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Effects of Artificial Intelligence-Related Factors on Students' Learning Behavior: The Role of AI Bias, Cultural/Social Factors and Technology Acceptance

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Abstract

Artificial Intelligence (AI) is a crucial education technology that impacts students' learning experiences and outcomes. But there are a number of factors related to AI that can impact students' learning behavior, such as Bias in AI, Subjective Norms, Perceived Ease of Use, and Perceived Usefulness. Hence, in this study, the impact of these factors on students' learning behavior was studied. The quantitative research design was used, and the data were gathered from 200 university students using a structured questionnaire. SPSS was used for statistical analysis which included descriptive statistics, Pearson correlation and multiple regression analysis. Descriptive statistics showed that the mean scores of Bias: M = 3.6375, Subjective Norms: M = 3.5050, Perceived Ease of Use: M = 4.0483, Perceived Usefulness: M = 4.1250, and Learning Behavior: M = 3.9940 were all positive. The results of the correlation analysis indicated that all the independent variables were positively correlated with Learning Behavior variable at significant level. Perceived Usefulness (β = .437, p = .000) mostly predicted Learning Behavior, followed by Bias (β = .270, p = .000) and Perceived Ease of Use (β = .167, p = .003). Subjective Norms had no significant impact on Learning Behavior (β = .043, p = .447). The results indicate that positive learning behavior is more likely to be seen when students feel usefulness, ease of use, and fairness of AI technologies. The study highlights the need to improve the usefulness and usability of AI systems and decrease bias in educational technologies.

Introduction

The Research examined algorithmic bias for student progress monitoring. The study was aimed at addressing the potential for unfair outcomes in assessment systems when AI-based monitoring systems create or exacerbate age, gender, disability or other student characteristic biases. The paper described that unfair Artificial Intelligence systems may affect the way that students' academic development is measured and understood. The present paper is relevant to this study because this study supports the notion that AI evaluation mechanisms' bias could impact students' trust, engagement, and learning processes in AI-driven education (Idowu *et al.*, 2024). Attitude, subjective norms, and perceived behavioral control are all believed to influence human intention and behavior and this model, the Theory of Planned Behavior, was developed to explain this relationship. The theory states that people are more likely to engage in an action when the key people in their lives support that action, and when people feel they can control the action. The

theory is relevant to the present paper since students' usage of AI tools can be affected by peers, teachers, family members or other important individuals whose opinions can affect academic decisions and student's learning behavior (Ajzen, 1991).

Venkatesh and Davis further developed the TAM as TAM2, incorporating social influence processes including subjective norm as well as perceived usefulness and perceived ease of use. The model suggested that user perceptions on technology and social influence influence users' acceptance of technology. This study is significant to the present paper as it refutes the link among subjective norms, perceived helpfulness, perceived ease of use, and students' acceptance of AI-based learning tools (Venkatesh and Davis, 2000).

This study examined the factors that affect international students' use of Generative Artificial Intelligence. AI literacy, perceived ease of use, perceived usefulness, subjective norms, and trust were the main study variables. The results indicated that the more students think of generative AI as being helpful, easy to use, accepted in society, and trustworthy, the more likely they are to use it. The current paper is significant for the present study, as it integrates cultural/social aspects with technology acceptance variables and elucidates their impact on the learning adoption of AI tools by students (Ittefaq *et al.*, 2025).

While AI bias, subjective norms, perceived usefulness, perceived ease of use, and social influence have been mentioned in previous studies in an educational context, there has been little discussion on the combined effect of AI bias, culture/ social factors, and technology acceptance on students' learning behavior. The studies that are available have primarily been related to technology adopted or the intention to adopt AI, with fewer studies examining the impact of technology adoption or intention to use on students' problem-solving, decision-making and critical thinking. Hence, the present paper aims to study the impact of Artificial Intelligence related factors on students' learning behavior particularly focusing on Artificial Intelligence bias, Cultural/social factors, Perceived ease of use and Perceived usefulness.

Significance of the Study

Students' learning behavior in AI-assisted education is affected not only by the availability of AI tools but also by the students' attitude towards the AI tools, the support of AI use by social surroundings and the usefulness or ease of use of AI-based systems. There is a risk that AI bias will cause students to have less trust and confidence in the information produced by AI, while there is a potential cultural/social benefit that AI can encourage students to use for learning.

