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Assessing The AI-Literacy among Prospective Teachers: A Case Study of the Faculty of Education, University of Sindh, Jamshoro

Saira Soomro [1*] Jameel Ahmed Qureshi [2] Muhammad Kamran Abbasi [3]

Corresponding Author: Saira Soomro (✉: saira@usindh.edu.pk)

Abstract

Artificial Intelligence (AI) is a dynamic sphere from the very beginning. Artificial Intelligence (AI) is evolving at such a rapid pace that it is transforming practically all spheres of civilization, including business, education, health care, and governmental domains. University students are supposed to apply AI-based technology and analyze their effects, both ethical, social, and academic, in a critical manner in the context of higher education. As a result, the notion of AI literacy has become an essential aspect of digital and technological literacy. Therefore, the aim of the research was to examine the level of awareness, skills, and attitudes of university students about AI technologies in academic learning and their level of AI literacy. The study contributed to the growing body of research on the topic of digital competency and educational technology by exploring the understanding and use of AI tools among students. To assess the AI-literacy among the prospective teachers in terms of their functional competency, practical application, critical reflection, and self-efficacy. To sum up, the research findings indicate that university students have a medium and developing degree of AI literacy with a high level of practical use, medium knowledge, and critical awareness. The use of AI by students is proactive, aimed at learning, improving efficiency, and meeting academic objectives, yet students are not very successful in assessing AI and comprehending its essence.

Key Words

Artificial Literacy (AI), Functional Competency, Practical Application, Critical Reflection, Self-Efficacy

Introduction

Artificial Intelligence (AI) is a dynamic sphere from the very beginning. Artificial Intelligence (AI) is evolving at such a rapid pace that it is transforming practically all spheres of civilization, including business, education, health care, and governmental domains (Burgsteiner et al., 2016). Examples of AI-powered technologies that are increasingly being integrated into everyday activities and workplace environments are machine learning systems, intelligent tutoring systems, and automated expert systems. Therefore, AI literacy and AI implications have emerged as a core skill of 21st-century students (Grizzle et al., 2021; Yang, 2022).

University students are supposed to apply AI-based technology and analyze their effects, both ethical, social, and academic, in a critical manner in the context of higher education. As a result, the notion of AI literacy has

[1] Assistant Professor, Faculty of Education, University of Sindh, Jamshoro, Sindh, Pakistan.
Email: saira@usindh.edu.pk
[2] School Education & Literacy Department (SE&LD), Government of Sindh, Pakistan.
Email: jameel.queshi@scholars.usindh.edu.pk
[3] Associate Professor, Faculty of Education, University of Sindh, Jamshoro, Sindh, Pakistan.
Email: abbasikamran@usindh.edu.pk

become an essential aspect of digital and technological literacy (Wang et al., 2023). Artificial Intelligence (AI) is evolving at such a pace that it is altering nearly all spheres of civilization, such as business, education, healthcare, and governance. The use of AI-based technologies, like intelligent tutoring tools, machine learning systems, and automated decision-making tools, is becoming more prevalent in personal and professional life. Consequently, understanding AI and its implications has become an essential competency of students in the twenty-first century. Besides applying AI-based technologies, students in higher education are expected to evaluate their ethical, social, and academic consequences critically (Zhao et al., 2022). This has led to AI literacy being included as a component of digital and technology literacy.

AI literacy is defined as the knowledge, skills, and attitudes that allow one to comprehend the functioning of AI systems, engage with AI technologies, and evaluate their advantages, drawbacks, and ethical considerations of AI in a critical way (Long & Magerko, 2020). Academics, such as Long and Magerko, view AI literacy as a set of skills that can help students recognize AI in everyday applications, interpret AI output, and make prudent decisions when interacting with AI-driven systems. These competencies will encompass a theoretical understanding of AI concepts, hands-on skills in using AI, an understanding of ethical concerns such as bias and privacy, and the ability to critically evaluate data generated by AI. It is important to make students AI literate to prepare them to take up a career in the future and become an ethical digital citizen, as AI technologies keep gaining ground (Kong et al., 2021)

