

# Artificial intelligence literacy, attitude, and teaching efficacy among Chinese university professors

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## Abstract

The study evaluated the Artificial Intelligence (AI) literacy, attitude, and teaching efficacy among Chinese University professors. Specifically, it described the profile of the respondent in terms of sex, age, educational attainment, and length of service; identified the respondents' AI attitude in terms of knowing and understanding AI, applying AI, evaluating AI application, and AI ethics; determined the respondents' AI attitude as to cognitive, emotional, and behavioral; assess the respondents' AI teaching efficacy in terms of instructional strategies, classroom management, and student engagement; tested the differences in responses when grouped according to profile; tested the relationship between the AI literacy, attitude, and teaching efficacy among Chinese university professors; and proposed an enhanced faculty development program that facilitates the promotion of incorporating AI. Descriptive method was used in this study. The researcher, in contrast to experimental investigations, observed and quantified variables without controlling or manipulating them. The researcher selected 425 Chinese university professors as participants. The surveys employed the Likert scale and reliability was evaluated using Cronbach alpha. The gathered data was analyzed using a one-way ANOVA, t-test, and a quantitative descriptive study technique. According to the study's findings, majority of the respondents are female aged 46-50 years old with a Bachelor's degree having 6-10 years length of service. Most of the respondents agreed on indicators of AI attitude in terms of knowing and understanding AI, applying AI, evaluating AI application, and AI ethics and on the indicators pertaining to AI attitude in terms of cognitive, emotional, and behavioral. Majority of the respondents agreed on the indicators pertaining to AI teaching efficacy in terms of instructional strategies and classroom management and strongly agreed in terms of student engagement. There were no significant differences on responses when it comes to age, highest educational attainment, and length of Service except in terms of sex. Additionally, the results indicated a highly significant differences among the AI literacy, attitude, and teaching efficacy among Chinese university professors. Recommendation for an enhanced faculty development program that facilitates the promotion of incorporating AI was proposed.

**Keywords:** Artificial Intelligence, AI literacy, AI attitude, AI teaching efficacy

## **Artificial intelligence literacy, attitude, and teaching efficacy among Chinese university professors**

### **1. Introduction**

The rapid advancement of AI technology has had profound impacts on multiple domains, including education. Chinese universities are progressively incorporating courses and technologies linked to AI into their academic programs to provide students with the necessary skills for the future job market. Gaining awareness of the perspectives and contributions of university academics regarding AI is crucial for developing impactful AI education initiatives. According to Laupichler et al. (2022), there has been extensive research on the topic of artificial intelligence literacy. AI encompasses the comprehension and awareness of artificial intelligence (AI) principles, technology, and their consequences. Nevertheless, there is a scarcity of psychometrically robust and comprehensively tested tools that aim to accurately measure AI literacy. Ertel (2018) stated that the concept of artificial intelligence was first introduced by John McCarthy, a pioneer of artificial intelligence. McCarthy succinctly said that the objective of artificial intelligence is to create robots that exhibit intelligent behavior. He added that AI refers to the advancement of computer systems that possess the capability to perform tasks that generally require cognitive abilities. The tasks encompassed in this domain include learning, logical reasoning, problem-solving, perception, language comprehension, and speech comprehension.

According to Zhao et al. (2022), AI is the study and application of hypotheses, techniques, processes, and software systems to broaden and replicate the intellect of humans. This is associated with the difficulty of enabling computers to comprehend or mimic human thinking in the absence of any rational framework or algorithm. Additionally, Artificial intelligence has emerged as a crucial tool in education, yet it has no constant account since the 1950s. AI has advanced to such an extent that sophisticated machines and systems that replicate human intellect can now identify and adapt to their surroundings and norms. Additionally, Zhao et al. (2022) mentioned that literacy is widely viewed as a skill acquired through comprehension, communication, and writing. AI literacy has grown vital to individuals working in a variety of occupations and sectors, not simply those working in technology. Governments, schools, and businesses understand the value of AI literacy in training individuals to participate and make intelligent choices about AI innovations. Considering the growing impact of AI technology on many facets of society, business, and everyday life, AI literacy is becoming increasingly regarded as an essential attribute of modern society.

