



Impact Of AI In Today's Education System

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Abstract: Artificial Intelligence (AI) is changing the way education works today. It helps students learn better, supports teachers in their work, and makes education more organized. This study looks at how AI affects education by collecting opinions and analyzing different areas like personalized learning, automated assessment, and accessibility. Two types of analysis are considered: overall perception and aspect-based impact. Overall, perception shows whether people feel positive or negative about AI in education, while aspect-based analysis focuses on specific areas such as learning support, teacher assistance, and evaluation systems. The results show that AI improves learning speed, understanding, and engagement. However, challenges like overdependence on technology and privacy concerns still exist. The study concludes that AI has a strong positive role in education when used carefully and responsibly.

Keywords - Artificial Intelligence, Education, Sentiment Analysis (SA), Aspect-Based Sentiment Analysis (ABSA)

I. INTRODUCTION

The project "Impact of AI on Today's Education system" was created to understand how students, teachers, and parents are feeling about AI. The main goal of this project was to collect and understand the opinions of students, teachers, and parents about AI. The survey form was created with 14 simple questions which can be easily understood by students and parents. The questions are divided into several sections like Awareness of AI in education, perception of AI in education, benefits of AI in education, etc. This study focuses on understanding the impact of Artificial Intelligence (AI) on today's education system through a survey of students, teachers, and parents. The survey shows that most people are aware of AI and believe it helps make learning easier, faster, and more interesting. Students use AI tools like chatbots and learning apps for better understanding, while teachers use them to prepare lessons and check assignments quickly. Parents feel that AI supports their children's studies and helps track progress. Overall, the survey results show that AI has a positive impact on education by improving learning quality, saving time, and making education more personalized and effective.

II. Background and related work

Artificial Intelligence (AI) is being used in education to improve learning and support teachers [1], [2]. It provides tools like chatbots and smart systems that help students understand topics easily.

AI can reduce teachers' workload and make education more accessible [3], [4]. Many studies show that AI has potential to improve education, but its actual impact depends on how it is used.

Some research also highlights challenges such as overdependence on AI, lack of human interaction, and data privacy issues [3].

Sentiment Analysis is used to understand people's opinions from feedback [5], while Aspect-Based Sentiment Analysis (ABSA) helps to analyze opinions about specific areas like learning and teaching [7].

These methods help in understanding whether AI is positively or negatively affecting education [6].

III. METHODOLOGY

The data science process follows an organized sequence of steps to understand and solve data-related problems. Figure 1 presents this workflow.

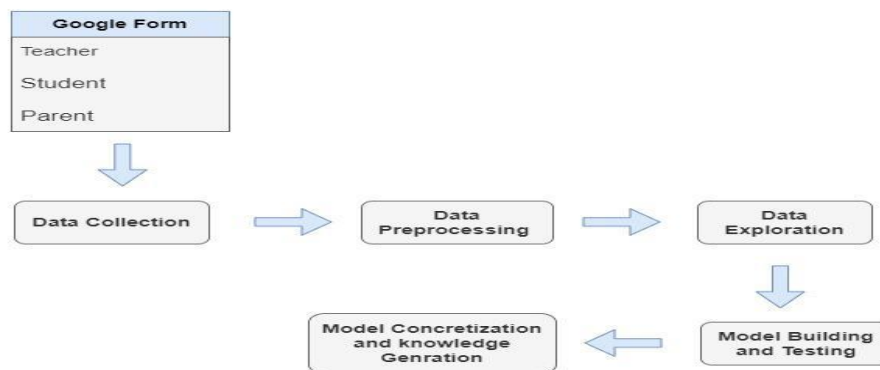


Fig. 1. Data Science Process

A. Data Collection

Data was collected using a Google Form comprising multiple-choice questions (MCQs) and an open-ended question. A total of 680 responses were received (Fig. 2). Participants include students, teachers, and parents, which helps in getting different opinions. The open-ended responses provided deeper insights for Sentiment Analysis and Aspect-Based Sentiment Analysis (ABSA), enabling a comprehensive understanding of public sentiment.

