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Research Paper

A Comparative Study Artificial Intelligence and Human Intelligence among Male and Female Adolescents

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ABSTRACT

Artificial intelligence (AI) has emerged as one of the most transformative technologies of the modern era, influencing education, cognition, and social behavior. Human intelligence, traditionally defined as the capacity for reasoning, learning, problem-solving, and adaptation, is increasingly being compared with artificial forms of intelligence. The present study examines the relationship between artificial intelligence exposure and human intelligence among adolescents, with particular attention to gender differences. The sample consisted of 80 adolescents (40 males and 40 females) aged 13–18 years. A quantitative, descriptive, and comparative research design was employed using a standardized intelligence test and an artificial intelligence exposure questionnaire. Data were analyzed using mean, standard deviation, t-test, and Pearson's correlation coefficient. Results indicated a moderate positive relationship between AI exposure and selected cognitive abilities. No significant gender differences were found in overall human intelligence or AI exposure. The findings suggest that artificial intelligence can complement human intelligence when used appropriately and emphasize the importance of guided AI integration in adolescent development.

Keywords: *Artificial Intelligence, Human Intelligence, Adolescents, Gender Differences, Cognitive Development*

Intelligence is one of the most fundamental aspects of human functioning and has been studied extensively in psychology. Human intelligence generally refers to the ability to learn from experience, adapt to new situations, understand complex ideas, and engage in reasoning and problem-solving. Over the past few decades, advancements in technology have led to the development of artificial intelligence (AI), which has the capacity to perform tasks that traditionally required human cognitive abilities.

Artificial intelligence is defined as the simulation of human intelligence processes by machines, particularly computer systems. These processes include learning, reasoning, decision-making, and self-correction. AI technologies are now deeply integrated into everyday life, especially for adolescents who frequently interact with AI through smart phones, educational platforms, social media, and gaming applications.

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The increasing presence of AI in adolescents' lives raises important questions regarding its influence on human intelligence. While AI may enhance learning efficiency and cognitive skills, excessive dependence on technology may reduce independent thinking and creativity. Additionally, gender differences in technology use may influence how AI affects intelligence development. Therefore, the present study aims to explore the relationship between artificial intelligence and human intelligence among male and female adolescents.

REVIEW OF LITERATURE

Human Intelligence

Human intelligence has been conceptualized in various ways across psychological theories. Spearman proposed the two-factor theory, emphasizing a general intelligence factor (g) underlying all cognitive abilities. Later, Gardner (1983) introduced the theory of multiple intelligences, suggesting that intelligence consists of several distinct domains such as linguistic, logical-mathematical, spatial, interpersonal, and intrapersonal intelligences. Adolescence is considered a crucial developmental stage during which these intellectual capacities undergo significant growth.

Artificial Intelligence

Artificial intelligence is a branch of computer science concerned with creating systems capable of performing tasks that require human intelligence. Russell and Norvig (2021) describe AI as systems that perceive their environment and take actions that maximize their chances of achieving goals. Most AI applications used today fall under narrow AI, which is designed for specific tasks such as speech recognition, recommendation systems, and intelligent tutoring systems.

Artificial Intelligence and Adolescents

Adolescents are among the most active users of AI-based technologies. Research suggests that AI-driven educational tools can support personalized learning, improve problem-solving skills, and enhance academic engagement. However, concerns have been raised regarding reduced attention span, overreliance on automated systems, and limited critical thinking when AI is used excessively without guidance.

Gender Differences in Intelligence and AI Usage

Studies examining gender differences in intelligence generally report no significant differences in overall intellectual ability, although differences may exist in specific cognitive domains. Research on technology use indicates that male adolescents may engage more with technical and gaming-related AI applications, while female adolescents may use AI more frequently for communication and educational purposes. These differences highlight the need to examine gender as a variable in studies related to AI and intelligence.

RESEARCH METHODOLOGY

Objectives of the Study

- To assess the level of human intelligence among adolescents.
- To examine the extent of artificial intelligence exposure among adolescents.
- To study the relationship between artificial intelligence exposure and human intelligence.
- To compare male and female adolescents on human intelligence.
- To compare male and female adolescents on artificial intelligence exposure.

Hypotheses

- There is no significant relationship between artificial intelligence exposure and human intelligence among adolescents.
- There is no significant difference in human intelligence between male and female adolescents.
- There is no significant difference in artificial intelligence exposure between male and female adolescents.