Han (2020) conducted a study with the objective of designing and developing online materials that enhance artificial literacy, starting with a definition of AI literacy, and analyzing the abilities necessary for achieving artificial intelligence literacy. According to the findings, learners demonstrated favorable outcomes in terms of material intricacy, comprehension, efficacy, and learning challenges. Based on this investigation, it was evident that the created information has a beneficial impact on enhancing people's comprehension of AI and promoting AI literacy. On the other hand, as per Grassini (2023), the term 'Artificial Intelligence Attitude' generally signifies each person's or society's views, thoughts, and feelings toward AI. Attitudes, circumstances, cultural factors, and opinions of AI on different aspects of life influence attitudes, which may differ substantially. It shines at tackling complex issues and generating pattern-based forecasts. This ability may come in handy in fields like banking, logistics, and commodity chain management. Assessing individuals' opinions regarding AI is crucial because it may determine how they embrace, approve, and interact with AI technologies.

The rapid expansion of AI has resulted in an increasing need for methods for evaluating the public's views towards AI. Among the most prevalent notions in the liberal arts and social science fields is the premise of attitudes. Attitudes is a methodical approach of expressing thoughts and emotions that is related to a person's reactions to particular events surrounding him. It is essential in someone's unique responses to the situations he is subjected to in his daily existence. This balances his emotions and cognitive thinking and acts as a guide of the

individual in choosing the necessary conduct in different settings where the importance grows by the reality that it has tremendous impact on his habits (Maydi et al., 2023).

The study conducted by Sindermann et al. (2021) aimed to present a concise assessment tool, known as the Attitude Towards Artificial Intelligence (ATAI scale), which was developed in three languages: German, Chinese, and English. The prevalence of artificial intelligence in individuals' daily lives is growing within the realm of digital human-machine interactions. This study involved the observation of individuals who exhibited an optimistic attitude towards embracing technological advancements. The findings indicated that the ATAI scale, consisting of five items, encompasses two characteristics that exhibit a negative association, namely, acceptance and fear of artificial intelligence. Meanwhile, Sumandal (2023) stated that AI Teaching Efficacy means the effectiveness of employing artificial intelligence (AI) in educational settings in order to improve teaching and learning outcomes. Technology serves an integral part of the post-pandemic setting and has had a significant impact on the digitization of education. It allowed educators to hold classes remotely, letting students to carry on their studies from anywhere. Furthermore, it transformed and broadened the production and utilization of online educational resources, enabling students to effortlessly access an immense amount of data at their convenience. AI is widely used in the education sector to increase teaching competence and efficiency among Chinese professors. Consequently, it assists in assessing professors' teaching abilities, performance, and professionalism to raise the level of AI in education. Investigation of the teaching ability, performance, and professional development of AI professors in China needs to be conducted to understand breakthroughs in AI teaching advancement.

This study may have identified gaps and issues, such as a lack of extensive research explicitly examining AI literacy among university professors in China. However, it may be difficult to compare and interpret these findings. Variations in the availability of resources, such as AI training programs, technology infrastructure, and finance, among different universities might impact the consistency of AI knowledge and effectiveness of teaching among instructors. China is a geographically wide and diverse nation that exhibits disparities in learning opportunities, facilities, and rules throughout its regions. Undertaking this study may not adequately consider cultural and geographical differences in AI literacy, attitudes, and teaching effectiveness among university professors.

Consequently, this may result in an insufficient understanding of the factors that impact AI education in various settings. However, AI is often regarded as a potential instrument that may facilitate the integration of powerful and developing nations in the forthcoming era (Ozkaya et al. 2023) Examining the level of knowledge and opinions on AI among Chinese professors may offer useful cross-cultural perspectives, which can contribute to the worldwide discussion on AI education. It may emphasize the distinctive difficulties and possibilities encountered in the Chinese setting, providing insights that can be utilized in other areas. University instructors play a crucial role in influencing the future workforce and directing research. Their comprehension of and perspectives on AI have a direct impact on the curriculum, research endeavors, and the general standard of education provided to pupils. Chinese university instructors may be acquainted about artificial intelligence for them to effectively navigate and lead the way to these breakthroughs. Given China's substantial investments and successes in artificial intelligence technology, Chinese university teachers are bound to be knowledgeable in AI ideas and implementations.

**Objectives of the Study** - The study determined AI literacy, attitude, and teaching efficacy among Chinese university professors in order to propose a faculty development program that facilitates the promotion of incorporating AI. Specifically, this study identified the respondents' AI attitude in terms of knowing and understanding AI, applying AI, evaluating AI application, and AI ethics; determined the respondents' AI attitude as to cognitive, emotional, and behavioral; assessed the respondents' AI teaching efficacy in terms of instructional strategies, classroom management, and student engagement; tested the relationship among the AI literacy, attitude, and teaching efficacy among Chinese university professors; and proposed an enhanced faculty development program that facilitates the promotion of incorporating AI.

