

**Impact of Artificial Intelligence Use on Students’
Academic Performance in Ethiopian Higher education:
In the Case of Adama Science and Technology University**



Melekot Hayiliye Aleme

A Thesis Submitted to the Department of Technology and Innovation
Management
College of Humanities and Social Science

Presented in Partial Fulfillment of the Requirement for the
Degree of Master’s in Technology and Innovation Management

Office of Post Graduate Studies
Adama Science and Technology University

June 2025
Adama, Ethiopia

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DECLARATION

I hereby declare that this thesis entitled “Impact of Artificial Intelligence Use on Students’ Academic Performance in Ethiopian Higher Education: In the Case of Adama Science Technology University” is my original. That is, it has not been submitted for the award of any academic degree, diploma or certificate in any other university. All sources of materials that are used for this thesis have been duly acknowledged through citation

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Name of the Student

Signature

Date

RECOMMENDATION

I, the advisor(s) of this thesis, hereby certify that I have read the revised version of the thesis entitled “Impact of Artificial Intelligence Use on Students’ Academic Performance in Ethiopia Higher Education: In the Case of Adama Science and Technology University” prepared under my guidance by **Melekot Hayiliye Aleme** submitted in partial fulfillment of the requirements for the degree of Master’s of Science in Technology and Innovation. Therefore, I recommend the submission of the proposal to the department for further review and evaluation.

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APPROVAL PAGE

I/we, the advisors of the thesis entitled “Impact of Artificial Intelligence Use on Students’ Academic Performance in Ethiopian Higher Education: In the Case of Adama Science and Technology University” by Melekot Hayiliye Aleme, hereby certify that the recommendation and suggestions made by the board of examiners are appropriately incorporated into the final version of the thesis.

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APPROVAL OF BOARD OF REVIEWERS

We, the undersigned, members of the Board of Examiners of the thesis by Meleket Hayiliye Aleme have read and evaluated the thesis entitled “Impact of Artificial Intelligence Use on Students’ Academic Performance in Ethiopian Higher Education: In the Case of Adama Science Technology University” and examined the candidate during open defense. This is, therefore, to certify that the thesis is accepted for partial fulfillment of the requirement of the degree of Master of Science in Technology and Innovation Management.

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Final approval and acceptance of the thesis is contingent upon submission of its final copy to the Office of Postgraduate Studies (OPGS) through the Department Graduate Council (DGC) and School Graduate Committee (SGC).

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LIST OF ACRONOMYS AND ABBREVIATIONS

ASTU	Adama Science and Technology University
AI	Artificial Intelligence
GPA	Grade Point Average
SPSS	Statistical Package for the Social Sciences
UTAUT	Unified Theory of Acceptance and Use of Technology

ABSTRACT

Artificial Intelligence (AI) technology is changing almost everything around us. Various industries, including education sectors were changing by this technology. The study aimed to identify factors influencing AI tools acceptance, investigate impact of AI tools usage on student academic performance and its potential draw back. This study seeks to address the existing gap in understanding how AI tools are being used and what effect they have on student academic outcomes. The study employed mixed-method cross-sectional design. And it involved 285 students and 43 teachers from Adama Science and Technology University. The participants were selected using multi-stage sampling and sample size was determined by Yamanes's formula. The research utilizes both primary data and secondary data. The data was analyzed using descriptive, correlation and ordinal logistic regression analyses by using SPSS software. The finding shows that performance expectancy was the most significant factors influencing AI tools acceptance, with 80% of respondents agreed that expected academic performance improvement was key driver to adopt AI tools. Student interaction was the second key factors to accept AI tools with (76% agreement). The correlation result shows that AI tools usage and academic performance improvement had moderately strong and statistically significant positive relationship. Additionally, ordinary logistic regression result confirmed that effective AI tools usage significantly increases log odds of achieving higher GPA improvement category. Additionally, teachers believe that AI tools have the potential to improve student performance, especially when students use them thoughtfully and responsibly. Additionally, they noted its draw back including laziness, loss in critical thinking and degrading of independent decision-making capacity. To enhance academic performance students should utilize these tools properly. On the other side, creating AI tools usage frame work is important things to avoid drawback of these tools. Continues training, task-based easement method and investing on digital infrastructure were key step to balance advantage and dis advantages of these tools.

Key words: Artificial Intelligence, Higher Education, Technology Acceptance, Academic Performance, Ordinary Logistic Regression

CHAPTER ONE INTRODUCTION

In this chapter the background of the study, statement of the problem, research questions and objectives were discussed. Also, the importance of the study, its boundaries and delimitation were presented.

1.1 Background of the study

AI or Artificial Intelligence technology is changing almost everything around us. Various industries, including education sectors were changing by this technology. The inclusion of AI technology in teaching and learning process has got a chance to make the traditional education practice better. And it enhances students' academic performance. AI contains a range of technologies including machine learning chatbots, computer vision, natural language processing and etc. According to (Strohmeier, 2022) computer do jobs requiring human intellect. AI tools such as chatbots, virtual tutors are being used for personalized learning. And It provided supports, guidance and fast feedback for teachers and students (Wollny et al., 2021).

The fast enhancement of AI tools has direct to a change tertiary education across the globe. AI technologies gave academic support to students anytime and anywhere to develop their skills and knowledge. The inclusion of artificial intelligence (AI) technologies in learning practices has gained high attention by different researcher across the world by highlighting its power to increase learning outcomes. Including both developed and developing countries researchers indicate AI tools support personalized learning (Wollny et al., 2021).

The studies conducted by Dahri et al. (2024) focused on understanding the factors affecting AI tools' adoption, its impact on students' academic outputs and students satisfaction in Pakistan and Malaysia higher education. According to this study the adoption of AI technologies among students and teachers depends on multiple elements, such as availability, computer proficiency, recognized value, and organizational backing.

Studies demonstrate that while AI possesses the capacity to enhance productivity and educational results, its implementation often encounters obstacles like insufficient knowledge, operational challenges, and opposition to transformation (Dwivedi et al., 2023).

For Adama Science and Technology University, comprehending these elements remains essential in assessing how successfully AI has been incorporated into scholastic procedures and pinpointing areas that require enhancement.

Moreover, the enduring influence of AI in education necessitates thorough examination. Excessive reliance on AI tools may result in student complacency, as learners might become overly dependent on computerized systems to accomplish academic assignments rather than participating substantively in the learning process. Additionally, consistent utilization of AI for decision-making could reduce essential thinking and analytical abilities, rendering students less proficient at exercising autonomous judgment. Security considerations, including information leaks and misapply of individual information, further emphasize the necessity for a measured approach to AI integration in education (Selwyn, 2020)

Despite the increasing importance of AI in education, insufficient investigation had been done on its adoption and effect in the context of developing countries. The gap observed in literature highlights the need for the study to analyze the factors affecting AI adoption and its extensive implications on scholarly performance in higher education.

By resolving this gap, this research aimed to offer suggestion into how AI tools can be successfully implemented to improve educational results while reducing its possible drawbacks. This study seeks to analysis the acceptance and effect of AI on students learning outcomes at ASTU by analyzing both student and teacher perspectives.

Furthermore, it plans to investigate the factors affecting artificial intelligence tools adoption as well as differentiate the future adverse challenges of these tools, such as student carelessness, degrading independent decision-making capacity, and challenges in information protection.

The outcomes of this research will enhance the awareness of AI tools role in tertiary education sectors and offer actionable recommendations for its optimal integration in teaching and learning process.

1.2 Statements of the problem

Studies have shown that integrating AI or artificial intelligence into tertiary education can improve students understanding, engagement, and academic achievement, garnering considerable attention globally. Investigation on the adoption of AI tools in learning and teaching process had been carried out in various countries, including the USA, China, and the UK. When a UK affiliated university introduced the AI Assessment Scale (AIAS) as part of a pilot program, it observed a noticeable improvement in student outcomes (Furze et al., 2024). This study show, overall academic performance rose by 5.9%, and the number of students passing their modules increased by 33.3%.

Similarly, a study involving 383 university students in China learning English as a foreign language revealed that those who used AI-driven platforms such as Duolingo demonstrated noticeably greater motivation, participation in class activities, and overall enjoyment (Yuan & Liu, 2025).

Additionally, In Harvard’s introductory computer science course, CS50, an AI-based assistant called “CS50 Duck” was introduced to support students during their learning process. According to the findings, learners who used this chatbot designed with GPT technology were able to grasp concepts more effectively and in a shorter amount of time compared to those relying solely on traditional classroom methods (Liu et al., 2024).

Similarly, research in African countries like South Africa, Tanzania, and Egypt Ayanwale & Ndlovu (2024), Patel & Ragolane (2024) and Stuart (2024) has explored AI adoption in higher education, identifying challenges such as technological infrastructure, digital literacy, and faculty readiness. On the other side, studies conducted by Ahmad et al.(2023) & Sabharwal et al.(2023) indicated the challenges of AI tools on independent decision- making capacity and laziness

However, little studies had been conducted on AI tools adoption and its impact in Ethiopian higher education sectors, despite the rising gaps in literature on the subject.

Despite offering insightful information, some studies might not be immediately applicable to Ethiopia because of contextual factors, such as disparities in facilitating condition, pedagogical fit, and technological availability. Additionally, socioeconomic and cultural issues might have a big impact on how AI technologies are viewed and used in Ethiopian colleges, although this is still a little-studied topic.

This research aimed to address these disparities by examining the acceptance and impact of AI tools usage on student academic outcomes at Adama Science and Technology University (ASTU).

Additionally, the study seeks to address the existing gap in understanding how AI tools are being used and what effect they have on student academic outcomes within Ethiopian higher education by focusing on Adama Science and Technology University.

1.3 Research question

The research questions listed below were line with the objective of the research

RQ1: What are key factors that affect the acceptance of AI tools among students in ASTU?

RQ2: What are the impacts of AI tool usage on students' academic outcomes at ASTU?

RQ3: What are teachers' perceptions of their students' use of AI tools?

1.4 Research Objectives

1.4.1 General objectives of the study

The overall aim of this investigation is to examine the acceptance and impact of AI or artificial intelligence tools usage on student academic outcomes in Ethiopian higher education at ASTU.

1.4.2 Specific objective

1. To identify the key factors influencing the acceptance of AI tools among students at ASTU.
2. To examine the impact of AI tool usage on student academic performance.
3. To investigate the potential perception of teachers on AI tools usage by their students

1.5 Significance of the study

This research provided significance insights to various stakeholders. The results could be used by policymakers to inform the creation of rules and procedures that will guarantee the ethical use of AI in tertiary education. University leaders could create targeted training programs to integrate AI technologies effectively. Additionally, this study provided foundation to explore the impacts of these tools in higher education.

1.6 Scope and Delimitation of the study

Examining the acceptance and effects of using artificial intelligence (AI) tools on Adama Science and Technology University (ASTU) students' academic performance is the main goal of this research. The study's focus on university instructors and undergraduate students from a range of subjects offers a thorough grasp of viewpoints from many academic specialties. Survey was used to gather the data. The study's scope is restricted to ASTU and generalizing them to other Ethiopian universities required further research.

1.7 Organization of the paper

This study was structured into four main chapters. The opening chapter laid the foundation by outlining the background of the research, identifying the core problem, and setting out the research questions and objectives. It also clarified the importance of the study, its boundaries and limitations, and introduced.

The second chapter explored existing literature relevant to the topic. It covered both theoretical perspectives and practical studies related to the use of artificial intelligence in higher education. In addition to discussing the adoption and application of AI tools, the chapter examined their influence on students' academic performance and concluded by presenting the conceptual framework guiding the study.

The third chapter focused on the methods used to conduct the research. It detailed the overall research approach, described the population under study, explained the sampling procedures, and outlined the tools and techniques used for data collection and analysis.

Ethical considerations were also addressed to ensure the study met academic standards. The fourth chapter presented the findings and interpretation of the data. It featured descriptive statistics as well as correlation and regression analyses, all aimed at understanding how the use of AI tools related to students' academic outcomes.

Finally, the closing section of the paper summarized the major findings, drew conclusions from the results, and offered practical recommendations to support the effective integration of AI tools in ASTU.

CHAPTER TWO LITERATURE REVIEW

This chapter explored existing literature relevant to the topic. It covered both theoretical perspectives and practical studies related to the use of artificial intelligence in higher education. In addition to discussing the adoption and application of AI tools, the chapter examined their influence on students' academic performance and concluded by presenting the conceptual framework guiding the study.

2.1 Importance of AI tools in education sector

The inclusion of artificial intelligence technologies in learning practices has garnered significant attention in recent research, by considering its potential to enhance academic results. Based on different scholar perspective AI technology increase personalize learning. Similarly, study investigated by (Huang et al., 2023) shows AI tools enabled personalized recommendations within the context of a flipped classroom. The study found that the AI-enabled personalized video suggestion could highly enhance the academic out comes and engagement of students with a reasonable motivation level. This finding underscores the potential of AI to tailor educational content to individual learners, thereby enhancing their learning experiences and outcomes. The personalized approach helps address diverse learning needs and preferences, making education more inclusive and effective (Huang et al., 2023) in this investigation the researchers use experimental types of research , however it is limited sample was included on the investigation.

In resent year study conducted by (Swarglary & Roy, 2024) on the Transformative Impact of Artificial Intelligence in Education for student and teacher perspective at Guwahati, Assam, India, using surveys and interviews, the result shows that AI technologies positively support student engagement, academic achievement, and perceptions of learning. Particularly, students reported increased interest in learning, improved learning out comes, and enhanced learning experiences due to AI integration.

In this study, the researchers were shows important of AI technology in academic area. However, the studied focus only in specific educational institutions in Guwahati, Assam, India.