This research will be useful in comprehending the impact of the bias in AI assessment techniques and decision making algorithms on students' learning behavior. This will also illustrate the significance of subjective norms, peer influence, perceived ease of use, and perceived usefulness in determining students' acceptance and use of AI tools. The use of AI tools will be associated with improved problem-solving, decision making, and critical thinking if they are perceived as fair, socially acceptable, easy to use and of benefit for academic tasks.

The results will be valuable for students, teachers, universities and policy makers. Students can be better equipped to navigate AI tools with knowledge, teachers can learn how to inform students about bias and responsible AI use, universities can make improvements to AI training, and policymakers can foster equitable and ethical use of AI in higher education.

Objectives of the Study

1. To examine the effect of bias in AI on students' learning behavior.
2. To investigate the effect of cultural/social factors on students' learning behavior.

3. To assess the effect of perceived ease of use of AI-based systems on students' learning behavior.
4. To examine the effect of perceived usefulness of AI-based systems on students' learning behavior.
5. propose recommendations for enhancing students' higher-order thinking skills considering AI bias, cultural/social factors, and technology acceptance

Theoretical Framework

Theory of Planned Behavior

It is called Theory of Planned Behavior and is developed by Ajzen (1991). This theory states that there are three key factors that affect human behavior: attitudes toward a behavior, subjective norms, and perceived behavioral control. Attitude is either the are factors consisting of the social pressure, or expectations, of significant persons in the person's world. Perceived behavioral control is the extent to which the person thinks that the behavior can be performed or that it is hard to perform.

The Theory of Planned Behavior can be helpful to explain cultural/social factors in the present study, particularly subjective norms. The use of AI in learning might be decided by the students themselves because they believe that using AI is helpful or acceptable in learning based on the opinion of their peers, teachers, classmates, or other important people. Students might also be more inclined to adopt the use of AI in their own learning if they see others around them applying AI tools for their assignments, writing, exam preparation, or understanding concepts. Thus, subjective norms can impact students learning behavior and the acceptance of AI tools.

This theory is similar to the present research because the subjective norms are also part of the cultural/social factors that are measured in the questionnaire. These consist of such statements as people who influence students' behaviour think that they should use AI based systems, important people think that they should use the system, and peers think they should use the system. Thus, TPB helps to support the concept that pupils' learning behavior is not just a personal choice, but one that is also influenced by social pressure and cultural norms.

Technology Acceptance Model

The Technology Acceptance Model was developed by Davis (1989). This model is used to describe the reasons behind the uptake or non-use of a technology. TAM suggests there are two key points to consider when it comes to technology acceptance: perceived usefulness and perceived ease of use. Perceived usefulness is defined as "the extent to which the user thinks that the technology will help to improve his or her performance". Perceived ease of use is the ease of use that a person thinks of when using a technology.

In the current research, the direct link between TAM and the perceived usefulness and ease of use of AI-based systems are established. Students are more likely to employ AI tools in their learning process if they feel the tools enhance their learning efficiency, academic performance, and academic benefits. In the same way, if students think that using AI-based systems is easy, simple and easy to get good at, they may be more confident in using AI tools. Thus, TAM is a good indicator of the students' learning behavior due to their perception of the use of AI tools in their learning process.

Review of Literature

Olanrewaju *et al. (*2025) investigated algorithmic bias in educational systems, specifically the influence of the use of algorithmic decision-making in the modern education system. The study highlighted the potential for AI systems in admissions, assessments, learning platforms, and

student support to perpetuate unfair outcomes if they are not well-designed, due to the importance of the datasets, evaluation criteria, and decision-making algorithms used. The paper is relevant to the current study because it highlights that bias in AI decision-making algorithms can negatively impact on some students and potentially affect their academic prospects, self-esteem and learning style.

Peña-García (2026) used two approaches digital equity that were explored in teacher preparation: dialogic reflection and algorithmic bias. This study specifically examined the role of algorithmic bias awareness in supporting educators and learners in detecting unfairness in digital learning. It highlighted the significance of reflective awareness of AI bias for ensuring fairness, equity, and responsible AI use in education. The current study is connected to this paper because it corroborates the idea that educators can enhance the critical engagement of students with AI tools by fostering awareness of AI bias.