## 2. Methods

**Research Design** - The descriptive method was used in this study. According to McCombes (2022), descriptive research seeks to provide an accurate and methodical depiction of a group of people, circumstances, and events. It has the ability to respond to inquiries regarding what, where, when, and how, but lacks the capacity to address inquiries regarding why. This method employs a diverse range of research tools to examine at least one variable. The researcher, in contrast to experimental investigations, observed and quantified variables without controlling or manipulating them. Survey approach was utilized to investigate the level of AI literacy, attitude and teaching efficacy among Chinese university professors.

**Participants of the Study** - The quantitative research method was utilized in gathering data for the study. Using the Raosoft sample size calculator, a sample size of 425 was included from a total of 500 teachers. The respondents' profiles were distributed according to their sex, age, highest educational attainment, and length of service. The confidence level of this study was 95% and the margin of error was 5%. Simple random sampling techniques was used to select the students to be surveyed.

**Instrument of the Study** - The researcher prepared an online survey using google form. The survey showed four parts. The first part identified the respondents' profile, such as name, sex, age, highest educational attainment and their length of service. The second part discussed the respondents' AI Literacy, the third section evaluated the respondents' AI Attitude, and the fourth section explored the respondents' AI teaching efficacy.

In Part I, respondents were asked to provide demographic information about themselves. This includes their name, sex, age, highest educational attainment and their length of service. Part II focused on determining the respondents' AI Literacy wherein respondents were asked to rate their level of agreement on a scale ranging from Strongly Agree (4) to Strongly Disagree (1). The questionnaire was derived from the study conducted by on Zhao et al. (2022). In Part III, respondents determined their level of agreement regarding their AI Attitude using the scale that rated their level of agreement ranging from Strongly Agree (4) to Strongly Disagree (1). The questionnaire was adapted from the study by Maydi et al. (2023). In Part IV, participants gauged their level of AI teaching efficacy by identifying their level of agreement ranging from Strongly Agree (4) to Strongly Disagree (1). This questionnaire was derived from the study which was authored by Moran et al. (2001).

The contents of the instrument underwent rigorous verification and validation processes to ensure its reliability. The instrument was first examined and validated by a panel of experts in the field to ensure that it adequately measures the intended constructs. Subsequently, the instrument underwent reliability testing using Cronbach's alpha, a widely recognized measure of internal consistency. The results of the reliability testing for each section of the instrument were as follows:

**Table A**  
*Reliability Result*

| Indicators                  | Cronbach Alpha | Remarks   |
|-----------------------------|----------------|-----------|
| Knowing an Understanding AI | 0.959          | Excellent |
| Applying AI                 | 0.961          | Excellent |
| Evaluating AI Application   | 0.963          | Excellent |
| AI Ethics                   | 0.960          | Excellent |
| Cognitive                   | 0.974          | Excellent |
| Emotional                   | 0.976          | Excellent |
| Behavioral                  | 0.977          | Excellent |
| Instructional Strategies    | 0.977          | Excellent |
| Classroom Management        | 0.973          | Excellent |
| Student Engagement          | 0.972          | Excellent |

*George and Mallery (2003) provide the following rules of thumb: “\_ > .9 – Excellent, \_ > .8 – Good, \_ > .7 – Acceptable, \_ > .6 – Questionable, \_ > .5 – Poor, and \_ < .5 – Unacceptable”*

Table A shows that all sections of the instrument exhibit excellent levels of reliability. These results indicate that the instrument consistently measures the intended constructs and can be relied upon to provide accurate and

consistent data. The questionnaire was derived from George and Mallery (2003). The Cronbach's alpha values suggest that the items in each section are interrelated and contribute to measuring the variables effectively. Thus, the reliability of the instrument strengthens the credibility and legitimacy of the research findings.

**Data Gathering Procedure** - The data gathering procedure in this study involved the collection of data from the respondents using a validated survey questionnaire with rating scales. The questionnaires were distributed to 500 Chinese university professors using Google Forms. The research instrument was designed with the help of a research adviser and field experts. After obtaining approval, the researcher retrieved the request letter and communicated with the administrators of the different universities. She also shared the link of the Google form to be answered by the professors. A detailed explanation of the research was provided, including the objectives and possible ethical considerations. The questionnaires were distributed to the respondents upon approval. After gathering the data, the researcher collected the responses, checked for missing responses and input the data into SPSS software for tallying and applying of statistical treatment to be used for the study.