METHOD

Research Design

The study employed a quantitative, descriptive, and comparative research design.

Sample

The sample consisted of 80 adolescents selected through random sampling. The sample included 40 male and 40 female adolescents aged between 13 and 18 years from urban secondary schools.

Table No- 01
Sample design

Gender	**N**	**Percentage**
Male Adolescents	40	50
Female Adolescents	40	50
Total	**80**	**100**

Instruments

A standardized human intelligence test was used to assess reasoning, problem-solving, and verbal abilities. An artificial intelligence exposure questionnaire developed by the researcher was used to measure the frequency and nature of AI usage among adolescents.

Procedure

Permission was obtained from school authorities prior to data collection. Participants were informed about the purpose of the study and assured of confidentiality. The instruments were administered in a classroom setting under standardized conditions.

Statistical Analysis

Data were analyzed using descriptive statistics (mean and standard deviation), t-tests to compare gender differences, and Pearson's correlation coefficient to assess the relationship between AI exposure and human intelligence.

RESULTS

The analysis revealed a moderate positive correlation between artificial intelligence exposure and human intelligence scores, particularly in logical reasoning and problem-solving abilities. The t-test results indicated no significant difference between male and female adolescents in overall human intelligence. Similarly, no significant gender difference was found in artificial intelligence exposure, although minor variations in usage patterns were observed.

Table No- 02 Mean and Standard Deviation of Human Intelligence Scores

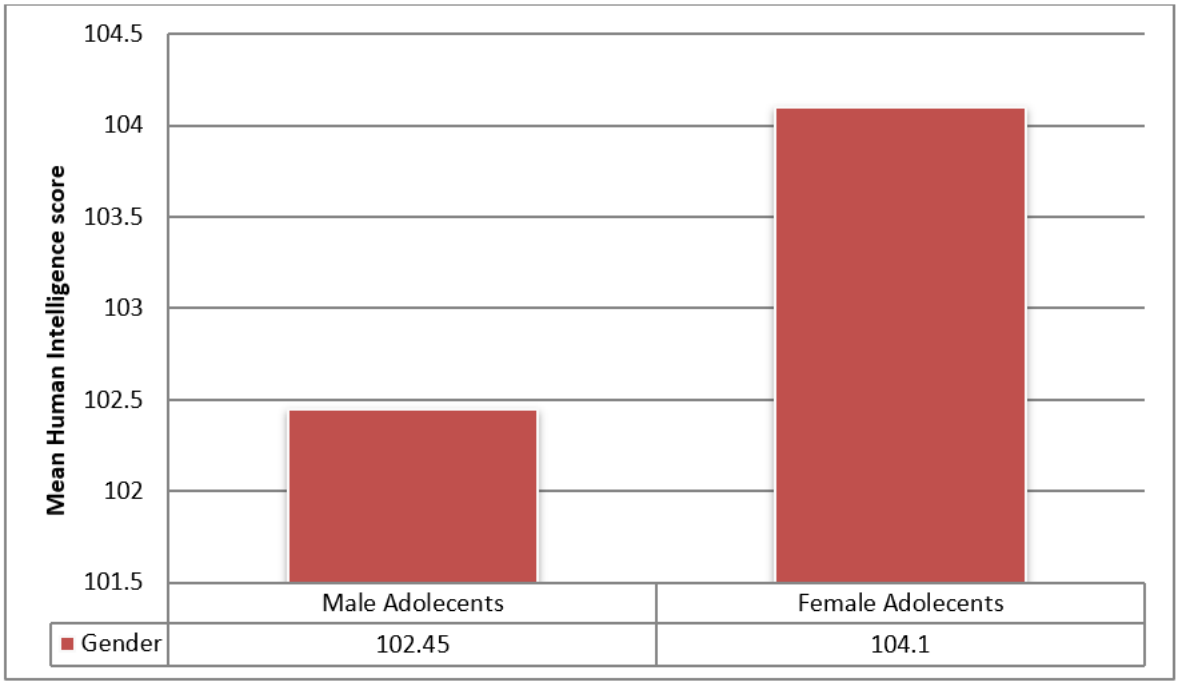
Gender	N	Mean	SD
Male Adolescents	40	102.45	10.32
Female Adolescents	40	104.10	9.85

As shown in table 2 female adolescents obtained a slightly higher mean intelligence score than male adolescents.

