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| RESEARCH ARTICLE

Behavioral Intention to Adopt Artificial Intelligence in Educational Institutions: A Hybrid Modeling Approach

Ashok Ghimire[1], Md Ahsan Ullah Imran[2], Barna Biswas[3], Anamika Tiwari[4] ✉ and Sanchita Saha[5]
[12345]Department of Business Administration, Westcliff University, 17877 Von Karman Ave 4th Floor, Irvine, CA 92614, United States
Corresponding Author: Anamika Tiwari, **E-mail**: a.tiwari.8501@westcliff.edu

| ABSTRACT
The introduction and implementation of Artificial Intelligence (AI) in higher education has brought out new opportunities and obstacles. The utilization of AI will result in a significant transformation of the governance structure within global higher educational institutions. The potential use of AI involves exploring the educational implications of how teachers may enhance their teaching methods, how students can improve their learning experience, and how institutions of higher education can make more accurate and timely judgments. This is significant because the workload has significantly increased as a result of the widespread expansion of higher education. Given the circumstances, AI assistance is crucial. The implementation of artificial intelligence in higher education is a significant matter in this context. The objective of this study is to investigate the feasibility of individuals adopting it. To do this, we have formulated hypotheses and a conceptual framework, which we then validated through a survey by obtaining feedback from a total of 240 respondents. Research has discovered that the model can assist authorities in promoting the implementation of artificial intelligence in higher education. The outcome of this study will help practitioners understand the insights of people's intentions and psychology in adopting AI in educational sectors.

| KEYWORDS

Artificial Intelligence; Higher Education; Hybrid Modeling; Partial Least Square.

| ARTICLE INFORMATION

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1. Introduction

Advanced technologies have significantly altered several commercial sectors and have also presented prospects for educational improvements. Artificial Intelligence (AI) is a very influential sophisticated technology that has found extensive use in the field of online education. The AI industry is projected to have a market value of $390.9 billion by 2025, driven by various applications such as natural language processing, intelligent decision-making, and robotic automation (Kuleto et al., 2021). Deep learning methods, as a subset of AI, have found significant success in many fields, such as customized recommendation, computer vision, linguistics, and bioinformatics. The closure of schools due to COVID-19 has led to a significant rise in the use of online learning platforms that use artificial intelligence and deep learning algorithms to facilitate remote education.

The proliferation of AI and deep learning methodologies provides a basis for transformation in the field of education. The integration of AI and deep learning methodologies in the education sector is currently revolutionizing the industry and has the capacity to significantly alter the current status of education. AI-powered digital learning tools revolutionize the location of student learning, the instructors responsible for teaching them, and the methods by which they gain fundamental skills. For instance, artificial intelligence tutors have the potential to provide specific and tailored support to students who need it without being influenced by factors such as family history, geographic region, or gender. Automatic recognition has been used in affect detection to simulate and comprehend the emotional requirements of pupils (Pedro et al., 2019). Deep learning and its associated algorithms have the potential to provide intelligent question responses using natural language processing.

In both wealthy and developing nations, governments are committed to improving the quality of education. This may be accomplished by embracing contemporary technologies such as AI. The use of AI would revolutionize the process of evaluating and enhancing pupils' talents. Through this, the kids would get knowledge about their current location. Governments worldwide are increasing their spending to increase the reach of higher education by using current technology. Implementing AI in higher education may enhance its quality. Various research has shown that learning with the assistance of AI is consistently superior to learning in conventional teacher-centered environments (Amon et al., 2020; Bataev & Bataeva, 2019; Hasan, Al Mahmud et al., 2024; Hasan, Chy, et al., 2024; Hasan, Farabi, et al., 2024; Johora et al., 2024).

The question is how to match the prospective consumers' acceptance attitude towards this. The adoption of modern technology by users is often shown as a significant focus of study in current Information Technology Literature (Khan et al., 2023; Md Abdullah Al Mahmud et al., 2024; Nur et al., 2024). Various theories and models exist to elucidate the purpose of prospective users to adopt revolutionary technology such as AI (Bates et al., 2020). These ideas and models are grounded in the disciplines of Information Systems (IS), Sociology, and Psychology.