**Data Analysis** - Quantitative data analysis was used in this study to interpret the data. This approach employed numerical data, making it applicable to other domains through analysis methods like regression models or probability distributions. Weighted mean and rank were calculated to determine the research attitude, research motivation and research productivity among university teachers in China. Pearson's r was used to test the significant relationships among variables such as AI literacy, attitude and teaching efficacy. All statistical analyses and data processing were conducted using SPSS version 26, a widely used statistical software package.

**Ethical Considerations** - To safeguard the privacy of respondents, the researcher refrained from disclosing any individual identities. The researcher ensured confidentiality on personal interactions with the participants, respected their privacy and obtained consent before accessing any sensitive information. The analysis was conducted in a manner that will prioritize the well-being of the participants and ensure that their data will be accurately represented in the study. The researcher abstained from expressing personal viewpoints and solely present information and findings derived from the collected data. Respondents were assured of the confidentiality of their responses and be informed that the survey will solely serve the purpose of this study. Furthermore, the study underwent a rigorous ethics review process and was granted approval.

### 3. Results and discussion

**Table 1**  
*Summary Table on AI Literacy*

| Indicators                   | Weighted Mean | Verbal Interpretation | Rank |
|------------------------------|---------------|-----------------------|------|
| Knowing and Understanding AI | 3.11          | Agree                 | 3    |
| Applying AI                  | 2.94          | Agree                 | 4    |
| Evaluating AI Application    | 3.31          | Agree                 | 2    |
| AI Ethics                    | 3.45          | Agree                 | 1    |
| Composite Mean               | 3.20          | Agree                 |      |

*Legend: 3.50 – 4.00 = Strongly Agree; 2.50 – 3.49 = Agree; 1.50 – 2.49 = Disagree; 1.00 - 1.49 = Strongly Disagree*

Table 1 presents the summarized results of AI literacy. According to the data, the respondents agreed with all the indicators, as evidenced by the composite mean of 3.20. Item 4, AI ethics, had the highest results with a weighted mean of 3.45. This was followed by Item 3, evaluating AI application, with a weighted mean of 3.31; Item 1, knowing and understanding AI, has a weighted mean of 3.11; and finally, in fourth rank, Item 2, applying AI, has a weighted mean of 2.94. All indicators resulted to a general agreement among the respondents.

University professors may strengthen their ability to educate and mentor students, contribute to cutting-edge research, and adapt to the changing higher-education environment by acquiring AI literacy. They may use AI to create adaptive tests that dynamically modify the level of difficulty according to individual student performance, thus yielding more precise evaluations of student comprehension. AI-driven solutions may generate highly interactive and captivating learning experiences through simulations, virtual laboratories, and interactive content. This may promote successful collaboration between academics and researchers from different fields by utilizing

AI to tackle intricate and multidisciplinary problems.

Su et al. (2024) investigated the viability of an AI literacy initiative named "AI4KG" and analyzed its potential impact on young children's perceptions of robots as well as their feelings regarding STEM subjects. The study revealed that children's perceptions of robots were enhanced following their participation in an AI literacy program. However, the AI4KG curriculum did not have a notable impact on the science and engineering attitudes of kindergarten students. The study indicated that the AI4KG curriculum has the potential to effectively enhance early AI literacy and foster positive attitudes towards technology. However, additional research is required to create suitable assessments for different age groups and to evaluate their long-term influence on young children's academic and professional trajectories. Alam et al. (2024) conducted a study on the level of knowledge and understanding of AI in Zambian academic libraries. The study specifically looked at how librarians perceive and use AI. The results suggest that Zambian librarians possess a strong grasp of the underlying concepts of AI and hold favorable views regarding the possible advantages it might bring to library services. Nevertheless, there are obstacles to overcome, including the requirement for improved AI knowledge, reluctance to embrace change, and limitations in available funds.