In the context of higher education, university students actively use AI-based learning, research, and problem-solving systems. Intelligent search engines, recommendation systems, automated writing aids, and generative AI platforms have radically changed the manner in which students access information and complete academic tasks. These technologies have a problem of academic integrity, disinformation, excessive dependence on automation, and ethical use, despite the opportunities to learn individually and achieve greater efficiency. Universities should therefore ensure that students are AI literate to handle these tools in a sensible, effective, responsible, and successful way in their day-to-day teaching-learning journal (Ng et al., 2021).

Although the use of artificial intelligence (AI) in education is gaining popularity, not every student understands how AI systems work and how the results should be interpreted. Research shows that AI-based tools are often used by students who have not read through issues related to AI applications, such as algorithmic biases, privacy of data, and restrictions imposed by automated systems. This gap highlights the importance of conducting a study on the current AI literacy rates of university students and determining what factors affect their knowledge, attitudes, and AI technologies usage. Teachers can develop curriculum, training, and policy that promote ethical and informed participation in AI by considering the AI literacy of students (Butt et al., 2025).

Therefore, the aim of the research was to examine the level of awareness, skills, and attitudes of university students about AI technologies in academic learning and their level of AI literacy. The proposed study will contribute to the growing body of research on the topic of digital competency and educational technology by exploring the understanding and use of AI tools among students. The findings can also assist educators and lawmakers in developing strategies for integrating AI literacy in college classes and promoting proper use of AI in educational institutions (Mansoor et.al., 2024).

The dramatic emergence of artificial intelligence (AI) has significantly affected the education systems in different parts of the world. The AI technologies, such as generative AI platforms, automated assessment tooling, and intelligent tutoring systems, are revolutionizing teaching and learning processes. In its turn, this is why the concept of AI literacy is gaining increasing interest among educational researchers (Bećirović et al., 2025).

AI literacy is the capacity to effectively understand, evaluate, and interact with AI technologies. According to Long and Magerko, AI literacy refers to a set of skills that enables individuals to realize the presence of AI systems, understand their functionality, critique the outcomes of the system, and make decisions on how to utilize them (Haeniah et.al., 2025).

Similarly, the study of Gonzalez-Perez et al. identifies the core aspects of AI literacy, such as conceptual knowledge of AI, skills to critique AI systems, and ethical consciousness of AI uses. Students need to be aware of the advantages and drawbacks of using AI-driven tools in classrooms .

Moreover, research indicates that university learners have been using AI-based technologies more in their academic activities, such as information retrieval, writing support, and data analysis. As an example, generative AI systems, like ChatGPT and other AI-based applications, can be significantly utilized by students to aid in their research and study. Despite the fact that these tools may enhance productivity and personalized learning, they provoke concerns regarding academic honesty, false information, and excessive dependence on automation (Lee et al., 2024).

Surveys show that many students use AI technology without fully comprehending its shortcomings or the way it functions. Wayne Holmes claims that students need to be AI literate to be in a position to critically analyze AI-generated results and apply these technologies in a morally responsible manner. Lack of AI literacy can cause students to struggle with identifying trustworthy and untrustworthy information produced by AI (Rožman et al., 2025).

Moreover, ethical issues such as algorithmic bias, privacy, and transparency are gaining prominence in the context of the application of AI in the field of education. Manzini notes that understanding of ethical implications is a vital aspect of AI literacy because it allows individuals to consider how AI systems make decisions and how these decisions can affect society.

The literature reveals that AI literacy is a complex phenomenon, which includes knowledge, skills, attitudes, and ethical issues. Nevertheless, the empirical research on the AI literacy of university students, particularly in poorer nations, remains insufficient. Hence, additional studies are needed to understand the attitudes and competencies of students towards AI technologies in higher education (Chen et al., 2021).

Research Objectives

1. To assess the AI-literacy among the prospective teachers in terms of their functional competency, practical application, critical reflection, and self-efficacy.