Colclasure (2025) focused on student views of AI-influenced learning with an emphasis on fairness, trust and learning support. The study noted that students' acceptance of the use of AI tools might be influenced by their trust in the AI learning systems and their sense of responsibility for their fairness in learning. Students' acceptance of using AI tools could be related to their trust in AI learning systems and their perception of their responsibility for the fairness of learning. When students feel that the AI systems are biased or unfair, their trust and engagement in the system may become lower. This study is relevant to this paper because it links student perception of the fairness of AI to the learning experience, as well as students' learning behavior.

Li, (2023) focused on The Technology Acceptance Model to explore the factors that influence students' actual use of AI-based systems at college. This study centered on perceived usefulness, perceived ease of use, attitude, behavioral intention, and usage of AI based systems. The results revealed that students are more inclined towards using AI-based systems if they believe in their usefulness and ease of use. The current paper is directly connected with the above-mentioned study because the perceived usefulness and ease of use are two of the major independent variables that may affect the learning behavior of students in AI-mediated learning environments.

GC (2024) investigated the influence of social, learning value and trust on intention to use ChatGPT among students. This study, with its emphasis on peer influence, AI trust, and the perceived value of AI in learning, sought to better understand how academic decisions are made when using AI as a learning resource. The results showed that social influence and learning value are potential factors that influence students' willingness to use ChatGPT for academic purposes. This paper is significant for the current study as it sheds light on how AI adoption and learning behavior could be impacted by cultural/social factors and perception of learning value.

Sallam *et al.* (2024) The study investigated the use of and attitudes toward ChatGPT among university students and determined students' attitudes toward ChatGPT use are influenced by the perceived usefulness, ease of use, risks, and psycho-social impact. This study revealed that students' attitudes toward ChatGPT can be positive when they perceive that it is useful and easy to use, and negative when they see potential dangers and concerns regarding its use. This paper is of relevance to the present study as it reinforces the perceived usefulness, the perceived ease of use and the psycho-social dimension in students' AI related learning behavior.

Rahman *et al.* (2025) explored students' mindset when using AI chatbots in the context of the effectiveness of online learning outcomes. The research examined four factors: perceived usefulness, perceived ease of use, subjective norms, and facilitating conditions, as well as learning outcomes. The results revealed that the usefulness, ease of use, and social support of the AI chatbots have an impact on student usage. The present study is directly related to this paper as this paper focuses on linking technology acceptance and subjective norms with online learning outcomes and learning behavior.

Korchak (2025) went through a study of the social influence in the use of Generative Artificial Intelligence for higher education. This research was aimed at peer influence, social popularity, and students' intention to use generative AI tools. The paper reasoned that students can use the AI tools when they notice that they are used and supported by peers and important social groups. The present paper is beneficial from this study as it backs up the impact of cultural/social factors and subjective norms on students' AI adoption and behaviour in learning.

Polyportis (2025) examined the technology adoption factors: attitude, perceived usefulness, perceived ease of use and technology adoption behavior. The results demonstrated that students' acceptance of ChatGPT is influenced by its usefulness and ease of use for academic tasks. The relationship between technology acceptance factors and students' use of AI tools in learning activities is supported in this paper and is relevant to the current study.

Grassini (2024) surveyed university students' acceptance of ChatGPT. The study emphasized on behavioral intention, acceptance, perceived ease of use and perceived usefulness. The results revealed that students will be more accepting of ChatGPT if they think it can assist them in their academic work and if it is user-friendly. The current paper is relevant to the present research as it discusses student perception of usefulness and ease of use and how these can influence their learning behavior, and uptake of AI tools.

Namatovu (2025) analyzed the factors related to acceptance (performance expectancy, effort expectancy, social influence, academic use) to determine how university students were using ChatGPT in academic activities. The study highlighted three factors: the perception of helping students with academic performance, usability, and social support from environment, which affect student use of ChatGPT. The present study is relevant because of the link between the social influence and technology acceptance factors with the academic use of AI tools by students.

Koteczki *et al (2025)* analysed the adoption of generative AI in higher education by using TAM and UTAUT model. The study concentrated on the perceived usefulness, perceived ease of use, behavioral intention and user groups. The findings indicated the students' perceptions of usefulness, ease of use, among other technology acceptance factors, influence their use of generative AI. It is important to note that the paper is connected with the current research since it reinforces the importance of technology acceptance in the AI-mediated learning behavior of students.