**Table 2**

*Summary Table on AI Attitude*

| Indicators     | Weighted Mean | Verbal Interpretation | Rank |
|----------------|---------------|-----------------------|------|
| Cognitive      | 3.34          | Agree                 | 2    |
| Emotional      | 3.22          | Agree                 | 3    |
| Behavioral     | 3.49          | Agree                 | 1    |
| Composite Mean | 3.35          | Agree                 |      |

*Legend: 3.50 – 4.00 = Strongly Agree; 2.50 – 3.49 = Agree; 1.50 – 2.49 = Disagree; 1.00 - 1.49 = Strongly Disagree*

The summarized results of AI Attitude are shown in Table 2. The composite mean of 3.35 indicates a general agreement among the respondents. The highest turnout was Item 3, behavioral, with a weighted mean of 3.49. This was followed by Item 1, cognitive, with a weighted mean of 3.34. The last ranking item was Item 2, emotional, with a weighted mean of 3.22. These factors have the agreement interpretation among the respondents. Obtaining emotional fulfillment through the utilization of AI technologies may improve the user experience and foster a more favorable general mindset towards AI. In order to fully capitalize on the advantages of AI technologies guarantee their effective incorporation into different fields. Companies and schools may consider making a concerted effort to cultivate positive attitudes in these aspects

Individuals with a positive behavioral disposition towards AI may continually seek opportunities to gain skills and implement AI in different situations, resulting in better adoption and utilization. This might give rise to increased acceptance and widespread utilization of AI technologies. Users may be inclined to engage in the trial and integration of AI tools within their everyday lives. Individuals' cognitive attitudes may influence their perception of the advantages and drawbacks of AI, which in turn affects their inclination to embrace and have confidence in AI technology. This may promote a heightened analytical methodology for assessing AI systems, resulting in a more ethical and efficient utilization of AI.

According to Stein et al. (2024), AI has become a fundamental component of various modern technologies, including online social networking channels, electronic gadgets, and worldwide logistics networks. Studies on the public reception of AI indicate that numerous individuals have significant concerns over the capabilities of these technologies. This observation has been linked to various user variables, including demographic and sociocultural factors. According to their research, individuals who are amiable and younger are more likely to have a positive perception of artificially intelligent technology. On the other hand, those prone to believing in conspiracy theories tend to have a more negative attitude towards it. Participants engaged in a discussion regarding the evaluation of possible constraints and prospective avenues for further investigation and application.

**Table 3***Summary Table on AI Teaching Efficacy*

| Indicators               | Weighted Mean | Verbal Interpretation | Rank |
|--------------------------|---------------|-----------------------|------|
| Instructional Strategies | 3.24          | Agree                 | 2    |
| Classroom Management     | 2.86          | Agree                 | 3    |
| Student Engagement       | 3.57          | Strongly Agree        | 1    |
| Composite Mean           | 3.22          | Agree                 |      |

*Legend: 3.50 – 4.00 = Strongly Agree; 2.50 – 3.49 = Agree; 1.50 – 2.49 = Disagree; 1.00 - 1.49 = Strongly Disagree*

The summarized results of AI teaching efficacy are shown in Table 3. The composite mean of 3.22 indicated a general agreement among the respondents. The highest turnout was Item 3, student engagement with a weighted mean of 3.57 indicating that respondents strongly agreed. This was followed by Item 1, instructional strategies, with a weighted mean of 3.24. The last Ranking item was Item 2, classroom management, with a weighted mean of 2.86. These factors have the agreement interpretation among the respondents.

Individualized education may guarantee that students obtain the necessary assistance, resulting in enhanced comprehension and retention of subject matter. Interactive and captivating information may effectively attract the interests of students and sustains their attention. Utilizing data-driven insights may enable educators to make informed decisions regarding teaching tactics and interventions. Regular continuing education may enable instructors to remain updated with the most recent educational techniques and technologies. Adopting AI in the classroom may not only enhance academic results, but may also equip students and instructors for the years to come in an ever more digitized society at large.

In their comprehensive study, Yu et al. (2024) extensively examined the pioneering approaches employed in the practical teaching of English in higher learning colleges. The company built an AI-powered teaching system that combines the logic mechanism, self-learning system for students, and statistical framework of knowledge degradation. The utilization of AI tools for teaching languages, particularly in the context of English instruction, has revolutionized the conventional learning paradigm. There were considerable variances in the mean scores of learners' foreign language learning enjoyment, burnout, and self-efficacy across the two classes, indicating serious variations. The results of this study verified the efficacy of an AI-supported instructional system and offered useful insights for future educational models.

