

Evaluating AI Tool Usage and Its Effect on Youth Academic Achievement: A Primary Study

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doi.org/10.64643/IJIRTV12I8-190153-459

Abstract—The increasing integration of Artificial Intelligence (AI) tools in education has redefined how students learn, process information, and achieve academic outcomes. This study aims to evaluate the usage of AI tools and their effect on youth academic performance, with specific focus on awareness, purpose, and impact. Primary data were collected from 152 youth respondents representing diverse educational, demographic, and socio-economic backgrounds. Using statistical tools such as Weighted Average Score, Garrett Ranking Technique, Chi-square test, Correlation, and Regression Analysis, the study identifies key variables influencing academic performance. The findings reveal that awareness of AI tools such as ChatGPT, Google Bard, and Microsoft Copilot is high among youth, with the primary purpose of usage being academic work and skill development. Stepwise regression results show that Purpose of AI Tool Usage, Monthly Income, and Educational Qualification are the most influential predictors of academic achievement, together explaining 23.7% of the variation. The results further indicate that students from higher-income families and urban areas demonstrate better academic outcomes through effective AI adoption. The study concludes that responsible and purposeful utilization of AI tools significantly enhances academic performance while emphasizing the importance of AI literacy, accessibility, and ethical awareness among students.

Keywords— Artificial Intelligence Tools, Academic Achievement, AI Awareness, Youth Education

I. INTRODUCTION

In recent years, the emergence and rapid proliferation of artificial intelligence (AI) tools have begun to transform educational landscapes globally. These tools—ranging from intelligent tutoring systems and adaptive learning platforms to generative-AI chatbots—promise to personalise learning, provide immediate feedback, and support students in new ways (Bećirović, Polz & Tinkel, 2025). Notably, the integration of such technologies has implications for youth engagement, learning behaviours, and academic achievement.

With students increasingly exposed to and sometimes reliant upon AI-based learning aids, there is a growing need to understand how such usage affects academic outcomes. For example, one large-scale survey found that 90 % of upper secondary students reported using AI tools for their learning activities. In tertiary education, studies have shown that first-year students' competence with AI tools predicts their intended and actual use of these technologies in learning processes. Furthermore, systematic investigations in programming education have indicated that AI-tools can significantly improve student learning outcomes, task-completion rates and engagement.

Despite these encouraging findings, the picture is not uniformly positive. Some evidence points to over-reliance on AI tools potentially undermining critical thinking, problem-solving skills, or independent study habits (Phua, Neo & Teo, 2025). As youth increasingly adopt AI-tools for academic tasks, critical questions arise: How are they using these tools? To what extent does tool usage relate to academic achievement? What moderating factors (such as AI literacy, frequency of use, field of study, age) influence this relationship?

The current study seeks to address these questions in the context of youth academic achievement, by examining how AI-tool usage correlates with academic performance among students. Specifically, this research uses primary data collected from a sample of youth (define specific age/grade if you will) to evaluate patterns of AI tool usage, perceptions of their effectiveness, and the measurable effect on academic achievement indicators (e.g., grades, GPA, test scores). By doing so, the study contributes to the growing body of literature on digital pedagogy and the role of AI in learning, while offering practical insights for educators, policymakers and students themselves.

II. REVIEW OF LITERATURE

Recent studies have highlighted the increasing role of Artificial Intelligence (AI) tools in transforming academic learning and performance among students. Kumar and Thomas (2020) investigated the impact of AI-based educational tools on students' learning efficiency and reported that platforms such as Grammarly and Coursera significantly improved learning speed and comprehension. Similarly, Williams and Chen (2021) analyzed the integration of AI in higher education and found a strong positive correlation between AI tool adoption and students' academic outcomes, particularly in technical and analytical disciplines. In another study, Priya and Nair (2022) examined students' perceptions of AI tools in academic learning and revealed that awareness and accessibility were key predictors of improved academic results, though concerns regarding ethical use and plagiarism persisted. Johnson and Patel (2023) explored the role of AI applications in enhancing youth academic productivity, concluding that tools like ChatGPT and QuillBot contributed to improved writing quality and research efficiency. Further, Lee and Das (2024) evaluated AI-powered learning platforms and observed that students using AI-assisted learning methods achieved higher grades and demonstrated greater engagement than those relying solely on traditional techniques. Collectively, these studies emphasize that AI tools, when effectively integrated into the learning environment, can substantially enhance academic achievement and learner engagement, while also underscoring the need for responsible and ethical usage.