2.2 Impacts of AI tools usage on students' behavior

(Sabharwal et al., 2023) conducted study on the subject of Artificial Intelligence (AI)-Powered Virtual Assistants and their Effect on Human Productivity and Laziness in the case of Indian and United Arab Emirate students. The investigation shows that artificial intelligence greatly affects the ability of human to make independent decision-making capacity, idleness, as well as it alters security and privacy of human being. The shows that 68.9% of respondent agreed that AI tools had a cause for human laziness, similarly, 68.6% of respondent agreed that these tools affect privacy and personal security, and 27.7% of respondent were agreed that these tools altered the ability of human to made independent decision. Additionally, the researcher shows that AI technology aids decision-making assists teachers and students in completing tasks and streamlines various activities. However, these difficulties are being exacerbated by the increased acceptance and dependence on AI in the education sector. Sabharwal et al. (2023) sum up their finding by summarizing the overhaul negative impacts of AI use on education sector.

Generally, the researchers' concluded that an ethical usage of AI tools makes human worse at making important choices, users slow via task automation and it adds more privacy and security problems.

Similarly, the study conducted by(Ahmad et al., 2023) on the Impact of artificial intelligence on human loss in decision making, laziness and safety in education in the case of Pakistan and China students. This investigation shows that AI significantly impacts on the loss of human decision-making and makes humans lazy. (Ahmad et al., 2023) Saied "Accepting AI without addressing the major human concerns would be like summoning the devils."

Additionally, (Stuart, 2024) by using exploratory research design, using mixed method approach on the effect artificial intelligence on the Academic Competency of Students of Higher Learning Institutions: A Case Study of Kampala International University in Tanzania.

The researcher identified negative and positive impact of artificial intelligence use by student. This study shows that AI used for to save time and easier access to information on the other hand, it may hinder personal development.

To sum up, different literatures shows that over reliance on AI tools encourage laziness, loss on decision capability and security challenges.

2.4 Technology acceptance model

Technology acceptance has been widely studied by different researchers. To enhancing existing models and proposing additional variables to explain the factors affecting technology acceptance. Models such as Composite Technology Acceptance Model and Theory of Planned Behavior (TAM-TPB), Task Technology Fit (TTF), PC Utilization Model (MPCU), Social Cognition Theory (SCT), and Motivation Model (MM) have been applied in specific industries. These factors are consolidated in to Unified Theory of Acceptance and Use of Technology (UTAUT), a prominent framework in 2003 by Venkatesh et al.

UTAUT applicability across diverse technologies such as mobile apps (ARAIN et al., 2018), e-learning platforms (Zacharis & Nikolopoulou, 2022), mobile devices (Hoi, 2020), Social media use (A. M. Al-Rahmi, Shamsuddin, et al., 2022), and online learning W. M. Al-Rahmi et al. (2021). Therefore, the UTAUT model has emerged as a valuable framework for interpreting users' intentions to accept emerging technologies like AI (Almaiah et al., 2022).

Different researchers have accepted and modified this model to match with their specific contexts and have achieved favorable results. In AI tool acceptance, the UTAUT framework has been instrumental in understanding users' willingness to accept these technologies. According to Dahri et al.(2024) Constructs drawn from the Unified Theory of Acceptance and Use of Technology (UTAUT) framework play crucial roles in understanding AI tool adoption. Different researcher introduced different variables to extend this model. In the case of AI tools, the following variable introduces by a numbers of researcher.

“Performance Expectancy (PE)” looks at the expected advantages students think they will gain from AI tools to improve learning results and school performance (Dahri et al., 2023). “Facilitating conditions (FC)” relate to the resources and help that people have to use a certain technology effectively (Venkatesh et al., 2016). “Assessment Effectiveness (AE)” a look at how tools help in assessment methods that are efficient (Dodeen, 2013). “Students’ Interaction” explores peer engagement (Wei et al. 2012), while “Information Accuracy (IA)” assesses content reliability (Filiari & McLeay, 2014), and “Pedagogical Fit (PF)” looks at how course goals match with teaching ways (Pittalis, 2021). And “Use” measures students’ active incorporation of AI tools into their academic routines (Venkatesh et al., 2016). and “Enhancement of Students’ Academic Performance” looks at how tools affect grades and learning (Tawafak et al., 2023).

These ideas, made for using AI tools, give a full structure for knowing things that affect their acceptance and use in higher education and information technology education. They help direct research and actions to aid student learning and success

2.5 Theoretical frame work

The theoretical frame work for study extended from Unified Theory of Acceptance and Use of Technology (UTAUT), which is developed by (Venkatesh et al., 2003). This model had four variables to adopt new technology. These are Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), and Facilitating Conditions (FC) (Venkatesh et al., 2003). This UTAUT extended by different researcher. (Dahri et al., 2024) was the one who extend this model, on acceptance of AI tools by students by including different variable.

In this research the researcher aims to use extended UTAUT model which is done by (Dahri et al., 2024) by adjusting the variables according to the need of the thesis. Using different study, the following variables were selected. These variables are Performance Expectancy (PE), Facilitating conditions (FC), Assessment Effectiveness (AE), Students’ Interaction, Information Accuracy (IA), Pedagogical Fit (PF), AI Tools Use (AIU), and Enhancement of Students’ Academic Performance.

Performance Expectancy (PE)

It is expected advantages students think they will gain from AI tools to improve learning results and school performance (Dahri et al., 2023). The study conducted by (An, Chai, Li, Zhou, & Yang, 2023) on the area of modeling students' perceptions of artificial intelligence assisted language learning, the result shows performance expectancy positively boost the respondents behavioral intentions to use AI tools. Similarly (Foroughi et al., 2024) conducts study on Determinants of Intention to Use ChatGPT for Educational Purposes. According to this study students who perceived AI tools as valuable aids for understanding complex subjects strongly intended to adopt them for their learning.

Facilitating conditions (FC)

It is related to resources and help that people have to use a certain technology effectively (Venkatesh et al., 2016). Foroughi et al. (2023) shows that the significance of institutional resources and technical support in influencing students' intention to use AI tools.

Assessment Effectiveness (AE)

It is the assesses of content reliability (Filieri & McLeay, 2014). According to the study by (Dodeen, 2013) students' perceptions of assessment effectiveness influence their willingness to accept these tools. Additionally, investigation conducted by Rolim and Isaías (2019) and Fergus et al. (2023) had concluded the integration of predictive analytics and AI tools helped identify struggling students early and provided tailored interventions, leading to higher retention rates and academic success.

Students' Interaction (SI)

It explores peer engagement (Wei et al., 2012). Al-Rahmi et al. (2022) explored the impact of students' interactions on students' intentions to use digital technologies. Similarly, (Strzelecki, 2024) assessed students' perceptions of AI tools as open educational resources. According to this study, guidance and Positive student involvement were identified as factors impacting students' engagement and usage of AI tools.

Information Accuracy (IA)

It assesses content reliability (Filiari & McLeay, 2014). According to Dahri et al., (2024), trust in the accuracy of information significantly supports students' willingness to use AI tools. Similarly, research conducted by Foroughi et al. (2024) explained students' perceptions of using AI-driven writing assistants. This study shows that students valued tools that provided accurate information.

Pedagogical Fit (PF)

It indicates how course goals match with teaching ways (Pittalis, 2021). Research conducted by Pittalis (2021) shows that pedagogical fit was identified as a critical factor that affects students' perceptions of the usefulness of these AI tools.

AI Tools Use (AIU)

It refers to how students use AI-infused tools for their learning activities (Dahri et al., 2024). Investigation conducted by Shen, et al. (2023) on English language as well as, investigation by Strzelecki (2024) that chatbot usage of AI tools enhances student academic performance.

Study Hours

Numerous studies have established a clear link between study hours and academic performance. More time dedicated to studying is generally correlated with better understanding, mastery of course material, and improved academic outcomes (Britton & Tesser, 1991).

Class attendance

There was substantial evidence linking class attendance with academic performance. Attending classes allows students to engage with the material, ask questions, and better understand the course content, which contributes to higher grades and performance (Carroll, 2015).

Use of computer or laptop

While excessive laptop use can be distracting, when used appropriately for academic purposes, laptops can enhance learning by providing access to resources, note-taking apps, and digital textbooks (Sarwar et al., 2019).

2.6 Literature Gap

While several studies were examined the impacts of AI tools usage on student academic performance, most of them have been conducted in international context, specifically in developed countries, which is strong digital infrastructure. More ever, existing literature conducted in students' side. However, perception teacher on usage of AI tools by their student's investigation. In the context of Ethiopian higher education, there is significance of lack of studies that indicate the impacts of AI tools usage on student academic performance. This study conducted to fill this gap by investigating impacts AI tools by including both students and teachers' perspective, focusing on ASTU under graduate students.

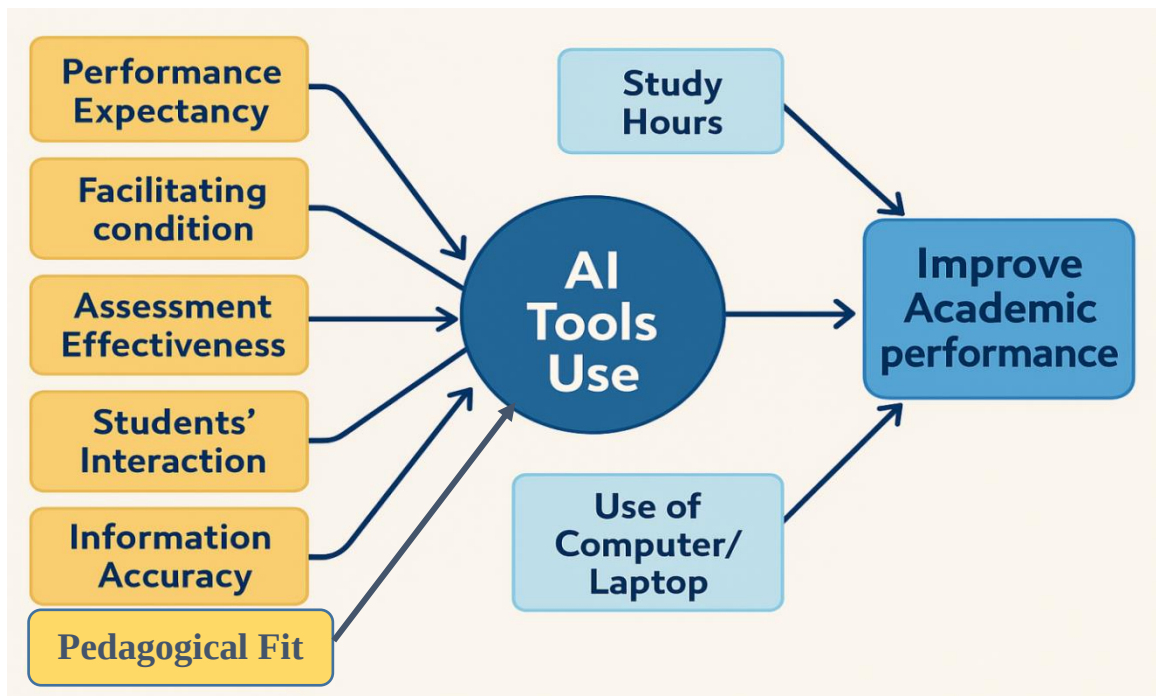


FIGURE 2.1 Proposed research theoretical frame work

CHAPTER THREE METHODOLOGY

Research techniques applied in the study was presented in this section. It describes the research plan, targeted population, how and where participants were chosen. Additionally, the description of the study site, study participant, method applied to choose participant, sample size calculation method, material used to collect data, data analysis technique, and ethical considerations were highlighted in this chapter.

3.1 Research Design

This study was used a mixed-method cross-sectional design. Undergraduate students were surveyed to analysis elements that affecting AI tools acceptance and its impact on their learning outcomes. Additionally, teachers were surveyed to access students' classroom behavior resulting from their use of AI tools..

3.2 Study Site/Area

This research was conducted at Adama Science and Technology University located in Adama city. Adama Science and Technology University (ASTU), is located in Adama city, Oromia regional state, Ethiopia. ASTU was originally established as Nazareth Technical College in 1993. It was undergone various transformations before attaining its current status in 2011 (Science, 2018). ASTU is known for its focus on research, innovation, and industry-driven education center (Messele Kumilachew Aga, 2017)

The university has taken meaningful steps to improve the quality of education by helping its teachers grow professionally, encouraging hands-on, skills-based learning, and nurturing a spirit of entrepreneurship among students (Likisa, 2018)

The university has been actively working to strengthen its research capabilities, encourage entrepreneurship among students and staff, and drive technological innovation, all in line with Ethiopia's national development goals outlined in the Growth and Transformation Plan (Ethiopia & Dagne, 2024).

3.3 Target Population

According to (Taherdoost, 2016) a target population is an entire group sample is chosen and which share important future. The participants targeted by this study were undergraduate students and teachers at Adama Science and Technology University. The students from different disciplines were gave an overview of their insight, feeling, and challenges related to the acceptance and result of AI tools usage on their academic performance.

Furthermore, the perceptions instructors from various faculties were given worth to the observation concerning the utilization of AI by students, and its impact on the learning outcomes.

3.4 Sampling Technique

The sampling technique used in this study was multi-stage sampling. In the first stage, a purposive sampling method was used to target undergraduate students and teachers from Adama Science and Technology University (ASTU).

The focus was on 4th- and 5th-year 2024-2025 academic calendar undergraduate students, as they are more likely to have substantial knowledge about the study topic and possess relevant academic experience, making them suitable respondents for the research (Etikan et al., 2016).

Secondly, by using simple random sampling method participants were selected from the 4th- and 5th-year 2024-2025 academic calendar undergraduate students across various disciplines, ensuring that the sample was representative of the broader student population.