The questions focused on areas such as awareness of AI tools, how AI affects learning, critical thinking, research skills, and teaching performance. Participants were also asked to rate whether AI improves or reduces academic performance and learning experience.

The collected responses provided both numerical ratings and personal opinions. This helped us clearly understand how AI tools are influencing education and learning in real life.

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"Timestamp","Full Name :","What is your primary role in the education system?","AI will fundamentally change how students learn in the next critical thinking skills?","How has using AI tools affected students' research skills?","How has the use of AI tools impacted the teacher-education system. "
"2025/08/30 10:55:18 pm GMT+5:30","Thorat Shradha Paraji ","Student","5","4","2","4","4","More","Improved Performance","Negative Impact","
"2025/08/30 11:45:32 pm GMT+5:30","Tejashri Dayaram Dhomkar","Student","4","5","4","5","5","More","Improved Performance","Positive Impact","
"2025/09/02 11:01:50 pm GMT+5:30","shindetrupri2004@gmail.com","Student","4","5","1","4","4","Less","Improved Performance","Positive Impact
"2025/09/02 11:04:02 pm GMT+5:30","Vaishnavi Sahadev Handal ","Student","5","4","3","4","3","Less","Reduced Performance","Positive Impact",
"2025/09/03 8:14:32 am GMT+5:30","Areeba Shaikh ","Student","3","4","3","4","4","More","Improved Performance","Not Sure","Improved research
"2025/09/03 8:18:14 am GMT+5:30","Arati Shrikant Salunke ","Student","4","5","2","4","5","Not Sure","Improved Performance","Positive Impact
"2025/09/03 8:25:29 am GMT+5:30","Deshmukh Aamrapali Subhash ","Student","4","4","5","5","4","Less","Improved Performance","Positive Impact
"2025/09/03 12:22:44 pm GMT+5:30","Tejal Hase","Student","4","5","3","5","5","Not Sure","Improved Performance","Positive Impact","Reduced r
"2025/09/03 12:25:51 pm GMT+5:30","Jagruti Suryakant Badhe","Student","5","3","2","5","5","Same","Improved Performance","Not Sure","Reduced
"
"2025/09/03 12:30:36 pm GMT+5:30","Sakshi Vitthal Wagh ","Student","5","5","2","5","5","Same","Improved Performance","Positive Impact","Imp
"2025/09/03 12:31:38 pm GMT+5:30","Sonika Sanjay Waghmare ","Student","5","4","3","3","4","More","Improved Performance","Positive Impact","
"2025/09/03 12:52:19 pm GMT+5:30","Shradha Abhaysinh Ghorpade ","Teacher","1","1","1","1","1","More","No big change","Positive Impact","Im
"2025/09/03 12:54:17 pm GMT+5:30","Deepali Karajgikar ","Student","5","4","3","5","5","More","Improved Performance","Positive Impact","Impr
"2025/09/03 1:35:00 pm GMT+5:30","Monika Jadhav","Teacher","5","3","5","1","1","Less","Reduced Performance","Negative Impact","Reduced rese
"2025/09/03 1:36:25 pm GMT+5:30","Monika Tushar Jadhav","Teacher","5","3","5","2","2","Less","Reduced Performance","Negative Impact","Reduc
"2025/09/03 2:44:38 pm GMT+5:30","Khetre Sarika Ashok ","Teacher","5","3","4","4","4","Less","Reduced Performance","Negative Impact","Reduc
"2025/09/03 2:54:09 pm GMT+5:30","Pawar Tejas Balasaheb ","Student","1","1","1","1","1","More","Reduced Performance","Positive Impact","Imp
"2025/09/03 2:56:14 pm GMT+5:30","Kalokhe Pratiksha Balu","Student","4","5","5","5","4","More","Reduced Performance","Positive Impact","Imp
"2025/09/03 2:57:48 pm GMT+5:30","Divya Pradip Gadekar","Student","5","5","1","3","2","More","Improved Performance","Positive Impact","Impr
"2025/09/03 3:01:16 pm GMT+5:30","Siddharth rohidas ghegade ","Student","1","1","2","2","3","Less","Improved Performance","Positive Impact"
"2025/09/03 3:03:23 pm GMT+5:30","Todkar Rutuja Santosh ","Student","5","5","4","5","5","More","Improved Performance","Not Sure","Not sure"
"2025/09/03 3:13:37 pm GMT+5:30","Bhapkar harshada Narendra ","Student","5","5","5","5","5","More","Improved Performance","Positive Impact"
"2025/09/03 3:15:48 pm GMT+5:30","Shifa Momin ","Student","3","3","2","2","3","Same","Not sure","Not Sure","Not sure","No big change","Yes
The path forward "
  
