (AI) literacy is the student's understanding to AI concepts. What is AI, how does it work, what is their benefits and limitations and also its potential risks. Students who have basic understand about AI have higher literacy rate and they are more confident about AI and also engage in AI technologies (Ng et al., 2021). Those who have lack of knowledge about AI have higher level of Anxiety related to AI. Decrease AI literacy can also reduce misconception about AI. Thus, literacy can also play an important role in reducing anxiety related toward artificial intelligence. Knowing these factors can help us to recognize the factors that can influence how feel and think about Artificial Intelligence, this is because AI technologies are involve in everyday life. By examining the factors that cause AI Anxiety, this research can better understand public concerns and fear related to job displacement, privacy concerns (Chen et al., 2024).

It shows people's thoughts, convictions, beliefs, ideas and perceptions about how AI will affect their lives. These viewpoints or attitudes might range from positive to negative. A person with a positive attitude toward AI, for example may expect that AI will enhance the quality of their lives, while a person with a negative attitude may be anxious about losing privacy. The knowledge, skills, or proficiency related to artificial intelligence or the comprehension of AI and its applications is referred to as artificial intelligence literacy. People can

engage with AI more confidently if they have a higher level of AI literacy. However, a lack of knowledge about artificial intelligence may make people more anxious because there are misconceptions and inaccurate information about AI that can cause irrational worries (Pedro et al., 2019).

Studying the brain and emotional reactions associated with AI applications has become crucial as they become more and more integrated into all facets of our lives (Rimsha, 2024). By identifying the causes of people's personal concerns and worries about AI, academics can create plans to deal with these problems. In order to shape our interactions with AI and make sure that it is built to promote trust and reduce anxiety, this research is crucial. To encourage positive experiences with these technologies and guarantee their successful use in both personal and professional contexts, it is imperative to understand and ease concerns about artificial intelligence. Additionally, strong security measures for privacy, ethical principles, and behavioral guidelines can be placed up to help people feel less stressed and anxious and to increase confidence in AI systems. Ultimately fostering greater confidence in these technologies (Jia & Tu, 2024).

Long and Magerko (2020) outline AI literacy as a fixed of abilities people want to apply AI correctly and that transform how humans talk and collaborate with AI technologies. AI literacy gives a vast idea of abilities to apply, explore, and talk (with) AI at domestic and with inside the workplace (Long & Magerko, 2020). The ability to understand, use, monitor, and significantly replicate on AI packages without always being capable of increase AI fashions themselves is generally known as being "AI literate" (Long et al., 2021; Ng et al., 2021). The term 'literacy' at the beginning mentioned the cap-potential to examine and write. In today's virtual era, the belief of 'practical literacy' has been prolonged to consist of a variety of 'new' or 'multiple' literacies together with visual, media, computer, virtual data, and AI literacy. AI literacy involves "growing essential questioning abilities to assess AI-generated data and make knowledgeable decisions" (Hattwig et al., 2013). AI

literacy includes "information the moral and social implications of AI and its capacity effect on society" (Kong & Yuen, 2024).

Kim and Lee (2024) found that those who have a positive attitude toward AI also have more initiative in engaging themselves (Ahmed, 2024), in learning related to AI and have higher AI literacy. Wang and Wang (2019) found that AI literacy is a significant predictor of one's attitude toward AI positivity, that is, attitudinal change as a function of education and training. In a study conducted by Li and Huang (2020), better AI literacy appeared to enhance an individual's confidence toward the use of AI technologies and was also positively associated with general attitudes toward AI. Lipovec et al. (2024) found that high AI literacy increased a person's chances of having a more favorable attitude toward AI, as High AI literacy meant that people viewed AI as an enhancement tool for their career opportunities and results in better academic achievement (Adewale et al., 2024).

Artificial Intelligence literacy mean you have a knowledge about AI, what is AI, how it works. This means understanding the basics of AI systems, such as how the data process, make decisions, and perform tasks. It also involves recognizing different types of AI, from virtual assistants like Siri to more complex systems like self-driving cars. AI literacy is the ability to think critically about AI and its impact on the society. This means that having a proper understanding of its potential benefits and risks of AI technologies, such as issues related to privacy, security, and ethics. When you have a knowledge about AI you easily participate in discussion and make informed decision about AI. AI literacy lower your anxiety related to AI. Anxiety leads to some misconception and fear of unknown (Hornberger et al., 2023). Through data-driven machine learning techniques, AI can optimize learning outcomes, streamline pedagogical processes, and tailor educational tools to individual needs. The adoption of AI in education offers a promising pathway to personalized learning and improved academic performance (Adewale et al., 2024).

