

Effects of Artificial Intelligence on the Academic Performance of Grade Six Pupils

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Abstract

This study examined the effects of Artificial Intelligence (AI) on the academic performance of Grade Six pupils in selected public elementary schools in the District of Binangonan, Division of Rizal, School Year 2025–2026. It employed a descriptive survey research design complemented by documentary analysis of pupils' quarterly grades. A total of 352 respondents were selected from 2,042 Grade Six pupils using Slovin's formula and simple random sampling. Data were gathered through a researcher-made questionnaire-checklist measuring AI's perceived effects in terms of motivation, class engagement, lesson mastery, and critical thinking and problem solving. Academic performance was determined using first and second quarter grades. Findings revealed that most respondents were 12 years old, female, firstborn, and from low-income families. Parents were generally high school to college graduates, with varying occupations, and pupils reported occasional use of AI tools. Results indicated that AI has a high perceived effect on pupils' motivation, engagement, lesson mastery, and critical thinking skills. No significant differences were found in the perceived effects when grouped according to age, sex, number of children in the family, father's educational attainment, and monthly family income. However, sibling position, mother's educational attainment, parents' occupation, and frequency of AI use showed significant differences. Pupils demonstrated a Very Satisfactory level of academic performance. Moreover, no significant positive relationship was found between perceived AI effects and academic performance. The study concludes that AI meaningfully influences learning processes but does not directly translate to higher academic performance. It recommends the formulation of school policies on AI integration, teacher training on instructional alignment, parental guidance, and responsible pupil use of AI as a learning support tool. Future researchers are encouraged to explore additional variables and conduct longitudinal studies to further validate these findings across diverse learning contexts and improve AI integration practices in basic education in the Philippines.

Keywords: Artificial Intelligence, academic performance, Grade Six pupils, descriptive survey, documentary analysis, AI Tools

Introduction

Education serves as a pathway that shapes individuals' growth, development, and future opportunities. Through continuous exploration and learning, learners acquire knowledge, skills, and experiences that extend beyond the four corners of the classroom. It is widely recognized that education plays a vital role in building a successful future and in producing competitive individuals equipped with 21st-century skills needed in a rapidly changing global society. In this context, learning is no longer confined to traditional classroom instruction but is continuously enriched by technological advancements that support teaching and learning processes.

Technology has become an essential component of modern education. Schools continuously adapt to technological innovations as these tools assist teachers in preparing instructional materials and help learners accomplish academic tasks more efficiently. Various Department of Education (DepEd) orders and memoranda support the integration of Information and Communication Technology (ICT) in teaching across learning areas. This reflects the government's strong commitment to digital transformation in education. In the Philippine context, Article XIV, Section 12 of the 1987 Philippine Constitution emphasizes that the State shall promote the adaptation of technology for national development and encourage participation from various sectors in science and technology utilization. This provision highlights the importance of integrating technology in education to promote digital literacy, critical thinking, and problem-solving skills among learners.

In line with this, DepEd Order No. 13, s. 2025, establishing the Center for Artificial Intelligence Research in the Department of Education, emphasizes the growing role of artificial intelligence (AI) in transforming education. It highlights the need to develop policies and initiatives that support AI integration in schools and ensure alignment with national educational standards and workforce requirements. This policy reflects the government's recognition of AI as a tool that can enhance teaching, learning, and educational research.

Artificial intelligence refers to systems capable of performing tasks that normally require human intelligence, such as analyzing information, generating responses, and supporting decision-making. In education, AI is increasingly used as a learning support tool that helps pupils understand complex lessons, complete assignments, and access information more efficiently. It provides opportunities for personalized learning and enhanced academic engagement. However, concerns have also been raised regarding its overuse, which may lead to reduced critical thinking, weakened problem-solving skills, and dependency among learners.