We are omitting certain details to avoid unnecessary prolongation of the talks. When researchers synthesize the acceptance behavior of users, they often encounter several similar factors from existing theories and models. Typically, they choose a model or theory that aligns with their specific study, disregarding the contributions of other theories and models. This study will develop a hybrid model that will determine the influence of various factors on the adoption rate of AI in educational sectors. At last, we can say that researchers will get deeper insights into how some specific factors influence individuals' behavior on the conversion from a conventional educational system to a driven education system.

2. Background of AI in Education

AI enables the customization of learning. It can accommodate the special requirements of students from all categories. Each student would appreciate obtaining a novel and distinctive instructional methodology that is customized to suit their own demands. An AI-powered library may enhance the learning experience at higher educational institutions. Artificial intelligence has the potential to assist in implementing a personalized and customized approach to learning. Various uses of artificial intelligence may be used to personalize the learning experience (Jabin et al., 2024; Rakibul Hasan et al., 2024; Shahana et al., 2024; Sobuz, Al, et al., 2024; Zaman et al., 2024; Zawacki-Richter et al., 2019). Nevertheless, the current state of AI technology may not be sufficiently equipped to handle such an event and may need more time for further development. Chatbots may provide tailored assistance to resolve complex problems. It has the ability to provide solutions tailored to the specific requirements of each learner. An AI-powered chatbot has the potential to accurately address specific student inquiries as the technology advances. These chatbots, backed by artificial intelligence, may provide students with answers to their questions outside of their normal lectures. This AI-powered solution may also assist with admission inquiries from students and support administrative decision-making processes (Alhumaid et al., 2023). AI technology may be valuable for creating intelligent content.

One such use is the digitization of textbooks, which may be transformed into customizable digital learning interfaces for all levels of education. Artificial intelligence has the potential to significantly contribute to higher education in several ways. AI has created new opportunities and stimulating obstacles in the realm of higher education. The possibilities it has brought have greatly enhanced governance by increasing its effectiveness and efficiency. In the context of implementing AI in higher education, AI may be understood as computational systems that can perform human-like functions such as adapting, learning, synthesizing, correcting, and using diverse inputs needed for processing complicated tasks (Colchester et al., 2017; Datta et al., 2024; Sobuz, Joy, et al., 2024a). The use of AI in higher education is anticipated to provide significant assistance to students, instructors, administrative staff, and researchers (Aditto et al., 2023; Hasan et al., 2023; Kabbo et al., 2023; Sobuz, Joy, et al., 2024b; Sobuz, Khan, et al., 2024). Consequently, it becomes imperative to include AI in the realm of higher education. Therefore, it is crucial to incentivize the stakeholders to embrace this advanced technology (AI) that is anticipated to bring about comprehensive advancements in the higher education system.

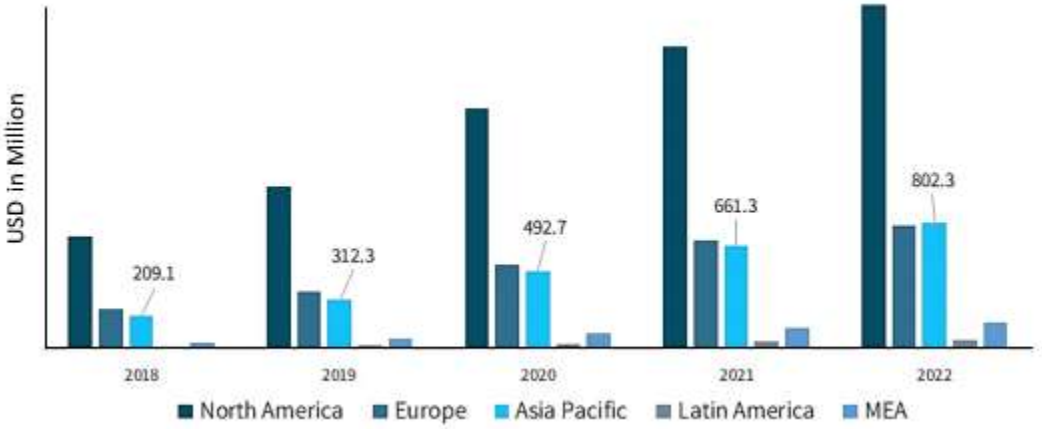

Fig. 1. Statistics of the AI education market worldwide.