### **Gender Differences**

Gender always play an important role in psychological aspects (Bashir, 2024). A study by Kim and Lee (2024) found that male students have higher AI literacy levels compared to female students. Male university students had a higher level of knowledge about AI concepts and applications compared to female students. A study by Kim and Lee (2024) investigated female students reported lower confidence in their AI skills compared to male students. Research by Lipovec et al. (2024) suggested that male university students are more likely to pursue AI-related courses and degrees compared to female university. Men are more likely feeling confident in their AI skills than women. A survey by Madgavkar et al. (2019) found that 44% of men are more feeling confident in their AI skills, compared to 26% of women.

Men have more basic understanding of AI concepts, such as machine learning and natural language processing, than women. A survey by Zhang et al. (2020) found that 55% of men reported having a basic understanding of AI, compared to 36% of women. Men have more capability to adopt AI-powered technologies, such as smart home devices and virtual assistants, than women. A survey by Mulrean (2020) found that 62% of men reported using AI-powered technologies, compared to 45% of women. Women are less likely to pursue careers in AI and data science than men. A report by Madgavkar et al. (2019) found that women make up only 22% of the AI workforce. Researches shown that AI literacy is not distributed equally across generation. The younger ones have higher level of Said literacy as compared to the old generations. (Bennett & Verma, 2020). The main cause and reason of this is because the younger generation is grown up using these technologies, they are more familiar with AI-powered tools and technologies than old generation, that making them more familiar how these technologies and AI system works.

### **Hypotheses**

1. Positive attitude towards artificial intelligence is positively related to artificial

intelligence literacy and academic achievement among university students.

2. Negative attitude towards artificial intelligence is negatively related to artificial intelligence literacy and academic achievement among university students.

3. There will be gender differences in attitude towards artificial intelligence, artificial intelligence literacy and academic achievement among university students.

## METHOD

### Research Design

The present study aimed to examine the attitude towards artificial intelligence as predictor of artificial intelligence literacy and academic achievement among university students. The "cross-sectional design" of survey research served as the foundation for this investigation. Data were gathered from several student groupings that were separated based on age and gender. The researchers sent out questionnaire booklets to the pupils.

### Sample

In the present study a sample of students (N= 300), both male (N=150) and female (N=150) was collected from different universities of Pakistan, both public and private sector. Because we employed a convenient technique, we chose participants based on their availability and desire to take part. In order to choose participants who are readily available, willing, and available at the time of data collection, we employed convenience sampling. This approach is helpful for rapidly collecting information from a certain group.

### Instruments

General Attitude Toward Artificial Intelligence Scale was used to measure the positive and negative attitude towards artificial intelligence. The scale was established by Schepman and Rodway

(2020). There are 32 items on this scale. It consists of two subscales, each of which has an equal amount of items. The range of values for positive and negative views about artificial intelligence is 16 to 80, respectively. A 5-point Likert-type scale, with Strongly Disagree at 1 and Strongly Agree at 5, was employed for the answer format. Positive attitude toward AI =.088 and negative attitude toward AI =.082 are two subscales with high internal consistency. The scale is a reliable indicator of how people generally feel about AI.

Literacy AI subscale of Artificial Intelligence Student Survey was used to measure AI literacy of students. The scale was established by Dai et al. (2020). This scale is consisted a total of 50 items, and the literacy AI subscale which is used in the present study consists of 5 items. It is Likert type scale with four categories including 1= strongly disagree to 4= strongly agree. The score of AI literacy subscale ranges from 5-20. Higher scores Literacy AI subscale is  $\alpha = 0.90$  which shows high internal consistency. This scale is a valid measure of AI literacy

### Procedure

The current study used convenient sampling technique to gather data from university students during working hours after first consulting with relevant authorities and obtaining their consent. It was carried out using SPSS-27. Initially the demographic characteristics were identified through frequency and percentages. Descriptive statistics and alpha reliability coefficient were computed. Independent sample T-test was applied to examine the mean differences across demographic characteristics. Pearson correlation was computed to examine the relationship between the variables. Finally, linear regression analysis was applied.