Recent literature supports both the benefits and challenges of AI in education. Dong et al. (2025) found that AI significantly improves academic achievement across educational levels, particularly in higher education, while emphasizing the need for further study on contextual factors influencing its effectiveness. Similarly, Henkel et al. (2025) demonstrated that AI-powered tutoring systems significantly enhance mathematics performance, especially in low-resource settings, highlighting AI's potential for personalized instruction. Wang et al. (2024) emphasized the importance of understanding the conceptual foundations of artificial intelligence in education and recommended interdisciplinary collaboration to strengthen AI integration. On the other hand, Zhai et al. (2024) cautioned that over-reliance on AI dialogue systems may negatively affect learners' critical thinking, decision-making, and analytical reasoning skills despite improving academic efficiency.

Local studies present similar findings. Seblian and Calos (2025) reported a significant relationship between AI usage and academic performance among junior high school students. However, Cubillas et al. (2025) found that AI adoption does not always directly influence academic performance, suggesting that other factors such as study habits and learning strategies play a significant role. Likewise, Donasco and Oliveros (2024) highlighted both the advantages and risks of AI in education, including improved engagement but also concerns on overdependence. Furthermore, Dingal (2024) established a strong relationship between AI usage and students' academic writing performance, while Atienza et al. (2023) found that AI positively influences learners' critical thinking skills when properly utilized. These studies collectively suggest that the impact of artificial intelligence in education is complex, context-dependent, and influenced by how it is used by learners and educators.

In the District of Binangonan, Division of Rizal, Grade Six pupils are increasingly exposed to artificial intelligence tools in their academic tasks. As observed by the researcher, a public elementary school teacher handling Technology and Livelihood Education (TLE) with ICT integration, pupils frequently utilize AI tools when accomplishing school activities. While AI provides academic support, some learners tend to rely heavily on it, which may affect their effort, self-confidence, and critical thinking skills. Moreover, the researcher has observed that some pupils use AI inappropriately, relying on it even for simple tasks that they can accomplish independently. This overdependence has raised concerns regarding its possible effects on learners' intellectual development, particularly in terms of independent thinking and problem-solving skills. Although AI enhances accessibility to information, excessive reliance may reduce learners' motivation to think critically and creatively. These observations prompted the researcher to investigate the effects of artificial intelligence on the academic performance of Grade Six pupils in selected public elementary schools in the District of Binangonan, Division of Rizal. Specifically, the study aims to determine how AI influences learners' motivation, class engagement, lesson mastery, and critical thinking and problem-solving skills, as well as their overall academic performance.

Despite the growing body of literature on artificial intelligence in education, a research gap remains evident. Most existing studies focus on secondary, senior high school, or tertiary learners, with limited attention given to Grade Six pupils in Philippine public elementary schools. Additionally, many studies focus on either AI usage or academic performance separately, rather than examining their perceived effects in relation to actual academic outcomes in a single comprehensive framework. Furthermore, inconsistencies in findings regarding the relationship between AI and academic performance indicate the need for localized and context-specific studies.

Thus, this study addresses these gaps by examining the effects of artificial intelligence on the academic performance of Grade Six pupils in selected public elementary schools in Binangonan, Rizal. The findings of this study may serve as a basis for developing policies, instructional strategies, and an action plan for the responsible and effective integration of AI in basic education.

Material and methods

2.1 Research Design

This study utilized the descriptive research method which is designed to gather information about present existing conditions needed in the study.

2.2 Locale of the Study

The study was conducted in selected public elementary schools in the District of Binangonan, Division of Rizal, comprising Bilibiran Elementary School, Don Jose Ynares Sr. Elementary School, Doña Susana Madrigal Elementary School,

Mabuhay Homes 2000 Elementary School, Sitio Mata Elementary School, Tagpos Elementary School, and Tayuman Elementary School. These schools offer complete elementary education from kindergarten to grade six.

2.3 Respondents of the Study

The respondents of the study are selected grade six pupils in selected public elementary schools in the District of Binangonan. The sample size was determined using Slovin's formula. Hence, out of 2042 grade six pupils, 352 were considered. They were chosen using a simple random sampling technique. They were described in terms of age, sex, sibling position, number of children in the family, parents' educational attainment, parents' occupation, monthly family income, and frequency of using AI.

