Enhancing Moodle with External Data Integration: A Case Study at the University of São Paulo

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Outline

Introduction

In response to the increasing demand for advanced learning analytics in educational settings, this project proposes a discussion on ways to enrich the information available about learners in the Moodle learning management system by incorporating external data sources. [Park & Jo, 2015]

Context

We are constructing a dashboard in Moodle to display the results of predictive models, such as the probability of dropout in a course. To achieve this, we utilize the built-in Moodle Analytics API, which considers indicators as independent variables and the target as the dependent variable.

Context

Moodle comes with default indicators and targets, and it is possible to extend its classes to define custom indicators and targets based on Moodle data. However, to increase the model's accuracy, we aim to incorporate external data into Moodle to be used as additional indicators and targets.

Research Questions

1. **What kind of external data can be usefully and safely integrated with the Moodle (behavioral) data?**

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2. **How this enriched data can be used as features for statistical and machine learning models respecting privacy and student autonomy in dashboards?**

Methodology

Our goal is to create a plugin that provides a schema for saving external data locally. This plugin will enable the creation of new indicators and targets based on the data it stores.

Plugin data

- **Gender**

Plugin data

- Gender
- **Race**

Plugin data

- Gender
- Race
- **Address (time spent in commuting)**

Plugin data

- Gender
- Race
- Address (time spent in commuting)
- **Academic History**

Plugin data

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- **Admission information (racial quota, entrance exam results)**

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- Student Aid and Scholarships
- **Employment status (whether the student has an external job)**

Plugin data

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- Race
- Address (time spent in commuting)
- Academic History
- Admission information (racial quota, entrance exam results)
- Student Aid and Scholarships
- Employment status (whether the student has an external job)
- **Socioeconomic data**

Discussion

Storing sensitive student data, such as gender, race, city, grade, admission method, scholarship status, employment status, reprobations, and socioeconomic information, in plugin tables requires careful consideration of data security and privacy (in human rights sense). Some possible isses:

- **Compliance with Regulations: Ensure compliance with data protection regulations, such as GDPR, FERPA, or other relevant laws**

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- **Access Control**

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- **User Consent, Transparency**

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- **Secure Coding Practices**

Bibliography

Park, Y. & Jo, I.-H. (2015).
Development of the learning analytics dashboard to support students' learning performance.
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