Methodology

Research Design

The research design adopted in this study was a quantitative research design, which involved a cross-sectional survey design in order to assess AI-Literacy in terms of functional competency, practical application, critical reflection, and self-efficacy of the prospective teachers. The quantitative approach was deemed suitable since it will enable statistical analysis of the relationships between variables and the extrapolation of the results to a larger population.

Study Population

The study population comprised prospective teachers who undertake teacher education courses in universities and teacher training institutions. Such students are future teachers who will be expected to incorporate new

technologies like artificial intelligence in their teaching and learning activities. Due to limited time and resources, this study is limited only to the faculty of education, University of Sindh, Jamshoro.

Sample and Sampling Technique

A sample of prospective teachers was chosen with the help of a probability sampling technique, especially simple random sampling, to make sure that all respondents had the same opportunity to be chosen. This reduced the risk of sampling bias and increased the representativeness of the sample.

Research Tool

The research tool was adapted from the previous studies. The questionnaire is designed in accordance with the current literature on AI literacy and digital competence. The questionnaire comprised two parts, which included

Section A: Demographic Information

- Gender
- Age
- Academic program
- Previous experience with AI tools

Section B: AI- Literacy

1. Functional Competency
2. Practical Application
3. Critical Reflection
4. Self-Efficacy
5. AI Literacy

Validity of the Research Tool

To achieve content validity, the questionnaire was checked by specialists in educational technology and teacher education. Their comments were applied to modify the wording, comprehension, and applicability of the items.

Reliability of the Research Tool

Cronbach's alpha coefficient was used in determining the reliability of the research tool. A Cronbach's Alpha of 0.70 or above was deemed fair to determine the internal consistency of the items.

Procedure of Data Analysis

The data collected were analyzed using statistical software such as SPSS. The analysis included:

- Frequencies
- Percentages
- Means
- Standard deviations

Data Analysis and Result

The data was entered, edited, classified, and cleaned in the statistical package, Social Sciences (SPSS) version 26, to give the correct and systematic understanding of the results. Frequency, percentage, mean, standard deviation,

and standard error were used as descriptive statistics to outline the demographics and determine the level of AI literacy of the prospective teachers in the four dimensions of functional competency, practical application, critical reflection, and self-efficacy.

Demographic variables (gender, age, year of study, and academic program) were measured through frequency and percentage distributions, and to analyze the level of AI literacy of the prospective teachers at the University of Sindh, Jamshoro, for each factor, mean, and standard deviation were used. The analysis allowed and enabled assessing and measuring the artificial intelligence (AI) Literacy among prospective teachers at the University of Sindh, Jamshoro.

Demographic Characteristics of the Respondents

Table 1

Gender

	Gender	Frequency	Percent
Valid	1 Male	85	26.6
	2 Female	235	73.4
	Total	320	100.0

Table 2

Age (in Years)

	Age	Frequency	Percent
Valid	1 17 – 22	157	49.1
	2 23 – 28	145	45.3
	3 29 and above	18	5.6
	Total	320	100.0

Table 3

Year Current Year of Study

	Year of Study	Frequency	Percent
Valid	1 1st year	7	2.2
	2 2nd year	173	54.1
	3 3rd year	74	23.1
	4 4th year	66	20.6
	Total	320	100.0

Table 4

State Your Program

	Program	Frequency	Percent
Valid	1 B.Ed. 1.5	86	26.9
	2 B.Ed. 2.5	51	15.9
	3 B.Ed. (Hons)	183	57.2
	Total	320	100.0

Analysis

The demographic characteristics of the study mentioned in the above tables 2, 3, 4, and 5 indicate that the majority of female respondents (73.4%), with males taking (26.61%), this imbalance is because the majority of students who study in the faculty of education, University of Sindh, are female. The age groups are mostly comprised of young

undergraduates, with the majority (49.1%) being within the 17-22 age group, and (45.3%) between the 23-28 age group, and a very small percentage making up the 29 and above group (5.6%). Regarding the year of study, the majority of the respondents are in 2nd year (54.1%), 3rd year (23.1%), and 4th year (20.6%), and very few are from 1st year (2.2%) because their response rate was low. Whereas in the study program, most students (prospective teachers) are from the B.Ed. (Hons) (57.2%) and thereafter, B.Ed. 1.5 (26.9%), and B.Ed. 2.5 (15.9%).

