

Rescuing Potential Dropouts

in Morocco

Dropout Early Warning System (DEWS)

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PROBLEM

Dropout is a serious issue in Morocco

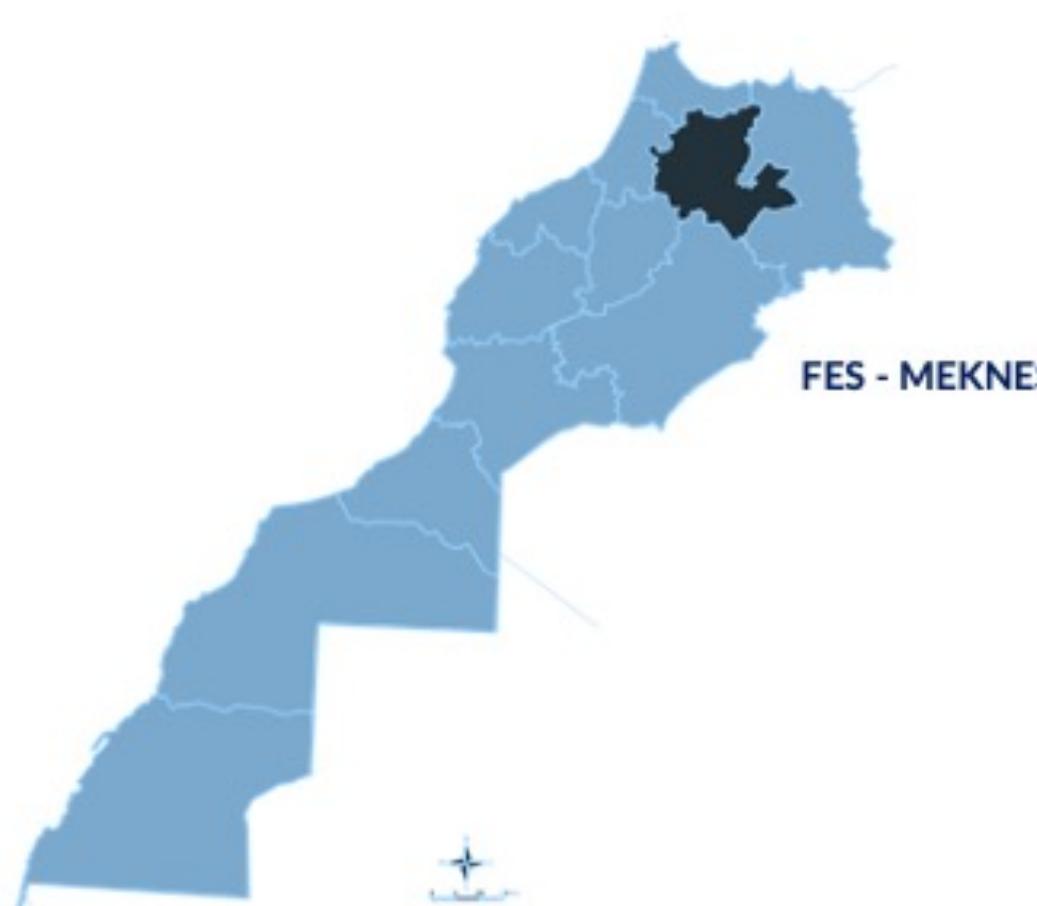
- 3.6% in Primary School (2019)
- 14.3% in Middle School (2019)
- 10.4% in High School (2019)

OBJECTIVES

1. Accurately predict student dropout for the upcoming school year.
2. Understand the main drivers of dropout.

METHODS

- Collect data for 336,135 students in the region of Fes – Meknes from 2015 to 2019.
 - Grades
 - Absences
 - Economic background
 - Special needs (e.g. handicap)
 - School characteristics

