

Generation of Automatic Data-Driven Feedback to Students Using Explainable Machine Learning

Bentley Gift

Roy Kamau Mbui

Angelo Okari Morara

Abstract

This paper proposes a novel approach that makes use of learning analytics techniques and explainable machine learning to provide automatic and intelligent data-driven feedback that supports students' self-regulation of learning analytics. Prior studies within the field of learning analytics predict students' performance and use the prediction status without explaining the reasons behind it. Our proposed method has been developed based on learning management system (LMS) data from a university course. It extends this approach by explaining the reasons for the predictions and automatically provides data-driven recommendations for the action. The effectiveness of the predictive model of the proposed approach is evaluated, with the results demonstrating 90 per cent accuracy.

Keywords: Learning analytics, Explainable machine learning, Feedback provision, Recommendations generation, Dashboard