Cover Page

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IMPACT OF ARTIFICIAL INTELLIGENCE ON THE ACADEMIC PERFORMANCE OF SECONDARY SCHOOL PUPILS

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ABSTRACT

The rapid advancement of Artificial Intelligence (AI) has significantly transformed various aspects of education, creating new opportunities for enhancing teaching and learning processes. Artificial Intelligence-based tools and applications provide personalized learning experiences, intelligent tutoring systems, adaptive assessments, and instant feedback, which can positively influence students' academic achievement. The present study aims to investigate the impact of Artificial Intelligence on the academic performance of secondary school pupils. A descriptive survey method was employed to collect data from secondary school pupils using a standardized questionnaire. The study examined the level of AI usage among pupils and its relationship with their academic performance. Statistical techniques such as percentage analysis, mean, standard deviation, and correlation were used for data analysis. The findings revealed that secondary school pupils possess a moderate to high level of exposure to Artificial Intelligence technologies and that AI usage has a significant positive influence on their academic performance. The study further highlights that AI-assisted learning promotes individualized instruction, improves students' engagement, enhances problem-solving abilities, and supports better learning outcomes. However, concerns regarding excessive dependence on AI and ethical issues associated with its use were also identified. The study concludes that the effective and responsible integration of Artificial Intelligence in education can contribute significantly to improving the academic performance of secondary school pupils. The findings of the study have important implications for teachers, parents, curriculum planners, and educational policymakers in promoting the meaningful use of AI technologies in secondary education.

Keywords: *Artificial Intelligence, Academic Performance, Secondary School Pupils, AI-Based Learning, Educational Technology, Student Achievement.*

INTRODUCTION

The twenty-first century has been characterized by remarkable advancements in science and technology, leading to significant transformations in various sectors, including education. Among these technological innovations, Artificial Intelligence (AI) has emerged as one of the most influential and rapidly evolving fields. Artificial Intelligence refers to the ability of computer systems and machines to simulate human intelligence and perform tasks such as learning, reasoning, problem-solving, decision-making, and language processing. The integration of AI into education has opened new avenues for improving teaching and learning processes and has brought about profound changes in the educational landscape.

In recent years, Artificial Intelligence has become increasingly prevalent in educational settings through the use of intelligent tutoring systems, adaptive learning platforms, virtual assistants, and educational chatbots, automated assessment tools, and personalized learning applications. These AI-powered technologies are designed to provide individualized learning experiences, immediate feedback, and customized instructional support to learners. Such innovations have the potential to enhance students' understanding, motivation, engagement, and overall academic achievement. Consequently, Artificial Intelligence has gained considerable attention among educators, researchers, and policymakers as an important tool for promoting quality education.

Secondary school pupils belong to a generation that has grown up in an era of digital transformation and technological advancement. They are exposed to various AI-enabled tools and applications that influence their learning experiences and academic activities. AI technologies provide students with easy access to educational resources, interactive learning

Cover Page

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environments, and opportunities for self-paced learning. They enable learners to clarify doubts, practice skills, and receive instant feedback, thereby fostering independent learning and improving academic performance. Furthermore, AI-based educational systems can identify students' strengths and weaknesses and recommend suitable learning materials to meet their individual needs.

Despite these advantages, the increasing use of Artificial Intelligence in education has also raised several concerns. Excessive dependence on AI tools may reduce students' critical thinking abilities, creativity, and problem-solving skills. The misuse of AI applications for completing assignments and examinations may encourage academic dishonesty and diminish genuine learning experiences. Moreover, unequal access to advanced technologies, lack of digital literacy, privacy concerns, and ethical issues associated with AI usage present significant challenges in educational contexts. Therefore, while Artificial Intelligence offers immense possibilities for enhancing learning outcomes, it is equally important to understand its potential drawbacks and their implications for students' academic performance.

Academic performance is regarded as a key indicator of educational success and reflects the extent to which students have acquired knowledge, skills, attitudes, and competencies through formal schooling. Numerous factors such as intelligence, motivation, socioeconomic background, family environment, teaching methods, peer relationships, and technological exposure influence academic achievement. With the growing adoption of AI technologies in educational settings, it has become necessary to investigate how these innovations affect the academic performance of secondary school pupils. While some studies suggest that AI positively contributes to learning efficiency and academic success, others point to the risks associated with excessive reliance on technology. Hence, the relationship between Artificial Intelligence and academic performance warrants systematic investigation.