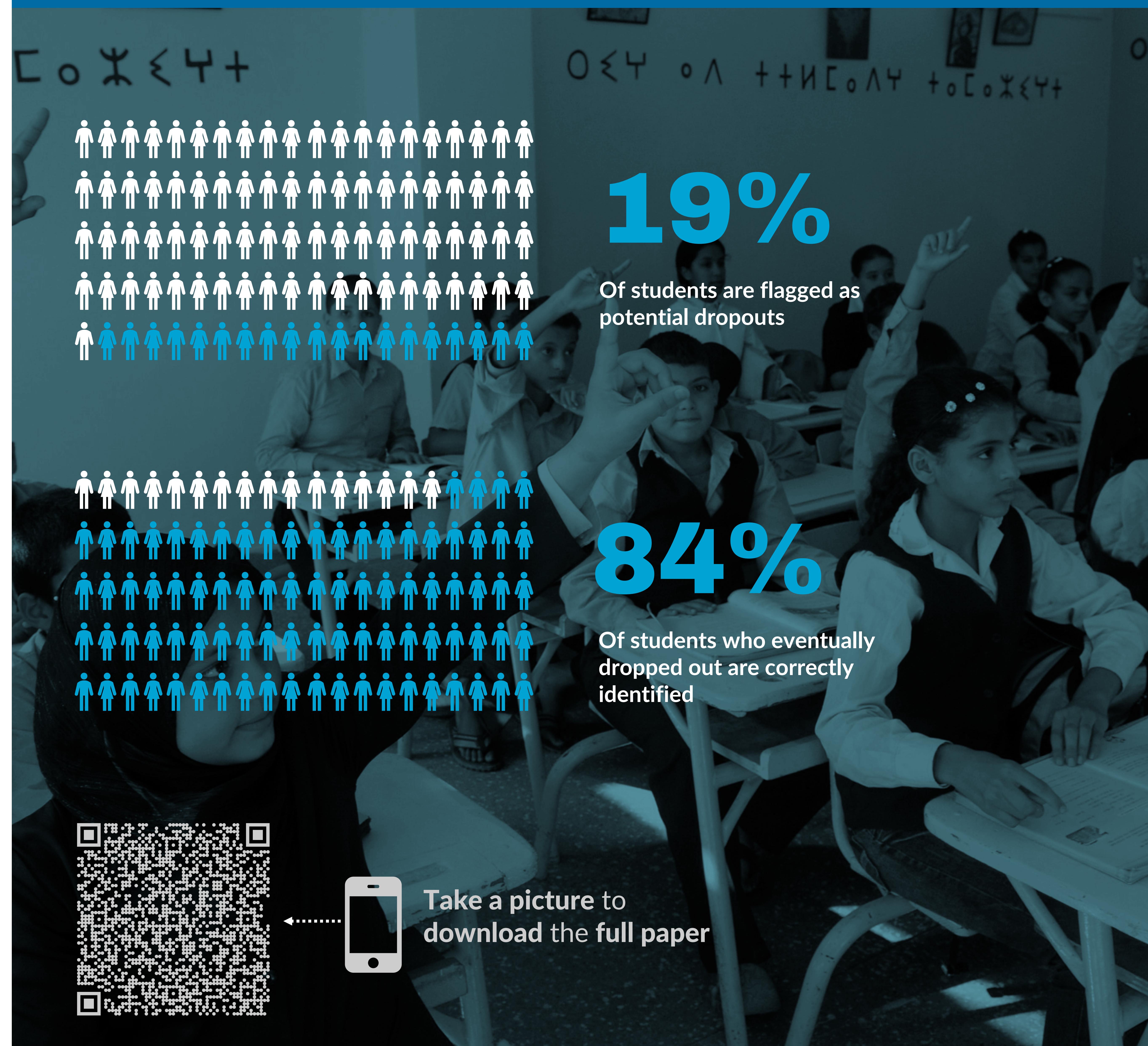


- Develop Machine Learning models to predict dropout from 2018 to 2019.
- Analyze feature importance to understand the main drivers of dropout.



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We can predict more than 80% of potential dropouts for the upcoming school year.