Level of AI-Literacy of Prospective Teachers

Table 6

Functional Competency

Functional Competency	Mean	Std. Deviation	Std. Error Mean
FC1 I know the most important concepts of the topic "artificial intelligence."	2.97	1.198	.067
FC2 I know the definitions of artificial intelligence.	2.96	1.190	.066
FC3 I can tell if I am dealing with an application based on AI.	2.98	1.178	.066
FC4 I can distinguish devices that use AI from devices that do not.	3.24	1.087	.061
FC5 I can distinguish if I interact with an AI or a "human."	3.01	1.201	.067
FC6 I can design new AI applications.	3.03	1.123	.063
FC7 I can program new applications in the field of AI.	3.46	1.062	.059
FC8 I can develop new AI applications.	2.82	1.228	.069
FC9 I can select useful tools (e.g., frameworks) to program an AI.	3.06	1.140	.064
Functional Competency	3.06	.668	.037

Analysis

The scores of the functional competency in the above table items are M=2.82 to M=3.46, with an average score of M=3.06, which means the overall level of artificial intelligence is moderate among the respondents. Comparatively higher ability is demonstrated by students in AI applications programming (M = 3.46) and AI-enabled devices (M = 3.24), and comparatively lower in creating new AI applications (M = 2.82) and core concepts and definitions (means around 2.96-2.98). The standard deviations (SD=1.06-1.23) imply that there is a certain level of variation in the responses, which raises the level of skill variance of students. All in all, the results suggest that students have a basic to intermediate level of practical and identification skills in the field of AI, but in the areas of deeper conceptual knowledge and higher development, they are more unadvanced.

Table 7

Practical Application

Practical Application	Mean	Std. Deviation	Std. Error Mean
PA1 I can operate AI applications in everyday life.	3.00	1.207	.067
PA2 I can use AI applications to make my everyday life easier.	3.40	1.159	.065
PA3 I can use AI meaningfully to achieve my everyday goals.	3.79	.912	.051
PA4 I can interact with AI in a way that makes my tasks easier.	3.78	.952	.053
PA5 I can work together gainfully with an AI.	3.64	.975	.055
PA6 I can communicate with AI in everyday life.	3.45	1.146	.064
PA7 I can think of new uses for AI.	3.55	1.165	.065
PA8 I can imagine possible future uses of AI	3.59	1.141	.064
Practical Application	3.53	.613	.034

Analysis

The average scores of practical applications in item of the above table no.7 are between M=3.00 and M=3.79, with a total average of M=3.53, which depicts a fairly high degree of students' skills to apply AI in their daily lives. The most developed competencies are perceived in working with AI to reach the objectives (M = 3.79) and communicating with AI to make work easier (M = 3.78), which implies a high level of practical activity. Reduced, but still average performance is found in simple working of AI applications (M = 3.00). Standard deviations (SD=0.91-1.20) indicate a moderate variability of respondents. On the whole, the outcomes suggest that prospective teachers are quite competent in the application of AI to real-life tasks, particularly those related to their efficiency and goal accomplishment, although the basic competencies in operations might be slightly different.

