TARGETING DEGREE-AWARDING GAP ACROSS ETHNICITIES THROUGH MEANS OF OUANA L YSE PREDICTIONS

INTRODUCTION

- Universitas UK and Advacne report a 13% degree-awarding gap for Black, Asian and Minority Ethnic (BAME). This degree-awarding gap is also present at The Open University.
- OUAnalyse generates predictions aiming to identify students at-risk of not submitting their assignments. Last year pilot showed 7% higher chances to pass modules for students when their tutors used OUAnalyse.
- We investigate if the predictions provided by existing learning Analytics (LA) models are fair and serve the majority and minority ethnicity groups with the same effectiveness.

METHODOLOGY

- Analysis of predictions made by LA models in the 14 highest modules from the 2019/20. Evaluation (Baseline) made on data of 32,598 unique students. When disaggregated by ethnicity: White (28,535), Black (1,078), Asian (1,195), Rest (Mixed, Other, Refused, Unknown) (1,730).

METRICS

- False Positive Rate (FPR) - students erroneously predicted to Not Submit (NS).
- False Negative Rate (FNR) - students erroneously predicted to Submit (NS), more severe error as students most likely don't receive needed support.
- AUC - model's overall accuracy.

RQ1: Do existing LA prediction models work equally effectively for all ethnicities?

- A separate evaluation of each ethnicity is made.
- Comparison of the minority groups evaluation with the majority group (White) evaluation (green-better score, red-worse score).

Existent LA models contain inequalities in accuracy and error rates across different ethnicity groups. Different methods can help to reduce inequalities on different levels, but the solution is not systematic, and therefore, different adaptations and definitions of fairness are needed.

RQ2: Fairness through unawareness

- The "ethnicity" protected attribute is excluded during the model training process.
- A comparison with Baseline evaluation is made to discover the influence of unawareness on the metrics (green-improvement, red-deterioration).

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CONCLUSION

- Existing LA models discover inequalities in terms of accuracy and fairness across ethnicities.
- Removing the protected attributes from model training (RQ2) or building separate models for particular ethnicities (RQ3) seems to enhance accuracy and fairness for some ethnicity groups but does not systematically make the models more accurate and fair for everyone.
- Different settings bring different results.
- Therefore more research in terms of different adaptations and definitions of fairness is needed to ensure that the technology solution we build does not perpetuate existing educational gaps.