Teachers, on the other hand, were selected directly through random sampling to maintain fairness and eliminate selection bias (Taherdoost, 2016).

This approach ensures a balanced representation of perspectives, allowing for meaningful insights into the acceptance and impacts of AI tools use on student academic performance.

3.5 Sample size determination method

To determine the appropriate sample size for this study (Yamane, 1973) formula was applied. This formula offers an easy and effective way to figure out the right sample size when total population is known. It's especially helpful when there are limits on time, money, or other resources. This approach works well for social science and education research because it helps to decide how precise results to be setting by acceptable margin of error (Yamane, 1973). Yemane's formula is expressed as follows:

$$n = \frac{N}{1+N(e^2)}$$

Where:

n = required sample size

N = total population (students and teachers at ASTU)

e = margin of error (5% or 0.05)

Using this formula, the sample size was determined based on the total students and teachers from different discipline. This method ensures a representative sample while maintaining statistical accuracy in the findings. Number of total populations was obtained from ASTU registrar.

Table 3.1 Total number of population targeted for the study

2024 – 2025 Academic Year		
COLLEGES	Male	Female
Electrical Engineering and Computing	654	209
Mechanical, Chemical and Materials Engineering	226	42
Civil Engineering and Architecture	325	119
Sub total	1205	370
Total = 1575		
Teachers	44	8
Total =52		

Source: ASTU Registrar (2025)

The total population targeted to this study was 1545 students. Using (Yamane, 1973) formula.

$$n = \frac{1575}{1 + 1575(0.05^2)}$$

$$n = 318 \text{ Students and}$$

$$n = \frac{52}{1 + 52(0.05^2)}$$

$$n = 46 \text{ Teachers}$$

318 Students and 46 teachers were selected as a sample. The total sample that used on this study including both teachers and students from different disciplines was 364.

3.6 Data gathering tools

The data used for this research was obtained from both primary and secondary sources. Secondary data was obtained from institutional records that related information about student profiles and a number of teachers particularly from the human resource and registrar Department. Additionally, the researcher used secondary data with regard to grade point average (GPA).

The primary data was obtained directly from students and teachers at ASTU. Likert scale questionnaires were used for students' responses and Open-ended questionnaire were used to collect insights from teachers regarding student behavioral changes due to AI technology. Open-ended questions, enabling a more in-depth exploration of participants' perspectives (Creswell & Creswell, 2017).

3.7 Variables for the study

For each of research objective the following study variables were identified.

Objective 1: To identify the key factors influencing the acceptance of AI tools among students at ASTU.

To address this study objective the researcher was extended Unified Theory of Acceptance and Use of Technology (UTAUT) theoretical model. Based on this model the researcher was identified six variables that affect the adoption of AI tools usage by the students. These variables are Performance Expectancy (PE), Facilitating Condition (FC), Assessment Effectiveness (AE), Students Interactions (SI), Information Accuracy (IA) and Pedagogical Fit (PF).

To measure these variables items were developed from different literatures. Respondent gave their perception for each item from strongly dis agree to strongly agree responses. And the researcher was used average values of each item to analysis the data.

To measure students' academic performance improvement expectation five measurement scale were taken from Venkatesh et al. (2016). And extended by Dahri et al.(2024).

The data collected from these items sheds light on how students view the impact of AI tools in their academic routines. It shows how they rely on these tools to simplify everyday campus tasks and to find academic information more easily. Many students expressed that AI helps them tackle academic challenges faster and more effectively. The responses also reveal that students believe using AI could lead to better academic performance. Moreover, their choices reflect a clear interest in using AI tools that add real value to their daily university experience.

To measure facilitating condition to use AI tools five indicators were taken from Venkatesh et al.(2016) and extended by Dahri et al.(2024). These items helped reveal how students experience the ease of using AI tools in their learning. They highlight whether students find these tools simple and helpful during their study sessions. The responses also show how clearly students can follow the instructions and communication from the tools, along with how easy and comfortable they feel using them in practice.

To measure assessment effectiveness four statements used from Dodeen (2023). These items explored how students experience AI tools when it comes to assessments and accessing information. They looked into whether students feel that AI-enhanced quizzes and tests are useful and whether the results they receive are accurate and trustworthy. The items also considered how quickly students can find the information they're looking for using AI, and whether the assessments reflect what they were actually supposed to learn.

To measure students interaction with AI tools the researcher adopted five items from Wei et al. (2023). These items offered a glimpse into how students feel about using AI tools going forward. They looked at how open students are to continuing their use of AI and whether they're currently satisfied with the experience. The responses also reflected students' curiosity and interest in exploring how AI tools might further support and improve their academic life.

Information accuracy was measured by five items taken from Farooq et al. (2017). And it extended by Dahri et al.(2024). These items looked into how students feel about the information they get from AI tools whether they see it as reliable and accurate. They also considered how well these tools fit with students' academic needs and if the information provided is both up-to-date and useful. Along with this, the items captured how much students trust AI tools when using them to support their academic work

Similarly, the researcher used five factors to measure pedagogical fit this factors taken from Pittalis (2021). These factors helped us understand which AI tools students prefer based on how they learn and how they're taught. They also showed how well these tools fit with different learning styles and how easily they can be adjusted to suit various learning situations and research approaches.

The **characteristics** of the variable were shown on table 3.2 **given below**.

Table 3.2 Characteristics of study variables

Variables	Code	Measurement
Performance expectancy	PE	Ordinal: Likert scale (1-5)
Facilitating condition	FC	Ordinal: Likert scale (1-5)
Assessment Effectiveness	AE	Ordinal: Likert scale (1-5)
Students' Interaction	SI	Ordinal: Likert scale (1-5)
Information Accuracy	IA	Ordinal: Likert scale (1-5)
Pedagogical Fit	PF	Ordinal: Likert scale (1-5)

Objective 2: To examine impact of AI tools usage on student academic performance.

To examine impact of AI tools usage on student academic performance correlation and regression analysis were performed. The correlation analysis determined how strongly and in which direction variables are related. And the regression analysis was performed to determine the predictive capacity of independent variables on student's outcome.

To address these research objective four variables were chosen and listed below.

Dependent variable

Academic performance improvement (GPA Improvement) was predicted variables in this study. To measure this variable first student were asked when they started to use these tools. And the difference of current GPA with GPA when they started was calculated. This GPA difference value was changed into categorical range. And the variable was treated as ordinary variable. To measure GPA improvement there is no standardize threshold. However different studies used their own category based on GPA difference observed on the selected sample. For this study the researcher used the following ranges by observing GPA difference of the selected sample. And the researcher analyzed this variable as ordinal based classification given on table 3.3.

Table 3.3 GPA range and interpretation

Change in GPA	Interpretation	Descriptions
Change ≤ -0.30	Significantly Worsened	Large drop in academic performance
$-0.29 \leq \text{Change} \leq -0.10$	Slightly Worsened	Minor GPA decline
$-0.09 \leq \text{Change} \leq +0.09$	No significant change	Stable
$+0.10 \leq \text{Change} \leq +0.29$	Slightly Improved	Minor improvement
Change $\geq +0.30$	Significantly improved	Strong positive change in GPA

Source: Own data set

Independent Variables

In this study the researcher used four predictors. These are AI tools usage, class attendance, use of computer or laptop and hours of reading

To determine AI tools usages the five items were constructed. Each item contained Likert scale choices for respondent from strongly disagree to strongly agree. In order to analysis the data average value was taken.

Five items were created to accesses class attendance of students. For each item Likert scale response were prepared which indicate level of agreement of respondent. In order to analysis the data average values of items were taken.

Five items were used to measure average study time of student used for their study. And dummy variables of item were used both students had an access to laptop or computer or not. The characteristics of this variable were presented on table 3.4 given below.

Table 3.4 Characteristics of predictors' variables

Variables	Code	Type	Measurement
Academic Performance Improvement	GPA IMP	Dependent	Ordinal Y =1 significantly worse Y= 5 significantly improve
AI Tools Usage		Independent	Ordinal: Likert scale (1-5)
Hours of reading		Independent	Continuous Average study hour per week
Number of classes attended per week		Independent	Continuous Average class attendance per week
Use of laptop or computer		Independent	Dummy 1= use of laptop or computer 0= no use of laptop or computer

3.8 Data gathering procedures

Before distributing the questioners' pilot study was conducted to check understandability of the questionnaires.

3.8.1 Pilot study

Pilot investigation, was carried out on 5 teachers and twenty (n=20) under graduated ASTU students on March 2025. From 25 pilot study participant 23 questionnaires were returned, the remaining three (n=3) questionnaires' but not return. After analyzing the responses of pilot study participant some of the items were adjusted.

After all items revised, the researcher was started to distribute the questionnaires. Before distributing the questionnaires, the respondents were briefly informed about the objective and purpose of the study.

3.8.2 Survey response

Data gathering activity was completed in one month march (2025). Out of total distributed sample size, students (318) and teachers (46) total 64 questionnaires' 285 valid students' response and 43 teachers' response were obtained and used for analysis. Survey responses summery were indicated on the table 3.5 given below.

Table 3.5 Survey responses summery

Participant	Total Questionaries’	Unreturned Questionaries’	Incomplete Questionaries’	Valid Questionaries’ used for analysis		
Students	318	19	14	Male	238	Total
				Female	47	285
Teachers	46	3	0	Male	38	43
				Female	5	
				Total =328		

Source: Own survey (2025)

3.9 Data analysis tools and procedure

Descriptive and inferential analyses were used to analyze the data. In order to analysis the data was analyzed using Statistical Package for the Social Sciences (SPSS) software. By using this software descriptive and logistic regression analysis were performed. Tables and graphs were used to present the results.

Objective 1: To identify the key factors influencing the acceptance of AI tools among students at ASTU.

By extending Unified Theory of Acceptance and Use of Technology (UTAUT) six factors were identified. Based on these factors descriptive analysis which includes mean, median, variance and percentage analysis were performed.

Objective 2: To examine impact of AI tools usage on student academic performance.

To investigate the impact of AI tools usage on students' academic performance logistic regression and correlation analysis were performed.

The regression and correlation analysis were conducted using AI tools usage, Class attendance, Use of computer and Hours of reading predictors.

The equation for this analysis is given as:

Academic performance Improvement =
 $f(\text{AI tools usage, Class attendance, Use of computer, Hours of reading})$

Ordinary Logistic Regression Model

Ordinary Logistic regression analysis extends the techniques of multiple regression to research situations in which the outcome variable is Ordinary (Mbada et al., 2013).

The model equation given by:

$$\text{Log} \left[\frac{P(Y \leq j)}{1 - P(Y \leq j)} \right] = \alpha_i - (\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k) \dots \dots \dots (1)$$

Where:

α_i -cut-off points

Predictors = ($x_1, x_2 \dots x_k$)

Academic performance Improvement = $f(\text{AI tools usage, Class attendance, Use of computer, Hours of reading})$

Academic performance improvement was measured using GPA difference and ordered from significantly worsened to significantly improved.

Independent variables

X_1 : AI tools usage. X_2 : class attendance X_3 : Hours of reading

X_4 : Use of laptop or computer

The model equation reduced into:

$$\text{Log} \left[\frac{P(Y \leq j)}{1 - P(Y \leq j)} \right] = \alpha_i - (\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4) \dots \dots \dots (2)$$

$$p(Y \leq j) = \frac{1}{1 + e^{-(\alpha_j - (\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4))}} \dots \dots \dots (3)$$

Objective 3: To investigate the potential perception of teachers on AI tools usage by their students

To investigate the potential perception of teachers on AI tools usage by their student's thematic analysis was performed which includes their recommendation. In this analysis advantage and drawback of AI tools were identified in teacher perspective. As well as, behavioral signs observed on student in academic situation also stated. Additionally, teachers' recommendation also included.

3.10 Reliability Test

Reliability in research means the consistency, stability and dependability of a measurement instrument. Reliability occurs when a research tool yields consistent results under consistent conditions across time. Certainly, reliability refers to the degree to which an instrument produces the same results on different occasions during persistent time (Creswell, 2014). Internal consistency is the most widely used for multi-item scales and is frequently assessed by computing Cronbach's alpha coefficient (Tavakol & Dennick, 2011). Cronbach's alpha (α) measures the level of homogeneity of a set of items as a group. It can take values between 0 and 1, the larger the value, the higher the reliability. For this study, the reliability test of the questionnaire with 43 items resulted in a Cronbach's alpha of 0.806. This falls within the "good" level, indicating that the items on the questionnaire have good internal consistency.

3.11 Ethical consideration

To protect the rights and welfare of study participants, ethical considerations were carefully observed. Informed consent was obtained from all respondents, ensuring they were aware of the study's objectives, that their participation was voluntary, and that their responses would remain confidential. The data collected was used solely for academic reasons, and all personal information was protected to preserve privacy. Participants were also free to withdraw from the study at any time without facing any consequences. The study upheld principles of fairness, transparency, and respect for all participants by adhering to established ethical research standards.

CHAPTER FOUR RESULT AND DISCUSION

In this study 43 ASTU teachers and 285 students' responses were used to analyze the data. The summery of respondents' geographical information was presented on the table 4.1.

Table 4.1 Sample students Demographic Information

Ranges of age in years				
Age	<=20	21-25	>=25	Total
frequency	6	263	16	285
Departments	4th year		5th year	
	Male	Female	Male	Female
Electrical Engineering	14	3	14	2
Material science Engineering	14	3	20	3
Software Engineering	21	3	18	4
Mechanical Engineering	20	4	18	3
Computer Science Engineering	18	3	22	5
Civil Engineering	24	4	20	4
Chemical Engineering	8	3	7	3
Sub Total	119	23	119	24
Total	285			

As indicated on the table 4.1 there were 285 students' responses used to analyze the data. The respondents in this study were predominantly university students in their early to mid-twenties. The majority, a staggering 92.3%, fell within the 21-25 age range, which is typical for those in their fourth and fifth years of study. Smaller percentages, 5.6%, were 25 or older, while only 2.1% were 20 or younger.