2.4 Sample and Sampling Procedure

The respondents of the study were selected Grade Six pupils from selected public elementary schools in the District of Binangonan, Division of Rizal. The sample size was determined using Slovin's formula, resulting in 352 respondents out of a total population of 2,042 Grade Six pupils. The respondents were chosen through a simple random sampling technique to ensure that each pupil had an equal chance of being selected, thereby reducing bias and ensuring representativeness of the sample. The selected respondents were described in terms of age, sex, sibling position, number of children in the family, parents' educational attainment, parents' occupation, monthly family income, and frequency of using artificial intelligence.

2.5 Research Instrument

The study utilized a researcher-made questionnaire-checklist to gather the needed data. It consists of two parts: the first part gathers the personal profile of the pupil-respondents in terms of age, sex, sibling position, number of children in the family, parents' educational attainment, parents' occupation, monthly family income, and frequency of using Artificial Intelligence. The second part measures the extent of the effects of Artificial Intelligence on the performance of Grade Six pupils as perceived by themselves in terms of motivation, class engagement, lesson mastery, and critical thinking and problem-solving, with 10 items per indicator for a total of 40 items. Respondents rated each item using a five-point Likert scale ranging from Never (Least Effect) to Always (Very High Effect). In addition, documentary analysis was employed to determine the pupils' academic performance based on their average grades in the first and second quarters using standardized grade descriptors. The instrument was content-validated by professorial lecturers, the thesis adviser, statistician, and the Dean of the Graduate Studies Program, with further validation provided by the school principal and master teachers, and all suggestions were incorporated into the final version of the questionnaire.

2.6 Data Gathering Procedure

The researcher used the Gantt Chart of Activities as a guide while conducting the study. The process includes formulating research questions that can be found in the statement of the problem, as well as deciding what relevant literature and studies are related to the present study, which is in Chapter Two. After completing chapters 1-3, the proposal defense is the next step. Following the proposal defense, the thesis adviser, professorial lecturers, and other experts worked together to create and validate the research instrument. After the validation of the instrument, the researcher requested permission to conduct the study in the Office of the Schools Division Superintendent. Following retrieval, the data were encoded and processed using the Statistical Package for Social Sciences (SPSS). The data gathered were analyzed with appropriate statistical methods based on the subproblems. Based on the interpreted data, a summary of results, conclusions, and recommendations was formulated. Oral defense followed. Then, a revision of the document based on the comments and suggestions of the Oral Examination Committee. The College Statistical Center tested the manuscript for plagiarism. After the finalization, the researcher submitted hardbound copies to the Office of the Dean of the Graduate Studies Program and other concerned offices.

2.7 Data Analysis Techniques

The data gathered in this study were analyzed using appropriate statistical tools based on the objectives of the study. Frequency, percentage, and rank distribution were used to describe the profile of the respondents in terms of selected variables. To determine the extent of the effects of Artificial Intelligence on the academic performance of Grade Six pupils as perceived by themselves in terms of motivation, class engagement, lesson mastery, and critical thinking and problem-solving, weighted mean was applied. One-way Analysis of Variance (ANOVA) was used to determine the significant differences in the perceived effects of Artificial Intelligence when grouped according to the respondents' profile variables. Meanwhile, frequency, mean, and standard deviation were utilized to determine the level of academic performance of Grade Six pupils based on their average grades in the first and second quarters. Finally, correlational analysis was employed to determine the significant relationship between the perceived extent of effects of Artificial Intelligence and the pupils' level of academic performance.

2.8 Ethical Considerations

This study strictly adhered to ethical standards in the conduct of research. Prior to data collection, permission was sought from the school authorities and concerned officials to ensure proper coordination and approval. The respondents were

informed about the purpose of the study, and their participation was entirely voluntary. Informed consent was obtained, assuring them that they could withdraw from the study at any time without any consequences. Confidentiality and anonymity of the respondents were strictly maintained by not disclosing their identities and ensuring that all collected data were used solely for academic purposes. Additionally, the researcher ensured that no harm, discomfort, or bias would affect the participants throughout the process. All information gathered was treated with utmost respect and integrity, and results were presented honestly and objectively.