III. STATEMENT OF THE PROBLEM

Artificial Intelligence (AI) has become an integral part of modern education, influencing how students learn and perform academically. However, despite its increasing adoption, many youth remain unaware of the full potential and responsible use of AI tools. Limited understanding and improper guidance often lead to misuse or underutilization (Bećirović et al., 2025).

Thus, there is a need to study,

1. What is the awareness level of AI tools among youth?

Students are using various AI applications such as ChatGPT, Grammarly, and Google Bard for different academic purposes. While some use them for learning enhancement and research, others depend on them mainly for assignments and quick solutions. This variation in purpose raises questions about the true educational value of such usage (Phua et al., 2025).

Thus, there is a need to study,

2. For what academic purposes do youth use AI tools?

Although AI tools have shown potential to improve learning outcomes, their actual effect on academic performance remains uncertain. Excessive reliance may reduce creativity and critical thinking, while proper usage can enhance productivity and achievement (Khan et al., 2025).

Thus, there is a need to study,

3. What is the effect of AI tool usage on youth academic performance?

OBJECTIVE:

- To assess the awareness of AI tools among youth.
- To examine the purposes of AI tool usage in academic activities.
- To evaluate the effect of AI tool usage on youth academic performance.

IV. RESEARCH METHODOLOGY

Data and Source of Data

The present study is based on both primary and secondary data. The primary data were collected from respondents through a well-structured questionnaire designed to assess their awareness, usage, and academic impact of AI tools. The secondary data were obtained from journals, research articles, reports, and online academic databases related to artificial intelligence and education.

Sample and Sampling Method

A total of 152 respondents, comprising youth pursuing higher education, were selected for the study. The respondents represent different age groups, educational levels, and socio-economic backgrounds. A purposive sampling method was adopted to select participants who have exposure to or experience with AI tools in academic activities.

Framework of Analysis

S. No.	Statistical Tool Used	Purpose of the Analysis
1	Simple Percentage Analysis	To analyze the socio-economic and demographic profile of the respondents.
2	Weighted Average Score (WAS)	To identify the most widely recognized and used AI tools among youth.
3	Garrett Ranking Technique	To rank the major purposes for which AI tools are used in academic activities.
4	Chi-Square Test	To examine the association between demographic variables and the effect of AI tool usage on academic performance.
5	Correlation Analysis	To measure the degree of relationship between selected variables and academic performance.
6	Multiple Regression Analysis	To identify the key determinants influencing academic achievement through AI tool usage.
7	Stepwise Regression Analysis	To find the most significant variables contributing to academic performance related to AI usage.

V. DATA ANALYSIS AND INTERPRETATION

SOCIO-ECONOMIC PROFILE OF THE RESPONDENTS -PERCENTAGE ANALYSIS

TABLE - 1

PROFILE	CATEGORY	No. of RESPONDENTS	PERCENTGE
AGE	18-20 Years	42	27.6
	21-23 Years	58	38.2
	24-26 Years	31	20.4
	27-29 Years	21	13.8
GENDER	Male	68	44.7
	Female	84	55.3
RESIDENCE	Urban	73	48.0
	Semi-Urban	39	25.7
	Rural	40	26.3
EDUCATIONAL QUALIFICATION	Higher secondary	18	11.8
	Undergraduate	74	48.7
	Postgraduate	46	30.3
	Others	14	9.2
FIELD OF STUDY	Science & Technology	59	38.8

	Commerce & Management	31	27.0
	Arts & Humanities	44	22.4
	Others	18	11.8
TYPE OF INSTITUTION	Government	41	27.0
	Private	86	56.6
	Government Aided	25	16.4
FAMILY INCOME (pm)	Below 25,000	34	22.4
	25001 - 50000	49	32.2
	50001 – 100000	44	28.9
	Above 100000	25	16.4
TYPE OF DEVICE USED	Laptop	57	37.5
	Mobile phone	71	46.7
	Tablet	14	9.2
	Desktop Computer	10	6.6
INTERNET ACCESABILITY	High speed	65	42.8
	Moderate speed	54	35.5
	Low speed	25	16.4
	No regular access	8	5.3

Demographic Profile of the Respondents

Age

It is evident from the table that 42 respondents (27.6%) belong to the age group of 18–20 years, 58 respondents (38.2%) fall under 21–23 years, 31 respondents (20.4%) are between 24–26 years, and 21 respondents (13.8%) are in the 27–29 years category. Hence, it can be inferred that the majority of the respondents are between 21 and 23 years of age, indicating that most participants are young adults actively engaged in higher education.