This age distribution aligns with the academic levels of the participants, indicating that the study captured the perspectives of students at the heart of the university experience. There were 119 males and 23 females for the fourth-year students, 119 males and 24 females for fifth year students. This indicates a wide gender difference, with male students largely dominating female students in all fields.

In terms of departmental representation, students came from seven different engineering disciplines: Electrical Engineering, Material Science Engineering, Software Engineering, Mechanical Engineering, Computer Science Engineering, Civil Engineering, and Chemical Engineering. Civil Engineering and Computer Science Engineering had the highest number of male students in both fourth and fifth years, indicating these are among the most populated departments. Software Engineering and Mechanical Engineering also had a substantial number of male respondents. On the other hand, Chemical Engineering had the fewest students overall. Female participation remained low in all departments, with slight variations ranging from two to five students per department in each year of study.

Additionally, in this study 38 male and 5 females' teachers were participated.

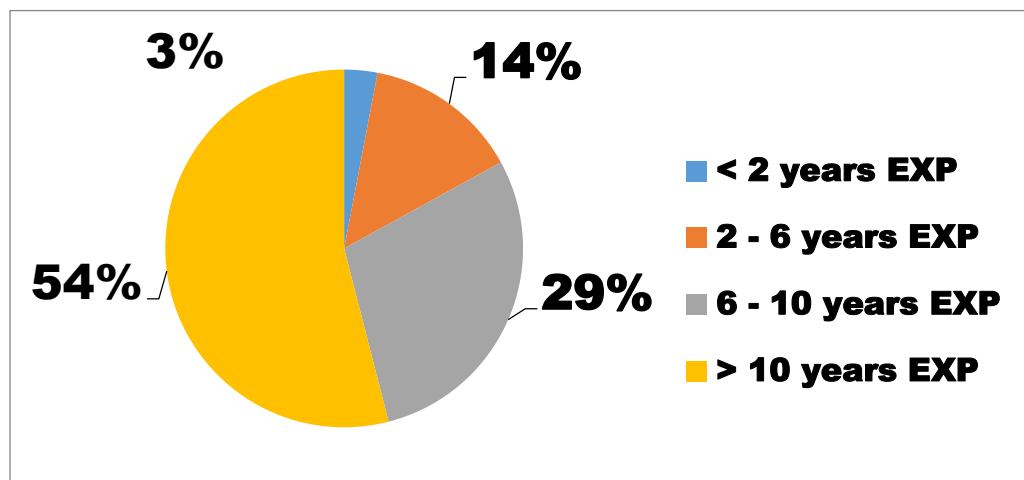


FIGURE4.1. Respondent teaching experience

In order to understand the professional backgrounds of the teachers participate on the research, data on their teaching experience was collected. The result shows that the majority of the teachers have significance teaching experience. Specifically, 54% (24 out of 43) respondent reported having more than ten years teaching experience.

In second place is 29% (12 teachers) who have been teaching for 6 to 10 years, 10% (6 teachers) have 2 to 6 years teaching experience.

However, only 1 teacher was reported only having less than 2 years teaching experience. As shown in the result majority of respondents have depth teaching experience, which adds significance insights to the study.

4.1 Factor affecting acceptance of AI tools

The table 4.2 presents' students' responses on factor affecting AI tools acceptance. On this table items with their average value were presented. As presented on the table, there were 28 items used to identify factor affecting AI tools acceptance. From 28 items the highest value was observed related to performance expectation variable.

This item provided information related to AI tools as they were time saving tools in the academic area. The respondent believes that using AI tools in education is one of methods of time saving.

The second items the shows highest value was item related to student interaction. This item provided information about respondent perception related to AI tools in the future. The result shows student will want to interact more with AI technology in the future.

In third item related to facilitating condition scored highest value. This item provided information related to simplicity of AI tools usage. As observed in the result AI tools were easy to use and user friendly.

On the other hand, items related to information accuracy provided smallest value. This item provided information about accuracy of answer obtained from these tools. As observed in the result sometimes these tools give wrong information.

Table 4.2 Description statistics of Items

Code	Items Description			
	Performance expectancy	Mean	Median	Variance
PE1	I find AI tools useful in my daily campus life	4.01	4.00	0.57
PE2	Using AI tools increases my chances of achieving academic-related information	3.89	4.00	0.65
PE3	Using AI tools helps me to accomplish my academic problems and managing academic matters more quickly	4.47	4.00	0.30
PE4	Using AI tools increases my productivity in academics	3.81	4.00	0.50
PE5	In general, I believe AI tools benefit for my academic life	4.02	4.00	0.62
Facilitating Condition				
FC1	Learning how to use AI tools is practical and easy	3.88	4.00	0.67
FC2	The communication and interaction with the AI tools are understandable and clear	3.80	4.00	0.74
FC3	I find AI Tool to became skill full easily	3.73	4.00	0.64
FC4	I find it easy to get the information as per my expectations while using an AI tool	3.79	4.00	0.61
FC5	I find AI tools easy and user friendly	4.09	4.00	0.64
Assessment Effectiveness				
AE1	Using AI tools enhances the effectiveness of my quizzes and assessments	3.74	4.00	0.79
AE2	Using AI tools leads to more accurate and reliable assessment results	3.71	4.00	0.80
AE3	Using AI tools allows me to get my results directly at the same time	3.72	4.00	0.75
AE4	Using AI tools increase the alignment between assessment effectiveness and learning objectives	3.66	4.00	0.88

Students' Interaction				
SI1	In the future, I am open to interact with AI to keep myself up to date on the latest era of technology/Courses	4.35	4.00	0.36
SI2	I am willing to devote my time and efforts to exploring the benefits of AI tool interaction	4.06	4.00	0.55
SI3	I feel comfortable getting information using AI tools	3.65	4.00	0.85
SI4	I feel free to ask questions while using AI tools	3.82	4.00	0.82
Information Accuracy				
IA1	AI tools provide accurate and reliable information for my academic purposes	3.74	4.00	0.63
IA2	Using AI tools is consistent with my learning purposes	3.65	4.00	0.73
IA3	AI tools contribute to delivering up-to-date and relevant content for my learning	3.71	4.00	0.68
IA4	I trust AI tools to collect information and knowledge	3.62	4.00	0.80
IA5	AI tools provide accurate and reliable information for my academic purposes	3.65	4.00	0.72
Pedagogical Fit				
PF1	AI tools align well with my current learning strategies and approaches	3.91	4.00	0.64
PF2	The integration of AI tools complements my learning style effectively	3.83	4.00	0.53
PF3	AI tools are adaptable to different learning contexts and research methods	3.94	4.00	0.68
PF4	Using AI tools feels seamless and integrated within my learning style	3.79	4.00	0.63
PF5	AI tools enhance content delivery in a way that resonates with my learning philosophy	3.68	4.00	0.77

Source: Own analysis (2025)

The average values of items presented on table 4.2 were categorized in to six categories to identify factors that influence the adoption of AI tools. The descriptive statistics of these variables were presented on table 4.3.

Table 4.3 Descriptive statistics of variables that influence AI tools adoption

		Performance Expectancy	Facilitating Condition	Assessments effectiveness	Student Interactions	Information Accuracy	Pedagogical Fit
N	Valid	285	285	285	285	285	285
	Missing	0	0	0	0	0	0
Mean		4.04	3.86	3.71	3.97	3.678	3.83
Median		4.00	3.800	3.75	4.00	3.60	3.80
Variance		0.200	0.301	.473	.215	.364	0.264
Range		2.20	2.40	3.50	2.50	3.00	2.60
Minimum		2.80	2.60	1.50	2.50	2.00	2.40
Maximum		5.00	5.00	5.00	5.00	5.00	5.00

Source: Own analysis (2025)

The descriptive analysis was performed using six variables that determined the adoption of AI tools among students. Valid sample sizes used in this analysis were 285 students. And Likert scale data was used. For each variable the maximum value observed in the data was 5.00-point scale and the minimum value were varied variables to variables. From the six variable performances expectancy had highest mean value of 4.04. And its median was 4.00 which were closely related with its mean value. Compared to others variables and it had minimum variance of 0.200.

This result shows performance expectancy was key factor to adopt AI tools. The finding was alligned with the study of (Dahri et al., 2024). The second variables that had higher mean value was student intractions which was 3.97 mean value. And it contained a median of 4.00. This variables had minimum variance wich is 0.215. This analysis shows students intraction was the second most important factor to adopt AI tools. This was alligned to the study of (Dahri et al., 2023). The third variables that had higher mean value was facilitating condition with the value of 3.86 and median of 3.80 0. This vauue shows it the data was symetrycally distriputed. And its variance was 0.301.

The average value for six factor to accept this tool were illustrated on figure 4.2

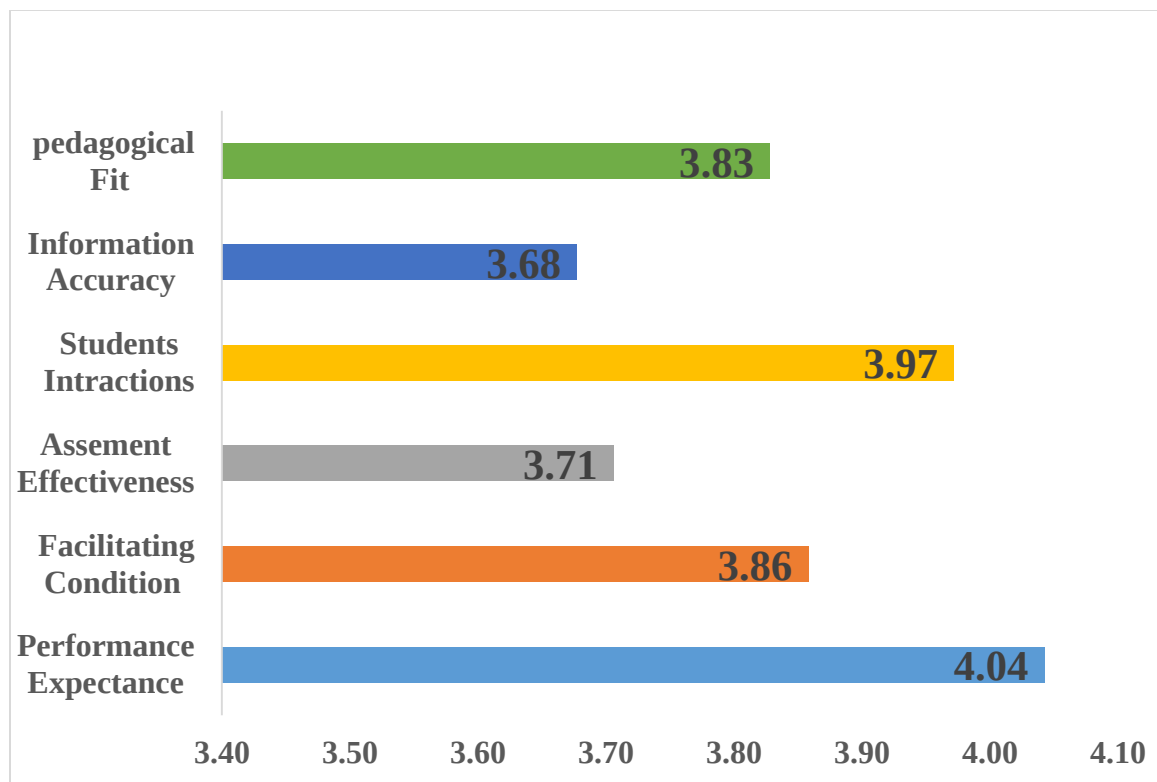


FIGURE 4.2 Average values of variables that affect AI tools adoption

Source: Own Analysis (2025)

Table 4.4 Summery of variables that influence adoption of AI tools

Variables	Strongly Agree		Agree		Neutral		Dis Agree		Strongly Dis Agree	
	FRQ	100%	FRQ	100 %	FRQ	100 %	FRQ	100%	FRQ	100 %
PE Average	79	28%	148	52%	49	17%	8	3%	0	0%
FC Average	62	22%	136	48%	71	25%	15	5%	0	0%
AE Average	51	18%	131	46%	74	26%	27	9%	2	1%
SI Average	77	27%	140	49%	54	19%	11	4%	3	1%
IA Average	44	16%	130	46%	86	30%	25	9%	0	0%
PF Average	59	21%	130	46%	84	30%	10	4%	0	0%

Source: Own Analysis (2025)

As shown on the table4.3 from total sample of respondent 28% of them strongly agree they adopt AI tools due to expectancy of academic performance improvement. And 52% of them agree expecting positive academics out comes key factor to adopt AI tools technology. Next to performance expectancy, student interaction is key factors to adopt AI tools by the student according to data obtained from the study. Thirdly, facilitating condition was other factor to boost the adoption of AT tools technology. In fourth place pedagogical fit has highest value to accept AT tools. Assessment effectiveness and information accuracy were other key factor to use those tools.