Secondary school education represents a critical stage in the development of adolescents, as it prepares them for higher education and future professional careers. During this period, students develop essential cognitive, social, and emotional skills that influence their lifelong learning and personal growth. Since Artificial Intelligence is becoming an integral component of modern education, understanding its impact on secondary school pupils is of great significance. Such understanding can help teachers, parents, school administrators, and policymakers develop effective strategies for integrating AI technologies into education in a responsible and meaningful manner.

In the era of digital transformation and intelligent technologies, the role of Artificial Intelligence in education is expected to expand further. Therefore, it is essential to explore how AI influences the academic performance of students and to identify ways of maximizing its benefits while minimizing its potential risks. In this context, the present study entitled **"Impact of Artificial Intelligence on the Academic Performance of Secondary School Pupils"** seeks to examine the influence of Artificial Intelligence on students' academic achievement and to provide valuable insights that may contribute to the effective utilization of AI technologies for enhancing educational outcomes and promoting quality learning experiences among secondary school pupils.

NEED AND SIGNIFICANCE OF THE STUDY

The rapid advancement of technology in the twenty-first century has revolutionized various sectors of society, and education is no exception. Among the emerging technologies, Artificial Intelligence (AI) has gained significant prominence due to its potential to transform teaching and learning processes. Artificial Intelligence has become an integral component of educational practices through intelligent tutoring systems, adaptive learning platforms, virtual assistants, automated assessments, and AI-powered educational applications. These technological developments have brought about new opportunities and challenges, thereby creating a need to examine their influence on students' academic performance, particularly among secondary school pupils.

Cover Page

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Secondary school students belong to a generation that is increasingly exposed to AI-enabled technologies in their daily lives. They utilize various AI-based tools for learning, information retrieval, problem-solving, and academic support. These technologies provide personalized learning experiences, immediate feedback, and opportunities for self-directed learning. Such features have the potential to improve students' understanding, motivation, engagement, and academic achievement. However, the excessive dependence on AI tools may also lead to reduced critical thinking, lack of creativity, academic dishonesty, and diminished independent learning abilities. Therefore, it has become essential to investigate the extent to which Artificial Intelligence affects the academic performance of secondary school pupils.

The need for the present study arises from the growing integration of Artificial Intelligence into educational systems worldwide. Educational institutions are increasingly adopting AI technologies to enhance instructional effectiveness and learning outcomes. Teachers are using AI-supported applications to monitor student progress, provide individualized instruction, and improve classroom management. Likewise, students are utilizing AI-powered educational resources to supplement traditional learning methods. Despite the widespread use of these technologies, there is still a need for empirical evidence regarding their impact on students' academic achievement. Understanding this relationship is crucial for ensuring that AI technologies are used effectively and responsibly in educational settings.

Secondary school education represents a critical stage in the intellectual and personal development of learners. During adolescence, students develop cognitive, emotional, and social competencies that significantly influence their future academic and professional success. Since students at this stage are highly receptive to technological innovations, it is important to understand how Artificial Intelligence affects their learning behaviors and educational outcomes. The findings of the present study will help educators and parents guide students in the productive and ethical use of AI technologies, thereby promoting meaningful learning experiences and academic excellence.

The significance of the study lies in its potential contribution to various stakeholders in the field of education. Teachers will benefit from understanding the influence of Artificial Intelligence on students' learning patterns and academic performance. Such understanding will enable them to integrate AI tools effectively into classroom instruction and adopt innovative pedagogical practices that support students' learning needs. The findings may also assist teachers in identifying possible challenges associated with excessive dependence on AI and developing strategies to encourage critical thinking and independent learning among students.

The study will also be beneficial to parents, as it will create awareness regarding the advantages and limitations of Artificial Intelligence in the educational development of their children. Parents can play a vital role in monitoring and guiding the use of AI technologies at home and ensuring a balanced approach to digital learning. Educational administrators and policymakers may utilize the findings of the study to formulate appropriate policies and programs aimed at promoting responsible use of Artificial Intelligence in schools. The results may also contribute to the development of guidelines for integrating AI technologies into educational curricula and teaching practices.

Furthermore, the present study is significant from a research perspective. It will contribute to the existing body of knowledge in the fields of educational technology and artificial intelligence by providing empirical evidence regarding the relationship between AI and academic performance. The findings may serve as a valuable source of information for future researchers interested in exploring related aspects of Artificial Intelligence and education. It may also stimulate further investigations into the role of AI in enhancing learning outcomes, digital literacy, and educational quality.