Jung (2025) carried out an ECM research on the sustainable learning engagement using Generative AI. The study was concerned with the following variables: confirmation, satisfaction, perceived usefulness, continuance intention, and learning engagement. The results revealed that students persist with the use of generative AI when they are satisfied with its use and feel it is learning supportive. The present study relies on this paper as it links PU to sustainable learning engagement and students' continuing use of AI tools for academic learning.

Research Methodology

The cross-sectional survey research design was used in the present study. This design was appropriate since data were gathered at a single time to explore how changes in the students' learning behavior related to the effects of the various factors of AI.

Study Area

The research was carried out in the University of Agriculture, Faisalabad, Pakistan. This region was chosen because University students are increasingly meeting AI tools for academic learning and research activities.

Target Population and Sample Size
The study aimed at the undergraduate and post-graduate students of the University of Agriculture, Faisalabad. The students were chosen as they were relevant to the research on the use of AI and learning behavior. The number of the students proposed for the study was 200.

Sampling Technique
A convenient sampling technique was used to choose the respondents. The research technique was conducted using this method as it made gathering data from students within the University relatively easy.

Data Collection Tool
Structured questionnaire was used to collect data. The questionnaire featured items to capture demographic data, as well as the Likert scale questions on bias in AI, cultural/social factors, perceived ease of use, perceived usefulness, and students' learning behavior.

Measurement of Variables
Bias in AI, cultural/social factors, perceived ease of use and perceived usefulness were independent variables. Students learning behavior measured based on problem solving, decision making and critical thinking became the dependent variable.

Data Analysis
Data gathered was coded and analyzed using SPSS. Descriptive statistics such as frequency, percentage, mean, and standard deviation were used to describe demographic characteristics and study variables. The relationship between independent variable that is Bias,subjective norms,perceived ease of use and perceived usefulness and dependent variable that is learning behavior were analyzed through Pearson correlation and to check overall significance of the Independent variable, multi regression was employed.

Results and Discussion
Socio-economic and demographic characteristics:
Most respondents were females (77.0%) with males making up 23.0% of the sample based on the demographic characteristics of the respondents. As far as age was concerned, almost half of the respondents (49.5%) fell in the age group of 21-23 years followed by 43.0% in the age group of 18-20 years, which meant that the majority of the respondents were young university students. With respect to place of residence, 62.0% of the respondents were in urban areas while 38.0% were in rural areas. The majority of the occupational distribution (91.0%) were students and only 5.5% of the students were working and 3.5% were studying and working. As far as family type is concerned, the maximum percentage of respondents (62.0%) were from nuclear families, followed by the Joint (31.0%) and External (7.0%) families respectively. The respondents who were enrolled in BS programs were 71.5% while the respondents who were enrolled in M. were 18.0%. In Phil programs, 10.5% are PhD programs.
In addition, the results showed that the use of mobile phone was the highest (47.0%) for the study device, followed by both mobile phones and laptop/ computers (38.0%) and the lowest was laptop/computer (15.0%). The participants were quite digitally engaged, with over half (53.5%) accessing the internet every day. As for the usage of AI tools for purpose, primary reason for using AI tools was assignments (48.5%), followed by understanding concepts (29.0%), examination preparation (17.5%) and writing activities (5.0%). When it comes to AI technologies, chatbots (69.5%) were the most widely used tools, while writing tools and educational tools saw 11.5%

usage each, and only 2.0% was for coding tools. Last, the amount of time spent using AI tools revealed that the majority of users (37.5%) used such tools for under one hour per day, with 29.0% using them for one to three hours per day, suggesting that most students engaged with AI tools for comparatively brief periods of the day in their studies.

Descriptive Statistics

Table :1 Descriptive Statistics of Bias, Subjective Norms, PEOU and PU

Variables	Mean	Std. Deviation
Bias	3.6375	.67893
Subjective Norm	3.5050	.86201
Perceived ease of use	4.0483	.71234
Perceived Usefulness	4.1250	.74685
Learning Behavior	3.9940	.64696

The presents the descriptive statistics of Bias, Subjective Norms, Perceived Ease of Use, Perceived Usefulness, and Learning Behavior. Generally, the respondents responded positively as demonstrated in the results by the mean value of all variables being above the mid-point. The mean scores of Perceived Usefulness (M = 4.1250) and Perceived Ease of Use (M = 4.0483) were the highest, indicating that students perceive the AI tools as useful and easy to use. Learning Behavior is also characterized with a high mean value (M = 3.9940), which means that these factors have positive effects on student's learning. The Moderate level of agreement for respondents is indicated by the scores for Bias (M = 3.6375) and Subjective Norms (M = 3.5050). The standard deviations show that most of the variables gave similar responses.