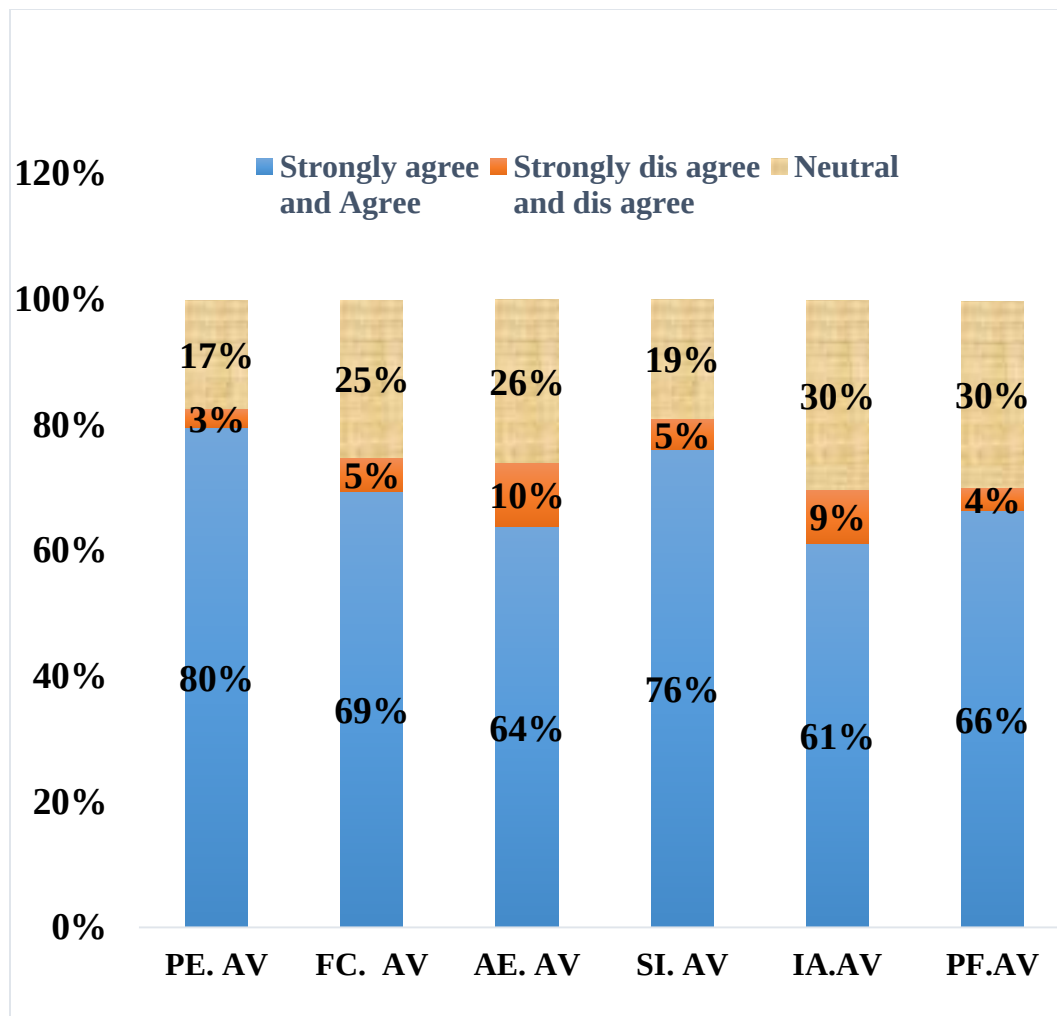


FIGURE 4.3 Respondent perceptions to adopt AI tools

Source: Own Analysis (2025)

Where:

PE. AV Average Performance Expectancy

FC. AV Average Facilitating Condition

AE. AV Average Assessments Effectiveness

SI. AV Average Students Interaction

IA. AV Average Information Accuracy

PF. AV Average pedagogical FIT

Respondents perception to adopt AI tools was illustrated on figure 4.3. From total respondents 80% were agreed that performance expectancy was key factor to to accept AI tools. This result strongly support study conducted by (Dahri et al., 2024).

Additionally 76% of respondents were agreed that students intraction was infulence the adoption of AI tools. This result aligned with the study of (A. M. Al-Rahmi, Al-Rahmi, et al., 2022). Similarly, 69% of respondents agreed facilitating condition was the third important factor to adopt AI tools. This out put was suport investigation done by (Foroughi et al., 2023).

In the fourth place pedagogical fit was other factors to adopt AI tools. It was supported by 66% of respondents. This study out put has direct relation ship with the study conducted byPittalis (2021). Also 64% of respondant agreed that assessment effectiveness was additional factors for the adoption of these tools. Which was aligned with Fergus et al.(2023) study.

Lastly information accuracy is another factor to accept this tool. It was supported by 61 % of respondent. This result was closer to the study of Foroughi et al. (2024). To sum up performance expectancy, student interaction, facilitating condition, pedagogical fit, assessment effectiveness and information accuracy were key factors to accept AI tools in education area.

4.2 Impacts of AI tools usage on student academic performance

In this section the relation ship between students acadamic performance spesificaly, their average grade point (GPA) and AI tools usage, study hours,class attendance and use of laptop/computer was explained.

AI tools Usage

The respondents were asked either they use this tools or not for their acadamic work. Table 4.5 illuminate a summery about, either respondent uses or not AI tools.

Table 4.5 Summery of AI tools usage

AI TOOLS USE	4 th YEAR		5 th YEAR		TOTAL	
	FRQ	PER (100%)	FRQ	PER (100%)	FRQ	PER (100%)
YES	122	99%	161	99%	283	99%
NO	1	1%	1	1%	2	1%

Source: Own Analysis (2025)

As observed on the table 4.5 from 285 student 283 (99%) of them use AI tools. This result implies that almost the students were adopt these tools.

The past three years students were adopting these tools. Table 4.6 shows when students start to use these tools. This table shows that 81% of respondent started to use these tools the past three years. On the other hand, 2.5% of them were started to use these tools before university.

Table 4.6 Students responses on when they began to use AI tools

Start to use	4 th Years		5 th Years		Total	
	FRQ	Percent (100%)	FRQ	PER (100%)	FRQ	PER (100%)
Before university	4	3%	3	2%	7	2%
1ST Year	32	26%	10	6%	42	15%
2ND Year	58	48%	65	40%	123	43%
3RD Year	25	20%	72	44%	97	34%
4TH Year	4	3%	8	5%	12	4%
5TH Year	----	-----	4	2%	4	1%
			Total		285	100%

Source: Own Analysis (2025)

The usage frequency of AI tools in academic purpose illustrated on the table 4.7.

Table 4.7 Usage frequency of AI tools in academic activity

	4th Years		5th Years		Total	
FRQ. OF USAGE	FRQ	PER (100%)	FRQ	PER (100%)	FRQ	PER (100%)
Never	1	1%	1	1%	2	1%
Rarely	7	6%	4	2%	11	4%
Sometimes	40	33%	65	40%	105	37%
Often	48	39%	69	43%	117	41%
Always	27	22%	23	14%	50	18%

Source: Own Analysis (2025)

The result obtained from the respondent shows the large percentage (41%) of respondent often use AI tools. Similarly, 35% of them sometimes use these tools. However, 18% of them always use AI technology. But small percentage (5%) rarely used this technology. The details of usage frequency summarized on the table 4.7.

Students' academic result summery

This section provided overview about students' academic performance-based GPA data collected from ASTU registrar. The data reflect about GPA trend of the sample students. On the figure 4.4 average values of GPA was indicated. In this study seven academic semesters were observed for 5th year (2024-2025) academic year students. And five academic semesters were observed for 4th year's (2024-2025) academic year students. The data obtained from the ASTU registrar shows students GPA shows improvement from semester to semester. This GPA change illustrated on figure 4.4.

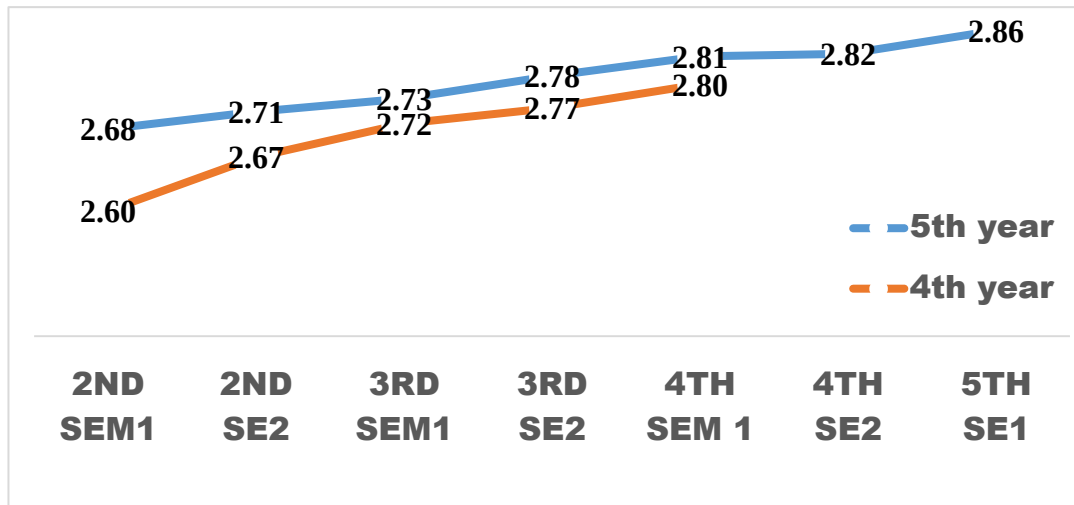


FIGURE 4.4 Average GPA distributions of sample (2022-2025)

Source: ASTU Registrar (2025)

4.2.1 Regression and Correlation analysis

This section described the correlation and regression output that conducted to investigate the relationship between AI tools usage and student academic outcomes in Ethiopian higher education in the case of ASTU. The correlation result shows how strongly and in which direction variables are related. And the regression analysis was performed to determine the predictive capacity of predictors' variables on student's outcome.

The academic performance measured by students GPA. The independent variables considered in order performing correlation and regression analysis was Student Academic performance improvement and measured by GPA. The predictors of this analysis were AI tools usage, study hour, class Attendance and use of Laptop/Computer

By using those variables correlation analysis was performed to examine the relationship between dependent and independent variables. The result was illustrated on table 4.7 given below.

Table 4.8 Spearman's rho Correlations analysis output

Spearman's rho Correlations		GPA IMP	Average AI tools usage	Average study hours	Average Class Attendance	Use of Laptop/ Computer
GPA IMP	Correlation Coefficient	1.000	.597**	.548**	.303**	.411**
	Sig. (2-tailed)	.	.000	.000	.000	.000
	N	285	285	285	285	285
Average AI tools usage	Correlation Coefficient	.597**	1.000	.441**	.187**	.319**
	Sig. (2-tailed)	.000	.	.000	.002	.000
	N	285	285	285	285	285
Average study hours	Correlation Coefficient	.548**	.441**	1.000	.285**	.267**
	Sig. (2-tailed)	.000	.000	.	.000	.000
	N	285	285	285	285	285
Average Class Attendance	Correlation Coefficient	.303**	.187**	.285**	1.000	.022
	Sig. (2-tailed)	.000	.002	.000	.	.715
	N	285	285	285	285	285
Use of Laptop/Computer	Correlation Coefficient	.411**	.319**	.267**	.022	1.000
	Sig. (2-tailed)	.000	.000	.000	.715	.
	N	285	285	285	285	285

**. Correlation is significant at the 0.01 level (2-tailed)
Source: Source: Own Analysis (2025)

The interpretation of the correlation results was followed guide lines set by Cohen (2013). According to Cohen (2013) when the correlation coefficient lies between 0.1-0.29 weak correlation, 0.30- 0.49 moderate, 0.50 – 0.69 moderately strong, 0.70 – 0.89 strong and 0.90 -1.00 very strong correlations.

The correlation analysis shows the association between AI tools usage and GPA Improvement had significantly ($p\text{-value} = 0.00$) and strong moderately ($r = 0.597$) positive relationship. This indicates the association between AI tools usage and academic performance is not by chance since; its $p\text{-value}$ is less than 0.05. It was statically significance (“Discovering Statistics Using R,” 2012).

Additionally, the correlation coefficient between AI tools usage and academic performance improvement were 0.597. This value indicates AI tools usage and GPA improvement had moderately strong relationship. This relationship implies incorporating AI tools in learning process enhances students’ academic performance by increasing personalized learning, efficiency and learning engagement of student. This result aligned with the research conducted by Fadel et al.(2019). Which was generative AI helping the improvements of student outcomes in higher education.

Similarly, the result obtained from correlation analysis shows study hours and GPA improvement had significantly ($p\text{-value} = 0.00$) and strong moderately ($r = 0.548$) positive relationship. The analysis shows the two variables had a moderate positive and significance relationship. This result implies that the students who spent more time for studying more likely experience for GPA improvement. To sum up, spent more time in studying is key factor for academic success. This output was aligned studies conducted by Nonis & Hudson (2010).

Additionally, class attendance and GPA improvement had significantly ($p\text{-value} = 0.00$) and moderately ($r = 0.303$) positive relationship.

Based on the result obtained from the analysis class attendance and GPA improvement had moderate and significance positive correlation. The output indicates the better class attendance associate with GPA improvement, but not strong as study time and AI tools usage.

And use of laptop and GPA improvement also significantly ($p\text{-value} = 0.00$) and strong moderately ($r = 0.411$) positive relationship

There were moderate positive and significance relationship exists between these two variables. This result suggested that students who use laptop/computer tend to have better GPA improvement. This output implies access to digital device and digital literacy support learning, productivity and research.

In addition to this, AI tools usage and study hour have moderate positive and significance correlation. Similarly, use of AI tools and use of laptop/computer have moderate positive and significance.

To determine the predictive capacity of independent variables on students' outcome ordinary logistics regression analysis was performed. Regression output provided case processing summery, modeling fitting information, Goodness of Fit, Pseudo R- Square, parameter estimation and Parallel line test.

The case processing summery output shows 285 valid respondents were used to analysis the data. Additionally, no missing value was indicated. Majority of respondents (34%) GPA was slightly improved and 30.9% of them were significantly improved.