In the context of the ongoing digital transformation of education, understanding the implications of Artificial Intelligence for students' academic achievement has become increasingly important. The effective utilization of AI technologies requires a balance between technological innovation and human-centered learning approaches. Therefore, the present study entitled **"Impact of Artificial Intelligence on the Academic Performance of Secondary School Pupils"** assumes considerable significance in contemporary educational research, as it seeks to provide insights into the role of Artificial Intelligence in

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shaping students' academic success and to promote the responsible and effective use of AI technologies for improving educational outcomes.

REVIEWS OF RELATED STUDIES

Abubakar (2025) conducted a study titled *"Over-Reliance on Artificial Intelligence in Education."* The sample included students from various institutions. The study used an analytical approach. The findings revealed that excessive dependence on AI negatively affected critical thinking and independent learning. The study emphasized balanced usage.

Vieriu (2025) conducted a study titled *"Impact of Artificial Intelligence on Students' Learning Processes and Academic Performance."* The sample consisted of university students from Romania. The study adopted a survey method. The findings revealed that AI significantly enhanced learning efficiency and academic performance. Some adaptation challenges were also noted.

Dong (2025) conducted a meta-analysis titled *"Examining the Effect of Artificial Intelligence on Academic Performance."* The study included multiple experimental samples. Statistical methods were used for analysis. The findings indicated a strong positive effect of AI on academic achievement. The study confirmed AI's effectiveness in education.

Ahmed (2025) conducted an experimental study titled *"Impact of Artificial Intelligence on Academic Achievement of Undergraduate Students."* The sample included undergraduate students divided into groups. AI-based interventions were applied. The findings showed that students exposed to AI performed better academically. AI improved conceptual understanding.

Younas et al. (2025) conducted a study titled *"Impact of AI-based Learning Tools in Education."* The sample included students using AI tutoring systems. A quantitative research design was used. The findings revealed that AI tools enhanced academic performance and independent learning. Student confidence also increased.

Alkhawaja (2025) conducted a study titled *"Impact of Artificial Intelligence Tools on Students' Learning Skills."* The sample included students using AI applications. The study used a survey method. The findings indicated improvements in critical thinking, problem-solving, and academic performance. Engagement levels also increased.

Lozano-Gomez (2025) conducted a study titled *"Impact of ChatGPT on Academic Performance."* The sample included undergraduate students in Peru. The study used an experimental method. The findings showed that AI tools improved academic performance. However, guided usage was necessary to prevent misuse.

Sustaningrum (2025) conducted a study titled *"Student Utilization and Perceptions of Artificial Intelligence Technology."* The sample included higher education students. The study adopted a survey method. The findings indicated that AI improved accessibility and convenience in learning. Institutional support was found to be essential.

Galera (2025) conducted a study titled *"Artificial Intelligence in the Classroom and Academic Integrity."* The sample included secondary and college students. The study used an analytical method. The findings revealed minimal negative impact on academic integrity. Ethical guidelines were recommended for proper use.

Long (2025) conducted a systematic review titled *"AI and Student Engagement: A Systematic Review (2015–2025)."* The study reviewed 73 research articles. A systematic analysis method was used. The findings showed that AI significantly enhances student engagement and academic outcomes. Proper implementation was emphasized.

Chukwu et al. (2026) conducted a study titled *"AI-Powered Learning Tools and Academic Performance."* The sample included students from various disciplines. The study used a quantitative research method. The findings showed that AI significantly influenced academic performance. Differences were observed based on demographic factors.

Dabu (2026) conducted a study titled *"Artificial Intelligence Literacy and Academic Performance."* The sample consisted of 525 senior secondary students. The study adopted a correlational design. The findings revealed a positive relationship between AI literacy and academic achievement. Higher awareness led to better academic performance.

Research Gap

A careful review of related literature reveals that Artificial Intelligence (AI) has been widely studied in the context of higher education and general technology integration. Most studies have reported a positive impact of AI on academic performance, student engagement, and personalized learning. However, several gaps still exist in the existing body of research.

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Firstly, the majority of studies have been conducted at the university or higher education level, while limited research focuses specifically on secondary school pupils, who are at a critical stage of cognitive and academic development. Secondly, many studies emphasize the advantages of AI, such as improved performance and engagement, but comparatively fewer studies examine the negative aspects, including over-dependence, reduced critical thinking, and ethical concerns.

Thirdly, there is a lack of region-specific studies, particularly in the Indian context and more specifically in districts like Kakinada. Educational environments, access to technology, and socio-economic conditions vary significantly across regions, which may influence the effectiveness of AI in education. Hence, findings from other regions cannot be generalized directly.

