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Attitudes Toward the Use of Artificial Intelligence in Academics Among Students at Selected High Schools

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Abstract

Introduction: Artificial Intelligence (AI) has significantly influenced various sectors, including education, by enabling machines to perform tasks that typically require human intelligence. This study investigates high school students' attitudes toward the use of AI in their academic experiences. **Materials and Methods** :A cross-sectional study was conducted in July 2024, involving 150 students from selected high schools in Amritsar, Punjab. A purposive sampling technique was employed, and data were collected through a self-administered five-point Likert scale questionnaire. The scale measured students' attitudes toward AI, with scores categorized as positive, neutral, or negative. Descriptive statistics and chi-square tests were used to analyze the data, with a significance level set at $P < 0.05$. **Results**: Of the 150 participants, 46% held a neutral attitude toward AI integration in education, while 34.7% expressed a positive attitude, and 19.3% reported a negative view. The overall mean attitude score was 56.32±16.35. Significant associations were found between students' attitudes and demographic variables such as age, gender, and parental education. **Conclusion:** The findings indicate a predominantly neutral or positive attitude toward AI in academics, with demographic factors playing a significant role in shaping these perceptions. The study emphasizes the need for increased awareness and practical exposure to AI technologies to maximize their potential in the education sector.

Keywords: Artificial Intelligence (AI), demographic factors, education, student attitudes

Introduction

The evolution and widespread accessibility of personal computers played a crucial role in driving the advancement of electronic computing across various sectors of the economy. This development enabled individuals and non-governmental organizations to harness computing technology for a wide range of purposes, leading to the extensive integration of computers into numerous facets of society and the economy.[1]

Over time, the continuous advancement of computer and information communication technologies paved the way for artificial intelligence (AI). Coppin defines AI as the

ability of machines to adapt to new circumstances, solve complex problems, and perform tasks typically requiring human-like intelligence.[2] Similarly, Whitby describes AI as the study of intelligent behavior in humans, animals, and machines, and the effort to replicate this behavior in artificial systems.[3] These perspectives highlight AI as a convergence of technological advancements, enabling machines to execute tasks with near-human capabilities, a trend increasingly embraced in the education sector.

Web-based and online education has evolved significantly from simply providing downloadable materials to now incorporating intelligent and adaptive systems that analyze both instructor and learner behavior, thereby enhancing the educational experience.[3-7] Artificial Intelligence (AI), which involves machines exhibiting human- like intelligence and capable of iterative self-improvement, has become increasingly integrated into daily life, including in fields like dentistry. This study examined Turkish dental students' attitudes and perceptions of AI and its application in their field.[8] While AI's importance is well-recognized in higher education, especially in professional programs, fostering an early interest in AI among all students is equally crucial.[9]

Artificial intelligence (AI), a branch of computer science, focuses on creating systems that mimic human cognitive functions like learning, reasoning, and self-correction. Increasingly adopted in the education sector, AI offers various applications that enhance teaching and learning processes.[10-11] Despite its potential, educators' understanding of AI and its benefits remains limited. However, studies highlight several positive aspects of AI integration, such as time-saving in lesson planning, instructional material searches, and homework evaluation.[12-15] AI has evolved from early computer-based technologies to sophisticated systems like humanoid robots and web-based chatbots that assist in instructional duties, enabling educators to manage tasks with greater efficiency and personalize learning based on individual student needs, leading to improved engagement and learning outcomes.[16]

Materials and Methods: A cross-sectional study design was adopted with a quantitative approach. Data were collected July 2024. A total of 150 students were included using the purposive sampling technique. The study was conducted at Selected High Schools, Amritsar, Punjab. Data were collected using demographic and a pre-designed five-point Likert attitude scale, which included ratings of Strongly Disagree (1), Disagree (2), Neutral (3) ,Agree (4) and Strongly Agree (5).The scale comprised

20 items; minimum score was 20 and the maximum was 100. Further, the level of attitude was categorized as follows: Positive (67-100), neutral (34-66), Negative (20- 33). The reliability of research instrument was 0.87measured using Cronbach's alpha.

Eligibility criteria

Students who were proficient in Hindi, Punjabi, or English. Those were willing to participated in study.

Data Collection Procedure

After obtaining permission form authorized person from selected schools. The objective and aim of the study was cleared explained to the study subjects. Then data were collected using by socio-demographic proforma and self-structured five point Likert attitude scale. Data were collected by self-administered method.

Statistical Analysis

Data analysis was conducted using the Statistical Program for the Social Sciences v27.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics included frequency, percentage and mean. For inferential statistics, chi-square wad used to investigate the association between the attitude and selected socio-demographic variables, P-value determination, with significance set at $P < 0.05$.