However, only 3.3% respondents GPA were significantly declined. On the other side 86% of respondents have an access to laptop or computer. But 14% of respondent have not laptop/computer access.

Modeling fitting information shows the final model contains all predictors. And -2 Log Likelihood ($-2LL$) of 535.481 which was much lower than intercept (727.949), which serve as base line. It indicates better fit than null hypothesis. and Chi-Square of 192.469 which indicates improvement in model fit compered to null hypothesis("Discovering Statistics Using R," 2012).

Table 4.9 Regression output for Model Fitting Information

Model Fitting Information				
Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	727.949			
Final	535.481	192.469	4	<.001

Link function: Logit.

Source: Source: Own Analysis (2025)

On the other side (df=4) was indicated on the output. It implies the model have four predictors. Additionally, the model fit information has p-value <0.001 which is less than 0.05. It implies that the model fit statistically highly significance.

Table 4.10 Regression output of Goodness-of- Fit

Goodness-of-Fit			
	Chi-Square	df	Sig.
Pearson	888.546	1020	.999
Deviance	518.609	1020	1.000

Link function: Logit.

Source: Source: Own Analysis (2025)

Goodness - of - Fit table contains the Pearson and Deviance Chi – Square tests. These test useful to determine either the given data fit with ordinary logistic regression model or not. According to Discovering Statistics Using R (2012) non significance test was indicators of either the given data fit the model or not.

As observed on the table 4.9 both Pearson and Deviance Chi – Square value were non-significant. These outputs suggest good fit model.

Table 4.11 Regression output of Pseudo R – Square

Pseudo R-Square	
Cox and Snell	.491
Nagelkerke	.530
McFadden	.258

Source: Source: Own Analysis (2025)

Nagelkerke R- square value observed on regression output was 0. 53. It implies that 53% of variance in GPA improvement was explained by dependent variables found on the model. According to (Nagelkerke, 1991) this value was significant.

Ordinary logistic regression Parameter estimate result shows the effects of the use of AI tools, study hours, attending courses and access to digital devices on the probability of obtaining good academic outcome. Table 4.11 shows reports of regression coefficients, significance levels, and odds ratios. All predictive factors in the model were significant $p < .001$, showing a strong effect on the outcome.

The regression output shows the effect of predictors' variables on dependent variable. On table 4.11 the estimates values and the level of significance were indicated. As observed on this table, the significances value of all predictors < 0.001 and they were strong and positive effect on dependent variable (GPA IMP).

Table 4.12 Parameter estimates of ordinary logistic regression

		Parameter Estimates					95% Confidence Interval	
		Estimate	Std. Error	Wald	Df	Sig.	Lower Bound	Upper Bound
Threshold	[GPA IMP = 1]	5.189	1.208	18.462	1	<.001	2.822	7.556
	[GPA IMP = 2]	7.697	1.123	46.944	1	<.001	5.496	9.899
	[GPA IMP = 3]	10.991	1.216	81.722	1	<.001	8.608	13.373
	[GPA IMP = 4]	13.262	1.298	104.339	1	<.001	10.717	15.806
Location	Average AI tools usage	1.508	.232	42.260	1	<.001	1.053	1.962
	Average study hours	1.083	.204	28.189	1	<.001	.683	1.483
	Average class attendance	.664	.190	12.252	1	<.001	.292	1.036
	[Not have laptop/ computer =0]	-2.049	.406	25.458	1	<.001	-2.845	-1.253
	[have laptop/computer=1]	0 ^a	.	.	0	.	.	.

Source: Own Analysis (2025)

The first significant predictors variable shown in table 4.11 is average AI tools usage, with coefficient, 1.083 and p-value =0.001<0.05. This result implies that effective usage of AI tool increase by one unit, we expect a 1.508 increase in the order log odds of being in a higher level of academic outcomes given that, all other predictors in the model held constant.

These result shows, effective usage of AI tool enhances students' academic performance by increasing personalized learning, providing fast feedback. It also reduced spent time to address single problem. Additionally, it provided target answer to any question. Also, it reduced language barriers by addressing translation. Study conducted by (Luckin & Holmes, 2016), argument of AI in education shows related to this output. They study implies that AI tools were supportive technology for improvements of students' academic outcome by facilitating personalized learning and providing adaptive learning technique.

To sum up, effectively and wisely usage of AI tool increase student academic GPA. This result aligned with studies conducted by Boubker (2024), Dahri et al.(2024), Huang et al., (2023) and Ward et al.(2024).

For average study hours with coefficient, 1.083 and $p\text{-value} = 0.001 < 0.05$, shows that, for one unit increase average study hours, we expect a 1.083 increase in the order log odds of being in a higher level of learning outcomes by making all other variables in the model constant. This result shows, increasing study hours enhances student GPA. This result supports investigation conducted by Credé & Kuncel (2008 and Jafari et al.(2019).

Similarly, average class attendance with coefficient, 0.664 and $p\text{-value} = 0.001 < 0.05$, shows that, for one unit increase average study hours, we expect a 0.664 increase in the order log odds of being in a higher level of learning outcomes by making all other variables in the model constant. This result shows class attendance boost students GPA. Attending class could create communication with instructors, accessing course material on time and it used to discuss with class mate. Those factors are base for students to enhances their academic out comes. Similarly studies conducted by (Dey, 2018; Ha et al., 2024) shows attending class was key mechanism to improve learning out comes.

On the other hand, not access laptop/computer with coefficient, -2.049 and $p\text{-value} = 0.001 < 0.05$ negatively associated with GPA improvement. Students who have not access for laptop/computer had about 87% of lower odd of GPA improvement. This result shows digital divided affect students' academic improvement. This result associated with study conducted by Assefa et al. (2025).

Table 4.13 Odds ratio and confidence interval

Predictors	Odds Ratio	95% Confidence Interval	
		Lower Bound	Upper Bound
Average AI tools usage	4.52	2.87	7.11
Average study hours	2.95	1.98	4.41
Average class attendance	1.94	1.34	2.82
[Not have laptop/ computer =0]	0.13	0.06	0.29

Table 4.12 presents the coefficient parameters converted to proportional odds ratios and their 95% confidence intervals. The odds ratios were derived by exponentiation of coefficients parameters. These odd ratios are strictly in line with the proportional odds assumption. This assumption states that the odds ratios are the same across categories of the dependent variables (Sesay et al., 2021).

As indicated on the table effective usage of AI tool increase by one unit related with over 4.5 times greater odds of achieving higher GPA Improvement category. In 95% confidence interval this value found between 2.87 lower bound and 7.11 upper bound of the odd ration.

Additionally, increasing average study hour by one unit related with nearly 3 times higher odds ratio of GPA improvement category with 95% confidence interval this value found between 1.98 lower bound and 4.41 upper bound of odds ratio value.

Thirdly, increasing class attendance by one unit related with nearly 2 times higher odd ratio of GPA improvement category with 95% confidence interval this value found between 1.34 lower bound and 2.82 upper bound of odds ratio value.

On the other hand, students who have not access for laptop/computer had about 87% of lower odd of GPA improvement.

To check the assumption of ordinary logistic regression parallel line test was performed. Parallel line test indicates either the proportional odd assumption satisfied or not. According to Peng et al., n.d.(2003), if the significance value greater than 0.05 proportional odds assumption is full field. The significance value on parallel line test was 0.064 which is greater than 0.05. This value shows the assumption was satisfied.

Table 4.14 Test of parallel line

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Null Hypothesis	535.481			
General	515.311 ^b	20.169 ^c	12	.064

Source: Own Analysis (2025)

4.3 Potential perception of teachers on AI tools usage by their students

To obtain the perception of teachers on the usage of AI tools by their students the first open ended question raised to them was they believe either AI tools contributed to students' academic performances. The second question raised to them was the behavioral sign they observe on their student either they use or not these tools. Thirdly the researcher was asked them benefit of this tools in teaching and process. Additionally, their recommendation also included.

Most teachers expressed the view that AI tools have a positive impact on students' academic performance. They attributed this to the way students use these tools to deepen their understanding, build skills, and enhance their overall learning experience. Teachers noticed that many students make thoughtful and responsible use of AI, especially when it comes to referencing and citing sources. They also observed that as long as students maintain a balanced approach without becoming overly reliant AI can be a powerful aid in academic success.

Teachers observed that AI tools bring a range of meaningful benefits to student learning. They noted that these tools help students' access information more easily, improve how they organize their writing, and save time on various academic tasks.

AI also encourages independent learning by guiding users through tasks like grammar correction and content editing. According to teachers, students have shown noticeable growth in both their skills and understanding. The tools often provide clear, summarized responses to questions, offer quick feedback, and contribute to better overall language use.

Many teachers noticed certain behavioral patterns suggesting that students were relying on AI tools for their academic work. One common observation was the use of very similar wording in assignments, and in some cases, even identical responses were submitted by different students. This raised concerns about growing dependence on such tools. Although some of the answers submitted were notably clear and well-structured—often pointing to AI involvement there were also signs of student disengagement. For example, some learners seemed careless when completing assignments, struggled with paraphrasing, and participated less actively in class discussions. Teachers also observed a decline in students' ability to think critically or analytically. In addition, a few students tended to work alone and submitted content that followed a uniform style, which seemed to match typical AI-generated writing.

Teachers shared a range of suggestions for how AI tools could be thoughtfully integrated into the educational process. They emphasized the need to guide students on using these technologies effectively, encouraging awareness of both their benefits and limitations. In addition to teaching proper use, educators highlighted the importance of fostering ethical and balanced engagement with AI tools. Rather than relying on a single essay question, they recommended offering varied types of assignments. They also underlined the value of providing psychological support not just to help students use AI tools, but to build their confidence in understanding and even developing such tools themselves. Encouraging students to treat AI as a supplementary aid rather than a replacement was another key point.

From a broader, policy-focused viewpoint, teachers advocated for incorporating AI literacy directly into the curriculum. Also they proposed designing tasks that integrate pedagogical methods and classroom teaching, helping students engage with AI in a more hands on and meaningful way. Creating a clear framework for AI usage, along with enforcing plagiarism guidelines, was also seen as essential to promoting responsible and constructive use of these technologies in academic settings.

To sum up the result obtained from teachers' response shows that, in the current era AI technology were one of the powerful and globally spread innovations. Especially in education center it changes the way information was searched. These tools solve any academics problems and it is accessible 24 hours seven days. It boosts students to train personalized learning. On the other side if it is not well managed and unwisely used it may hide students' critical thinking and the ability independent decision-making capability as well as encourage laziness. They also recommended academics administrator and policy makers to include AI tools usage and development frame work. Additionally, they recommended following a strategy that increase field work and lab practice enhance student performance addition to theoretical knowledge obtained in teaching and learning processes.

CONCLUSSION AND RECOMMENDATION

CONCLUSSION

This study explored Impact of Artificial Intelligence Use on Students' Academic Performance in Ethiopian Higher education: In the Case of Adama Science and Technology University. The study aimed to identify factors that affect AI tools acceptance, impact of AI tools usage on student academic performance and its potential draw back. The study was employed mixed-method cross-sectional design. In the study 285 students and 43 teachers were participated. The numbers of respondents were calculated using (Yamane, 1973) sample size determination formula. To select these respondent multi stages sampling technique was applied. And every ethical consideration was taken to account during data gathering process. In the research both primary and secondary data were used. The primary data was obtained directly from respondent using questionnaires. Additionally, secondary data was taken from ASTU registrar. The research was completed in six months starting from January 2025 to June 2025. To address the study objectives thematic and statistical analysis were performed.

To investigate factors affecting AI tools adoption six variables were identified using extended Unified Theory of Acceptance and Use of Technology (UTAUT) theoretical model. Based on this model, Performance Expectancy (PE), Facilitating Condition (FC), Assessment Effectiveness (AE), Students Interactions (SI), Information Accuracy (IA) and Pedagogical Fit (PF) were considered as key factors to adopt AI tool. To measure each factor 28 items were used. For each item the respondent were provided the level of agreement from strongly disagree to strongly agree. Result shows From total respondents 80% were agreed that performance expectancy was key factor to accept AI tool. They believes that using AI tools was useful for their campus life. Additionally 76% of respondents were agreed that students intraction was infulence the adoption of AI tools. This result shows intraction with this tools create word of mouth information. And it opens way for the spread of of this tools among students.

Similarly, 69% of respondents agreed facilitating condition was the third important factor to adopt AI tools. Simplicity and user freindely characterstics of this tools made student to adopt it. According to the respondent perception pedagogical fit and assessment effectiveness ranked on fourth and fith place.

Based on this study information accuracy was last factor for the adoption of these tools. It was supported by 61 % of respondent. To sum up performance expectancy, student interaction, facilitating condition, pedagogical fit, assessment effectiveness and information accuracy were key factors to adopt AI tools in education area.

Secondly to navigate the impacts of AI tools usage on student academic performance correlation and ordinal logistic regression analysis were performed. These statistical analyses were performed using four predictors. The outcome variable was measured by GPA improvement. The maximum GPA difference observed for selected sample was 0.81 and the minimum difference was -0.37. On average 0.17 differences was observed.

To measure the predictors variables likert questionnaires were used. From total population 99% of them were used AI tools. And more than 50% respondets were frequently used these tools. The majority of the respondat adopted this tools when they were second and third year student. However 2.3% them were started to use these tools before university.

The correlation result obtained from statistical analyisis shows acadamic performance improvement and AI tools usage had moderately strong relationship. Since the p- value was 0.000, their relationship were not happen by chance it is statitically significant. Additionally the correlation coefficient between AI tools usage and academic performance was 0.597. This value indicates AI tools usage and GPA improvement have moderately strong relationship. This relationship implies incorporating AI tools in learning process enhances students' academic performance by increasing personalized learning, efficiency and learning engagement of students.