Results and Discussion

3.1 Profile of the Respondents in Terms of the Selected Variables

It can be seen from the table that in terms of age, out of 352 pupil-respondents, the majority are 12 years old with 203 or 57.7%, followed by 11 years old with 102 or 29.0%, while 38 or 10.8% are 13 years old, and only 9 or 2.6% are 14 years old and above. In terms of sex, most of the respondents are females with 198 or 56.3%, while 154 or 43.8% are males. As to sibling position, the highest proportion of respondents are firstborn children with 137 or 38.9%, followed by second born with 79 or 22.4%, third born with 73 or 20.7%, fourth born with 33 or 9.4%, sixth and above with 19 or 5.4%, and fifth born with 11 or 3.1%. Regarding the number of children in the family, most respondents come from families with four or more children with 142 or 40.3%, followed by those with two children with 95 or 27.0%, three children with 94 or 26.7%, and only 21 or 6.0% belong to families with one child. In terms of father's educational attainment, most are high school graduates with 130 or 36.9%, followed by college graduates with 114 or 32.4%, while the least are elementary undergraduates with 14 or 4.0% and high school undergraduates with 19 or 5.4%. For mother's educational attainment, the majority are college graduates with 130 or 36.9%, followed by high school graduates with 121 or 34.4%, while the lowest are elementary undergraduates with 14 or 4.0%. As to father's occupation, most are locally employed with 301 or 85.5%, followed by others with 28 or 8.0%, while only 7 or 2.0% are self-employed and 4 or 1.1% are entrepreneurs. For mother's occupation, most are locally employed with 186 or 52.8%, followed by housewife/househusband with 118 or 33.5%, while the least are OFW with 8 or 2.3% and self-employed with 7 or 2.0%. In terms of monthly family income, the majority belong to families earning below ₱20,000.00 with 183 or 52.0%, followed by ₱20,000.00–₱24,999.00 with 95 or 27.0%, while the least is ₱25,000.00–₱29,999.00 with 30 or 8.5%. Lastly, in terms of frequency of using Artificial Intelligence, most respondents sometimes use AI with 205 or 58.2%, followed by rarely with 124 or 35.2%, often with 17 or 4.8%, and always with only 6 or 1.7%.

Table 1
Frequency, Percentage and Rank Distribution of the Respondents
in Terms of the Selected Variables

Profile	Frequency	Percentage	Rank
Age			
14 years old and above	9	2.6	4
13 years old	38	10.8	3
12 years old	203	57.7	1
11 years old	102	29.0	2
Total	352	100.0	
Sex			
Male	154	43.8	2
Female	198	56.3	1
Total	352	100.0	
Sibling Position			
First	137	38.9	1
Second	79	22.4	2
Third	73	20.7	3
fourth	33	9.4	4
Fifth	11	3.1	6
Sixth and above	19	5.4	5
Total	352	100.0	
Number of Children in the Family			
1	21	6.0	4
2	95	27.0	2
3	94	26.7	3
4 and above	142	40.3	1
Total	352	100.0	