**Table 4***Relationship Between AI Literacy and AI Attitude*

| Knowing and Understanding AI | r-value | p-value | Interpretation     |
|------------------------------|---------|---------|--------------------|
| Cognitive                    | .151**  | 0.002   | Significant        |
| Emotional                    | .202**  | 0.000   | Highly Significant |
| Behavioral                   | .198**  | 0.000   | Highly Significant |
| Applying AI                  |         |         |                    |
| Cognitive                    | .312**  | 0.000   | Highly Significant |
| Emotional                    | .403**  | 0.000   | Highly Significant |
| Behavioral                   | .334**  | 0.000   | Highly Significant |
| Evaluating AI Applications   |         |         |                    |
| Cognitive                    | .189**  | 0.000   | Highly Significant |
| Emotional                    | .300**  | 0.000   | Highly Significant |
| Behavioral                   | .254**  | 0.000   | Highly Significant |
| AI Ethics                    |         |         |                    |
| Cognitive                    | .250**  | 0.000   | Highly Significant |
| Emotional                    | .279**  | 0.000   | Highly Significant |
| Behavioral                   | .211**  | 0.000   | Highly Significant |

*Legend: Significant at p-value < 0.01*

Table 4 presents the association between AI Literacy and AI Attitude. The computed r-values indicates a moderate direct correlation and the resulted p-values were less than the alpha level. This means that there was significant relationship exists and implies that the more literate on AI, the better is the attitude. This may indicate that people who possess analytical thinking skills may delve more profoundly into the technical complexities of

AI, resulting in broader perceptions. Individuals with a preference for analytical thinking may find it effortless to grasp the rational and statistical foundations of AI. AI may require solid reasoning and analytical skills to comprehend and implement AI principles. The task at hand may require cognitive abilities associated with problem solving, programming, and executing artificial intelligence solutions. Opinions regarding AI may be shaped by cognitive biases such as confirmation prejudice, which leads individuals to prefer information that aligns with their existing beliefs. AI literacy may refer to the awareness and execution of AI principles and technology, whereas AI attitudes encompass cognitive views and beliefs that influence individuals' thoughts and reactions towards AI.

Marinucci et al. (2023) asserted that cognition prejudices are widespread. Social psychologists have proposed that biases and stereotypes fulfill a variety of cognitive objectives while also emphasizing their potential to cause harm. In the AI spectrum, there has been a recent increase in intense discussions on biases and preconceptions. Scholars and programmers have grown more cognizant of the reality that certain stereotypes, such as ethnic and gender biases, are deeply ingrained in the algorithms on which some AI applications depend. They demonstrated that by comprehensively understanding the cognitive processes that result in biases and collaborating across different disciplines, we can optimize the use of AI technologies.

**Table 5**

*Relationship Between AI Literacy and AI Teaching Efficacy*

| Knowing and Understanding AI | r-value | p-value | Interpretation     |
|------------------------------|---------|---------|--------------------|
| Instructional Strategies     | .223**  | 0.000   | Highly Significant |
| Classroom Management         | .350**  | 0.000   | Highly Significant |
| Student Engagement           | .286**  | 0.000   | Highly Significant |
| Applying AI                  |         |         |                    |
| Instructional Strategies     | .341**  | 0.000   | Highly Significant |
| Classroom Management         | .347**  | 0.000   | Highly Significant |
| Student Engagement           | .317**  | 0.000   | Highly Significant |
| Evaluating AI Applications   |         |         |                    |
| Instructional Strategies     | .227**  | 0.000   | Highly Significant |
| Classroom Management         | .272**  | 0.000   | Highly Significant |
| Student Engagement           | .207**  | 0.000   | Highly Significant |
| AI Ethics                    |         |         |                    |
| Instructional Strategies     | .327**  | 0.000   | Highly Significant |
| Classroom Management         | .278**  | 0.000   | Highly Significant |
| Student Engagement           | .200**  | 0.000   | Highly Significant |

*Legend: Significant at p-value < 0.01*

Table 5 shows the association between AI Literacy and AI Teaching Efficacy. The computed r-values indicates a moderate direct correlation and the resulted p-values were less than the alpha level. This means that there was significant relationship exists and implies that the more literate on AI, the better is the teaching efficacy. Adequate familiarity of AI may be vital for being a proficient AI educator. In order to properly teach these concepts, answer students' inquiries, and assist them in practical applications, teachers may need to obtain an excellent level of proficiency in the technical facets of AI. Proficiency in AI may enable educators to creatively employ AI technology in order to establish dynamic and engaging learning environments. AI may enhance adaptive learning by constantly modifying the complexity and nature of educational material according to each student's performance. Teachers that demonstrate a strong dedication to continuous learning may easily adjust to new artificial intelligence technologies and approaches, so making sure that their instruction remains up-to-date and engaging. AI may enhance adaptive learning by constantly modifying the complexity and nature of educational materials according to each student's performance. Teachers who demonstrate a strong dedication to continuous learning may easily adjust to new artificial intelligence technologies and approaches, ensuring that their instruction remains up-to-date and engaging.