## RESULTS

**Table 1:** Demographic Characteristics of Participants

| Characteristics    | n   | %  |
|--------------------|-----|----|
| Gender             |     |    |
| Male               | 150 | 50 |
| Female             | 150 | 50 |
| Type of University |     |    |



|                        |     |      |
|------------------------|-----|------|
| Public Sector          | 174 | 58.0 |
| Private Sector         | 126 | 42.0 |
| Department             |     |      |
| English                | 40  | 13.3 |
| Psychology             | 37  | 12.3 |
| Biotechnology          | 31  | 10.3 |
| Computer Science       | 105 | 35.0 |
| BBA                    | 19  | 6.3  |
| Chemistry              | 18  | 6.0  |
| Physics                | 35  | 11.7 |
| International Relation | 15  | 5.0  |
| AI Used/ Developed     |     |      |
| Yes                    | 222 | 74   |
| No                     | 78  | 26   |

Table 1 reveals that equal number of male participants (n=150, 50.0%) and female participants (n=150, 50.0%) participated in this study. Higher number of participants from Public Sector (n=174, 58.0%) as compared to Private Sector (n=126, 42.0%). Greater number of participants were from Computer Science department (n=105, 35.5%) as compare to English (n=40,

13.3%), Psychology (n=37, 12.3%), Physics (n=35, 11.7%), Biotechnology (n=31, 10.3%), BBA (n=19, 6.3%), Chemistry (n=18, 6.0%), and International Relation (n=15, 5.0%). Greater number of participants Used/Developed AI (n=222, 74%) as compared to those who did not Use/Developed AI (n=78, 26%).

**Table 2:** Pearson Correlations of Study Variables

| Variables                      | M     | SD   | 1 | 2     | 3      | 4      |
|--------------------------------|-------|------|---|-------|--------|--------|
| 1. Positive attitude toward AI | 46.08 | 8.77 | - | -.14* | .16*   | .15*   |
| 2. Negative attitude toward AI | 52.68 | 9.48 |   | -     | -.21** | -.46** |
| 3. AI Literacy                 | 10.70 | 4.18 |   |       | -      | .29**  |
| 4. Academic Achievement        | 2.8   | .54  |   |       |        | -      |

Note. AI = Artificial Intelligence

\*p < .05, \*\*p < .01

Table 2 show Pearson correlations among study variables. Result indicated that positive attitude toward artificial intelligence significantly negatively correlated with negative attitude toward artificial intelligence (r = -.14, p < .01), whereas significantly positively correlated with artificial intelligence literacy (r = .16,

p < .05) and academic achievement (r = .15, p < .05). Negative attitude towards artificial intelligence significantly negatively correlated with artificial intelligence literacy (r = -.21, p < .01), and academic achievement (r = -.46, p < .01). Findings indicated that artificial intelligence literacy significantly positively correlated with academic achievement (r = .29, p < .01).

**Table 3:** Mean comparison of Male and Female Participants on Positive and Negative Attitude towards Artificial Intelligence, Artificial Intelligence Literacy, and Academic Achievement

| Variables                   | Males |      | Females |      | t(298) | Cohen's d |
|-----------------------------|-------|------|---------|------|--------|-----------|
|                             | M     | SD   | M       | SD   |        |           |
| Positive attitude toward AI | 46.39 | 8.15 | 45.77   | 9.37 | .61    | 8.78      |
| Negative attitude toward AI | 52.23 | 9.86 | 53.13   | 9.10 | -.82   | 9.49      |
| AI literacy                 | 11.27 | 4.15 | 10.13   | 4.14 | 2.83*  | 1.12      |
| Academic Achievement        | 2.75  | .45  | 3.21    | .89  | .24    | .20       |

Note. AI = Artificial Intelligence

\*p < .01

Table 3 shows mean, standard deviation and t-values of positive attitude toward

artificial intelligence, negative attitude toward artificial intelligence, artificial intelligence literacy and academic achievement. Results revealed significant mean differences across gender in artificial intelligence literacy with  $t(298) = 2.83$ ,  $p < .01$ . Findings revealed that males have higher level of AI literacy ( $M = 11.27$ ,  $SD = 4.15$ ) as compared to female students ( $M = 10.13$ ,  $SD = 4.14$ ). The value of Cohen's  $d$  was 1.22 ( $>.80$ ) which indicate large effect size. Results were non-significant on positive attitude toward artificial intelligence, negative attitude toward artificial intelligence and academic achievement.