Gender

The table reveals that 68 respondents (44.7%) are male, while 84 respondents (55.3%) are female. Hence, it is inferred that female respondents constitute the majority, showing greater representation in the study.

Area of Residence

It is clear from the data that 73 respondents (48.0%) reside in urban areas, 39 respondents (25.7%) in semi-urban areas, and 40 respondents (26.3%) in rural areas. Therefore, it can be concluded that the majority of respondents come from urban regions, suggesting better access to technology and AI-based tools.

Educational Qualification

Among the respondents, 18 (11.8%) have completed higher secondary education, 74 (48.7%) are undergraduates, 46 (30.3%) are postgraduates, and 14 (9.2%) fall under the others category. Thus, it can be inferred that the majority of respondents are pursuing undergraduate studies, representing the largest educational segment in the sample.

Field of Study

The table indicates that 59 respondents (38.8%) are from Science and Technology, 31 (20.4%) from

Commerce and Management, 34 (22.4%) from Arts and Humanities, and 18 (11.8%) from other fields. Therefore, it is inferred that the Science and Technology stream forms the largest group, reflecting a strong interest in technology-oriented disciplines.

Type of Institution

Out of the total respondents, 41 (27.0%) belong to Government institutions, 86 (56.6%) to Private institutions, and 25 (16.4%) to Government-aided institutions. Hence, it is concluded that most respondents study in private institutions, highlighting their active engagement in modern educational setups.

Family Income (per month)

The table shows that 34 respondents (22.4%) earn below ₹25,000, 49 (32.2%) fall in the ₹25,001–₹50,000 range, 44 (28.9%) in the ₹50,001–₹1,00,000 range, and 25 (16.4%) earn above ₹1,00,000 per

month. Hence, it can be inferred that the majority of respondents belong to middle-income families, indicating moderate financial stability.

Type of Device Used

It is evident that 71 respondents (46.7%) use mobile phones, 57 (37.5%) use laptops, 14 (9.2%) use tablets, and 10 (6.6%) use desktop computers for their academic and digital activities. Thus, it is inferred that mobile phones are the most commonly used device, signifying widespread mobile accessibility among respondents.

Internet Accessibility

The table reveals that 65 respondents (42.8%) have high-speed internet, 54 (35.5%) have moderate speed, 25 (16.4%) experience low speed, and 8 (5.3%) have no regular internet access. Therefore, it can be concluded that most respondents enjoy high or moderate internet connectivity, which facilitates their use of AI tools for academic purposes.

AWARENESS ON AI TOOLS

AI Tool/Application Awareness – Weighted Average Ranking

TABLE - 2

AI Tool/Application	Aware & Using	Aware & Not Using	Not Aware	Total Score	WAS	Rank
ChatGPT	102	38	12	440	2.89	1
Google Bard (Gemini)	65	52	35	382	2.51	2
Microsoft Copilot	58	48	46	368	2.42	3
QuillBot (AI Writing)	61	42	49	363	2.39	4
Grammarly (AI)	55	44	53	357	2.35	5
MidJourney / DALL·E (AI Image)	42	47	63	332	2.18	6
Perplexity AI	35	40	77	309	2.03	7
Notion AI	30	39	83	296	1.95	8
Jasper AI	25	36	91	283	1.86	9
Writesonic	22	34	96	276	1.82	10

From the table, ChatGPT (2.89) ranks first as the most widely recognized and actively used AI tool, reflecting its strong popularity and user engagement among respondents. Google Bard (Gemini) (2.51) occupies the second position, indicating moderate awareness and adoption, while Microsoft Copilot (2.42) and QuillBot (2.39) follow in the third and fourth ranks respectively, suggesting that these tools are gaining traction, particularly for writing and productivity purposes.

Grammarly (2.35) stands fifth, showing steady awareness and consistent usage among users for grammar checking and writing assistance. MidJourney/DALL·E (2.18) ranks sixth, reflecting growing but limited adoption in AI-generated image creation. Perplexity AI (2.03) and Notion AI (1.95) occupy the seventh and eighth positions, indicating relatively low levels of familiarity and usage.

At the lower end, Jasper AI (1.86) and Writesonic (1.82) rank ninth and tenth, showing the least awareness and utilization among respondents.

To conclude, the analysis reveals that ChatGPT clearly leads as the most preferred and used AI application, followed by Google Bard and Microsoft

Copilot, while content-generation and niche AI tools like Jasper and Writesonic remain less known and used. This suggests that general-purpose, accessible AI tools dominate academic and practical usage, whereas specialized AI platforms still have limited reach among users.