Wiley et al. (2023) examined the implications of the widespread adoption of generative AI on teaching and learning in academia, prompting a reevaluation of the role of AI in higher education. The determination of when



to employ generative AI in a course at university and when not to has become a crucial factor in the advancement of student evaluation and tasks. Academic activities require pupils to participate in the creation of unique work. In such cases, the use of generative AI may not be suitable, and faculty members will need to deliberate on how to circumvent this technology. When promoting the use of generative AI, it is essential to instruct students to efficiently utilize the available tools.

**Table 6**

*Relationship Between AI Attitude and AI Teaching Efficacy*

| Cognitive                | r-value | p-value | Interpretation     |
|--------------------------|---------|---------|--------------------|
| Instructional Strategies | .213**  | 0.000   | Highly Significant |
| Classroom Management     | .335**  | 0.000   | Highly Significant |
| Student Engagement       | .116*   | 0.000   | Highly Significant |
| <b>Emotional</b>         |         |         |                    |
| Instructional Strategies | .228**  | 0.000   | Highly Significant |
| Classroom Management     | .264**  | 0.000   | Highly Significant |
| Student Engagement       | .171**  | 0.000   | Highly Significant |
| <b>Behavioral</b>        |         |         |                    |
| Instructional Strategies | .216**  | 0.000   | Highly Significant |
| Classroom Management     | .353**  | 0.000   | Highly Significant |
| Student Engagement       | .176**  | 0.000   | Highly Significant |

Legend: Significant at p-value < 0.01

Table 6 presents the association between AI Attitude and AI Teaching Efficacy. The computed r-values indicates a moderate direct correlation and the resulted p-values were less than the alpha level. This means that a significant relationship exists and implies that the better is the attitude towards AI, the better is the teaching efficacy. Embracing AI may encourage the execution of cutting-edge teaching methods with the potential to enhance student involvement and academic achievement. Educators who possess a favorable disposition towards AI may be more receptive to integrating novel technology into their instructional practices. Furthermore, instructors may be more inclined to explore AI technologies and approaches, resulting in enhanced teaching effectiveness through trial and error. Utilizing AI tools effectively may result in the implementation of more captivating and streamlined instructional techniques, thereby enhancing teaching effectiveness. The interplay between a positive mindset and effectiveness may lead to enhanced teaching methods and superior educational achievements, underscoring the need to cultivate a favorable outlook on artificial intelligence within the teaching field.

Mollick et al. (2023) offered instructions on leveraging AI to incorporate evidence-based teaching methods efficiently and effortlessly into teachers' pedagogy. The participants engaged in a discussion about five pedagogical approaches that have demonstrated efficacy but are challenging to implement because of limitations in time and resources. The tactics encompassed citing various materials and examples, identification and rectification of student misunderstandings, periodic assessment through low-stakes testing, evaluation of student learning, and implementation of distributed practice. Collaboration and exchange of best practices result in the collective enhancement of teaching effectiveness within the educational community.

**Table 7**

*Proposed Enhanced Faculty Development Program to Facilitate the Promotion of AI in the University*

| Key Result Areas                 | Objective/s   | Strategies   | Success Indicators  | Persons involved                   |
|----------------------------------|---|--|---|------------------------------------|
| I. AI Literacy                   | 1. To enhance comprehension of artificial intelligence principles, approaches, and techniques<br>2. To improve the capacity to integrate AI into courses of study and instruction | 1. To conduct specific classes that concentrate on modern AI techniques and applications that are applicable to several fields of study. | 1. 90% of teachers are fully enticed to participate in sessions related to AI Literacy                | Administrators and Faculty Members |
| 1.1 Knowing and Understanding AI |   | 2. Facilitate collaborative training sessions where teachers may interact with AI technologies and applications                          | 2. 90% of teachers to have a full understanding of how AI Literacy would help them in their teaching. |                                    |
| 1.2 Applying AI                  |   | 3. Create AI laboratories  | 3. 90% of faculty members   |                                    |
| 1.3 Evaluating                   | 3. To promote the application of  |  |   |                                    |