Table: 2 Correlation Matrix of Bias

H1 There is a significant correlation between Bias of AI and students' learning behavior.
H0 There is a no significant correlation between Bias of AI and students' learning behavior.

Correlation Matrix of Bias

Construct Link	Correlation (r)	p-value	interpretation
Bias → Learning Behavior	**0.533**	.000	Significant

The research used Pearson's correlation analysis to analyze the relationship between Bias in AI and Students' Learning Behavior. The values obtained showed r = 0.533 and p = .000. The p-value is less than the accepted level of significance (0.05), indicating that the difference between Bias in AI and Students' Learning Behavior is statistically significant.

For the obtained r = 0.533, there is a moderate positive relationship between the two variables. This implies that students' attitudes to learning behavior are more positive if they can see that the AI systems are fair, transparent, and do not contain bias. That is, students' learning behavior is better when they have the impression that the AI system gives fair evaluations and makes decisions.

The findings revealed enough statistical evidence to reject Null hypothesis (H_0) and accept the Alternative hypothesis (H_1) which indicates that Bias in AI is significantly related with Students' Learning Behavior. The findings suggest that enhancing the fairness and transparency of AI systems has the potential to positively affect students' academic engagement and learning processes.

In addition, students who are confident in the AI systems and believe that they are unbiased will more actively engage in learning activities, take informed academic choices, and cultivate critical thinking. AI technologies can be used more effectively in learning through the encouragement of fair AI systems.

The results align with the prior studies highlighting the significance of fairness and transparency in educational AI systems. Boateng and Boateng (2025) highlighted that the bias within an algorithmic system in education may have a profound impact on student learning and decision-making for educational outcomes.

Table:3 Correlation Matrix of Subjective Norms

H1 There is a significant correlation between Bias of AI and students' learning behavior.
H0 There is a no significant correlation between Bias of AI and students' learning behavior.

Construct Link	**Correlation (r)**	**p-value**	**interpretation**
Subjective Norms → Learning Behavior	**0.297**	.000	Significant

Pearson correlation test was used to investigate the relationship between Subjective Norms and Students' Learning Behavior. The results showed the correlation coefficient of r = 0.297 and the significance value of p = .000. The p value is smaller than the significance value (0.05) so that the relationship of Subjective Norms and Students' Learning Behavior is statistically significant.

The value of the correlation coefficient obtained is 0.297, which means the correlation between the two variables is weak to moderate positive. This implies that the influence of peers, teachers, and important persons in students' learning behavior is positive.

The results of the study showed that there is enough statistical evidence to reject the null hypothesis (H_0) and accept the alternative hypothesis (H_1) which states that Subjective Norms are significantly associated with Students' Learning Behavior. The findings suggest that encouragement and support from the social environment can influence students' willingness to use AI technologies and positively participate in learning activities.

In addition, students who believe that key individuals in their immediate environment encourage the use of AI-based systems are more likely to use these technologies for learning. This social support can boost students' self-assuredness, drive, and desire to utilize AI-powered educational resources.

The results of this study corroborate with the Theory of Planned Behavior (TPB) model proposed by Ajzen (1991) that suggests that the subjective norm plays a critical role in people's attitudes and actions. The results are consistent with those by Korchak (2025) and GC (2024), which indicated that social influence is a crucial factor in students' acceptance and use of AI technologies.

Table: 4 Correlation Matrix of Perceived ease of use

H1 There is a significant correlation between Perceives ease of use of AI and students' learning behavior.
H0 There is a no significant correlation between Perceives ease of use of AI and students' learning behavior.

Construct Link	**Correlation (r)**	**p-value**	**interpretation**
PEOU → Learning Behavior	**0.427**	.000	Significant

Pearson correlation analysis was used to investigate the correlation between Perceived Ease of Use and Students' Learning Behavior. The result showed that the correlation coefficient (r) was 0.427 and the p value was .000. The p-value is smaller than the significance level of $P<0.05$, which indicates that the relationship between Perceived Ease of Use and Students' Learning Behavior is statistically significant.

