Continuing The Transition to Outcome Based Education: The Design and Implementation of a Database for Attribute Data in the School of Engineering Science

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Project Overview

In this project, we developed a database to archive the necessary data for courses offered in the School of Engineering Science (ENSC). The database is currently developed to store course files for each semester as well as the associated indicator data and student artifacts as required by the Canadian Engineering Accreditation Board (CEAB).

Question(s) to be investigated/ Project Outcomes:

Because this project involved implementation, the "questions to be investigated" were used to determine the project outcomes. The following lists the questions proposed in the grant application annotated with their answers.

Q) What data must the database archive?

A) My research assistant, Charlie Yang, and I reviewed the requirements set forth by CEAB regarding indicators, and we talked with our undergraduate assistant, Margaret Crandell, regarding course files and the information contained within. We determined that we need to archive the raw data for each indicator in each class, where the indicator was assessed, which includes the type of assessment (e.g., homework, project, examination) and where within this assessment the indicator is located (e.g., in a test in may be question 1 and 2, or, in an essay, it may be a particular section). We also need to archive student artifacts that represent our four performance categories: exceeds expectations, meets expectations, marginal, and below expectations. For the course files, we need to archive what is currently being kept: course syllabus, final grade roster, course materials, etc.

Q) What reports must be generated?

A) We reviewed our last accreditation report regarding LO’s to determine the types of information CEAB expects when accrediting a school. Being able to create histograms based on specific indicators per course and year is a necessary feature. We incorporated several methods for sorting through data based on different criteria. We also ensured that students artifacts and where they were accessed were easily accessible.

Q) Can Canvas be used to help obtain data?

At the time this database was being created, the SFU version of Canvas did not easily support learning outcomes at the program level. Moreover, not all instructors use Canvas, so we can’t rely entirely on this LMS. However, I would still like to investigate how we can integrate Canvas into our data collection procedure for those instructors who use it already.

Q) What method should be used to add data to the database?

A) The database allows any registered user to input data. The eventual goal is to host this on a department or university server and use ACS (Academic Computing Services) passwords. The initial setup for a specific course offering must be completed by an administrator.

In the grant proposal, I listed the following project outcomes:

- archive indicator data, student artifacts, and other course related material;
- assist the undergraduate assistant in collecting material for course files;
generate reports based on the data that will inform curriculum change;
• generate reports for accreditation.

From a functionality perspective, the database meets all of these outcomes; I have attached a preliminary user manual that outlines some of the functionality. The user interface needs some improvement, and I need to determine an appropriate server to host the database. This portion should be completed by the end of the summer semester.

Variations in the project
No significant deviations from the proposed proposal occurred. Some milestone deadlines took longer than expected, but such variation is quite common with software development.

Dissemination of Findings
The major act of dissemination will occur when this database goes live and is hosted so that faculty can upload their course data. Up to this point, I have kept the department updated through discussions at faculty meetings, and I have kept in contact with the undergraduate program assistant regarding the progress of the project.

When the database is hosted, I will conduct formal training sessions. I also plan on developing a Canvas sandbox that outline the various features of the program and describes how to use it.

Applying Program to Teaching Practice
The goal of this project is to make archiving data easier, so faculty spend less time on this process and more on their teaching. At the program level, generating reports and analyzing LO data will help us improve our curriculum, and, I hope, in the process, increase student satisfaction and lower attrition rates.
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**Introduction**

This software is designed to manage course information for courses engineering students take; specifically, it manages indicators associated with these courses.

This software can be divided into two main parts. The first function is collecting, storing, and managing course information. The second function is to automatically distribute indicators according to the information stored such that, each engineering student will receive a proper coverage of each indicator in his undergraduate courses.

**Using the Program**

Click Database Management to:

- Add new course information to the database
- View and manage existing course information in the database

Click Map Indicators to:

- Run the algorithm to distribute the indicator
- Export the indicator mapping after running the algorithm
1. **Search Function:**

To search for information related to the course, including indicator information, branch information, and course description, selects CourseInfo.

To search for the course key, use select CourseKey.

Use the search button to execute the search. Alternatively click the display all button to see all information related to Courseinfo/Coursekey (depending on which is selected) displayed on the datagrid.
### 2. Edit Function

Select a cell and click the edit button or double click a cell to edit the information in the cell.

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</table>
3. **Delete Function**

After selecting a row on the datagrid click the delete button to delete a course.

4. **Add Course**

Click on the Add Course Info button to access the add course page.

![Add Course Form]

Fill the form and click on the addInfo/Edit button to add the course to the database.

If the courseID entered already exist in the database, the old information related to that course will be replaced by the new information.
Use the drop list to switch through attribute categories, click Reset to reset the form
Enter Indicator limit to indicate the amount of indicators each course can take, and enter indicator Occurrence to indicate the amount of times each indicator need to occur in a optimal coverage.

Click on the Calculate button to automatically distribute the indicators.

**Export**

The distribution can be exported by clicking on the export button, which will create, at the location you designate, a excel file of the indicator mapping, a PDF file of the detailed attribute and indicator information and the mapping, and a set of PDF files containing course descriptions for each course in the database.
How to read information in the Datagrid

For any branch or lock: 0 = false 1 = true
For each indicator, ND = Not Developed, IN = Introduced, UT = utilized, EM = emphasized.

XAMPP

XAMPP is currently installed in the applications folder of your computer; please make sure MySQL, FTP, and Apache is on in the XAMPP control when you use the system.