Table 8

Critical Reflection

Critical Reflection	Mean	Std. Deviation	Std. Error Mean
CR1 I can assess the limitations and opportunities of AI.	3.42	1.203	.067
CR2 I can assess what advantages and disadvantages the use of AI entails.	3.45	1.187	.066
CR3 I can weigh the consequences of using AI for society.	3.36	1.182	.066
CR4 I can incorporate ethical considerations when deciding whether to use data provided by an AI.	3.52	1.139	.064
C5 I can analyze AI-based applications for their ethical implications.	3.44	1.168	.065
CR6 I don't let AI influence my everyday decisions.	3.51	1.142	.064
CR7 I can prevent an AI from influencing me in my everyday decisions.	3.42	1.187	.066
CR8 I can tell if AI is influencing me in my everyday decisions.	3.25	1.423	.080
Critical Reflection	3.42	.721	.040

Analysis

The critical reflection items in the above table 8 mean scores are between M=3.25 and M=3.52, with the overall mean of M=3.42, which means that the students were rather moderate to quite high in critical awareness of AI. There is a greater level of proficiency in integrating ethical factors (M = 3.52) and resisting the influence of AI in decision-making (M = 3.51), whereas a relatively lower level of awareness is recorded in the identification of cases when AI affects their daily decisions (M = 3.25). The standard deviations (SD=1.14-1.42) imply that there is a significant difference in the perceptions and critical skills of students. On the whole, the statistical results suggest that prospective teachers have a reasonable amount of critical and ethical awareness of AI, and their skills to repeatedly recognize and analyze its insidious impact in everyday life may be developed.

Table 9

Self-Efficacy

Self-Efficacy	Mean	Std. Deviation	Std. Error Mean
SE1 I can rely on my skills in difficult situations when using AI.	3.30	.995	.056
SE2 I can handle most problems in dealing with AI well on my own.	3.09	.677	.038
SE3 I can usually solve strenuous and complicated tasks when working with AI	3.12	.736	.041
SE4 I keep control over feelings like frustration and anxiety while doing everyday things with AI.	3.08	.717	.040
SE5 I can handle it when everyday interactions with AI frustrate or frighten me.	3.03	.699	.039
Self-Efficacy	3.12	.526	.029

Analysis

The average scores of self-efficacy items in the above table no. 9 are between (M=3.03) and (M=3.30) with the overall mean of (M=3.12), which is a moderate level of confidence of the students in their capabilities to use AI. They were more likely to believe in their abilities when faced with challenging conditions (M = 3.30), and very little confidence is noticed in coping with frustration or fear when communicating with AI (M = 3.03). The standard deviations are relatively low (SD=0.67-0.99), which indicates that there is more consistency in responses than in other dimensions. In general, the findings show that the level of self-efficacy in addressing AI is rather fair among the students, yet emotional control and confidence during problematic situations can still be enhanced.

Discussion and Findings

The current work offers a multidimensional interpretation of artificial intelligence (AI) literacy among university students with an analysis of functional competency, practical implementation, critical reflection, self-efficacy, and demographic factors. Overall, the results indicate that students have an intermediate to comparatively high degree of AI literacy, where their practical application skills are stronger and more competent, and their skills in advanced development and a profound understanding of concepts are weaker. These results correspond with both national (Pakistan-based) and global studies, which means that there is a worldwide tendency in the dynamics of interaction between students and AI technologies and the way students learn them.

All the results show that the level of AI literacy is moderate among the students, especially in functional competency (Mean = 3.06) and self-efficacy (Mean = 3.12), but higher in practical application (Mean = 3.53) and comparatively good critical reflection (Mean = 3.42). This is an indication that students feel more at ease using AI tools as opposed to learning and creating them.

This is very much related to a Pakistani study by Yasin & Safdar (2025). which established that the use of AI tools in academic work by university students is common, and their users believe that these tools will assist in improving academic performance and creativity, yet their comprehension of the technology differs among students (Yasin & Safdar, 2025). Likewise, a second massive survey was carried out across university samples in Pakistan that indicated that students overall had a moderate level of AI literacy, with variances depending on discipline, with higher levels of AI literacy among technology students (Yasin & Safdar, 2025).

Cross-national studies on the issue also validate the fact that at the international level, students are more likely to become practically familiar with AI tools than conceptually or ethically knowledgeable, which implies the likelihood of using AI tools without understanding them (Hingle & Johri, 2025). Thus, this current research supports the idea that the AI literacy of students is not only uneven but also multi-layered, with its strengths being focused on applied skills.