The correlation coefficient obtained is 0.427 which shows moderate correlation between the two variables. It implies that the students' learning behavior is more positive when they believe that the ease of learning and ease of use of AI technologies is high.

The results suggest enough statistical evidence to support the rejection of the null hypothesis (H_0) and the acceptance of the alternative hypothesis (H_1), which means that the Perceived Ease of Use is significantly related to the Students' Learning Behavior.

Additionally, if students are comfortable with and understand how to use AI tools, they are likely to use them in their academic work. The user-friendliness could mitigate technological obstacles and promote the use of AI systems in education, learning, and problem-solving.

The results are in line with Davis's (1989) Technology Acceptance Model that predicts perceived ease of use is a significant factor in technology acceptance. The findings are also corroborated by Grassini (2024), and Sun (2025) who found that ease of use is crucial to students' willingness to use AI technologies in their education.

Table: 5 Correlation Matrix of Perceived usefulness

H1 There is a significant correlation between Perceived usefulness of AI and students' learning behavior.

H0 There is a no significant correlation between Perceived usefulness of AI and students' learning behavior.

Construct Link	**Correlation (r)**	**p-value**	**interpretation**
PU → Learning Behavior	**0.628**	.000	Significant

Pearson's correlation analysis was used to explore the correlation between Perceived Usefulness and Students' Learning Behavior. The results indicated that the correlation coefficient was r = 0.628 and the p value was .000. The result of the hypothesis test shows that the p-value is less than the significance level (0.05), so that the relationship between the Perceived Usefulness and Students' Learning Behavior is statistically significant.

The correlation coefficient obtained is 0.628, which suggests a high positive correlation between the two variables. It indicates a link between students' attitudes toward the usefulness of AI technologies and their learning behavior. This indicates that, on one hand, the attitude of students towards the usefulness of the AI technologies is related to their learning behavior.

The findings show sufficient statistical power for the rejection of the null hypothesis (H_0) and acceptance of the alternative hypothesis (H_1) which means that the value of Perceived Usefulness is significantly related to Students' Learning Behavior. The findings suggest that students who think that using AI tools for learning helps to enhance learning efficiency, academic productivity, and educational outcomes are more likely to actively participate in learning.

In addition, understanding the academic benefits of AI technologies increases the likelihood that students will utilize them to acquire information, problem-solving, writing assignments, and making academic decisions. This is one of the reasons why it helps to enhance learning behavior and engagement in academic pursuits.

The results are similar to Davis' (1989) and Venkatesh and Davis' (2000) studies, which noted that perceived usefulness is one of the most important factors in technology acceptance and usage behavior. This is also supported by the works of Jung (2025), who found that the perceived usefulness of AI technologies greatly improves student engagement in learning.

Table: 6 Regression Analysis Model Summary

Model	R	R Square	Adjusted R Square	Std. Error
	.709[a]	.503	.492	.46094

Table: 7 Regression Coefficient

Variable	Beta (β)	t-value	Sig.
Bias	0.270	4.421	.000
Subjective Norms	0.043	0.762	.447
Perceived ease of use	0.167	2.996	.003
Perceived Usefulness	0.437	7.478	.000

Multiple regression analysis was used to explore the influence of Bias in AI, Subjective Norms, Perceived Ease of Use, and Perceived Usefulness on Students' Learning Behavior. The model summary (Table 3.21) indicates an R value of 0.709 and an R Square value of 0.503. This means that the independent variables are together explaining 50.3% of the variance in Students' Learning Behavior. Hence, the model has considerable explanatory power and the remaining 49.7% of the variance may be due to other factors not measured in this study.

The regression coefficients shown in Table 3.22 show that three variables significantly affect the Students' Learning Behavior while one variable does not.

The results indicate that students' learning behavior is positively influenced by bias in AI with statistically significant value, $\beta = 0.270$, $t = 4.421$, $p = .000$. The discovery indicates that when students believe AI systems to be fair, transparent, and unbiased, they are more inclined to exhibit positive learning behaviors.

Likewise, Perceived Ease of Use positively and significantly influences Students' Learning Behavior ($\beta = 0.167$, $t = 2.996$, and $p = .003$). This suggests that the students who are easy to learn and use AI technology are more positive in learning behavior.