Father's Educational Attainment			
College Graduate	114	32.4	2
College Undergraduate	39	11.1	3
High School Graduate	130	36.9	1
High School Undergraduate	19	5.4	5
Elementary Graduate	36	10.2	4
Elementary Undergraduate	14	4.0	6
Total	352	100.0	
Mother's Educational Attainment			
College Graduate	130	36.9	1
College Undergraduate	55	15.6	3
High School Graduate	121	34.4	2
High School Undergraduate	16	4.5	4.5
Elementary Graduate	16	4.5	4.5
Elementary Undergraduate	14	4.0	6
Total	352	100.0	
Father's Occupation			
Employed (Local)	301	85.5	1
OFW	12	3.4	3
Self-employed	7	2.0	4
Entrepreneur	4	1.1	5
Others	28	8.0	2
Total	352	100.0	
Mother's Occupation			
Employed (Local)	186	52.8	1
OFW	8	2.3	5
Self-employed	7	2.0	6
Entrepreneur	16	4.5	4
Housewife/Househusband	118	33.5	2
Others	17	4.8	3
Total	352	100.0	
Monthly Family Income			
₱ 30,000 and above	44	12.5	3
₱ 25,000 - ₱ 29,999	30	8.5	4
₱ 20,000 - ₱ 24,999	95	27.0	2
Below ₱ 20,000	183	52.0	1
Total	352	100.0	
Frequency of Using Artificial Intelligence			
Always	6	1.7	4
Often	17	4.8	3
Sometimes	205	58.2	1
Rarely	124	35.2	2
Total	352	100.0	

3.2 Extent of Effects of Artificial Intelligence on the Academic Performance of Grade Six Pupils as Perceived by Themselves with Respect to the Different Aspects

As shown in the table, the composite mean is 3.65, interpreted as High Effect, with all indicators also rated High Effect. Among the four aspects, Critical Thinking and Problem Solving ranked first with a weighted mean of 3.71, while Class Engagement ranked last with 3.60. This indicates that artificial intelligence is perceived by Grade Six pupils as highly beneficial, particularly in enhancing higher-order thinking skills such as analysis, reasoning, and problem-solving, as well as in supporting lesson understanding and mastery. However, its influence on class engagement is comparatively lower, suggesting that AI is seen more as a cognitive learning aid than a tool for increasing participation and interest. These findings imply that AI integration in education should focus on strengthening critical thinking and lesson comprehension through guided problem-solving and scaffolded learning activities. This result is supported by Cubillas et al. (2025), who found that AI-related competencies and attitudes do not necessarily translate to significant academic achievement, indicating that other factors may also influence learning outcomes.

Table 2

Extent of Effects of Artificial Intelligence on the Academic Performance of Grade Six Pupils as Perceived by Themselves with Respect to the Different Aspects

Aspects	Overall Mean	Verbal Interpretation	Rank
Motivation	3.61	High Effect	3
Class Engagement	3.60	High Effect	4
Lesson Mastery	3.69	High Effect	2
Critical Thinking and Problem Solving	3.71	High Effect	1
Composite Mean	3.65	High Effect	

3.3 Significant Difference on the Extent of Effects of Artificial Intelligence on the Academic Performance of Grade Six Pupils as Perceived by Themselves with Respect to the Different Aspects in Terms of Their Profile

As shown in the table, the F-test results revealed no significant differences in the perceived effects of artificial intelligence on Grade Six pupils' performance in terms of age, sex, number of children in the family, father's educational attainment, and monthly family income, as all computed p-values were greater than 0.05, leading to the acceptance of the null hypothesis. This indicates that these profile variables do not significantly influence pupils' perceptions of AI's effects on motivation, class engagement, lesson mastery, critical thinking, and problem-solving. However, significant differences were found in sibling position, mother's educational attainment, father's occupation, mother's occupation, and frequency of AI use, as their p-values were less than 0.05, resulting in the rejection of the null hypothesis. This suggests that these factors influence how pupils perceive the effects of AI on their academic performance. The findings imply that demographic characteristics such as age, sex, and income do not substantially shape pupils' perceptions of AI, while family-related and usage-related factors play a more significant role. In particular, frequent use of AI appears to strengthen pupils' perception of its positive academic effects, indicating that greater exposure and consistent use enhance its perceived usefulness in learning. This is supported by Dong, Tang, and Wang (2025), who emphasized that educational level and related contextual factors significantly moderate the effectiveness of AI in learning outcomes, highlighting the importance of considering learner characteristics in AI integration.

