DEVELOPMENT OF AN INTEGRATED LEARNING SUITE FOR OUTCOMES AGGREGATION, ANALYSIS, AND REPORTING

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INTRODUCTION

The Faculty of Engineering and Applied Science (FEAS) at Queen’s University has been developing and refining process for continuous program improvement supported by outcomes assessment. This process must be sustainable, require little additional work for instructors and staff, and provide useful information to instructors and administration for both short-term course improvement and long-term program-wide improvement. A key element in our plan is adopting a software tool that automates much of the collecting, aggregating, and reporting of outcomes data.

The tool should provide:

- A modern, flexible and customizable e-learning environment capable of mapping and integrating an outcomes-based competency structure into the environment
- Simple yet effective methodology to define and map engineering graduate attributes/competencies at course and program levels
- Easy to use, flexible and diverse assessment methods to measure student learning outcomes in a variety of contexts
- Quick, customizable, concise and clear reporting on outcomes data for course instructors, departments, administrators to use for improvement purposes

Queen’s FEAS has been utilizing an ad-hoc process which involved multiple tools, combining word-processing, spreadsheets, curriculum mapping tools, paper forms, and a learning management system in a manual process in order to create, implement, assess and report on student learning outcomes. While this process worked, the highly manual process was piloted using a small number of courses and was considered to be unsustainable with a full-scale implementation across 10 programs.

Currently the process is error-prone as it relies on manually updating multiple documents across eight departments whenever changes are made. Most importantly, however, there is no mechanism to provide rapid feedback to instructors about the performance of students relative to expectations.

SELECTING A SOFTWARE TOOL

The faculty has surveyed a large number of learning management systems, assessment tools, and accreditation tools to identify a package that meets all of our goals [1,2]. There is a very large number of tools that can manage one piece of the process very well; for example some tools are very good at analyzing but very at poor reporting, or do not connect to a learning management system that would be used to grade students.

In the end Queens FEAS chose to partner with Desire2Learn (D2L), because of its modern learning environment, varied assessment capabilities and the potential to analyze and quickly report useful information through the continued development of its Insights Analytics tool.

The Desire2Learn Insights™ product today includes a number of reporting tools which provide visibility to outcome mapping and various methods for measuring outcome achievement. Desire2Learn is actively working with client partners like Queen’s University FEAS and others to richly expand the data reporting and visualization capabilities beyond what exists today. These changes are being driven by an update to the underlying data visualization engine as well as improvements to the competency tool within the learning environment. These improvements will provide for a tighter integration with external standards and accrediting bodies for data exchange.

This development consists of three primary phases of activity. Those three phases are:

1: New visualization engine with focus on personalized dashboards and improved interactivity of data.

2: Improved Learning Outcomes architecture.
   - Work has begun around defining new ways to catalogue, locate and align outcomes within the Learning Environment
   - Improved alignment and outcome creation workflows will provide less time consuming methods for the management and upkeep of outcomes in the system
   - Extend the evaluation methods for outcomes to multiple achievement scenarios based on activity performance
   - Improved curriculum mapping ability

3: Big Data architecture with an emphasis on real-time data interactivity, APIs and benchmarking of data across several domains (regional, countrywide, standards-based).

The ultimate goal of this development activity is to continue to enhance the use and reporting of rubric evaluation data and continue to support varied use cases for rubrics as effective evaluation tools. Our partnership work with key strategic clients continually helps us to improve data access and provide optimal data visualizations for the next generation of education analytics tools. Future enhancements to the product include personalized dashboard views, enhanced custom reporting and report customization as well as API data access for bi-directional data exchange with the data warehouse.

RESULTS

The Insights system is in its nascent stages, but is continually being improved with the input of clients including Queen’s FEAS providing feedback in an advisory capacity.

Insights will allow programs to identify department and engineering-wide indicators, display a mapping of courses to indicators, report on individual indicators and attributes, and drill down from program level data all the way to individual student artifacts. The tool is intended to help instructors use outcomes data to inform progress of their students, and program administrators to inform curriculum improvement.

DISCUSSION

This presentation will be presented as a case study, outlining the FEAS approach and how D2L plans to enhance Insights platform will support an outcomes-based, continuous program improvement process.

REFERENCES


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