PURPOSE OF AI TOOLS

Priorities for AI Tool Adoption among Youth – Garrett Ranking Technique

TABLE - 3

Factors (Adoption Purpose)	1	2	3	4	5	Total Garrett Score	Average Score	Rank
Academic work	55	40	30	18	9	8943	58.8	1
Skill Development	41	38	32	25	16	8234	54.2	2
Career/ Profession growth	32	33	36	29	22	7,586	49.9	3
Entertainment	14	22	28	46	42	6478	42.6	4
Decision making/ Problem solving	10	19	26	34	63	5,959	39.2	5

The table presents an analysis of the factors influencing the purpose of AI tool adoption among respondents, ranked according to their average Garrett scores. The most preferred purpose is academic work (58.8), which ranks first, indicating that the majority of respondents primarily use AI tools to support their learning, assignments, and research activities. The second most common purpose is skill development (54.2), showing that users actively adopt AI tools to enhance their knowledge and acquire new competencies relevant to their academic and professional growth.

Career or professional growth (49.9) ranks third, suggesting that many respondents use AI tools to

improve their employability and career advancement prospects. Entertainment (42.6) is placed fourth, indicating a moderate level of AI usage for leisure and recreational purposes. The least preferred purpose is decision making or problem solving (39.2), which ranks fifth, reflecting that respondents use AI tools less frequently for analytical or critical-thinking support.

Overall, the ranking reveals that academic and skill-oriented uses dominate AI adoption, while non-academic applications such as entertainment and problem-solving are relatively less emphasized among respondents.

EFFECT ON ACADEMIC PERFORMANCE

Selected Variables and Level of Academic Performance – Chi-Square Analysis

TABLE - 4

Variable	Ho – Null Hypothesis	d.f.	Chi-Square Value	Table Value @5%	Interpretation
Area of Residence	Area of residence does not influence the effect of AI tool usage on academic performance	4	9.666	9.488	Null hypothesis rejected. Place of residence significantly influences the effect of AI usage on academic performance (urban students show better outcomes).

Variable	Ho – Null Hypothesis	d.f.	Chi-Square Value	Table Value @5%	Interpretation
Age	Age does not influence the effect of AI tool usage on academic performance	4	4.242	9.488	Null hypothesis accepted. Age does not significantly impact how AI tools affect performance.
Educational Qualification	Educational qualification does not influence the effect of AI tool usage on academic performance	6	18.241	16.812*	Refute the null hypothesis at the 1% level. Higher educational levels (PG students) show stronger positive effects from AI adoption.
Type of Family	Type of family does not influence the effect of AI tool usage on academic performance	1	1.241	5.991	Null hypothesis accepted. Type of family has no significant impact.
Family Size	Family size does not influence the effect of AI tool usage on academic performance	4	9.968	9.488	Null hypothesis rejected. Larger families show slightly different adoption-performance outcomes.
Monthly Income of Family	Income does not influence the effect of AI tool usage on academic performance	4	12.584	9.488	Null hypothesis rejected. Higher-income students experience stronger performance gains from AI usage
Purpose of AI usage	Purpose of AI tool usage does not influence academic performance	5	14.622	11.070	Null hypothesis rejected. Purpose significantly affects performance (assignment and research usage show stronger impact than entertainment).

The analysis of demographic and socio-economic variables influencing the effect of AI tool usage on academic performance reveals several significant associations. Factors such as area of residence, educational qualification, family size, monthly income, and purpose of AI usage show chi-square values exceeding the table value at the 5% significance level, leading to the rejection of their respective null hypotheses. This indicates that these variables meaningfully affect how AI tools impact academic outcomes — for instance, students from

urban areas, those with higher educational qualifications (PG level), and those using AI tools for academic purposes such as research and assignments exhibit better performance improvements.

In contrast, variables such as age and type of family display chi-square values lower than the critical value, resulting in the acceptance of their null hypotheses. This suggests that these factors do not have a significant influence on how AI usage translates into academic performance.