3. Methodology

The study was conducted using the structural equation modeling (SEM) approach and partial least square analysis. For this purpose, data was collected using a questionnaire survey conducted with a diverse population. After that, a model was developed to analyze the dataset and establish a correlation between the variables so that it can be understood and find which factors affect our target outcome. For this purpose, the data analysis methodology has been illustrated in a flow chart below.

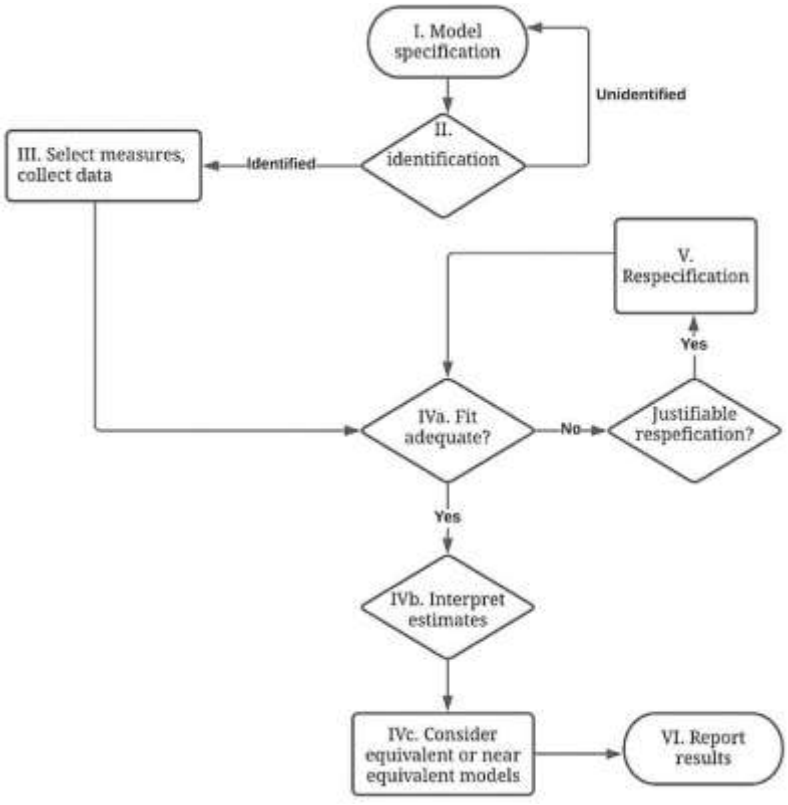

Fig. 2. Methodology of the data analysis.

4. Model development

Several studies have discovered that the UTAUT model is able to account for around 70% of the variation in behavioral intention (Wang et al., 2021). In contrast, other models and theories utilizing the same data are only able to explain between 17% and 53% of the variation in behavioral intention. The UTAUT model is regarded as a valuable tool for understanding users' intention to

adopt advanced technologies such as AI. Several researchers have used this model, making some alterations such as excluding certain elements and including new elements that are more suitable for the specific setting of their study.

The use of AI in education was analyzed using partial least squares (PLS) in this research. We used PLS analysis to evaluate our proposed conceptual model using the SmartPLS software. By using artificial intelligence, we were able to assess our study hypotheses and identify the components that were affected. However, the Partial Least Squares method was used to validate the factors that have a substantial influence on the adoption of AI in the building industry of the contemporary globe (Akande et al., 2020). To examine the factors that influence the study, a research model has been developed for the proposed investigation, as seen in the figure below.

