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Paper title: A Combined Approach of Process Mining and Rule-Based AI for Study Planning and Monitoring in Higher Education

Source: Google scholar

Keywords specific to the paper: Educational Process Mining, Conformance checking, Rule-based AI, Study planning, Study monitoring

Summary:

This paper presents an approach combining process mining and rule-based artificial intelligence to analyse student pathways from campus management system data and curriculum models called "The AIStudyBuddy Project". Process mining techniques characterize successful pathways and identify deviations from planned plans, while artificial intelligence develops rule-based recommendations to steer students towards more suitable paths. Two applications will be developed, one for students called StudyBuddy, and another for curriculum designers called BuddyAnalytics. StudyBuddy guides students in individualized planning with recommendations based on historical data. BuddyAnalytics, however, is an interactive dashboard for curriculum designers, visualizing the results of data analysis.

StudyBuddy, which is powered by artificial intelligence, will check students' preliminary plans against regulations, offering immediate feedback on potential conflicts. It will incorporate recommendations based on analysis of historical CMS data. On the other hand, BuddyAnalytics will enable curriculum designers to explore the results of process mining process mining by comparing recommended study plan models with actual paths to detect deviations.

In fact, in higher education, the diversity of students' study skills and constraints such as part-time jobs such as part-time jobs, create a variety of observed study paths, often deviating from idealized plans. In addition, capacity limits, such as room size, complicate planning. Thus, the AIStudyBuddy project involves several universities and uses data from campus management systems to carry out an in-depth analysis of student study paths and thus gain a better understanding of study planning. We also discuss Educational Process Mining (EPM), which is a sub-branch of Process Mining applied to education. Mining applied to education, using mainly data from Learning Management Systems (LMS). management systems (LMS). Work related to rule-based AI focuses on the modelling of academic regulations using answer set programming (ASP) and event calculus (EC). These approaches enable academic rules to be represented in a machine-readable, by processing and scheduling events while offering the ability to retract implications based on new evidence. They are flexible and adapt to changing situation, which is crucial in dynamic academic environments.

The aim of AIStudyBuddy is to facilitate individualized study planning for students and monitoring for curriculum designers. Study planning involves the organization of modules, courses and examinations throughout the program. Project data is transferred to specific event logs for in-depth insights.

Finally, the project extends data analysis to include course registrations, providing a more in-depth view of student study behaviour. This is an extension to the Learning Management System

(LMS). This combination of data, used in BuddyAnalytics, enables an accurate assessment of students' expected workload and helps curriculum designers to improve recommended plans. In StudyBuddy, the addition of information from the LMS will inform students about their possible deviation from the recommended plan. Theoretically, the project explores the synergies between artificial intelligence (AI) and process management (PM), with a focus on improving compliance checking and extracting beneficial constraints from event logs.

Supported by a software application? (If yes, provide more details)

The paper does not explicitly mention a specific software application supporting the AIStudyBuddy project. It discusses the integration of various frameworks in artificial intelligence (AI) and process mining to assist students and curriculum designers. The focus is on leveraging data available in universities to enhance decision-making for study paths and programs.