

LLU-460: A Dynamic Dataset of Large Language Model Usage Among
Students at Islamic Azad University, Karaj

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Abstract

LLU-460 is a dynamic dataset collected through an interactive web application to analyze large language model usage among students at Islamic Azad University, Karaj branch. A total of 460 complete responses were gathered. Random Forest and XGBoost were applied for predictive analysis. Although Random Forest achieved perfect test accuracy, it likely overfitted the limited data. XGBoost showed more stable performance with about 0.80 accuracy. ChatGPT was the most frequently used AI tool, and Google Chrome was the dominant access platform. These findings highlight important patterns in students' adoption of AI technologies and their preferred digital environments. The dataset can support further research on educational technology, user behavior, and model performance in academic settings.

Research method

- **Mixed-method, data-driven approach.**
- **Data collected through an interactive Streamlit web application.**
- **Adaptive questionnaire logic based on previous responses.**
- **460 complete responses gathered[5].**
- **Data exported to CSV and preprocessed.**
- **Classification models applied [5]:**
 - ❖ RandomForest
 - ❖ XGBoost
- **Evaluation strategy:**
 - ❖ 5-fold stratified cross-validation
 - ❖ 10% held-out test set
 - ❖ Accuracy, Precision, Recall, F1-score

conclusion

- LLU-460 provides a structured dataset for analyzing student engagement with AI tools.
- ChatGPT is the dominant AI tool among participants[2].
- Random Forest achieved perfect test accuracy but showed overfitting.
- XGBoost demonstrated more robust and generalizable performance [5].
- Model stability is more important than nominal accuracy in small datasets [7].

The purpose of the research

- Investigate how students use Large Language Models (LLMs) for academic tasks [2][4].
- Identify the most frequently used AI tools among participants [3].
- Analyze usage patterns and access environments (web/app/browser).
- Evaluate whether AI tools effectively support academic activities [6].
- Compare the predictive performance of Random Forest and XGBoost [5].

Practical or simulation results

- **Usage Findings**
ChatGPT was the most frequently used AI tool furthermore Most users accessed AI tools via the web version [1].
- **Model Performance**
The Random Forest model achieved very high accuracy (CV: 0.98 ± 0.03 , Test: 1.00), but the results indicate possible overfitting. In contrast, XGBoost showed lower yet more stable performance (CV: 0.79 ± 0.05 , Test: 0.80), suggesting better generalization on unseen data.