## DISCUSSION

This study aimed to identify the predictors of artificial intelligence anxiety among university students. The first hypothesis "positive attitude towards artificial intelligence is positively related to artificial intelligence literacy and academic achievement among university students" was supported in the present study. This means that students who are more open to artificial intelligence and see artificial intelligence as an exciting tool and feel more comfortable using it. The positive attitude towards AI leads to higher AI literacy rate. The findings of this research are in line with the previous studies such as a study by Awang et al. (2024) indicated that students with a positive attitude toward AI related greater level of motivation and engagement and led to better learning outcomes in AI literacy. Similarly, findings of another study showed that student's positive attitude towards AI directed to good application and understanding of AI concepts better which also resulted in better learning outcomes (Lee & Kwon, 2019).

The second hypothesis "negative attitude towards artificial intelligence is negatively related to artificial intelligence literacy and academic achievement among university students". Its means that the individual who have negative attitude toward Artificial intelligence have lower level of literacy related to AI anxiety. Kim and Lee (2024) found that individuals with higher AI literacy levels reported lower levels of AI anxiety. Awang et al. (2022) demonstrated that AI literacy played an important role in

reducing AI anxiety, among those individuals with lower levels of AI knowledge. AI literacy and attitude toward AI are closely connected. When people are more literate about AI they tend to have a more positive attitude toward it. This is because understanding AI reduces fear and uncertainty, leading to increased trust and confidence. However, a lack of AI literacy may end up in a negative attitude, which is driven by false beliefs and misunderstandings. By improving AI literacy, we can be more optimistic about AI and positive attitude toward AI can also help people learn more about AI (Long & Magerko, 2020).

The third hypothesis proposed that "There will be gender differences in attitude towards artificial intelligence, artificial intelligence literacy and academic achievement among university students" was approved. Finding reveals that Male have higher AI literacy as compare to female students. Male students had more exposure to technology and gadgets from a younger age, which can also lead to higher familiarity with tech concepts, including AI. Kim and Lee (2024) also revealed that male university students had higher AI literacy levels than female university students, even after controlling for other factors. Some other researches by Scheutz et al. (2024), and Awang et al. (2022) showed that male university students were more experienced and more interested in AI as compare to female students.

## Conclusion

Overall, the study emphasizes the importance of cultivating a positive attitude towards artificial intelligence to enhance the AI literacy and academic achievement. Moreover, male university students reported higher level of AI literacy compared to female university students. Taking proactive measures to increase AI-related literacy among students is vital. By raising awareness about AI and creating opportunities for students to engage with AI technologies, they can build confidence and gain the benefits of these advancements. The approach enables them to tackle challenges with a more optimistic mindset (Ahmed, 2024). Reducing fear surrounding AI not only supports students

but also contributes to a more promising future. The findings of the study enhance our understanding of the complex connections among attitudes toward AI, AI literacy, and AI anxiety. The findings indicate that fostering a positive attitude toward AI and enhancing AI literacy could be effective approaches to alleviating AI anxiety and enhancing academic achievement.

## REFERENCES

- Adewale, M. D., Azeta, A., Abayomi-Alli, A., & Sambo-Magaji, A. (2024). Impact of artificial intelligence adoption on students' academic performance in open and distance learning: A systematic literature review. *Heliyon*.
- Ahmed, M. F. (2024). Positive Psychology Perspectives: A Multifaceted Approach to Human Flourishing. *Pakistan Journal of Positive Psychology*, 1(1), 1–7.
- Awang, H., Benlahcene, A., & Mansor, N. S. (2024). Data Security Knowledge Among Students of Public Universities: A Fundamental Competency for Success in the Education 5.0 Era. In *Preconceptions of Policies, Strategies, and Challenges in Education 5.0* (pp. 17-32). IGI Global.
- Bashir, M. M. (2024). Relationship between gender discrimination, gender stereotype and bullying affect among teenagers. *Pakistan Journal of Positive Psychology*, 1(1), 38-43.
- Bennett, J., & Verma, A. (2020). AI literacy: A framework for understanding and critically evaluating artificial intelligence. *Journal of Educational Data Mining*, 12(1), 1-24.
- Chen, S. Y., Su, Y. S., Ku, Y. Y., Lai, C. F., & Hsiao, K. L. (2024). Exploring the factors of students' intention to participate in AI software development. *Library hi tech*, 42(2), 392-408.
- Dai, Y., Chai, C. -S., Lin, P. -Y., Jong, M. S. -Y., Guo, Y., & Qin, J. (2020). Promoting Students' Well-Being by Developing Their Readiness for the Artificial Intelligence Sustainability. *Age. Sustainability*, 12(16), 6597. <https://doi.org/10.3390/su12166597>
- Hattwig, D., Bussert, K., Medaille, A., & Burgess, J. (2013). Visual literacy standards in higher education: New opportunities for libraries and student learning. *portal: Libraries and the Academy*, 13(1), 61-89.
- Hornberger, M., Bewersdorff, A., & Nerdel, C. (2023). What do university students know about Artificial Intelligence? Development and validation of an AI literacy test. *Computers and Education: Artificial Intelligence*, 5, 100165.
- Jia, X. H., & Tu, J. C. (2024). Towards a New Conceptual Model of AI-Enhanced Learning for College Students: The Roles of Artificial Intelligence Capabilities, General Self-Efficacy, Learning Motivation, and Critical Thinking Awareness. *Systems*, 12(3), 74.
- Kim, S. W., & Lee, Y. (2024). Investigation into the influence of socio-cultural factors on attitudes toward artificial intelligence. *Education and Information Technologies*, 29(8), 9907-9935.
- Kong, K. Y., & Yuen, K. F. (2024). Sustainability risk management: Exploring the role of artificial intelligence capabilities through an information-processing lens. *Risk Analysis*.
- Lee, S. J., & Kwon, K. (2024). A systematic review of AI education in K-12 classrooms from 2018 to 2023: Topics, strategies, and learning outcomes. *Computers and Education: Artificial Intelligence*, 100211.
- Li, J., & Huang, J. (2020). Dimensions of artificial intelligence anxiety based on the integrated fear acquisition theory. *Technology in Society*, 63, 101410.
- Lipovec, A., Gartner, S., & Krašna, M. (2024). AI literacy meets socio-emotional learning: assessing transformative educational practices in Slovenia. In *INTED2024 Proceedings* (pp. 4295-4299). IATED.
- Long, D., & Magerko, B. (2020, April). What is AI literacy? Competencies and design considerations. In *Proceedings of the 2020 CHI*