Results:

Table 1: Socio-demographic Profile of Among Students at Selected High Schools. N=150

Variables		**%**
Age (years)		
15-16	83	55.3
17-18	62	34.7
18 or above	05	10.0
Gender		
Male	63	42.0
Female	87	58.0
Class		
10th	45	30.0
11th	76	50.7
12th	29	19.3

Type of School		
Government School	67	44.7
Private School	83	55.3
Location of School		
Urban	98	65.3
Rural	52	34.7
Father's Education Level		
No formal education	36	24.0
Upto 10th	38	25.3
Upto 12th	45	30.0
Graduation or above	31	20.7
Mother's Education Level		
No formal education	44	29.3
Upto 10th	36	24.0
Upto 12th	46	30.7
Graduation or above	24	16.0

Table 1 presents a socio-demographic profile of 150 students from selected high schools in Amritsar. The students are spread across different age groups, with 35.3% being 15- 16 years old, 34.7% falling within the 17-18 age range and 30% being 18 years or older. This distribution indicates that the study includes a relatively balanced representation of students from various age groups, though there is a slight concentration in the younger two categories.

Gender-wise, the study shows a higher proportion of female participants, with 58% being female and 42% male. This gender distribution suggests that female students are more represented in the study sample. The data also reveals that the majority of participants are in the 11th grade, making up 50.7% of the total sample, while 30% are in the 10th grade and 19.3% are in the 12th grade. This indicates a focus on students who are in the middle of their high school education.

Regarding the type of schools the students attend, 55.3% are from private schools and 44.7% are from government schools, showing a slight preference for private school students in the study. Additionally, a significant majority of the students, 65.3%, attend schools located in urban areas, while 34.7% are from rural schools. This urban-rural distribution suggests that the study may have a stronger urban representation.

The educational background of the students' parents varies, with 24% of the fathers having no formal education, 25.3% having education up to the 10th grade, 30% up to the 12th grade and 20.7% holding a graduation degree or higher. Similarly, the mothers' education levels show that 29.3% have no formal education, 24% have studied up to the 10th grade, 30.7% up to the 12th grade and 16% have completed graduation or higher. This indicates a diverse range of educational backgrounds among the parents, which could influence the students' perspectives and attitudes toward AI in academics.

Table 2: Information about Internet and Artificial Intelligence in Academics Among Students.

N=150

Variables	f	%
Access to Technology at Home		
Yes	106	70.7
No	44	29.3
Internet Use for Academic Purposes		
Daily	69	46.0
Weekly	38	25.3
Occasionally	29	19.3
Familiarity with Artificial Intelligence (AI)		
Very familiar	67	44.7
Somewhat familiar	83	55.3
Preferred Learning Method		
Traditional	84	56.0
Blended	66	44.0

Table 2 provide insights into the students' access to technology, their internet usage habits for academic purposes, their familiarity with Artificial Intelligence (AI) and their preferred learning methods. As result found that majority, 70.7%, have access to technology at home, while 29.3% do not. Regarding internet usage for academic purposes, the data shows that nearly half of the students, 46%, use the internet daily for their studies, while 25.3% use it weekly and 19.3% use it only occasionally When it comes to familiarity with AI, the responses are split between those who are very familiar (44.7%) and those who are somewhat familiar (55.3%). In terms of preferred learning methods, a slight majority, 56%, prefer traditional learning methods, whereas 44% favor a blended approach that combines traditional and digital learning.

Table 3: Level of attitudes toward the use of artificial intelligence in academics among students at selected high schools. **N=150**

Level of Attitude	f	%	Mean SD
Positive	52	34.7	56.32±16.35
Neutral	69	46.0	
Negative	29	19.3	

Table 3 indicates that students at selected high schools have varied attitudes towards the use of artificial intelligence (AI) in academics. A plurality of students, 46%, maintain a neutral attitude, neither strongly supporting nor opposing the integration of AI in their education. Meanwhile, 34.7% of the students exhibit a positive attitude towards AI, reflecting a significant portion that sees AI as a beneficial tool in academics. On the other hand, 19.3% of the students hold a negative attitude. The overall mean score of attitude score was 56.32±16.35.

