

Influence of AI TOOLS on Student's Learning Process

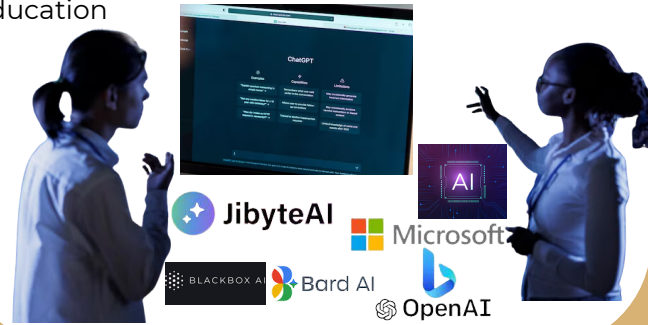
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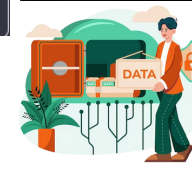
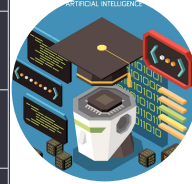
Introduction

In the era of technological advancement, Artificial Intelligence (AI) tools have emerged as transformative agents in education. This survey delves into the dynamic relationship between students and AI tools, exploring how these technologies influence the learning process. By capturing student perspectives on usage, impact, and satisfaction, we aim to unravel the multifaceted role AI plays in shaping modern education



Data Set

Aspect	Observation
Satisfaction	78% highly satisfied, 20% moderately satisfied, 2% dissatisfied
Learning Impact	85% positive impact, 12% neutral impact, 3% negative impact
Privacy Concerns	Varied opinions: 40% neutral, 30% disagree, 30% agree
Assessment Effectiveness	72% effective, 18% moderately effective, 10% ineffective
Integration Challenges	Diverse experiences: 45% seamless, 30% moderate challenges, 25% significant challenges
Age Influence	Consistent satisfaction; 18-25 age group has 5% higher privacy concerns
Gender Patterns	No significant differences observed
Educational Levels	Postgraduates more critical: 62% critical, 28% neutral, 10% supportive

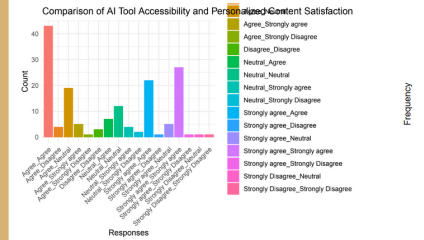


Informations Based on DataSet

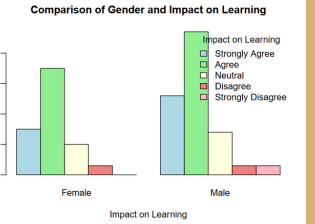
Categories	Insights
Technology Adoption	55% of respondents actively use AI tools in other areas outside of education
Learning Preferences	60% prefer a blend of AI and traditional teaching methods
Future Outlook	70% believe AI will play a significant role in future education
Training and Proficiency	48% feel adequately trained to use AI tools in education
Adoption Hurdles	42% cite lack of awareness as a barrier to AI tool
Preferred AI Applications	50% express interest in AI for personalized learning
Accessibility Concerns	55% emphasize the importance of ensuring AI tools are accessible to all students

Exploratory Analysis

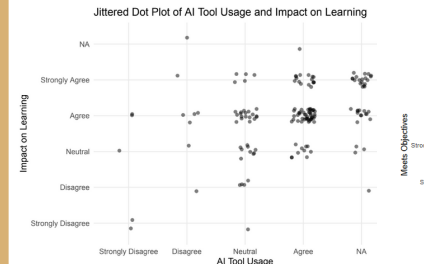
Comparison of AI Tool Accessibility and Personalized Content Satisfaction



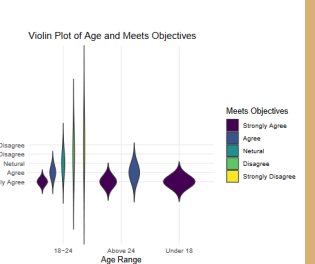
Comparison of Gender and Impact on Learning



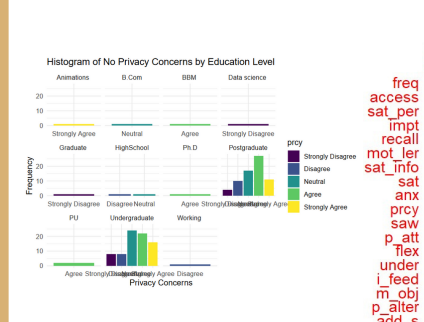
Jittered Dot Plot of AI Tool Usage and Impact on Learning