Table 3

Significant Difference on the Extent of Effects of Artificial Intelligence on the Academic Performance of Grade Six Pupils as Perceived by Themselves with Respect to the Different Aspects in Terms of Their Profile

Profile	f-value	p-value	Decision	VI
Age				
Motivation	.241	.868	Accepted	Not Significant
Class Engagement	1.138	.334	Accepted	Not Significant
Lesson Mastery	.382	.766	Accepted	Not Significant
Critical Thinking and Problem Solving	.290	.832	Accepted	Not Significant
Sex				
Motivation	1.927	.166	Accepted	Not Significant
Class Engagement	.375	.541	Accepted	Not Significant
Lesson Mastery	2.335	.127	Accepted	Not Significant
Critical Thinking and Problem Solving	.005	.945	Accepted	Not Significant
Sibling Position				
Motivation	4.979	.000	Rejected	Significant
Class Engagement	3.825	.002	Rejected	Significant
Lesson Mastery	9.105	.000	Rejected	Significant
Critical Thinking and Problem Solving	6.498	.000	Rejected	Significant
Number of Children in the Family				
Motivation	.083	.969	Accepted	Not Significant
Class Engagement	1.156	.327	Accepted	Not Significant
Lesson Mastery	1.169	.322	Accepted	Not Significant
Critical Thinking and Problem Solving	.781	.505	Accepted	Not Significant
Father's Educational Attainment				
Motivation	1.440	.209	Accepted	Not Significant
Class Engagement	1.681	.071	Accepted	Not Significant
Lesson Mastery	1.353	.242	Accepted	Not Significant
Critical Thinking and Problem Solving	1.071	.376	Accepted	Not Significant
Mother's Educational Attainment				

Motivation	3.138	.009	Rejected	Significant
Class Engagement	3.376	.005	Rejected	Significant
Lesson Mastery	2.918	.014	Rejected	Significant
Critical Thinking and Problem Solving	6.961	.004	Rejected	Significant
Father's Occupation				
Motivation	5.400	.000	Rejected	Significant
Class Engagement	5.094	.001	Rejected	Significant
Lesson Mastery	8.040	.000	Rejected	Significant
Critical Thinking and Problem Solving	3.407	.009	Rejected	Significant
Mother's Occupation				
Motivation	5.235	.000	Rejected	Significant
Class Engagement	3.308	.006	Rejected	Significant
Lesson Mastery	3.165	.008	Rejected	Significant
Critical Thinking and Problem Solving	8.628	.009	Rejected	Significant
Monthly Family Income				
Motivation	.430	.732	Accepted	Not Significant
Class Engagement	.359	.783	Accepted	Not Significant
Lesson Mastery	.748	.524	Accepted	Not Significant
Critical Thinking and Problem Solving	1.220	.123	Accepted	Not Significant
Frequency of Using Artificial Intelligence				
Motivation	7.683	.000	Rejected	Significant
Class Engagement	14.502	.000	Rejected	Significant
Lesson Mastery	11.592	.000	Rejected	Significant
Critical Thinking and Problem Solving	7.324	.000	Rejected	Significant

3.4 Level of Academic Performance of Grade Six Pupils as Revealed by Their Average Grade in the First and Second Quarters

The table shows an improvement in the academic performance of Grade Six pupils from the First Quarter to the Second Quarter, with the mean increasing from 85.67 to 87.21, both interpreted as “Very Satisfactory,” and an overall mean of 86.44. The majority of pupils consistently fall under the “Very Satisfactory” category, while the proportion of “Outstanding” learners increased in the second quarter and “Satisfactory” decreased, indicating a positive shift in performance. This trend suggests that pupils’ learning outcomes improved over time, which may be associated with their increased familiarity and use of Artificial Intelligence tools in academic tasks. However, the results also indicate that while AI may support general learning improvement, it may not equally address performance gaps among learners. This implies the need for more targeted and differentiated use of AI to better support struggling pupils and ensure more balanced academic progress across all performance levels.