- conference on human factors in computing systems (pp. 1-16).
- Luckin, R., & Holmes, W. (2016). Intelligence unleashed: An argument for AI in education.
- Madgavkar, A., Manyika, J., Krishnan, M., Ellingrud, K., & Yee, L. (2019). The future of women at work.
- Mulrean, C. (2020). Women in the fourth industrial revolution: A gendered perspective on digitalization in Kenya, Nigeria and South Africa (Doctoral dissertation, Master's thesis, European Institute and LUISS Guido Carli University) Retrieved from: [https://www.ie-ei.eu/Ressources/FCK/image/Theses/2020/MULREAN\\_Thesis\\_GEGPA\\_2020.pdf](https://www.ie-ei.eu/Ressources/FCK/image/Theses/2020/MULREAN_Thesis_GEGPA_2020.pdf).
- Ng, D. T. K., Leung, J. K. L., Chu, S. K. W., & Qiao, M. S. (2021). Conceptualizing AI literacy: An exploratory review. *Computers and Education: Artificial Intelligence*, 2, 100041.
- Pedro, F., Subosa, M., Rivas, A., & Valverde, P. (2019). Artificial intelligence in education: Challenges and opportunities for sustainable development.
- Rimsha. (2024). Perceived Stress and Psychological Well-being among Students. *Pakistan Journal of Positive Psychology*, 1(1), 15–21.
- Schepman, A. & Rodway, P. (2020). Initial validation of the general attitudes towards Artificial Intelligence Scale. *Computers in Human Behavior Reports*, 1, 100014. <https://doi.org/10.1016/j.chbr.2020.100014>
- Scheutz, M., Aeron, S., Aygun, A., de Rooter, J. P., Fantini, S., Fernandez, C., ... & Lyu, B. (2024). Estimating systemic cognitive states from a mixture of physiological and brain signals. *Topics in Cognitive Science*, 16(3), 485-526.
- Shank, D. B., Graves, C., Gott, A., Gamez, P., & Rodriguez, S. (2019). Feeling our way to machine minds: People's emotions when perceiving mind in artificial intelligence. *Computers in Human Behavior*, 98, 256-266.
- Wang, Y.-Y., & Wang, Y.-S. (2019). Development and validation of an artificial intelligence anxiety scale: An initial application in predicting motivated learning behavior. *Interactive Learning Environments*, 30(4), 619-634.
- Williamson, S. M., & Prybutok, V. (2024). Balancing privacy and progress: a review of privacy challenges, systemic oversight, and patient perceptions in AI-driven healthcare. *Applied Sciences*, 14(2), 675.
- Zhang, Y., Xiong, F., Xie, Y., Fan, X., & Gu, H. (2020). The impact of artificial intelligence and blockchain on the accounting profession. *Ieee Access*, 8, 110461-110477.