The results also showed that Perceived Usefulness has a positive and highly significant impact on Students' Learning Behavior ($\beta = 0.437$, $t = 7.478$, $p = .000$). The result indicates that students with positive attitudes towards the use of AI technologies in improving their academic performance and efficiency in learning are more likely to engage in positive learning behavior.

But Subjective Norms do not have a significant effect on Students' Learning Behavior ($\beta = 0.043$, $t = 0.762$, $p = .447$). The p-value is higher than 0.05, meaning that the null hypothesis is accepted. This suggests that the influence of peers, teachers, and significant others on Students' Learning Behavior is not significant when the influence of other influencing variables is removed.

When comparing the beta coefficients, it can be seen that Perceived Usefulness ($\beta = 0.437$) is the most significant predictor of Students' Learning Behavior, followed by Bias in AI ($\beta = 0.270$) and Perceived Ease of Use ($\beta = 0.167$). Subjective Norms have the weakest and non-significant effect ($\beta = 0.043$).

They are similar to Davis (1989) and Venkatesh and Davis (2000) who found that the most significant factor in technology acceptance and use was Perceived Usefulness. This is consistent with the results of other researchers, such as Jung (2025), who indicated that students are more

willing to use AI technologies if they believe them to be valuable. Moreover, Boateng and Boateng (2025) highlighted how fairness and ethical aspects of AI systems have positive impacts on learning results.

The regression analysis showed that Perceived Usefulness was the most influential factor on Students' Learning Behavior followed by Bias in AI and Perceived Ease of Use. However, Subjective Norms did not have a significant impact on Students' Learning Behavior. Thus, students' perceptions of the usefulness and fairness of AI technologies seem to play a more significant role than social influence in influencing learning behavior.

Discussion

The results of the present study suggest that Bias in AI, Perceived Ease of Use and Perceived Usefulness have significant effect on learning behavior of students while Subjective Norms do not significantly predict learning behavior.

The results of the correlation analysis showed that there is a significant positive correlation between Bias in AI and Learning Behavior ($r = .533$, $p < .01$). The result indicates that students' learning behavior is more positive if they see AI systems as fair and unbiased. The results are consistent with Boateng and Boateng (2025), who emphasized the impact of algorithmic fairness on educational outcomes, who highlighted the importance of ethical AI practices in education.

The regression analysis showed that Subjective Norms did not significantly predict Learning Behavior ($\beta = .043$, $p = .447$), although the correlation results indicated that there was a positive correlation between the two variables ($r = .297$, $p < .01$). The results imply that social influence can stimulate the adoption of AI technologies by students, but it may not be the sole factor influencing their learning behavior when other factors are taken into account.

Perceived Ease of Use was found to have a statistically significant positive correlation with Learning Behavior ($r = .427$, $p < .01$) and was statistically significant in predicting Learning Behavior ($\beta = .167$, $p = .003$). The results are similar to those of Davis (1989), who named ease of use as a factor affecting technology acceptance.

Perceived Usefulness was the strongest variable for predicting Learning Behavior ($\beta = .437$, $p = .000$) among all the variables studied. The finding is in accordance with the work of Davis (1989) and Venkatesh and Davis (2000) in their work on the Technology Acceptance Model and TAM2. Furthermore, the findings align with Jung (2025), who reported strong correlation between perceived usefulness and the acceptance of AI technologies and learning engagement by students. Overall, the results indicate that students' perceptions of the usefulness, fairness, and usability of the AI technologies are crucial to their learning behavior in higher education.

Conclusion

The present study aimed to explore the influence of Bias in Artificial Intelligence (AI), Subjective Norms, Perceived Ease of Use, and Perceived Usefulness on students' learning behavior in Higher education. In the current era of integration of AI technologies in education, it is highly relevant to grasp the factors affecting students' learning behavior. The results suggest that university students appear to have positive attitudes towards AI technologies and are actively implementing AI tools to enhance learning experiences. The descriptive findings also showed that AI tools like ChatGPT, especially chatbots, are commonly adopted in assignments, clarifying concepts, preparing for exams, and other educational tasks. This shows that AI has become a vital part of the learning environment and development of students.

The result of the correlation analysis showed that all four independent variables: Bias in AI, Subjective Norms, Perceived Ease of Use and Perceived Usefulness were significantly and positively correlated with students' learning behavior. When students feel positive attitudes toward

AI systems, they are likely to demonstrate positive learning behaviors, suggesting that the qualities attributed to AI systems of fairness, usefulness, ease of use, and social acceptability foster these positive attitudes. The results underscore the significance of students' attitudes and perceptions in their involvement with learning activities in relation to the AI technologies. AI's potential as an effective educational technology is further validated by the positive correlations found between the study variables, which demonstrate its ability to improve students' learning experiences.