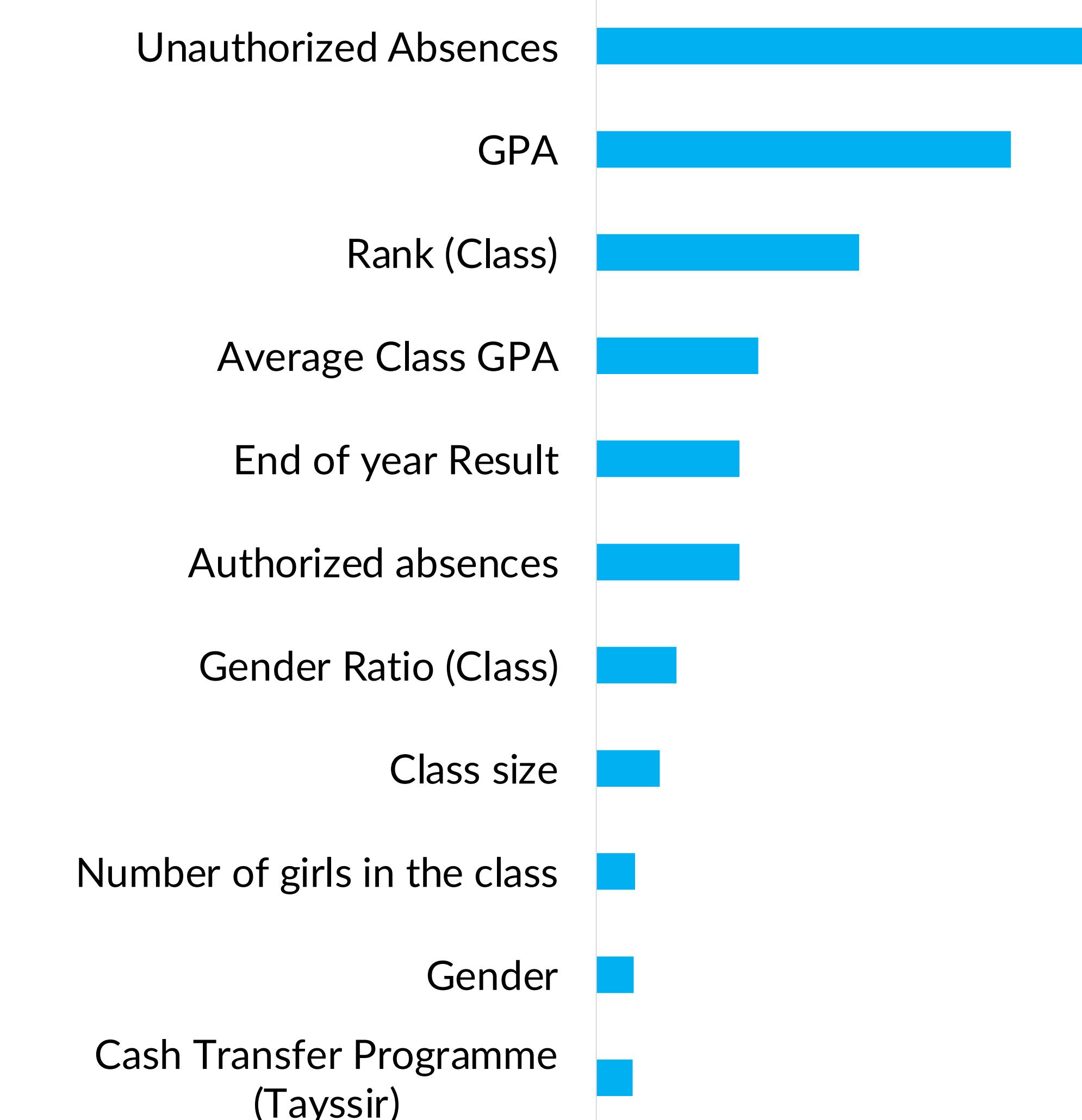


RESULTS

MODELS

Model	Accuracy	Macro-avg Precision	Macro-avg Recall	Precision	Recall	F2 Score
Logistic Regression	83.1%	0.66	0.81	0.35	0.79	0.63
Random Forest	90.3%	0.74	0.83	0.51	0.73	0.67
XGBoost	88.3%	0.72	0.85	0.45	0.81	0.70
LightGBM	86.6%	0.70	0.85	0.41	0.84	0.70
CatBoost	89.8%	0.73	0.86	0.49	0.81	0.72

FEATURE IMPORTANCE



LIMITATIONS AND FUTURE WORK

- **Causal inference :** While feature importance is a great tool, we cannot infer causal effects.
- **Data Availability :** Student behavior was not available but could have a strong impact on dropout.
- **Data Imbalance :** Future work could focus on predictions in Primary School, where Data Imbalance is even more extreme.