The second predictor that had significant correlation with GPA improvement was study hour with p- value of 0.000 and 0.548 coefficient of correlation. This result shows the two variables had a moderate positive and significance relationship. The stud implies that the students who spent more time for studying more likely experience for GPA improvement.

Other key factor to GPA improvement was student class attendance. Based on the result obtained from the analysis class attendance and GPA improvement had moderate and significance positive correlation. This variable had p-value of 0.000 and 0.303 Coefficient of correlation. The output indicates the better class attendance associate with GPA improvement, but not strong as study time and AI tools usage.

Additionally, access to laptop/computers other factors for academic outcome improvement. They had p-value 0.000 and coefficient of correlation 0.411. This value shows the two variables had moderate positive and significance relationship. This result suggested that students who have use laptop/computer tend to have better GPA improvement. This output implies that access to digital device and digital literacy support learning, productivity and research on education sector.

Similarly, ordinal logistic regression was performed using the predictors. The output shows estimate coefficient 1.508 and p-value <0.001. This result indicates Effective usage of AI tool increase by one unit related with over 4.5 time's greater odds of achieving higher GPA Improvement.

These result shows, effective usage of AI tool enhances students' academic performance by increasing personalized learning, providing fast feedback. It also reduced spent time to address single problem. Additionally, it provided target answer to any question. Also, it reduced language barriers by addressing translation. To sum up, effectively and wisely usage of AI tool increase student academic GPA.

Additionally, study hours and class attendance were key factors for GPA improvement. The regression result shows, both predictors were significant p value which is less than

0.001 and estimate coefficient of 1.083 and 0.664 respectively. Also access to laptop/computer other factor for GPA improvement. The result shows students who have not access for laptop/computer had about 87% of lower odd of GPA improvement. Lastly, perception of teachers on AI usage by their student was analyzed. They argued that AI tools were powerful and world-wide spread technology. If students were used wisely and ethically it enhances their academic performance. According to their perception these tools save students time by providing instant feedback, support self-learning, increase language quality and it gives summarized, constrictive and better answer to the question. However, if it is not well managed and unwisely used it may hide students' critical thinking and the ability independent decision-making capability and encourage laziness. They also recommended academics administrator and policy makers to include AI tools usage and development frame work. Additionally, they recommended following a strategy that increase field work and lab practice enhance student performance addition to theoretical knowledge obtained in teaching and learning processes.

RECCOMENDATION

From the research result, the following recommendations were proposed to enhance the positive impacts of AI tools while to reduced their negative effects in Ethiopian higher education, specifically at ASTU. These recommendations were proposed for students, teachers, university administrators and policy makers.

Recommendation for students'

Enhances AI tools usage:

Students were recommended to using these tools as a supportive resource to increase their learning, understanding unclear topics, improving and writing skills.

For instance, while tools like ChatGPT can clarify complex topics, students must verify the information against textbooks and seek guidance from their instructors to ensure correctness. To ensure the accuracy of information students should be cite sources when using AI produced content.

Enhance digital literacy:

To maximize the benefit of AI tools, students learn different software, even if not only use tries to believe it is possible to develop the tools its selves.

Focus on consistence study time and regular class attendance:

In addition to AI tools usage, actively attending class and practice regular study habit to cover all portion of course content can enhance learning outcomes.

Balancing AI and Traditional Learning:

It's advisable to set aside dedicated study times free from digital distractions to foster independent thinking and better retention of knowledge. A combination of AI-assisted learning with traditional study methods, such as reviewing class notes and participating in group discussions, is recommended for the best outcomes.

Emphasizing Ethical Use:

Students should receive training on the importance of avoiding plagiarism and over-reliance on AI, as well as using these tools responsibly to prevent undermining their genuine learning efforts, like cheating on assignments.

Recommendation to instructors and teachers**Incorporating AI into Teaching:**

Faculty members are encouraged to weave AI usage into their classroom activities. For example, they could create assignments where students utilize AI for drafting essays, followed by critical evaluations of the content to enhance analytical skills.

Supervision and Guidance on Usage:

Educators should establish well-defined protocols regarding the appropriate contexts for AI tool usage, ensuring that educational goals remain achievable. And constantly guide students on how to use these tools efficiently, wisely and ethically

Revising Assessment Methods:

It's important to craft assessments that require practical application and deeper understanding, which cannot be easily addressed through AI tools alone, thereby preserving academic integrity. Include task-oriented assessments. This type of assessments give chance to the student to think critically and it reduce potential drawbacks of AI tools usage. Additionally, Promote and encourage class room participation and study habits.

Recommendation for policy maker and University administrator**Establishing an AI Usage Framework:**

ASTU should create comprehensive guidelines that outline the acceptable academic uses of AI tools, addressing ethical considerations, data protection, and the line between helpful support and misuse

Even if positive GPA improvement observed on statistical output the response obtained from teachers shows some of the students use these tools unethically. So that there is a need to create frame work for the development and usage of this tools.

Offering Training:

Regular workshops and digital literacy initiatives should be organized for both students and faculty, focusing on the effective and responsible incorporation of AI tools in academic endeavors

Enhancing Digital Infrastructure:

Investment in improved internet access, computer facilities, and licensed AI educational tools across the university is essential to ensure equitable access for all students

Integrate AI education in the curriculums:

To enhance AI literacy and ethical AI use increasing course that related to these tools is very important.

Promote balance pedagogy:

To increase the positive effects of AI tools usage encourage teaching methodologies that integrate AI tools.

For Higher Education Policy Makers**Creating National Guidelines for AI in Education:**

The Ministry of Education should formulate clear policies regarding the acceptable use of AI in academic environments, addressing assessment practices, academic integrity, and digital ethics

Encouraging Research and Innovation:

Funding should be allocated for studies investigating the evolving role of AI in Ethiopian higher education to continually evaluate its long-term advantages and challenges.

Promoting Equity in AI Access:

It is crucial to ensure that universities nationwide possess the necessary tools and resources, thereby bridging the digital divide among students from diverse backgrounds or regions.

LIMITATION AND FEUTURE IMPLICATION

While this research provides significant insight, it's important to consider its limitation. The study had the following limitation.

Geographical limitation:

The study specifically conducted in ASTU. Therefore, concluding the result to other Ethiopian universities or higher education institutions in different context may require further investigation.

Predictive variables:

While the research identified several significant predictors variable for academic outcomes, other variables not included in the model also exist. Example economic and social factors, digital infrastructure and motivation level by considering these factors the researcher recommended coming researcher to elaborate the subject in detail.

Cross Sectional Design

The mixed method cross sectional design captures data at a single point. But learning is ongoing process to navigate impact of AI tools on student outcomes longitudinal and experimental research design elaborate long range impact of these tools.

General implication of AI tools

Currently there were different kinds of AI tools. The study does not consider a single effect of AI tools, example like chat GPT itself only.

REFERENCE

- Ahmad, S. F., Han, H., Alam, M. M., Rehmat, M. K., Irshad, M., Arraño-Muñoz, M., & Ariza-Montes, A. (2023). Impact of artificial intelligence on human loss in decision making, laziness and safety in education. *Humanities and Social Sciences Communications*, 10(1), 1–14. <https://doi.org/10.1057/s41599-023-01787-8>
- Al-Rahmi, A. M., Al-Rahmi, W. M., Alturki, U., Aldraiweesh, A., Almutairy, S., & Al-Adwan, A. S. (2022). Acceptance of mobile technologies and M-learning by university students: An empirical investigation in higher education. *Education and Information Technologies*, 27(6), 7805–7826.
- Al-Rahmi, A. M., Shamsuddin, A., Wahab, E., Al-Rahmi, W. M., Alismaiel, O. A., & Crawford, J. (2022). Social media usage and acceptance in higher education: A structural equation model. *Frontiers in Education*, 7, 964456.
- Al-Rahmi, W. M., Yahaya, N., Alamri, M. M., Alyoussef, I. Y., Al-Rahmi, A. M., & Kamin, Y. Bin. (2021). Integrating innovation diffusion theory with technology acceptance model: Supporting students' attitude towards using a massive open online courses (MOOCs) systems. *Interactive Learning Environments*, 29(8), 1380–1392.
- Almaiah, M. A., Alfaisal, R., Salloum, S. A., Hajjej, F., Shishakly, R., Lutfi, A., Alrawad, M., Al Mulhem, A., Alkhdour, T., & Al-Marroof, R. S. (2022). Measuring institutions' adoption of artificial intelligence applications in online learning environments: integrating the innovation diffusion theory with technology adoption rate. *Electronics*, 11(20), 3291.
- An, X., Chai, C. S., Li, Y., Zhou, Y., Shen, X., Zheng, C., & Chen, M. (2023). Modeling English teachers' behavioral intention to use artificial intelligence in middle schools. *Education and Information Technologies*, 28(5), 5187–5208.
- An, X., Chai, C. S., Li, Y., Zhou, Y., & Yang, B. (2023). Modeling students' perceptions of artificial intelligence assisted language learning. *Computer Assisted Language Learning*, 1–22.

- ARAIN, A. A., Hussain, Z., Vighio, M. S., & Rizvi, W. H. (2018). Factors influencing acceptance of Mobile learning by higher education students in Pakistan. *Sindh University Research Journal-SURJ (Science Series)*, 50(01), 141–146.
- Assefa, Y., Gebremeskel, M. M., Moges, B. T., Tilwani, S. A., & Azmera, Y. A. (2025). Rethinking the digital divide and associated educational in (equity) in higher education in the context of developing countries: the social justice perspective. *The International Journal of Information and Learning Technology*, 42(1), 15–32.
- Ayanwale, M. A., & Ndlovu, M. (2024). Investigating factors of students’ behavioral intentions to adopt chatbot technologies in higher education: Perspective from expanded diffusion theory of innovation. *Computers in Human Behavior Reports*, 14(July 2023), 100396. <https://doi.org/10.1016/j.chbr.2024.100396>
- Boubker, O. (2024). From chatting to self-educating: Can AI tools boost student learning outcomes? *Expert Systems with Applications*, 238, 121820.
- Britton, B. K., & Tesser, A. (1991). Effects of time-management practices on college grades. *Journal of Educational Psychology*, 83(3), 405.
- Carroll, J. E. (2015). Exploring the relationship between financial, academic, social, and environmental conditions and student retention rates. Northcentral University.
- Cohen, J. (2013). *Statistical power analysis for the behavioral sciences*. routledge.
- Credé, M., & Kuncel, N. R. (2008). Study habits, skills, and attitudes: The third pillar supporting collegiate academic performance. *Perspectives on Psychological Science*, 3(6), 425–453.
- Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.
- Dahri, N. A., Al-Rahmi, W. M., Almogren, A. S., Yahaya, N., Vighio, M. S., Al-maatuok, Q., Al-Rahmi, A. M., & Al-Adwan, A. S. (2023). Acceptance of mobile learning technology by teachers: Influencing mobile self-efficacy and 21st-century skills-based training. *Sustainability*, 15(11), 8514.

- Dahri, N. A., Yahaya, N., Al-Rahmi, W. M., Vighio, M. S., Alblehai, F., Soomro, R. B., & Shutaleva, A. (2024). Investigating AI-based academic support acceptance and its impact on students' performance in Malaysian and Pakistani higher education institutions. In *Education and Information Technologies* (Issue March). Springer US. <https://doi.org/10.1007/s10639-024-12599-x>
- Dey, I. (2018). Class attendance and academic performance: A subgroup analysis. *International Review of Economics Education*, 28, 29–40.
- Discovering statistics using R. (2012). *Choice Reviews Online*, 50(04), 50-2114-50–2114. <https://doi.org/10.5860/choice.50-2114>
- Dodeen, H. (2013). College Students' Evaluation of Effective Teaching: Developing an Instrument and Assessing Its Psychometric Properties. *Research in Higher Education Journal*, 21.
- Ethiopia, A., & Dagne, G. (2024). Dreams to Reality: Unraveling the Secrets of Youth Entrepreneurship in Adama C. *Journal of Indigenous Knowledge and Development Studies*, 6(2), 75–103.
- Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics*, 5(1), 1–4.
- Fadel, C., Holmes, W., & Bialik, M. (2019). Artificial intelligence in education: Promises and implications for teaching and learning. The Center for Curriculum Redesign, Boston, MA. *Journal of Computer Assisted Learning*, 14(4), 228.
- Farooq, M. S., Salam, M., Jaafar, N., Fayolle, A., Ayupp, K., Radovic-Markovic, M., & Sajid, A. (2017). Acceptance and use of lecture capture system (LCS) in executive business studies: Extending UTAUT2. *Interactive Technology and Smart Education*, 14(4), 329–348.
- Fergus, S., Botha, M., & Ostovar, M. (2023). Evaluating academic answers generated using ChatGPT. *Journal of Chemical Education*, 100(4), 1672–1675.