AI literacy frameworks have highlighted internationally that functional competency also encompasses knowledge, awareness, and technical skill, but many students are still at a basic or intermediate level, especially in non-technical subjects. This is supported in current research, where students have more confidence in recognizing and utilizing AI tools as compared to designing or developing AI systems.

The results show that the functional competency of the students is medium (Mean = 3.06). Since they can recognize AI applications and even code to a certain level, their knowledge of the basic concepts of AI and their capability to build AI systems is low.

This trend aligns with the results of studies carried out at the University of Balochistan, which discovered that students have the basic knowledge and awareness of AI but do not have the technical knowledge and systematic perception (Kurdzada et al., 2025). Equally, research in Pakistan points out that despite students getting more and

more acquainted with AI technologies, their conceptual clarity and technical skills remain in progress (Farooqui, 2024).

The AI literacy models adopted globally focus on functional competency, incorporating knowledge, awareness, and technical skills, whereas most students are at the basic or intermediate level, especially in non-technical fields (Hingle & Johri, 2025). This is supported in current research where students have more confidence in recognizing and utilizing AI tools as compared to designing or developing AI systems of all dimensions.

Practical application (Mean = 3.53) is the most robust, which means that students are highly active in their everyday academic and personal lives related to AI. They are especially good at applying AI to meet the objectives, streamline the work, and increase productivity.

This result is very consistent with that of the country, according to which Pakistani students use AI tools in their assignments, research, and the enhancement of academic performance every now and then (Yasin & Safdar, 2025). A different experimental report conducted in Pakistan revealed that the use of AI tools positively influenced classroom performance, which stresses the feasibility of the implementation of AI in classrooms (Ali et al., 2025). Trends are the same internationally. Students widely use AI for:

- Writing assistance, e.g., classroom assignments, project work, and presentations
- Research and information retrieval
- Learning complicated topics given by teachers and mentioned in books

Research indicates that AI technologies are mainly beneficial to information availability and academic efficiency, but the problem of excessive dependence is observed (Hossain et al., 2025).

In this way, the existing data prove that students use AI actively as they incorporate it into their daily learning experiences, although their knowledge about it is not equally developed.

The analysis reveals that the degree of critical reflection in the students is moderate to high (Mean = 3.42), especially towards the aspects of ethics and assessment of the benefits and harms of AI. Nevertheless, they cannot identify the implicit impact of AI on their choices as well.

This is in line with the study in Pakistan, which shows that the students are aware of the advantages of AI, but lack a high level of critical analysis, particularly in terms of ethical considerations and bias (Mohsin et al., 2026). On the same note, the literature highlights the need to implement ethical AI literacy in the curriculum of tertiary institutions.

The same problem is also pointed out by international research. Students often:

- Recognize ethical issues.
- Be aware of such risks as bias and misinformation.
- Difficult to recognize AI's impact on life choices.

According to a study conducted worldwide, students are afraid of the consequences of overreliance, less emphasis on critical thinking, and associated ethical threats (Hossain et al., 2025). Thus, the results indicate that students know about AI implications, but their level of critical literacy remains immature, especially in applied settings.

The scores have shown that there is a moderate degree of self-efficacy (Mean = 3.12), which implies that students possess a decent degree of confidence in their skills to use AI, but are not completely confident when dealing with difficult or complicated situations.

This happens to agree with the self-efficacy theory developed by Bandura and has been used in Pakistan with AI research to demonstrate that the confidence of students in their ability to utilize AI tools effectively depends on

their confidence (Farooqui, 2024). In the same vein, AI-assisted writing studies were able to identify that the use of AI may positively affect the confidence and achievement of students, although there are still other emotional issues, including frustration (Abdelmagid et al., 2025).

In international research, it has been established that students with higher AI self-efficacy are more likely to:

- Use AI tools effectively
- Engage in problem-solving
- Adapt to new technologies

Nevertheless, emotional regulation and trust in complicated tasks are still the areas that should be enhanced.