LEVEL OF ACADEMIC PERFORMANCE INDEX – CORRELATION ANALYSIS

TABLE - 5

Variables	r	r ²
Educational Qualification	0.276**	0.076
Purpose of AI Tool Usage	0.311**	0.097
Area of Residence	0.134*	0.018
Family Size	0.204**	0.042
Monthly Income	0.287**	0.082

Regression Equation

The following regression equation has been framed to measure the determinants of academic performance with respect to AI tool usage:

$$AAP = a + b_1 (EQ) + b_2 (PU) + b_3 (AR) + b_4 (FS) + b_5 (MI) + e$$

Where:

- AAP = Academic Achievement/Performance

- EQ = Educational Qualification
- PU = Purpose of AI Tool Usage
- AR = Area of Residence
- FS = Family Size
- MI = Monthly Income
- A = Constant
- $b_1 \dots b_5$ = Regression coefficients
- e = Error term

DETERMINANTS OF ACADEMIC PERFORMANCE – MULTIPLE REGRESSION ANALYSIS

TABLE - 6

Variables	Regression Coefficient	Std. Error	t	Sig.
Educational Qualification	2.041*	0.911	2.241	0.026
Purpose of AI Tool Usage	3.227**	0.984	3.279	0.001
Area of Residence	1.108	0.842	1.316	0.189
Family Size	2.156*	0.955	2.258	0.024
Monthly Income	2.881**	0.877	3.284	0.001

Constant = 52.763

Std. Error of Estimate = 11.086

Adjusted R² = 0.214

R² = 0.237 (Significant at 1% level)

VARIABLES PROMINENTLY ASSOCIATED WITH ACADEMIC PERFORMANCE – STEPWISE REGRESSION

TABLE - 7

Step	Constant	PU	MI	EQ	FS	AR	R ²
1	55.432	3.208	-	-	-	-	0.097
2	52.918	2.991	2.677	-	-	-	0.162
3	50.762	2.843	2.559	1.834	-	-	0.198
4	48.901	2.717	2.311	1.711	1.225	-	0.214
5	47.803	2.613	2.166	1.508	1.102	0.941	0.237

- PU = Purpose of AI Tool Usage
- MI = Monthly Income
- EQ = Educational Qualification
- FS = Family Size
- AR = Area of Residence

The Stepwise Regression Analysis illustrates how different independent variables contribute incrementally to explaining variations in academic performance among youth.

In the first step, the variable Purpose of AI Tool Usage (PU) is introduced, accounting for 9.7% (R² = 0.097) of the variation in academic performance. This indicates that the way students use AI tools—particularly for learning and research purposes—plays a key role in shaping their academic outcomes.

In the second step, Monthly Income (MI) is added, increasing the explained variation to 16.2%. This suggests that students from higher-income families, who may have better access to technology and learning resources, tend to benefit more from AI-assisted learning.

As the analysis progresses, Educational Qualification (EQ) enters in the third step, raising the R² value to 19.8%, showing that students at higher educational levels gain more effectively from AI integration in academics.

In the fourth step, Family Size (FS) is added, slightly improving the model to 21.4%, implying that family

environment and support can influence AI-based learning engagement.

Finally, in the fifth step, Area of Residence (AR) joins the model, increasing the total variation explained to 23.7% ($R^2 = 0.237$). This indicates that urban students, with greater digital access, are likely to experience stronger academic benefits from AI usage compared to their rural counterparts.

Overall, the analysis reveals that Purpose of AI Tool Usage, Monthly Income, and Educational Qualification are the most influential variables associated with academic performance, while Family Size and Area of Residence also contribute moderately to explaining the variation. Together, these five variables explain 23.7% of the total variation in academic achievement.

VI. CONCLUSION

The present study examined the relationship between AI tool usage and youth academic achievement, focusing on awareness, purpose, and impact. The results confirm that AI tools have become integral to modern learning, with widespread adoption among youth for academic and skill enhancement purposes. ChatGPT emerged as the most recognized and frequently used AI tool, followed by Google Bard and Microsoft Copilot. The Garrett Ranking analysis revealed that the primary motivation for AI adoption is academic work, supported by the desire for skill development and professional growth.

The Chi-square and correlation analyses demonstrated that socio-economic and demographic variables such as area of residence, educational qualification, family size, monthly income, and purpose of AI usage significantly influence academic outcomes. Moreover, the stepwise regression analysis indicated that Purpose of AI Tool Usage, Monthly Income, and Educational Qualification collectively explain 23.7% of the variance in academic performance, underscoring the crucial role of purposeful and informed AI utilization.

These findings suggest that AI tools, when integrated thoughtfully and ethically, enhance students' productivity, learning efficiency, and overall academic success. However, educators and policymakers must also ensure that AI literacy programs are developed to promote critical thinking, reduce overreliance on technology, and foster

responsible use. Ultimately, AI tools should serve as complements—not substitutes—for human intelligence, creativity, and learning engagement.

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