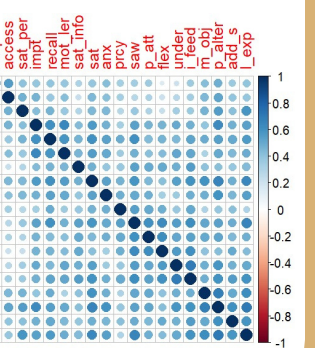
Violin Plot of Age Meets Objectives



Histogram of No Privacy Concerns by Education Level



Correlation



Research Questions

1. I often use AI tools for my learning activities.
2. I find AI tools easily accessible and user-friendly.
3. I am satisfied with the amount of personalized content delivered by AI tools
4. AI tools improve my engagement in the learning process.
5. My ability to retain and recall information is impacted by AI tools.
6. I am more motivated to learn when using AI tools.
7. I receive real-time feedback on my performance from AI tools effectively.
8. I am very satisfied with the overall use of AI tools in my education.
9. AI tools significantly reduce my learning anxiety.
10. I have no privacy concerns associated with the use of AI tools in education.
11. AI tools offer a very comprehensive and clear assessment of my strengths and weaknesses in my coursework.
12. AI tools positively affect my overall attitude towards learning.
13. AI tools significantly improve my collaboration with teachers. AI tools significantly enhance my depth and breadth of knowledge in my field of study.
14. AI tools support individualized feedback and assessment for me extremely well.
15. AI tools satisfy the objectives for completing the assessments.

Output of a Linear Regression

```
Call:lm(formula = section_4_score ~ section_5_score, data = std_data)
Residuals:
    Min     1Q   Median     3Q    Max
-9.9126 -1.5004  0.5187  1.7783  9.8126
Coefficients: Estimate Std. Error t value Pr(>|t|)
(Intercept)  1.66031    1.20978   1.372   0.172
section_5_score 0.86261    0.05078  16.986 <2e-16 *
Signif. codes:  0 ‘*’ 0.001 ‘**’ 0.01 ‘***’ 0.05 ‘.’ 0.1 ‘.’ 1
Residual standard error: 2.792 on 156 degrees of freedom
Multiple R-squared:  0.6491, Adjusted R-squared:  0.6468
F-statistic: 288.5 on 1 and 156 DF, p-value: < 2.2e-16
```

Tests

Correlation

```
cor_2_and_3 <- cor(std_data$section_2_score, std_data$section_3_score)
> print(cor_2_and_3)
[1] 0.6872555
```

Intercept the relation

The correlation coefficient between Section 2 scores and Section 3 scores is approximately 0.687. This positive correlation indicates a moderately strong positive linear relationship between the two sections. In other words:

As scores in Section 2 ("AI Tools Usage") increase, there tends to be an increase in scores in Section 3 ("Impact on Learning").

Conversely, as scores in Section 2 decrease, there tends to be a decrease in scores in Section 3.

Linear Regression

The **linear regression model** was used to assess the relationship between Section 4 scores ("Student Satisfaction") and Section 5 scores ("AI Tool Impact on Assessment"). Here's the interpretation:

Coefficients: Intercept: The estimated intercept (1.66031) is the expected Section 4 score when the Section 5 score is zero. However, it might not have a practical interpretation in this context.

Section_5_score: The estimated coefficient for Section 5 score (0.86261) indicates that, on average, for each one-unit increase in Section 5 score, the Section 4 score is expected to increase by 0.86261 units.

Statistical Significance: The p-value for the coefficient of Section 5 score is highly significant ($< 2e-16$), indicating a strong association between Section 4 and Section 5 scores. The overall model is statistically significant (p-value: $< 2.2e-16$), suggesting that the model as a whole explains a significant amount of variance in Section 4 scores.

T-test:

Two Sample t-test was conducted to compare the means of Section 2 scores ("AI tools Usage") and Section 3 scores ("Impact on Learning"). Here's the interpretation:

T-Statistic and Degrees of Freedom:

T-Statistic (t): 1.1953

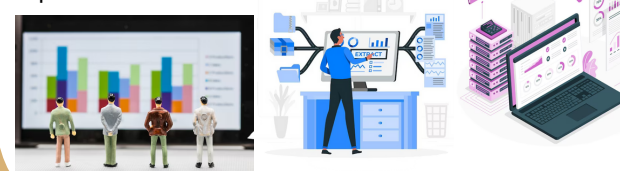
Degrees of Freedom (df): 311.72

P-Value: 0.2329

Interpretation: The p-value (0.2329) is greater than the common significance level of 0.05. There is not enough evidence to reject the null hypothesis. The null hypothesis assumes that there is no significant difference in mean scores between Section 2 and Section 3. The 95% confidence interval for the difference in means is (-0.2045, 0.8374), which includes zero.

Data PreProcessing

1. Changed the larger column names into smaller variable names.
2. Dropped Unwanted columns like timestamp, username and comments.
3. Checked for null values using is.na.
4. Converted character data to factors for better analysis (Age, education, gender).
5. Converted columns in Section 1, Section 2, Section 3, and Section 4 to ordered factors with specified levels.



Conclusion

The survey gave us useful insights into what people think about using AI tools in education. We now have a better understanding of how these tools affect the way students learn and how satisfied they are with them. Looking ahead, we can use these insights to make AI tools better, making sure they match up with what students need and like, no matter their age or background.



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