Table 4: Association between the level of attitude and selected demographic variables of the students. **N=150**

Variables	Level of Attitude			χ^2 values	df	*P* value
	Positive	Neutral	Negative			
Age (years)						
15-16	15	31	7	20.841	4	.001
17-18	14	30	8			
18 or above	23	8	14			
Gender						
Male	31	18	14	14.265	2	.001
Female	21	51	15			
Class						
10th	15	23	7	36.202	4	.001
11th	22	46	8			
12th	15	0	14			
Type of School						
Government School	29	31	7	7.540	2	.023
Private School	23	38	22			
Location of School						
Urban	38	46	14	5.156	2	.076
Rural	14	23	15			
Father's Education Level						
No formal education	15	14	7	33.628	6	.001
Upto 10th	8	23	7			
Upto 12th	22	8	15			
Graduation or above	7	24	0			

Mother's Education Level						
No formal education	22	22	0	25.441	6	.001
Upto 10th	7	15	14			
Upto 12th	15	24	7			
Graduation or above						

Table 4 shows the demographic variables are significantly associated with students' attitudes toward the use of artificial intelligence (AI) in academics. At the 0.01 significance level, the following variables are significantly associated: age, gender, class, father's education level and mother's education level. Additionally, the type of school attended by students is significantly associated with their attitudes at the 0.05 level. These results indicate that students' attitudes towards AI in academics are strongly influenced by their demographic backgrounds, particularly age, gender, educational level of parents and the type of school they attend.

Discussion

The findings of the present study reveal that among the 150 participants, 46% held a neutral stance regarding the integration of AI into their education, neither strongly supporting nor opposing its use. In contrast, 34.7% of the students expressed a positive attitude, indicating a notable group that views AI as a valuable tool in academic settings. On the opposite end, 19.3% of the respondents displayed a negative attitude toward AI. The mean attitude score was calculated at 56.32 ± 16.35.

This is in line with the study by Yadav (2024)[17], which reported that attitudes toward AI were predominantly positive, with participants acknowledging its potential to enhance diagnostic precision and optimize administrative functions. Nonetheless, concerns were raised about the reliability of AI systems and the possible reduction in human oversight. Moreover, practical implementation of AI was limited, especially among undergraduate students, illustrating a disparity between theoretical understanding and actual use.

A related study by Yüzbaşıoğlu (2021)[18] found that, out of 1103 students (650 female, 453 male; mean age 21.36 ± 1.93 years), 48.4% had basic knowledge of AI technologies, while 10.6% reported no sources of information on AI. A significant 85.7% agreed that AI would transform the field of dentistry, but 28.6% were skeptical about AI replacing human roles in the near future. Additionally, 74.6% and 79.8% of the participants

supported the inclusion of AI in undergraduate and postgraduate dental education, respectively.

Similarly, Slavov's (2023)[19] research, conducted with 766 Bulgarian high school students, indicated that many students understood the fundamental concepts of AI and recognized its value in daily activities. However, they were less clear about the specific benefits of AI in educational contexts and lacked sufficient knowledge regarding the ethical implications of AI use in education. This gap in understanding limited the positive perception of AI's usefulness in the learning process.

Further supporting this, Tang (2023)[20] demonstrated that the scale used to measure AI's impact on university students showed good reliability and validity. It was effective in assessing how AI influences college students' experiences through information-based university teaching. Tang's study also provided a foundation for the continued development and application of AI in higher education, offering insights into how students can better utilize AI technologies.

Strengths of the Study: One of the key strengths of this study is its comprehensive analysis of student attitudes toward AI across a diverse sample of high school students. The inclusion of various demographic factors such as age, gender, and parental education levels allowed for a detailed examination of how these variables influence attitudes toward AI in academics. Additionally, the study utilized a reliable and valid research instrument, with a Cronbach's alpha of 0.87, ensuring the consistency of the results. The use of both government and private schools, as well as urban and rural settings, further enhances the generalizability of the findings.

Limitations of the study: Despite its strengths, this study has several limitations. First, the sample size of 150 students may not fully represent the broader student population, limiting the generalizability of the findings to other regions or countries. The study's cross-sectional design also captures attitudes at a single point in time, which may not reflect changes in perceptions as AI becomes more integrated into education. Additionally, the self-reported nature of the survey could introduce response bias, as students may have provided socially desirable answers rather than their true opinions. Finally, the study focuses solely on high school students, leaving a gap in understanding how attitudes might differ across other educational levels or age groups.

Conclusion: In conclusion, the study highlights a mixed range of attitudes toward AI in academics among high school students, with a majority maintaining a neutral stance and a significant portion viewing AI as beneficial. The results align with previous studies, which found that students recognize AI's potential in education but may lack practical experience or a clear understanding of its applications. Demographic factors such as age, gender, and parental education were significantly associated with attitudes toward AI, suggesting that these variables play an important role in shaping perceptions. While the study underscores the potential of AI in transforming education, it also points to the need for greater awareness and practical exposure to AI technologies to fully realize their benefits.

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