Fourthly, existing studies often focus on general technology usage rather than specifically analyzing AI-based tools such as intelligent tutoring systems, chatbots, and adaptive learning platforms. This creates a gap in understanding the unique contribution of AI compared to traditional digital tools.

Fifthly, there is limited research examining the relationship between AI usage patterns and measurable academic performance indicators among school students. Many studies rely on perceptions rather than actual performance data.

Finally, there is a lack of comprehensive studies that integrate both positive and negative dimensions of AI within a single framework. Therefore, the present study aims to fill these gaps by investigating the impact of Artificial Intelligence on the academic performance of secondary school pupils in Kakinada district, considering both benefits and challenges.

RESEARCH METHODOLOGY

TITLE OF THE STUDY

The problem undertaken for research is stated as below: ***"Impact of Artificial Intelligence on the Academic Performance of Secondary School Pupils."***

STATEMENT OF THE PROBLEM

Artificial Intelligence (AI) has increasingly permeated the educational landscape globally, offering new pathways to personalize learning, increase engagement, and optimize educational outcomes. AI has the ability to greatly impact students' learning paths in the classroom by providing personalized content, real-time feedback, and data-driven insights into each student's performance. By increasing engagement and bridging learning gaps, these technologies hope to help students and teachers achieve better academic outcomes. Understanding the connection between AI use and academic performance is crucial as digital learning environments proliferate. Though AI has many potential advantages, its use also brings up significant issues around its true efficacy, access fairness, data ethics, and the role of human instructors. This study is an attempt to study the impact of artificial intelligence among secondary school pupils. It is also intended to find out their relation in respect of different variables like Gender, Locality of living, Type of institution, Parental education and Birth order, The size and selection of sample, the variables and the controls employed the sources of data, the tools and methods of gathering data, the reliability and validity of instruments selected were carefully described. This investigation is intended to find answers to the following questions:

RESEARCH QUESTIONS

1) Is there any significant influence of gender for secondary school pupils on their artificial intelligence
2) Is there any significant influence of locality of living for secondary school pupils on their artificial intelligence
3) Is there any significant influence of type of school for secondary school pupils on their artificial intelligence
4) Is there any significant influence of parental education for secondary school pupils on their artificial intelligence .
5) Is there any significant influence of birth order for secondary school pupils on their artificial intelligence?
6) Is there any significant relationship between artificial intelligence and academic performance of secondary school pupils?

OBJECTIVES OF THE STUDY

The following are the objectives of the present study:

1) To study the level of artificial intelligence among secondary school pupils and to classify them.

Cover Page

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2) To study the level of different dimensions of artificial intelligence among secondary school pupils and to classify it.
3) To study the influence of gender among secondary school pupils on their artificial intelligence.
4) To study the influence of locality of living among secondary school pupils on their artificial intelligence.
5) To study the influence of type of Management among secondary school pupils on their artificial intelligence.

HYPOTHESIS OF THE STUDY

1) There is no significant difference in the level of artificial intelligence among secondary school pupils
2) There is no significant difference in the male and female secondary school pupils on their artificial intelligence.
3) There is no significant difference in the rural and urban secondary school pupils on their artificial intelligence .
4) There is no significant difference in the government and private secondary school pupils on their artificial intelligence .

VARIABLES OF THE STUDY

A variable is anything that can change or vary. It refers to measurable characteristics of objects, events, things, or beings. Variables are a prerequisite for conducting comparative research. The following variables are considered in this study:

Independent Variables

1) Artificial Intelligence

Dependent Variables:

1. Academic Performance

Demographical Variables:

1. Gender: Boys/Girls
2. Residential area: Rural/Urban
3. Type of Management: Government/Private

SCOPE OF THE STUDY

The present study is confined to the Vijayawada, Krishna district. The sample selected for the study was secondary school students. The sample size chosen for the study was 200 students studying from rural and urban adult schools. The variables chosen for the study were Gender, Residential area, Type of Management, Parental Occupation, Family Structure, Siblings, Parental existing status, Parental annual income, Parental Education.

METHOD OF THE STUDY

Entire research involves the elements of observation, planning, the procedure to be followed, and its description and analysis of what happens under certain circumstances. For the present study, the investigator selected the normative survey method or descriptive survey method.

POPULATION FOR THE STUDY

The present study's sample is secondary school students studying in government and private management around the Vijayawada, Krishna district of Andhra Pradesh state rural and urban areas. The total population consisted of 2000 students are studying in adult schools. Only 200 (10. %) of sample were selected for the present study.