Findings

Demographic Findings

- The majority were female respondents (73.4%), and male respondents (26.6%) participated in this study.
- The majority of prospective teachers were 17-22 years old (49.1%), and (45.3%) were between 23-28 years old, where the percentage of 29+ was (5.6%).
- The majority of the respondents belong to the 2nd year of study (54.1%), and (23.1%) were from the 3rd year of the study, and (20.6%) belongs to the 4th year (Final year) of the study, whereas 1st year students were the least significant (2.2%).
- Most of them were from B.Ed. (Hons) program (57.2%), and (26.9%) were B.Ed. 1.5 and (15.9%) B.Ed. 2.5 program.

Findings of Functional Competency

- General functional competency is average (Mean = 3.06).
- The students are better at programming AI applications (M = 3.46) and distinguishing AI devices (M = 3.24).
- The low level of competency is observed in the development of AI applications (M = 2.82) and learning basic AI concepts/definitions (around M = 2.96-2.98).
- Responses have moderate variation, which means that there is a difference in the level of skills.

Findings of Practical Application

- The level of practical application is rather high (Mean = 3.53).
- Learners feel least friendly when it comes to utilizing AI in meeting objectives (M = 3.79) and communicating with AI to facilitate work (M = 3.78).
- The fundamental functionality of AI tools is the lowest (M = 3.00), but moderate.
- In general, the students show high-level practical activity with AI in their everyday lives.

Findings of Critical Reflection

- The critical reflection is moderate to high (Mean = 3.42).
- Students demonstrate higher skill in ethical consideration (M = 3.52) and resistance to the influence of AI (M = 3.51).
- Less skill is observed in perceiving AI affect in everyday choices (M = 3.25).
- The variance is good, implying that there is disparity in critical awareness amongst students.

Self-Efficacy Findings

- The self-efficacy is moderate (Mean = 3.12).
- Students feel more assertive in their way of coping with challenging situations (M = 3.30).

- Reduced trust is found in coping with frustration or fear (M = 3.03) when using AI.
- The answers are not very varied, and this means that the confidence rates of the respondents are similar.

Overall Key Findings

- There is no exceeding functional competency and self-efficacy and increased practical application, accompanied by average critical awareness, implying that students feel more at ease with AI in their day-to-day lives than with in-depth learning and development.

Conclusion

To sum up, the research findings indicate that university students have a medium and developing degree of AI literacy with a high level of practical use, medium knowledge, and critical awareness. The use of AI by students is proactive, aimed at learning, improving efficiency, and meeting academic objectives, yet students are not very successful in assessing AI and comprehending its essence.

These results can be correlated with the national and international studies, which prove that the development of AI literacy remains at the same stage worldwide. The findings also point to the urgent necessity of well-organized AI training, given not only the use of AI but also critical thinking, awareness of ethical issues, and technical skills, in order to equip students with an AI-based future.

Recommendations

- Students in all disciplines today use AI to receive assistance in their studies, and therefore, universities are advised to officially teach AI literacy as part of the curriculum, which includes AI-specific courses that offer a basic understanding of AI applications and ethics across all disciplines.
- The instruction should not only cover the usage, but also the way AI functions, algorithms, data, and constraints.
- Universities ought to encourage practical training among the students to offer practical workshops, labs, and projects where students can design, experiment, and engage with AI tools.
- Now, universities must improve the critical thinking of the students and include modules about issues related to ethics with regard to using AI responsibly.
- The teachers are required to teach students how not to be dependent on AI but to preserve academic integrity.
- Universities are expected to offer encouraging learning conditions, mentorship, and problem-solving tasks to assist students in enhancing their self-efficacy and confidence.
- Most of the Faculty members do not know the meaningful and responsible AI use, thus universities also need to offer faculty training programs to train faculty members to effectively implement AI tools in teaching and directing students.
- Universities are supposed to make sure that there are accessible, good AI platforms, software, and digital infrastructure for students.
- Institutions and policymakers must have detailed regulations on ethical and academic use of AI in education.

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