- Filieri, R., & McLeay, F. (2014). E-WOM and accommodation: An analysis of the factors that influence travelers' adoption of information from online reviews. *Journal of Travel Research*, 53(1), 44–57.
- Foroughi, B., Nhan, P. V., Iranmanesh, M., Ghobakhloo, M., Nilashi, M., & Yadegaridehkordi, E. (2023). Determinants of intention to use autonomous vehicles: Findings from PLS-SEM and ANFIS. *Journal of Retailing and Consumer Services*, 70, 103158.
- Foroughi, B., Senali, M. G., Iranmanesh, M., Khanfar, A., Ghobakhloo, M., Annamalai, N., & Naghmeh-Abbaspour, B. (2024). Determinants of intention to use ChatGPT for educational purposes: Findings from PLS-SEM and fsQCA. *International Journal of Human–Computer Interaction*, 40(17), 4501–4520.
- Furze, L., Perkins, M., Roe, J., & MacVaugh, J. (2024). The AI Assessment Scale (AIAS) in action: A pilot implementation of GenAI-supported assessment. *Australasian Journal of Educational Technology*, 40(4), 38–55.
- Ha, W., Ma, L., Cao, Y., Feng, Q., & Bu, S. (2024). The effects of class attendance on academic performance: Evidence from synchronous courses during Covid-19 at a Chinese research university. *International Journal of Educational Development*, 104, 102952.
- Hoi, V. N. (2020). Understanding higher education learners' acceptance and use of mobile devices for language learning: A Rasch-based path modeling approach. *Computers & Education*, 146, 103761.
- Huang, A. Y. Q., Lu, O. H. T., & Yang, S. J. H. (2023). Effects of artificial Intelligence–Enabled personalized recommendations on learners' learning engagement, motivation, and outcomes in a flipped classroom. *Computers & Education*, 194, 104684.
- Jafari, H., Aghaei, A., & Khatony, A. (2019). Relationship between study habits and academic achievement in students of medical sciences in Kermanshah-Iran. *Advances in Medical Education and Practice*, 637–643.

- Likisa, K. (2018). Challenges and prospects of competency-based education: The case of adama science and technology university alumni students and hawas TVET college, adama, ethiopia. *The Journal of Competency-Based Education*, 3. <https://doi.org/10.1002/cbe2.1163>
- Liu, R., Zenke, C., Liu, C., Holmes, A., Thornton, P., & Malan, D. J. (2024). Teaching CS50 with AI: leveraging generative artificial intelligence in computer science education. *Proceedings of the 55th ACM Technical Symposium on Computer Science Education V. 1*, 750–756.
- Luckin, R., & Holmes, W. (2016). *Intelligence Unleashed: An argument for AI in Education*. In UCL Knowledge Lab: London, UK. .
- Mbada, C. E., Olowookere, A. E., Faronbi, J. O., Oyinlola-Aromolaran, F. C., Faremi, F. A., Ogundele, A. O., Awotidebe, T. O., Ojo, A. A., & Augustine, O. A. (2013). Knowledge, attitude and techniques of breastfeeding among Nigerian mothers from a semi-urban community. *BMC Research Notes*, 6, 1–8.
- Messele Kumilachew Aga. (2017). Assessment of Higher Education Students Desire to Be an Entrepreneur: The Case Study of Adama Science and Technology University. *Global Journal of Management and Business Research*, 17(A4 SE-Articles), 31–41.
- Nagelkerke, N. J. D. (1991). A note on a general definition of the coefficient of determination. *Biometrika*, 78(3), 691–692. <https://doi.org/10.1093/biomet/78.3.691>
- Nonis, S. A., & Hudson, G. I. (2010). Performance of college students: Impact of study time and study habits. *Journal of Education for Business*, 85(4), 229–238.
- Patel, S., & Ragolane, M. (2024). The implementation of artificial intelligence in South African higher education institutions: Opportunities and challenges. *Technium Education and Humanities*, 9, 51–65.
- Peng, C. J., Lee, K. U. K. L., & Ingersoll, G. M. (n.d.). *An Introduction to Logistic Regression Analysis and Reporting*. 2(1).

- Pittalis, M. (2021). Extending the technology acceptance model to evaluate teachers' intention to use dynamic geometry software in geometry teaching. *International Journal of Mathematical Education in Science and Technology*, 52(9), 1385–1404.
- Sabharwal, D., Kabha, R., & Srivastava, K. (2023). Artificial Intelligence (AI)-Powered Virtual Assistants and their Effect on Human Productivity and Laziness: Study on Students of Delhi-NCR (India) & Fujairah (UAE). *Journal of Content, Community and Communication*, 17(9), 162–174. <https://doi.org/10.31620/JCCC.06.23/12>
- Sarwar, B., Zulfiqar, S., Aziz, S., & Ejaz Chandia, K. (2019). Usage of social media tools for collaborative learning: The effect on learning success with the moderating role of cyberbullying. *Journal of Educational Computing Research*, 57(1), 246–279.
- Science, A. (2018). Adama Science and Technology University. January, 1–2.
- Selwyn, N. (2020). Re-imagining 'learning analytics'... a case for starting again? *The Internet and Higher Education*, 46, 100745.
- Sesay, R. B., Kpangay, M., & Seppeh, S. (2021). An Ordinal Logistic Regression Model to Identify Factors Influencing Students Academic Performance at Njala University. *International Journal of Research and Scientific Innovation*, 08(01), 91–100. <https://doi.org/10.51244/ijrsi.2021.8104>
- Strohmeier, S. (2022). Artificial intelligence in human resources-an introduction. In *Handbook of Research on Artificial Intelligence in Human Resource Management* (pp. 1–22). Edward Elgar Publishing.
- Strzelecki, A. (2024). Students' acceptance of ChatGPT in higher education: An extended unified theory of acceptance and use of technology. *Innovative Higher Education*, 49(2), 223–245.
- Stuart, E. M. (2024). Effects of Artificial Intelligence on the Academic Competency of Students of Higher Learning Institutions : A Case Study of Kampala International University in Tanzania To equip students thorough understanding of international conventions , and norms dete. 1(2), 63–84.

- Swarglary, K., & Roy, K. (2024). Transformative Impact of Artificial Intelligence in Education: A Comprehensive Analysis of Student and Teacher Perspectives. September. <https://doi.org/10.13140/RG.2.2.18681.03685/1>
- Taherdoost, H. (2016). Sampling methods in research methodology; how to choose a sampling technique for research. *International Journal of Academic Research in Management (IJARM)*, 5.
- Tawafak, R. M., Al-Rahmi, W. M., Almogren, A. S., Al Adwan, M. N., Safori, A., Attar, R. W., & Habes, M. (2023). Analysis of E-learning system use using combined TAM and ECT factors. *Sustainability*, 15(14), 11100.
- Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 425–478.
- Venkatesh, V., Thong, J. Y. L., & Xu, X. (2016). Unified theory of acceptance and use of technology: A synthesis and the road ahead. *Journal of the Association for Information Systems*, 17(5), 328–376.
- Wei, C.-W., Chen, N.-S., & Kinshuk. (2012). A model for social presence in online classrooms. *Educational Technology Research and Development*, 60, 529–545.
- Wollny, S., Schneider, J., Di Mitri, D., Weidlich, J., Rittberger, M., & Drachsler, H. (2021). Are we there yet?-a systematic literature review on chatbots in education. *Frontiers in Artificial Intelligence*, 4, 654924.
- Yamane, T. (1973). *Statistics: An introductory analysis*.
- Yuan, L., & Liu, X. (2025). The effect of artificial intelligence tools on EFL learners' engagement, enjoyment, and motivation. *Computers in Human Behavior*, 162, 108474.
- Zacharis, G., & Nikolopoulou, K. (2022). Factors predicting University students' behavioral intention to use eLearning platforms in the post-pandemic normal: an UTAUT2 approach with 'Learning Value.' *Education and Information Technologies*, 27(9), 12065–12082.

APPENDICES

Appendix 1: Teachers research questionnaire

1. How many teachings experience (years) do you have?			
<2	2-6	6-10	More than 10

2. Do you believe that AI tools contribute to student performance? Why or why not?

3. What are the most common signs of AI-related performance among students?

4. What are the most significant benefits of AI tools in student learning?

5. In what ways do you think AI tools should be integrated into education without harming students' learning and critical thinking abilities?

6. What policies or strategies do you recommend to ensure students use AI tools responsibly in their learning?

7. Do you have any additional comments on AI use in student learning and its impact on their academic performance?

Appendix2: Students research questionnaire

Please fill the box with 'x' symbol that related with your information

Age (years)

< 20		20-25		26-30		31-35		>35	
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Gender: ☐ Male ☐ Female

Your current year of study: ☐ 4th year ☐ 5th year

What is your field of study? _____

Do you use AI tools (chat gpt, grammerly. etc.) for academic purpose?

☐ Yes ☐ No

If yes:

When do you start to use AI tools?

Before University		1 st Year		2 nd Year		3 rd Year		4 th Year		5 th Year	
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What was your GPA before using AI TOOLS_____?

How frequently do you use AI tools for your academic work?

Never		Rarely		Some times		Often		Always	
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Do you think using AI tools increase your academic performance (GPA)?

☐

Yes

☐

No

Which AI tools do you use most frequently? (Please indicate all that you use)

Catbots (chat gpt.etc		Grammerly		Language Translations tools	
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Other AI tools (please write) _____

How match your current grade point average (GPA)_____

Do you use laptop or computer for academic purpose?

☐

s

☐

o

On average how many hours do you spend for studying per week?

< 15 HRS		15-20 HRS		20-25 HRS		25-30 HRS		30-35 HRS		>35 HRS	
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On average, how many of your classes do you attend per week?

< 50%		50- 70%		70 - 90%		>90%	
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Appendix 3. Variables summery

		Statistics					
		Performance Expectancy	Facilitating Condition	Assessments effectiveness	Student Interactions	Information Accuracy	Pedagogical Fit
N	Valid	285	285	285	285	285	285
	Missing	0	0	0	0	0	0
Mean		4.04	3.86	3.71	3.97	3.678	3.83
Median		4.00	3.800	3.75	4.00	3.60	3.80
Variance		0.200	0.301	.473	.215	.364	0.264
Range		2.20	2.40	3.50	2.50	3.00	2.60
Minimum		2.80	2.60	1.50	2.50	2.00	2.40
Maximum		5.00	5.00	5.00	5.00	5.00	5.00

Descriptive Statistics						
	N	Range	Minimum	Maximum	Mean	Std. Deviation
CGPA DIFF.	285	1.18	-.37	.81	.17	.21
Average AI tools usage	285	3.20	1.80	5.00	3.81	.64
Average study hours	285	3.60	1.40	5.00	3.59	.70
Average Class Attendance	285	3.00	2.00	5.00	3.68	.65
Use of Laptop/Computer	285	1	0	1	.86	.35
Valid N (listwise)	285					

Appendix 4 summery of students' responses per each item

Items	Total Respondent	Strongly Agree		Agree		Neutral		Dis Agree		Strongly Disagree	
CODE		FRQ	100%	FRQ	100%	FRQ	100%	FRQ	100%	FRQ	100%
PE1	285	74	26%	148	52%	56	20%	6	2%	1	0%
PE2	285	64	22%	141	49%	65	23%	15	5%	0	0%
PE3	285	141	49%	137	48%	7	2%	0	0%	0	0%
PE4	285	40	14%	162	57%	73	26%	10	4%	0	0%
PE5	285	77	27%	150	53%	45	16%	11	4%	1	0%
FC1	285	65	23%	137	48%	68	24%	15	5%	0	0%
FC2	285	58	20%	132	46%	72	25%	22	8%	0	0%
FC3	285	48	17%	125	44%	98	34%	14	5%	0	0%
FC4	285	47	16%	147	52%	75	26%	16	6%	0	0%
FC5	285	92	32%	138	48%	44	15%	10	4%	1	0%
AE1	285	52	18%	136	48%	69	24%	26	9%	2	1%
AE2	285	54	19%	122	43%	83	29%	24	8%	2	1%
AE3	285	46	16%	144	51%	67	24%	26	9%	2	1%
AE4	285	52	18%	121	42%	77	27%	32	11%	3	1%
SI1	285	116	41%	155	54%	12	4%	2	1%	0	0%
SI2	285	83	29%	141	49%	57	20%	4	1%	0	0%
SI3	285	44	15%	134	47%	77	27%	23	8%	7	2%
SI4	285	66	23%	128	45%	71	25%	15	5%	5	2%

IA1	285	46	16%	135	47%	88	31%	16	6%	0	0%
IA2	285	43	15%	128	45%	86	30%	28	10%	0	0%
IA3	285	47	16%	129	45%	89	31%	20	7%	0	0%
IA4	285	44	15%	126	44%	79	28%	36	13%	0	0%
IA5	285	41	14%	131	46%	87	31%	23	8%	2	1%
								0			
PF1	285	71	25%	123	43%	84	29%	7	2%	0	0%
PF2	285	50	18%	142	50%	88	31%	5	2%	0	0%
PF3	285	77	27%	124	44%	73	26%	11	4%	0	0%
PF4	285	52	18%	134	47%	85	30%	14	5%	0	0%
PF5	285	47	16%	126	44%	92	32%	14	5%	6	2%

Appendix 4. Research schedule

Activity	Types of work Performed	Jan 2025 to Jun 2025 Month task was done
1	Research proposal was completed	January
2	Research design and validation of questionnaires was done	February
3	Questionnaires were distributed and responses was collected from participant	March
4	Data was cleaned, analyzed and interpreted	April
5	Research report was written	May
6	Documentation, submission and presentation were done	June

Appendix 5. Research budget

No	Item	Starting Place	Destination	Unit	Unit Cost	Total Cost	Remark
1	Per-diem for researcher (two-way road)	Bishoftu	ASTU	8(days)	400.00*8	3200.00	Standard (Based on Salary Scale)
2	Per-diem for research environment facilitator (02 Persons for each)	Bishoftu	ASTU	5(days)	250.00*5*2	2500.00	Agreement
3	Per-diem for assistant data collector and analyzer (02 person)	Bishoftu	ASTU	8(days)	250.00*8*2	4000.00	Agreement
	Stationary Expense			-----	-----	-----	-----
4	Document Printing (90 pages each)			Six (6) copy	7.00*6*90	3780	-----
	Document Binding			Six (6) copy	800.00*4	3200.00	-----
	Color Printing			60page	20.00*60	1200.00	-----
	Pen			Quantity (4)	4*30	120	
	Total			-----	-----	18,000.00	-----