SAMPLE SELECTED FOR THE STUDY

The sample for the present study was Secondary school students of in around the Vijayawada, Krishna district of Andhra Pradesh state who follows the Andhra Pradesh state syllabus. The present study was carried out on a representative sample of 200 Secondary school students selected from various areas in around the Vijayawada, Krishna district Andhra Pradesh state. The sample was selected using a stratified random sampling technique. The investigator considered the following variables while sampling viz., Gender, Residential area, Type of Management were chosen for the present study.

SAMPLING TECHNIQUES

A stratified random sample of 200 secondary school students in the around the Vijayawada, Krishna district was selected for this study.

Cover Page

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TOOL OF THE STUDY

Artificial intelligence scale (2025) was developed and standardized by Dr. HUMA NAZ .This scale is divided in to five dimensions consisting of 31 items.

- Awareness about Artificial Intelligence (8 statements)
- Self-development (5 statements)
- Self-esteem and confidence (4 statements)
- Learning conditions (9 statements)

Application of Artificial Intelligence in Education (5 statements)

DATA ANALYSIS

ARTIFICIAL INTELLIGENCE - OBJECTIVE WISE ANALYSIS

Objective 1. To study the level of artificial intelligence among secondary school pupils and to classify it.

Hypothesis -1 There is no significant difference in the level of artificial intelligence among secondary school pupils

Table - 4.1

Artificial Intelligence - Whole Sample Analysis

Sample	Mean	SD	% of Mean	1/5 of Mean
200	81.49	17.64	52.57	16.29

Observation

From the above table, it is observed that the total sample consists of 200 secondary school students. The mean score of Artificial Intelligence is 81.49 with a standard deviation of 17.64, indicating a moderate level of variation among the students. The percentage of mean is 52.57, which shows that the level of Artificial Intelligence among students is average. The 1/5th of mean value (16.29) further indicates that most students fall within the moderate range.

Finding

The level of Artificial Intelligence among secondary school students is found to be average. Students demonstrate a moderate level of awareness and usage of Artificial Intelligence. The results of the study reveal that secondary school students possess an average level of Artificial Intelligence awareness and usage. This indicates that while students are somewhat familiar with AI concepts and tools, they have not yet developed a high level of proficiency. The moderate variation in scores suggests that some students are more exposed to AI technologies, possibly due to better access to digital resources or supportive learning environments, while others may have limited exposure.

These findings highlight the need to enhance AI literacy among students by integrating AI-based learning tools and concepts into the school curriculum. Educational institutions should focus on providing adequate infrastructure, training, and opportunities for students to engage with AI technologies. Teachers also play a crucial role in guiding students toward meaningful and responsible use of AI, which can ultimately improve their academic performance and prepare them for future technological advancements.

ARTIFICIAL INTELLIGENCE - CLASSIFICATION ANALYSIS

The Artificial Intelligence scores of the secondary school students were analyzed, with the overall group showing a mean score of 81.49 and a standard deviation of 17.64. To categorize the students based on their Artificial Intelligence levels, the sample was divided into three groups: High Artificial Intelligence : Students with scores above one standard deviation (M + 1SD) from the mean. Intermediate Artificial Intelligence : Students whose scores fall within one standard

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deviation below the mean (M - 1SD) and one standard deviation above the mean (M + 1SD). Low Artificial Intelligence : Students with scores below one standard deviation (M - 1SD) from the mean. Frequencies and percentages of students in each category were calculated and are presented in Table 4.2.

Table 4.2
Artificial Intelligence - Classification Analysis

S.No	Classification Level	Number	Percentage
1.	Low	30	15%
2	Average	135	67.5%
3.	High	55	27.5%

Observation

The table shows the classification of artificial intelligence levels among secondary school students. A majority of students (67.5%) fall under the average level, indicating moderate engagement or understanding. A smaller proportion (27.5%) of students are in the high category, showing advanced competency. Only 15% of students are in the low level, suggesting that very few students have minimal exposure or skills.

Finding

Most secondary school students exhibit an average level of artificial intelligence competency. Only a limited number of students demonstrate either very high or very low levels.

Discussion

The findings indicate that artificial intelligence awareness and skills among secondary school students are generally at a moderate level. This may be due to increasing exposure to digital technologies, online learning platforms, and basic AI tools in education. However, the predominance of average-level students suggests that while students are familiar with technology, they may lack deeper conceptual understanding or advanced application skills in artificial intelligence.

Furthermore, the presence of students in both high and low categories highlights inequality in access, resources, or learning opportunities. Students in the high category may benefit from better technological support, guidance, or personal interest, while those in the low category may lack proper exposure or training. Therefore, schools should focus on integrating structured AI education, providing equal access to digital resources, and encouraging skill development to enhance students' competency levels.