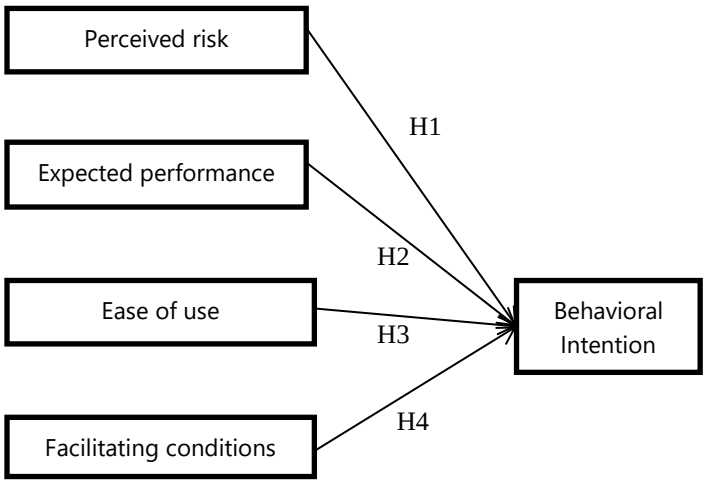

Fig. 3. Our developed model.

5. Data collection strategy

We randomly chose several United States higher educational institutes for the selection of respondents. We have chosen prestigious universities located in Texas and Los Angeles city. We reached out to students, faculty members, and administrative personnel of those higher education institutions. There were a total of 315 individuals. We obtained their email addresses and obtained their explicit authorization to provide feedback on the 33 questions. The surveys were dispatched with a stipulation to provide feedback within a 40-day timeframe. Additionally, data was collected by means of online forms that required complete submission by the user. Consequently, the absence of data did not pose any difficulties. According to several writers, the impact of outliers was mitigated by keeping a minimal disparity between the original mean and the 5% trimmed mean (Sharifani & Amini, 2023). We obtained 359 responses within the designated timeframe. We sought the input of several specialists to assess the efficacy of the 359 responses. Their assertion is that among the 260 responses, 20 of them are considered to be ambiguous and influenced by personal opinions. We overlooked those. The feedback from 240 respondents was evaluated using a standard Likert scale in comparison to the survey. The poll was conducted from November to December 2023, excluding the period of feedback gathering. The demographic characteristics of the 240 respondents who were included in the analysis are presented in Table 1.

Table 1. Respondent's identity

Factors	Frequency (%)
Gender	
Male	47.98
Female	52.02
Age	
26-40	68.54
≥ 41	31.46
Education	
University	86.12
College	13.88
Occupation	
Professionals	18.64
University students	69.89
Researchers	11.47

6. Development of hypothesis

6.1 Perceived Risk

Perceived Risk (PR) refers to the belief or perception that a user will have a negative outcome or loss when they pursue a certain goal or outcome. AI is a technology that operates over the internet. Perceived Risk (PR) is the combination of feelings of uncertainty in one's behavior and concerns about the surrounding environment. The unfriendly nature of internet functions plays a significant role in causing behavioral insecurity, while the unpredictable and whimsical nature of the internet is responsible for environmental insecurity (Zhang & Maruping, 2008). Research indicates that a decrease in PR has a substantial effect on consumers' attitudes. A theoretical model in the field of e-commerce suggests that PR has a negative and significant impact on the attitude of users. Perceived hazards in the context of AI in higher education are associated with the users' unpleasant emotions. Based on the above considerations, it is postulated that:

H1: PR has a strong positive influence on the behavioral intention to adopt AI.

6.2 Expected performance (EP)

Expected performance (EP) refers to the user's perception of how well a system or product will help them achieve their goals or tasks. It is understood as the degree to which a user believes that using a new system would significantly improve their job performance (Venkatesh et al., 2003). Performance Expectancy is considered to be synonymous with perceived usefulness, outcome expectancy, and relative advantage. These ideas have been utilized in previous adoption theories. Perceived usefulness and relative advantage are synonymous with EP. Studies conducted by many authors found that it had a substantial and beneficial effect on attitude (ATT). Based on these factors, the subsequent hypothesis is formulated.

H2: Expected performance positively impacts the intention to adopt AI.