The regression analysis gave a better understanding of the relative impact of each independent variable. The results indicated that students' learning behavior was most significantly predicted by Perceived Usefulness, Bias in AI, and Perceived Ease of Use, where all three significantly positively predicted student learning behavior. The results suggest that students will more readily embrace AI technologies if they believe they can enhance their learning efficiency, academic outcomes, and problem-solving skills. Similarly, students' positive learning behaviors are expressed when they consider AI systems are fair, transparent, and easy to use. By contrast, although there was a positive correlation between Subjective Norms and learning behavior, they were not significant predictors of learning behavior in the regression model. This implies that with the addition of perceptions of usefulness, fairness and usability, the social influences on students' learning behaviour do not fully determine it.

This study's results offer empirical evidence for the Technology Acceptance Model (TAM) and the theories that can be used to understand the adoption of technology in an educational environment. In this regard, the findings confirm that both the Perceived Usefulness and the Perceived Ease of Use are still key factors determining the acceptance and proper use of AI technologies by students. Moreover, as AI systems become more influential in the educational landscape, the ethical, transparent, and trustworthy use of AI in higher education has become more prominent. While AI is reshaping teaching and learning, educational institutions must not only embrace the use of AI technologies and tools but also ensure that they are developed and adopted in an equitable, transparent, and student-centric manner, reducing bias and building trust and confidence among students.

The study finds that students' learning behavior is mainly driven by their perceptions of usefulness, fairness, and ease of use of AI technologies, rather than by social pressure or other influences. The results of this study further enrich the current debate on the educational use of AI by illustrating how student perceptions and experiences of AI influence its educational value. Overall, the study offers several important implications for universities, educators, policymakers, and AI developers, highlighting the importance of incorporating reliable, ethical, and user-friendly AI technologies into higher education. Improving these elements will foster responsible use of AI in education, boost student engagement, and ultimately contribute to better learning experiences in the digital age.

Recommendations

1. Higher education institutions (HEIs) are encouraged to adopt AI-powered learning tools in a responsible and structured way in teaching and learning. Universities need to promote the educational application of AI technologies to boost students' academic achievements, problem-solving abilities, and learning styles, while ensuring that AI serves as a support for critical thinking and independent student learning.
2. Universities should organize regular training sessions, workshops and orientation sessions to enhance students and teachers knowledge about AI technologies. These programs should aim at enhancing the skills of using AI tools effectively, responsibly, and ethically in academic pursuits, thereby boosting the perceived ease of use.

3. The creation and implementation of transparent, fair, and unbiased AI systems should be prioritized in educational institutions and AI developers as well. Minimizing algorithmic bias and increasing students' trust in AI-supported learning environments requires clear AI evaluation mechanisms, explainable algorithms, and ethical guidelines.

5. Given that perceived usefulness was found to be the most significant predictor of students' learning behavior, faculty members need to show students how AI can be used in real-world scenarios relating to coursework, research, academic writing, and problem-solving. Demonstrating the benefits of using AI to enhance the efficiency of learning and academic productivity will promote the meaningful use of AI in higher education.Presenting the advantages of using AI to enhance the efficiency of learning and academic productivity will encourage the meaningful use of AI in higher education.

6. They should also have a more comprehensive approach to the academic use of AI technologies by creating policies and ethics guidelines by policymakers and university administrators. These policies should consider topics like the integrity of the academic process, privacy of information, transparency, responsible use of AI and to prevent misuse in order to foster innovation in teaching and learning.

7. Future studies could explore other factors that could affect students' learning behavior, including digital literacy, self-efficacy, trust in AI, academic motivation, AI anxiety, technological readiness, and institutional support. The results of this study only covered a portion of the learning behavior variations and further research into other factors that influence learning behavior could help to create a larger picture of AI use in higher education.

8. The findings of this study will be useful for future studies, which may be expanded to include respondents from other universities, from various academic disciplines and geographical areas. longitudinal or mixed-method research designs are encouraging to understand the students' perception changes over time and how these changes impact learning behavior in various educational contexts.

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