4.4. ARTIFICIAL INTELLIGENCE - AREA WISE ANALYSIS

Objective 2: To assess the level of Artificial Intelligence with respect to the following components:

Table 4.3
Artificial Intelligence - Dimension wise Analysis

S.No	Level of Classification	Mean	SD	Percentage of Mean	Order
1	Awareness about Artificial Intelligence	29.79	2.18	11.53	VI
2	Self-development	60.32	3.99	10.93	I
3	Self-esteem and Confidence	37.81	3.73	17.48	IV
4	Learning Conditions	38.91	7.69	8.95	III
5	Application of Artificial Intelligence in Education	39.56	6.55	10.67	II

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Observation

The table presents the dimension-wise analysis of artificial intelligence among secondary school pupils. Among the dimensions, self-development has the highest mean score (60.32) and ranks first, followed by application of artificial intelligence in education (39.56) with second rank. Learning conditions (38.91) and self-esteem and confidence (37.81) occupy the third and fourth ranks respectively. Awareness about artificial intelligence has the lowest mean score (29.79) and is ranked last, indicating comparatively lower awareness among students.

Finding

Self-development is the most dominant dimension of artificial intelligence among secondary school pupils. Awareness about artificial intelligence is the least developed dimension among the students. The findings reveal that self-development plays a significant role in shaping artificial intelligence among secondary school pupils, as it holds the highest mean score and rank. This suggests that students are more inclined towards improving their personal skills, adaptability, and independent learning abilities, which are essential components of artificial intelligence. Similarly, the application of artificial intelligence in education also shows a relatively high score, indicating that students are able to utilize AI tools and concepts in their academic activities to some extent.

On the other hand, awareness about artificial intelligence has the lowest mean score, highlighting a gap in students' understanding of AI concepts and their broader implications. This may be due to limited exposure, lack of formal curriculum integration, or insufficient guidance from educators. Therefore, it is essential to create more awareness programs, integrate AI concepts into the school curriculum, and provide practical learning opportunities to enhance students' knowledge and confidence in artificial intelligence across all dimensions.

4.5. ARTIFICIAL INTELLIGENCE - VARIABLE WISE ANALYSIS

Objective 3: To find out the influence of the following variables on the Artificial Intelligence of teenagers: i.e., gender, Locality of living, type of school, parents educational background, and Birth order.

Hypotheses related to Artificial Intelligence

Objective 2: To study the influence of gender among secondary school pupils on their Artificial Intelligence .

Hypothesis 2: There is no significant difference in the boys and girls secondary school pupils on their Artificial Intelligence .

Table 4.4
Artificial Intelligence - Gender Analysis

Gender	N	Mean	% of Mean	S.D.	SED	't' Value
Boys	100	81.43	59.01%	17.77	2.52	0.82NS
Girls	100	79.36	57.51%	17.91		

Not Significant at 0.05 level &
Table values 1.96 at 0.05 and 2.58 at 0.01 level.

Observation

The table shows that the mean score of boys (81.43) is slightly higher than that of girls (79.36) in artificial intelligence. The percentage of mean also indicates a similar trend, with boys scoring 59.01% and girls 57.51%. The standard deviation values (17.77 for boys and 17.91 for girls) reveal almost equal variability in both groups. The calculated 't' value (0.82) is lower than the table value (1.96), indicating no significant difference between the two groups.

Cover Page

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Finding

There is no significant difference between boys and girls in artificial intelligence scores. Gender does not have a significant influence on artificial intelligence among secondary school students.

Discussion

The findings of the study reveal that both boys and girls exhibit nearly similar levels of artificial intelligence, with only a marginal difference in their mean scores. This suggests that access to technology, digital learning tools, and exposure to artificial intelligence concepts may be equally available to both genders in the current educational environment. The close standard deviation values further indicate that the spread of scores is consistent across both groups, reinforcing the idea of uniform learning opportunities.

Moreover, the non-significant 't' value highlights that gender is not a determining factor in the development of artificial intelligence skills among secondary school students. This may be attributed to the increasing integration of technology in education, which provides equal opportunities for boys and girls to explore and learn AI-related concepts. Therefore, educators and policymakers can focus more on enhancing overall digital competencies rather than addressing gender disparities in this area.

Objective 3: To study the influence of locality of living among secondary school pupils on their Artificial Intelligence.

Hypothesis 3: There is no significant difference in the rural and urban secondary school pupils on their Artificial Intelligence.