6.3 Ease of use (EU)

Simplicity of use refers to the degree to which a new system is easy to use, as described by Davis in 1989 and further elaborated upon by Davis et al. (1989) in the same year. The concept of perceived ease of use and complexity, as found in previous models, aligns with the concept of the term ease of use mentioned in this study. The underlying theory of the other models suggests that perceived ease of use, which is comparable to the idea of EU, is a significant and effective predictor of Attitude (ATT) in technology adoption studies. This association has been well-established in previous investigations. These talks lead to the formulation of the following hypothesis.

H3: EU directly influences individuals to adopt AI in educational sectors.

6.4 Facilitating conditions (FC)

Beneficial technical and related infrastructure refers to the extent to which an individual believes that the necessary resources are effectively available to facilitate the usage of the new system. The FC sense encompasses the perception of behavioral control and the compatibility of other models. An explicit correlation has been shown between FC and behavioral intention (BI), according to many authors' studies. Empirical studies have shown that when it comes to individuals adopting technology, there is a considerable influence of FC on BI, as demonstrated by Chiu et al. (2012). The usage of e-filing by US taxpayers has been found to have a

considerable impact on the interpretation of taxpayers' behavioral intentions, as demonstrated by the meaningful significance of FC. Based on these conversations, the following hypothesis is presented.

H4: FC has a positive influence on the adoption of AI in the educational sector.

7. Results and discussion

7.1 Results of discriminant validity

Fig. 4 displayed the findings of discriminant validity in the form of a heat map visualization. It is evident that there is a substantial association between Behavioral intention and the perceived risk of the adoption of AI in education sectors. From the overall perspective, it can be seen that, as the modern educational sector largely depends on online platforms and cloud services for storing sensitive questions, marks as well as research data and information thus, risk is a major concern in this case when this whole process is controlled by AI technology. For this reason, incorporating AI is seen as a major risk when considering the opinions of the majority of scholars and academics.

Other factors such as EP, FC, and EU have almost similar types of associations with the behavioral intention of incorporating AI in educational institutions. Although advanced AI, such as ChatGPT or other platforms, makes the educational system convenient, it also increases the chance of reducing creativity and critical human thought. The ease of use of this technology is directly related to the individual's intention to adopt AI.

The findings of four hypotheses are shown in Table 2. The evaluation of the findings mostly relies on the mean and standard deviation of the sample, T statistics, and ultimately, P values. As seen from the above comments, it can be inferred that the link is robust, which confirms the validity of our created hypothesis. Among the other hypotheses, the conducive circumstances to BI association have the most considerable sample size based on the test results. Conversely, H1 and H4 had the most statistically significant P values.

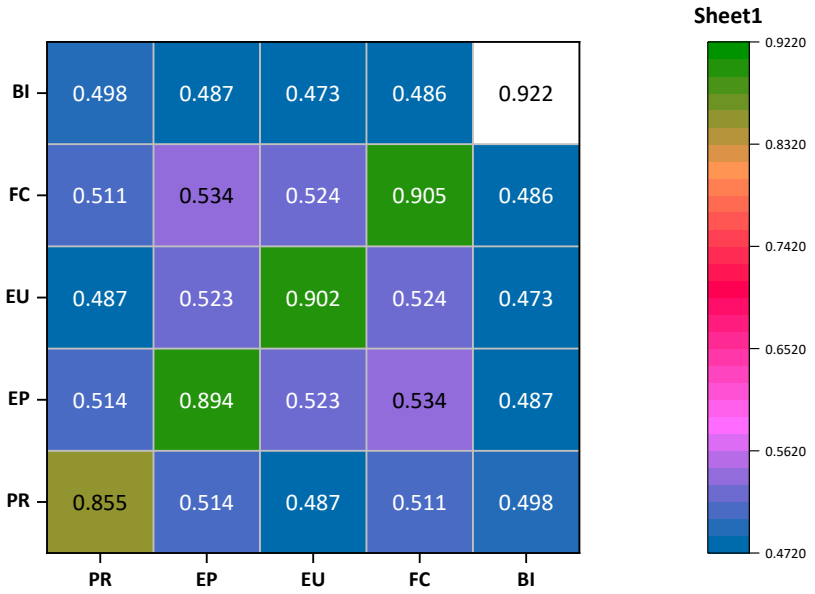

Fig. 4. Heatmap showing correlations between hypotheses.