Table 4

Level of Academic Performance of Grade Six Pupils as Revealed by Their Average Grade in the First and Second Quarters

		First Quarter			Second Quarter			Average		
Average Grade	Verbal Interpretation	F	%	R	F	%	R	F	%	R
90 and above	Outstanding	70	19.9	3	106	30.3	2	99	28.3	2
85 – 89	Very Satisfactory	142	40.4	1	163	46.3	1	148	42.1	1
80 – 84	Satisfactory	123	34.9	2	78	22.2	3	98	27.9	3
75 – 79	Fairly Satisfactory	17	4.8	4	5	1.5	4	7	2	4
Below 75	Did Not Meet Expectations	-	-	-	-	-	-	-	-	-
Total		352	100.0		352	100.0		352	100.0	
Highest Rating		94			98			95		
Lowest Rating		77			78			78		
Mean		85.67 (VS)			87.21(VS)			86.44 (VS)		
Std. Deviation		3.881			3.868			3.835		

3.5 Significant Relationship Between the Perceived Extent of Effects of Artificial Intelligence and the Level of Academic Performance of Grade Six Pupils

The data reveal a consistent pattern of non-significant relationships between the four aspects of Artificial Intelligence effects—Motivation, Class Engagement, Lesson Mastery, and Critical Thinking and Problem Solving—and the actual academic performance of Grade Six pupils. The correlation coefficients are all very low and near zero, indicating no meaningful relationship, and all p-values exceed 0.05, leading to the acceptance of the null hypothesis. This means that pupils’ perceived effects of AI on their learning do not significantly correspond to their actual academic performance. The

findings imply that while pupils view AI positively in terms of enhancing engagement, motivation, and cognitive support, these perceptions do not necessarily translate into improved grades. This suggests that the benefits of AI may be more affective and process-oriented rather than directly measurable in academic outcomes. It further implies that AI use may support learning experiences such as curiosity and task completion, but not necessarily deeper understanding or performance gains unless properly aligned with instructional objectives. This result contrasts with the findings of Atienza et al. (2023), which reported a significant positive impact of artificial intelligence on students' academic performance and critical thinking skills.

Table 5

Significant Relationship Between the Perceived Extent of Effects of Artificial Intelligence and the Level of Academic Performance of Grade Six Pupils

Literacy	r-value	p-value	Decision	Verbal Interpretation
Motivation	.010	.850	Accepted	Not Significant
Class Engagement	.015	.775	Accepted	Not Significant
Lesson Mastery	.085	.112	Accepted	Not Significant
Critical Thinking and Problem Solving	.073	.174	Accepted	Not Significant

Conclusions & Recommendations

The study concluded that pupils' age, sex, number of children in the family, father's educational attainment, and monthly family income are not contributory to the perceived effects of artificial intelligence on the academic performance of Grade Six pupils in terms of motivation, class engagement, lesson mastery, and critical thinking and problem-solving. However, sibling position, mother's educational attainment, father's and mother's occupation, and frequency of using artificial intelligence are contributory factors. Furthermore, there is a significant correlation between the perceived extent of effects of artificial intelligence and the academic performance of Grade Six pupils, indicating that pupils' perceptions of AI are meaningfully associated with their learning outcomes. These findings suggest that while basic demographic factors do not significantly influence perceptions of AI, family background and frequency of AI use play a more important role, and that proper and regular use of AI may enhance its perceived benefits in learning.

Based on these findings, school administrators are encouraged to develop clear policies and guidelines for the proper and purposeful integration of artificial intelligence in classroom instruction, allocate resources for AI-based personalized learning especially for struggling learners, and provide continuous professional development programs for teachers to effectively align AI use with curriculum goals and assessment standards. Teachers are likewise encouraged to design learning activities that promote higher-order thinking through AI use and provide targeted support for low-performing pupils through differentiated instruction. Parents are encouraged to actively monitor and guide their children's use of AI at home, while pupils are advised to use AI responsibly as a learning support tool rather than a substitute for independent thinking. The implementation of the proposed action plan is recommended, and further studies may be conducted to explore additional variables affecting AI use and academic performance.

Compliance with ethical standards

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