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Fig. 2 Data Collected from online Survey

B. Data Preprocessing

Data records were pre-processed by removing missing values to ensure data completeness and consistency (Fig. 3) [2]. Next, categorical responses were encoded into numerical values to make the data suitable for machine learning models (Fig. 4) [5]. Finally, open-ended feedback was cleaned using standard NLP techniques such as lowercasing, stop word removal, and lemmatization (Fig. 5) [4],[5].

C. Data Exploration

Exploratory Data Analysis (EDA) was done to understand how feedback is distributed and what sentiments (positive, negative, neutral) people have. Bar charts were used to show how many responses were given by students, teachers, and parents for each aspect [6]. Sentiments were shown using grouped bar charts [4]. A word cloud was created to display the most common words used in feedback. Aspect-Based Sentiment Analysis was performed on ten important aspects taken from the responses [7]. An overall sentiment chart was also included to show the general opinion of all responses. Lastly, another graph was made to study how sentiment changes based on students, teachers, and parent's familiarity with AI.

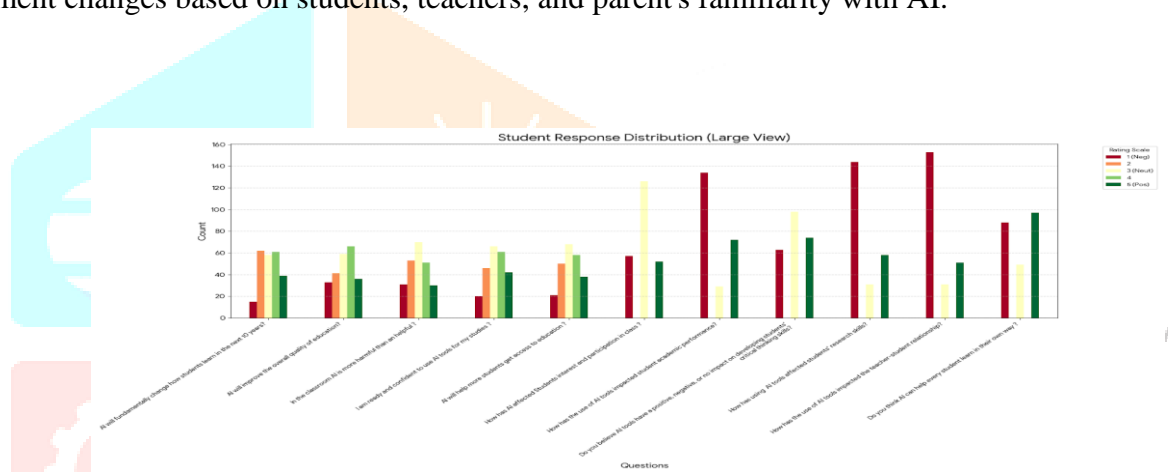


Fig. 3. Sentiment Distribution per question for Students

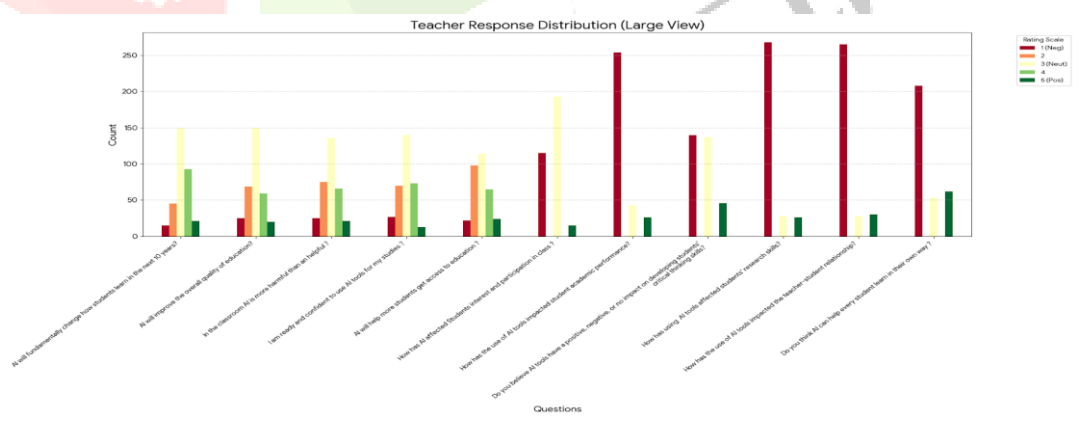
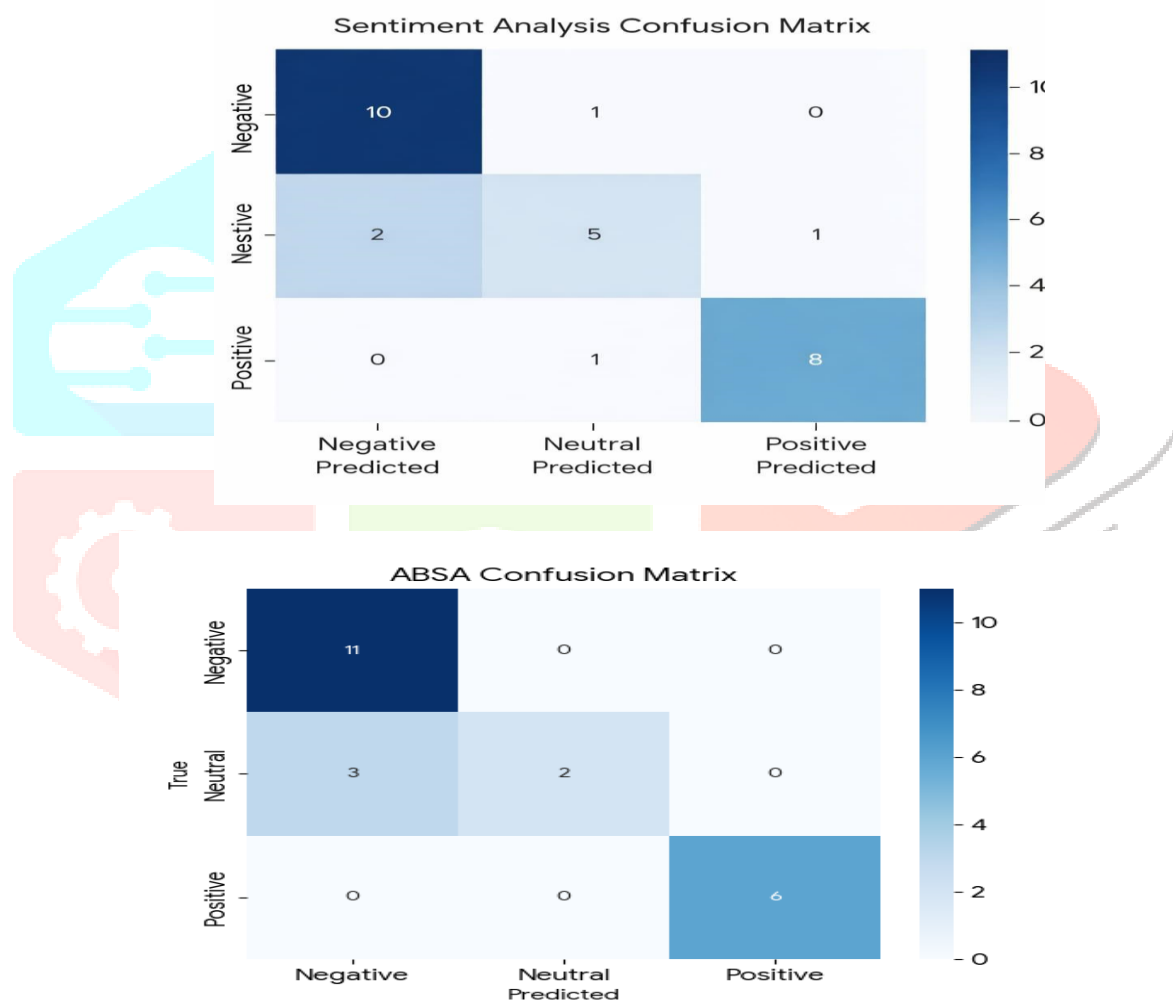