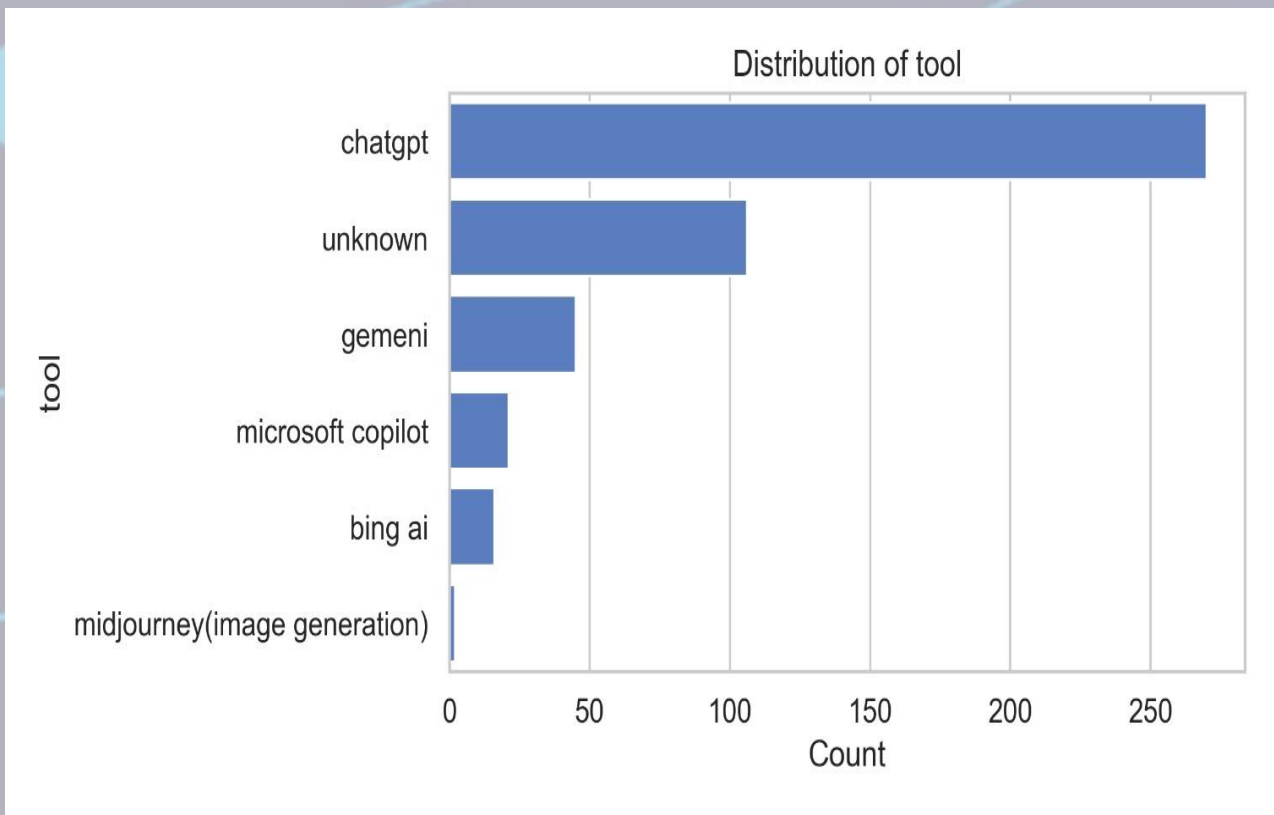


Fig. 1 Distribution of tools

References

[1] B. Dong, J. Bai, T. Xu, and Y. Zhou, "Large Language Models in Education: A Systematic Review," in *Proc. 6th Int. Conf. on Computer Science and Technologies in Education (CSTE)*, Apr. 2024, pp. 131–134, doi: 10.1109/CSTE62025.2024.00031.

[2] R. Deng, M. Jiang, X. Yu, Y. Lu, and S. Liu, "Does ChatGPT Enhance Student Learning? A Systematic Review and Meta-Analysis of Experimental Studies," *Computers & Education*, vol. 227, p. 105224, 2025, doi: 10.1016/j.compedu.2024.105224.

[3] T. K. F. Chiu, et al., "The Impact of Generative AI on Educational Practices and Policies: Perspectives from Teachers and Leaders," *Interactive Learning Environments*, 2024, doi: 10.1080/10494820.2023.2253861.

[4] W. Gan et al., "Large Language Models in Education: Vision and Opportunities," in Proc. IEEE Int. Conf. Big Data (BigData), 2023, pp. 4776–4785, doi: 10.1109/BigData59044.2023.10386291.

[5] M. Zou, W.-G. Jiang, Q.-H. Qin, Y.-C. Liu, and M.-L. Li, "Optimized XGBoost Model with Small Dataset for Predicting Relative Density of Ti-6Al-4V Parts Manufactured by Selective Laser Melting," Materials, vol. 15, no. 15, p. 5298, 2022. [Online]. Available: <https://www.mdpi.com/1996-1944/15/15/5298>.

[6] R. Goran et al., "Identifying and Understanding Student Dropouts Using Metaheuristic Optimized Classifiers and Explainable Artificial Intelligence Techniques," IEEE Access, vol. 12, pp. 122377-122400, 2024, doi: 10.1109/ACCESS.2024.3446653.

[7] B. Wang, Z. Liang, J. Zhang, and D. Wu, "Two-Stage High-Precision Visual 6-D Pose Measurement Method of Thin Parts With Irregular Shape for Precision Assembly," IEEE Transactions on Instrumentation and Measurement, vol. 74, pp. 1-13, 2025, doi: 10.1109/TIM.2025.3560727.