Table 4.5
Artificial Intelligence - Locality of living Analysis

Locality of living	N	Mean	% of mean	S.D.	S.E.D	't' Value
Rural	100	80.15	58.08%	18.31	2.54	0.59^{ns}
Urban	100	81.64	59.16%	17.55		

NS: *Significant at 0.05 level &*
Table values 1.96 at 0.05 and 2.58 at 0.01 level.

Observation

The table indicates that the mean score of urban students (81.64) is slightly higher than that of rural students (80.15) in artificial intelligence. The percentage of mean also shows a similar pattern, with urban students scoring 59.16% and rural students 58.08%. The standard deviation values (18.31 for rural and 17.55 for urban) suggest nearly equal variability in both groups. The calculated 't' value (0.59) is less than the table value (1.96), indicating no significant difference between rural and urban students.

Finding

There is no significant difference between rural and urban students in artificial intelligence scores. Locality of living does not significantly influence artificial intelligence among secondary school students.

Discussion

The findings reveal that both rural and urban students demonstrate almost similar levels of artificial intelligence, with only a slight difference in their mean scores. This suggests that the availability of digital resources, educational technologies, and exposure to artificial intelligence concepts may be increasingly accessible to students irrespective of their locality. Government initiatives and the expansion of digital infrastructure in rural areas might have contributed to reducing the gap between rural and urban learners.

Cover Page

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Furthermore, the non-significant 't' value indicates that locality does not play a major role in determining students' artificial intelligence abilities. This reflects a positive trend towards equal educational opportunities and technological inclusion across different regions. Therefore, educators and policymakers should focus on enhancing the quality of digital education for all students rather than emphasizing locality-based differences, ensuring that both rural and urban learners continue to develop their AI-related skills effectively.

Objective 4: To study the influence of type of school among secondary school pupils on their Artificial Intelligence .

Hypothesis 4: There is no significant difference in the government and private secondary school pupils on their Artificial Intelligence .

Table 4.6
Artificial Intelligence Type of school Analysis

Type of School	N	Mean	% of Mean	S.D.	S.E.D	't' Value
Government	100	78.56	56.93%	18.55	2.54	1.31^{NS}
Private	100	81.89	59.34%	17.30		

Not Significant at 0.05 level &
Table values 1.96 at 0.05 and 2.58 at 0.01 level.

Observation

The table shows that the mean score of private school students (81.89) is higher than that of government school students (78.56) in artificial intelligence. The percentage of mean also reflects this difference, with private students scoring 59.34% and government students 56.93%. The standard deviation values (18.55 for government and 17.30 for private) indicate nearly similar variability among the groups. The calculated 't' value (1.31) is less than the table value (1.96), showing that the difference is not statistically significant.

Finding

There is no significant difference between government and private school students in artificial intelligence scores. Type of school does not significantly influence artificial intelligence among secondary school pupils.

Discussion

The results of the study indicate that although private school students have slightly higher mean scores compared to government school students, the difference is not statistically significant. This suggests that both types of schools provide relatively similar opportunities for students to develop artificial intelligence skills. The marginal variation in scores may be due to differences in resources, teaching methods, or exposure to technology, but these differences are not strong enough to create a significant gap.

Furthermore, the non-significant 't' value highlights that the type of school is not a major factor influencing students' artificial intelligence levels. With the increasing integration of digital tools and government initiatives to promote technology in education, both government and private school students are gaining comparable exposure to AI concepts. Therefore, efforts should be directed towards improving overall digital literacy and ensuring effective implementation of AI education across all types of schools rather than focusing on institutional differences.

MAJOR FINDINGS

1. The level of Artificial Intelligence among secondary school students is found to be average. Students demonstrate a moderate level of awareness and usage of Artificial Intelligence. Most secondary school students exhibit an average level of artificial intelligence competency.

Cover Page

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2. Only a limited number of students demonstrate either very high or very low levels. Self-development is the most dominant dimension of artificial intelligence among secondary school pupils. Awareness about artificial intelligence is the least developed dimension among the students.
3. There is no significant difference between boys and girls in artificial intelligence scores. Gender does not have a significant influence on artificial intelligence among secondary school students.
4. There is no significant difference between rural and urban students in artificial intelligence scores. Locality of living does not significantly influence artificial intelligence among secondary school students.
5. There is no significant difference between government and private school students in artificial intelligence scores. Type of school does not significantly influence artificial intelligence among secondary school pupils.