Table 2. Hypothesis results

Hypotheses	Relationships	Original Sample (O)	Sample Mean (M)	Standard Deviation (σ)	T Statistics	P Values	Remarks
H1	PR → BI	0.244	0.258	0.059	2.885	0.001	Significant
H2	EP → BI	0.132	0.131	0.067	1.852	0.045	Significant
H3	EU → BI	0.119	0.118	0.060	2.572	0.031	Significant
H4	FC → BI	0.499	0.502	0.058	7.246	0.001	Significant

Fig. 5 displayed the hypothesis result as a means of β value. As can be seen, the perceived risk has a negative β value, and all other factors showed a positive β value. Similarly, all the β values indicate that all variables taken in this study as predictors of AI adoption in the educational sector are significant.

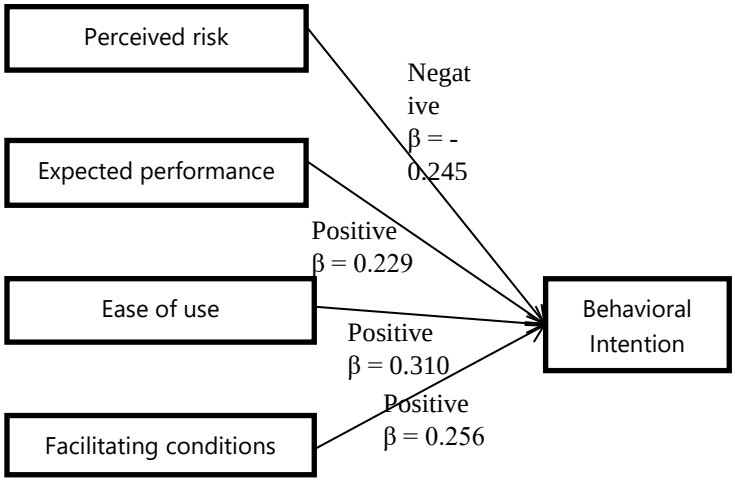

Fig. 5. Influence of parameters on BI.

8. Conclusions

The use of AI solutions has created several potentials for teaching, learning, and administrative tasks in higher education institutions globally. The use of AI is still in the early development phase. We have examined the potential for using AI in the field of higher education. We have developed a model that identifies the factors that contribute to and expedite the adoption of AI in higher education. We have previously stated that schools of higher education will see significant benefits from using AI. It is important to remember that education is fundamentally a human-centered endeavor. It does not primarily rely on a technological solution. Education is seen as a matter that primarily concerns human beings. Exclusively, depending on technology in education would not provide the desired outcomes. No matter what the latest technological achievements may be, people are certain to encounter challenges. Critiques serve the purpose of identifying potential hazards. Individuals often inquire about many aspects of higher education in order to foster innovation and originality. All of these tasks are intended to be enhanced by people, and it is indeed possible to achieve answers with the precise assistance of technology. AI might potentially play a significant role in this regard. In order to achieve success, it is crucial for human-based efforts and machine-based solutions to work together to nurture higher education in India. Therefore, the rising excitement around AI is projected to provide an undisputed solution for individuals who are progressing in their pursuit of higher education based on real-world experiences. The identification of difficulties and concerns in higher education is directly linked to human endeavors. Finally, it may be summarized as:

1. The implementation of AI in higher education systems has the potential to greatly benefit the stakeholders of these institutions. By utilizing AI, stakeholders can efficiently and accurately exchange knowledge, leading to an enhancement in the intellectual well-being of the higher education system. This acquired knowledge can be strategically applied in practice to further improve the system.

2. The attitude of stakeholders at higher educational establishments towards adopting AI is mostly influenced by Perceived Risk (PR). This mindset would stimulate people' inclination to use and embrace AI.
3. The favorable circumstances would also enhance users' willingness to employ AI in the higher education system, and these settings would have a good impact on users' expectations of the work required.

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