Fig. 4. Sentiment Distribution per question for Teachers

D. Model Building

1) Sentiment Analysis (SA)

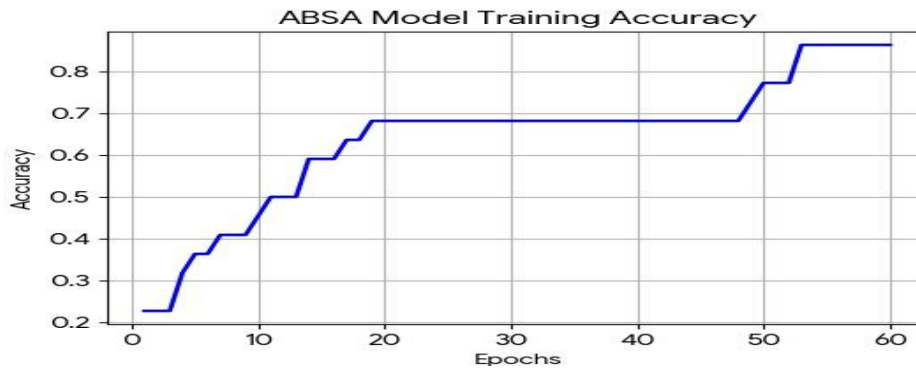
For sentiment analysis, the objective was to determine overall sentiment—positive, negative, or neutral—expressed in participants' detailed feedback [4]. The text data from the Detailed Opinion column was initially vectorized (TF-IDF) to convert textual content into numerical features [5]. Class imbalance was handled by applying SMOTE, which generates synthetic samples for underrepresented classes [6]. The sentiment labels were encoded using the Label Encoder. A Logistic Regression model was selected due to its interpretability and effectiveness in handling high-dimensional sparse data [5]. The dataset was partitioned into training and testing sets using stratified sampling to preserve class distribution. Model performance was evaluated using metrics such as accuracy, precision, recall, and F1-score, summarized in the classification report (Fig. 14), along with a confusion matrix to provide a visual representation of prediction accuracy across sentiment classes (Fig. 13) [6].



The confusion matrix shows how well the model understands negative, neutral, and positive sentiments.

The model is very good at identifying negative and positive sentiments, as it correctly predicts all of them. This means it can easily detect clear opinions.

However, it has difficulty with neutral sentiment. Some neutral cases are wrongly classified as negative, and only a few are correct. This happens because neutral sentences are harder to understand.



IV. Conclusion

This study concludes that AI has both positive and negative effects on education, but the overall impact in this study is more negative.

AI makes learning easier, but it can reduce critical thinking and increase dependency.

Therefore, AI should be used carefully along with traditional learning methods.

V. References

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