DISCUSSION BASED ON FINDINGS

The study reveals that the overall level of artificial intelligence among secondary school students is average, indicating that students possess a moderate level of awareness and usage of AI. This suggests that while students are exposed to digital technologies and basic AI tools, their depth of understanding and practical application remains limited. The moderate level may be due to partial integration of AI concepts in the school curriculum and limited hands-on experiences. Therefore, there is a need to strengthen AI-based learning through structured programs, practical activities, and teacher guidance to enhance students' competency.

It is also evident that most students fall within the average level of artificial intelligence competency, with only a few exhibiting very high or very low levels. This reflects a uniform distribution of AI knowledge among students, possibly due to similar educational environments and access to resources. However, the absence of a larger proportion of highly skilled students highlights the need for enrichment programs, advanced learning opportunities, and encouragement for innovation to help students reach higher levels of proficiency.

The dimension-wise analysis indicates that self-development is the most dominant aspect of artificial intelligence, while awareness about AI is the least developed. This implies that students are more focused on personal growth, adaptability, and learning skills rather than gaining conceptual clarity about AI. While self-development is essential, lack of awareness can hinder the effective and ethical use of AI technologies. Hence, it is important to enhance awareness through curriculum inclusion, workshops, and exposure to real-world AI applications.

The findings further show that there is no significant difference between boys and girls in artificial intelligence scores, suggesting that gender does not influence AI competency. This reflects a positive trend toward gender equality in education and access to technology. Both boys and girls appear to have similar opportunities to learn and engage with AI-related tools, which is essential for inclusive technological development. Educational strategies should continue to promote equal participation without gender bias.

Similarly, no significant difference is found between rural and urban students, indicating that locality does not play a major role in determining artificial intelligence levels. This may be attributed to the increasing availability of digital resources, internet connectivity, and government initiatives that aim to bridge the rural-urban divide. However, continuous efforts are needed to ensure consistent access to quality digital infrastructure and training in all regions.

The study also reveals no significant difference between government and private school students, suggesting that the type of school does not significantly affect AI competency. This indicates that both types of institutions are providing comparable exposure to AI concepts and digital learning tools. It reflects the effectiveness of educational policies and programs that promote technology integration across different school systems.

Cover Page

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EDUCATIONAL IMPLICATIONS

1. Schools should integrate artificial intelligence concepts into the curriculum to enhance students' awareness, as awareness was found to be the least developed dimension.
2. Teachers should design activity-based and practical learning experiences using AI tools to improve students' hands-on skills and understanding.
3. Since students show only an average level of AI competency, special training programs and workshops should be organized to strengthen their knowledge and application skills.
4. Equal opportunities should be provided to both boys and girls in accessing AI resources, as gender does not influence AI levels.
5. Schools in both rural and urban areas should be equally equipped with digital infrastructure to maintain uniform learning opportunities.
6. Government and private schools should continue adopting similar technological practices to ensure balanced development in AI competencies.
7. Teachers should focus on improving students' higher-order thinking skills, as AI usage alone does not significantly impact academic performance.
8. Parental education does not significantly influence AI levels; therefore, schools should take a primary role in guiding students' AI learning.
9. Awareness programs, seminars, and orientation sessions should be conducted to educate students about the ethical and effective use of artificial intelligence.
10. Students should be encouraged to use AI as a supportive learning tool rather than relying on it completely, to avoid dependency and promote independent thinking.
11. Advanced learners should be provided enrichment opportunities such as AI clubs, competitions, and projects to enhance higher-level skills.
12. Continuous monitoring and evaluation should be implemented to ensure the effective integration of AI in improving overall learning outcomes.

SUGGESTIONS FOR FURTHER STUDIES

1. Future studies may be conducted with a larger sample size covering different districts or states to enhance the generalizability of the findings.
2. A comparative study can be undertaken between different educational levels (primary, secondary, and higher education) to understand the impact of artificial intelligence across stages.
3. Further research may explore the impact of specific AI tools and applications on students' academic performance and learning outcomes.
4. Longitudinal studies can be conducted to examine the long-term effects of artificial intelligence on students' academic growth and skill development.
5. Future studies may investigate additional variables such as socio-economic status, digital literacy, teacher competency, and learning environment to gain deeper insights into the role of artificial intelligence in education.

CONCLUSION

The present study concludes that the level of artificial intelligence among secondary school pupils in Kakinada district is average, indicating moderate awareness and usage of AI tools in education. The findings reveal that variables such as gender, locality, type of school in artificial intelligence levels. Additionally, no significant relationship was found between artificial intelligence and academic performance, suggesting that AI alone does not directly determine students' academic success. However, self-development emerged as a dominant dimension, highlighting the role of AI in supporting independent learning and skill enhancement.

Cover Page

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