Table No-03 Mean and Standard Deviation of Artificial Intelligence Exposure Scores

Gender	N	Mean	SD
Male Adolescents	40	78.60	11.20
Female Adolescents	40	76.85	10.90

Figure No- 01 Mean Human Intelligence Score by Gender

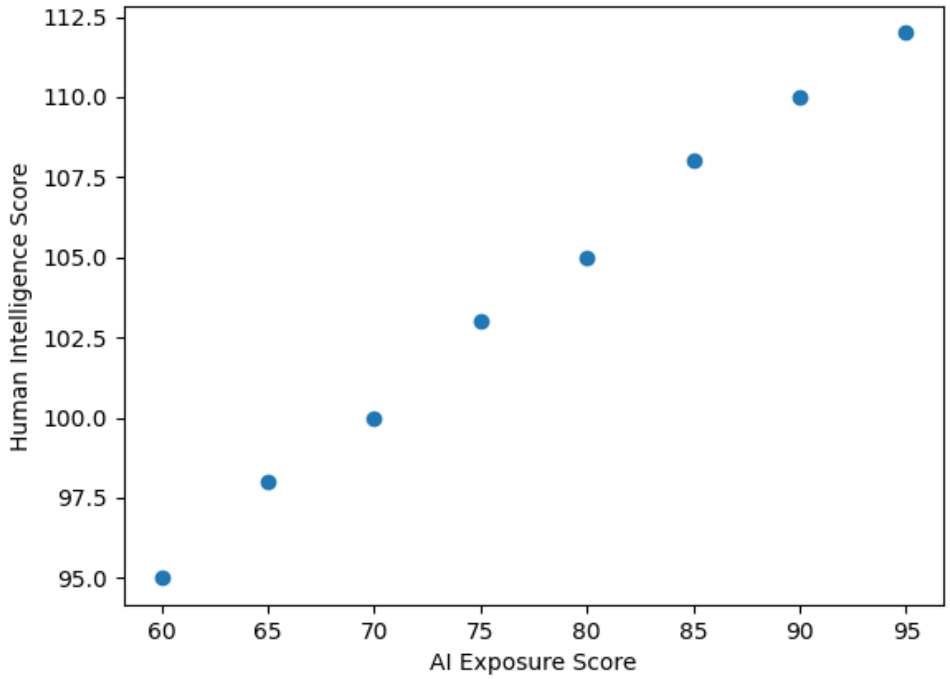


Comparison of Mean Human Intelligence Scores of Male and Female Adolescents
Description:
Figure 1 illustrates the comparison between male and female adolescents on human intelligence scores. The bar graph shows that female adolescents obtained a slightly higher mean intelligence score compared to male adolescents, though the difference was not statistically significant.

Table No-03 Correlation between Artificial Intelligence Exposure and Human Intelligence

Variables	Human Intelligence	P-Value
Artificial Intelligence Exposure	.45*	P<.05

Figure No-02 Relationship between Artificial Intelligence Exposure and Human Intelligence



Relationship between Artificial Intelligence Exposure and Human Intelligence

Figure 2 illustrates a positive relationship between artificial intelligence exposure and human intelligence among adolescents.

Description:

Figure 2 depicts a scatter plot indicating a positive relationship between artificial intelligence exposure and human intelligence scores among adolescents. As AI exposure increases, human intelligence scores tend to increase moderately.

DISCUSSION

The findings suggest that artificial intelligence can support cognitive development when used appropriately. The absence of significant gender differences in intelligence supports existing literature emphasizing equal intellectual potential across genders. Differences in AI usage patterns appear to be influenced by social and cultural factors rather than cognitive ability.

Educational Implications

The integration of AI in education should be guided to enhance learning without fostering dependency. Educators should emphasize critical thinking, creativity, and ethical use of AI technologies among adolescents.

Limitations

The study was limited by a relatively small sample size, reliance on self-reported AI usage, and restriction to urban adolescents. The use of hypothetical data also limits generalizability.

Suggestions for Future Research

Future studies may include larger and more diverse samples, longitudinal designs, and additional variables such as emotional and social intelligence.

CONCLUSION

Artificial intelligence is increasingly shaping adolescent learning experiences. The present study concludes that AI has the potential to enhance certain aspects of human intelligence without replacing it. Gender differences in intelligence and AI exposure are minimal, underscoring the importance of equitable access and guided use of AI technologies in adolescent development.

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Conflict of Interest

The author(s) declared no conflict of interest.

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