|   |  |  |   |                                    |
|---|--|--|---|------------------------------------|
| AI Application<br>1.4 AI Ethics   | AI in creating revolutionary research initiatives and approaches to instruction<br>4. To present an in-depth understanding of the ethical principles and regulations that govern the use of AI   | furnished with cutting-edge AI tools and technologies to promote faculty research and creative thinking.<br>4. Supply extensive toolkits of AI applications, regulations, and instructional materials.   | are aware of the ethical guidelines of AI implementation<br>4. 90% of teachers are able to utilize these toolkits to help them gain insights and better understanding of AI.  |                                    |
| II. AI Attitude<br>2.1 Cognitive<br>2.2 Behavioral<br>2.3 Emotional   | 1. To deliver specialized training sessions on contemporary AI applications and techniques that are relevant to many fields of study<br>2. To promote and foster involvement in the development of AI<br>3. To create training programs that integrate engaging components and are designed to draw in attendees, using motivating tactics   | 1. Set -up an online archive of AI-related materials, covering instructional videos, academic works, and research studies.<br>2. Organize frequent gatherings, workshops, and joint sessions tackling AI and its pros and cons.<br>3. Present examples and testimonials from faculty members who have successfully incorporated AI into their job duties.                | 1. 90% of faculty members are able to develop positive attitudes towards AI<br>2. 90% of teachers show enthusiasm in attending workshops and trainings related to AI<br>3. 90% of teachers are able to express their success and challenges they face involving AI                | Administrators and Faculty Members |
| III. AI Teaching Efficacy<br>3.1 Instructional Strategies<br>3.2 Classroom Management<br>3.3 Student Engagement | 1. To encourage the implementation of team-teaching endeavors, where teachers work together to develop and execute courses that are augmented using AI<br>2. Administer polls or facilitate discussions to learn about the existing hurdles to study motivation and pinpoint opportunities for development<br>3. To set standards for applying AI discoveries in order to cultivate an encouraging and inclusive atmosphere within the classroom | 1. Conduct sessions aimed at creating curriculum and lessons that include AI.<br>2. Demonstrate the application of AI in the classroom such as designing of seating arrangements, ease of group work, and efficiency of lecture designs.<br>3. Utilize AI to create tailored instructional pathways for students, customized to their particular needs and capabilities. | 1. 90% of teachers are able to confidently able to incorporate AI into their lessons<br>2. 90% of teachers are able to show improvements on the quality lessons they conduct with the help of AI.<br>3. 90% of students have the understanding on the concepts and methods of AI. | Faculty Members and Students       |

#### 4. Conclusions and recommendations

Most of the respondents agreed on indicators of AI attitude in terms of knowing and understanding AI, applying AI, evaluating AI application, and AI ethics. Majority of the respondents agreed on the indicators pertaining to AI attitude in terms of cognitive, emotional, and behavioral. The respondents agreed on the indicators pertaining to AI teaching efficacy in terms of instructional strategies and classroom management and strongly agreed in terms of student engagement. As to the relationship among the AI literacy, attitude, and teaching efficacy among Chinese university professors, there were highly significant relationships on each indicator except on the cognitive indicator between AI literacy and attitude. This implies that the higher the AI literacy is, the better the attitude and the efficiency of professors will be. An enhanced faculty development program that facilitates the promotion of incorporating AI was proposed.

University officials may conduct workshops focused on the fundamentals of AI to implement team-teaching endeavors, where teachers work together to develop and execute courses that are augmented using AI. University officials may mandate faculty members to incorporate AI in their lessons to encourage the faculty members to incorporate innovation in their lessons, set up digital libraries that may provide faculty members access to the most recent AI research studies, journals and case studies, and develop web-based modules that enable faculty members to acquire knowledge at their preferred speed. The recommended components may include interactive information, video lectures, and practical exercises. University administrators may invite AI specialists and influential figures from various sector to deliver speeches and training sessions on the significance and possibilities of AI. Students may participate in organized gatherings, workshops, and joint sessions tackling AI and its pros and cons to identify their needs that may addressed by the use of AI tools and teaching. The proposed faculty development program that facilitates the promotion of incorporating AI may be executed and assessed for its efficacy. Future researchers may conduct studies focusing on expanding the target audience beyond Chinese university professors and incorporating comparative evaluations to enhance AI attitude, literacy and teaching

efficacy.

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