Using Engage E-Text Data for Modeling Student Engagement
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INTRODUCTION

The recent and continued growth of electronic texts (Association of American Publishers, 2014) has corresponded with concentrated efforts to understand student engagement with such platforms through data analytics (see Junco & Clem, 2015; van Horne, 2016). This growth, however, has not offset the concerns of efficacy and efficiency in the usage of e-text platforms (Daniel and Woody, 2013). Unizin Engage is an electronic content delivery platform that allows instructors and students to Engage with a shared text. IUB was one of the initial adopters of this platform Understanding usage with the platform can enable deeper understanding of engagement with content and achievement patterns.

UNIZIN ENGAGE E-TEXT DELIVERY PLATFORM

- Engage Features
  - Instructor and student markings
  - Online and offline access through web and mobile devices
  - Shared annotations that allows students to see instructors feedback (Figure 1)
  - Front-end analytics available to instructors (Figure 2)

Figure 1: An example textbook on Engage platform

Figure 2: An example of Engage Front-End Analytics

INITIAL DATA SOURCES, MANAGEMENT, and VISUALIZATION

- Engage data is stored in record logs that provide summaries of user, section, course, and departmental level activity within the platform. At Indiana University, these records span from 2012 to the present.
- Organization of Engage data logs is distinct from our own institutional data models, which prevents automatic joining of Engage activity records to our enrollment data.
- This necessitated the development of our own data models that accomplished the following:
  - Identification of IUB-Bloomington (IUB) users
  - Development of course and class level mappings between Engage and IUB’s institutional data
  - Development of user and enrollment information mapping structures
  - Alignment of user information with enrollment and course records
- These data management processes led to data summaries and visualizations as exemplified in Figure 3 & 4.

DATA PREPARATION FOR EXPLORATORY MODELS

- Models were developed from a test semester of School of Business courses
- Data preparation for exploratory models have so far encompassed a two-step process
  - General steps:
    1. Identify high use sections
    2. Assign initial classifications to data from Engage features activity
  - Specific steps:
    1. Compare individual students summative activity for the semester to their class central tendencies of activity
    2. Assigned individual students to high and low activity groups depending on whether students’ activity was above or below their class average activity for semester

MODEL DEVELOPMENT

- Models were developed using the following data features:
  - Page views
  - Annotation Activity (e.g., bookmarks, highlights, notes, and questions)
  - Prior academic performance
  - Student Demographics (e.g., age, gender, ethnicity)
- Models were intended to explore structures and gaps (i.e., other relevant data) within our data
  - Decision trees (see Sutton, 2005 for a review) were used to partition these data into hierarchical classes that indicate some structural relations between our features (Figure 5)
  - Found expected relations between page view and prior academic performance

Figure 3: Unique Users by Major Departments/Schools by Term

Figure 4: Average Weekly Page Views by Sampled Courses

Figure 5: Decision Tree Example

OPPORTUNITIES & FUTURE DIRECTIONS

- Creating our own data schemes that map Engage activity data to institutional institutional data sources (i.e., SIS and Grades)
- Acquiring data from the vendor, transforming and properly storing the Engage data.
- Developing more robust data portraits of Engage users with other relevant information (e.g., previous enrollments, course structure, and pedagogical practices)

REFERENCES & ACKNOWLEDGMENTS


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