AAT – A Tool for Accessing and Analysing Students’ Behaviour Data in Learning Systems

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Motivation

- Learning systems usually track a lot of data every day
- Those data can
  - provide us with valuable information about what students are actually doing in our courses
  - help understanding students’ engagement and performance
  - help understanding which learning objects/materials/resources support students (and which do not)
  - ...

Moodle Analytics Project

- **Aim of the Moodle Analytics Project at Athabasca University** is to develop a tool that helps to better understand the effectiveness of the learning environment.

- **Draw conclusions about learners’ success and find indicators for success / drop-out / poor marks**
  
  Possible indicators can be:
  - Frequency of logins
  - Time a student spent in a learning system per week
  - Whether a student visited certain learning objects
  - Time spent on certain learning objects

- **Draw conclusions about learning material**
  - What (types of) learning objects are useful in a course?
  - Are there learning objects where students used to spend much more time than on other LOs?
Objectives and Design Decisions for the Academic Analytics Tool

- Aim is to allow users (e.g., learning designers, teachers) to:
  - extract detailed information about how students interact with and learn from online course in a learning system,
  - to analyse the extracted data, and
  - to store the results

- Allow users to decide and specify what data they are interested in (rather than choosing only from pre-defined information)

- Designed for analytics in educational institutions and therefore aims at flexibility with respect to the choice of course (rather than focussing only on one single course)

- Applicable for different learning systems and different versions of learning systems (not only one particular learning system)
Architecture of the Tool

- **Four design elements**
  - **Framework of learning objects**
    - Courses consist of learning objects (e.g., learning material, quizzes, forums, etc.)
  - **Patterns**
    - Based on types of learning objects
    - Specify what data the user is interested in (and what data should be extracted)
    - Can be a query or a formula supported by a query
Architecture of the Tool

- **Templates**
  - make the tool applicable for different learning systems
  - specify where the data resides within the database of the learning system (i.e., what tables and columns)
  - templates can be created for different learning systems and different versions of learning systems and then used for extracting data from the respective (version of) learning system

- **Profiles**
  - Experiment for extracting and analysing particular information
  - User specifies:
    - Which learning system is used (through templates)
    - How to connect to the data (through selecting and setting up database connections)
    - Which courses/learning objects should be investigated (through selecting the data set)
    - Which patterns should be investigated
  - Once the profile is created, it can be used for extracting data
Architecture of the Tool

Databases of a Learning System

Academic Analytics Tool (AAT)

Template
Pattern
Learning Object
DB Connection
Data Set

Academic Analytics Databases

CSV File
HTML File
Functionality of AAT

Demo ...
Conclusions and Future Work

- AAT allows users to perform simple and complex analytical queries on students’ behaviour in online courses

- Currently, the tool is under evaluation by our learning designers (with respect to usability and usefulness)

- Benefits of this tool and our plans for using it include:
  - Evaluate courses at AU, and based on the results, improve/extend the learning materials/resources which have less value for students and encouraging the development of learning materials/resources which generate successful learning
  - Identify factors affecting students’ success
  - Create automatic interventions to enhance student retention, motivation and/or learning; as well as sharing information about students’ progress with tutors and students

- Future work: Release the tool as open source product