Make it Relevant and They Just May Learn it

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Abstract

There are many different approaches to teaching Information Systems courses. Studies have shown that if the student is interested in the topic, they just may have a more productive classroom experience. This paper documents the practice of structuring assignments around topics that are of interest to each individual student. This method has been successful in courses from the freshman level up to the doctoral level. For each of the classes described in this paper, the students are given a framework to follow for the assignments, and then asked to individualize the assignment relevant to their interests. Student attitudes toward the courses are discussed, along with recommendations for course structure and content.

Keywords: Information Systems Coursework, Student interest, semester project

1. INTRODUCTION

How do you teach an Information Systems course to students from a variety of backgrounds? (Easton 2003) How do you teach it and keep the interest of your students? Should an Introductory Information Systems course be taught differently than a doctoral level course? The first answer that one might give to this question is yes, of course. But although the course work is obviously different, the same approach for assignments can be used in almost any Information Systems course. If the course material can be made more interesting to the student, then he will be more inclined to learn it. A real world project allows the students to "learn better through a particular domain of their interest" and "see the practical value of what they learned" (Robbert 2000). The fact that students all come from different backgrounds can be seen as an advantage in any Information Systems course. Each student can bring a different perspective to the same problem that all are addressing in any particular assignment.

Large semester projects are also an important aspect of the student's course of study. The skill set required for employment in the "real world" is constantly evolving. (Gallivan, Truex & Kyasny, 2004) Coding efforts are often large projects that are completed by many individuals and comprise many lines of code. Employers want their employees to be able to successfully complete large on-going projects, as well as communicate and document their work. Programming skills along with communication skills go hand in hand for successful employment. In fact, employers are increasingly demanding this of their entry level employees (Gruba & Al-Mahmood, 2004). Thus, large semester projects along with documentation are a key element of this author's student assignments.

Researchers have investigated project-based learning in a wide variety of disciplines and settings. They have generally found it to be effective in increasing student motivation, improving student problem solving , improving higher order thinking skills, addressing different learning styles, and providing students with an integrated learning situation. (Hutchings & Wutzdorff, 1998) (Albanese & Mitchell, 1992) (Buck Institute, 1999) (Tretten, & Zachariou,

1995). Project-based learning, unlike the traditional textbook/lecture approach, motivates the student to do additional work, illustrates to the student the value of the material covered, and most importantly, provides practical experiences that enrich the student's academic growth.

Students in the courses described in this paper were given the opportunity to apply their semester projects to an area of their choice and/or interest. "Students learn about technology if they can relate it to their lives". (Hoffman & Blake, 2003)

This paper describes how an individualized student selected project approach was accomplished in the following courses:
- Introductory Information Systems Literacy (freshman level)
- C++ Programming (under graduate level)
- Database Management (senior level)
- Knowledge Management (Doctoral level)

2. COURSE STRUCTURE

The approach documented in this paper is one that structures course assignments according to the following:
- Semester long project is required
- A basic template for each assignment/or phase within the project is provided to the student
- The student is required to customize the assignment to an area that interests him

A summary of each of the four courses is as follows:

Introductory Information Systems Literacy (freshman level)
This is a required course in the code for the University and the students come from a wide range of backgrounds. According to Tsai, "it is the responsibility of the education institution to offer a computer literacy class or series of classes for preparing its students with proper computer knowledge in a suitable learning environment before they enter the business world". (Tsai, 2002) The fact that students all come from different backgrounds and majors is seen as an advantage by this author. The students bring a wide view of the basic topics by applying the assignments to an area of their choice. A greater challenge is to "design IS courses for students who have no intention of pursuing the vigorous IS professional training". (Law, 2003) However, The National Association

of Colleges and Employers reported that employers are looking for employees with computer skills even in non-related positions. (http://www.naceweb.org) Therefore, this course could help to make the student more marketable in his job search. Also, allowing flexibility with this course is seen in a very positive light among other departments on Campus. (Learmonth 2001)

Information Systems topics were introduced to the student with his major or area of interest in mind. The student was asked to pick an organization to model throughout the entire semester. The choice of the organization related to the student's major or some other area of interest to the student. The organization was used by the student as the framework for all assignments during the semester.

This course was to teach Information Systems concepts as well as the application software, Microsoft Excel and Access. The approach taken for instruction in the classroom varied according to the topic being covered. In the case of Excel and Access, skills were taught before the assignments were given. As to the information system concepts, there was first a discussion of the particular topic in class. Next, the student researched the topic as it related to his organization. The student then reported his findings to the rest of the class. These oral reports were both formal with the use of Power Point, and informal in nature

Some examples of the organizations chosen by the students were:
- KDKA Pittsburgh Television Station – Student was a media arts major and had an internship with the station
- Restaurant – Student was a business major and had a job at the restaurant
- Hardware Store – Student was a business major and his parents owned the Store
- Insurance Firm – Student was a business major
- Elementary School – Student was a education major
- Law Firm – Student was a pre-law major
- Brokerage Firm – Student was an Economics major
- Hospital – Student was a Health Care Information Systems major

Initial Profile Project Assignment

The student chose some business or organization that he modeled for the semester. This could be a fictitious business or organization or it might be a real one in which the student may or may not have been involved. Any financial data provided during the semester was to be simulated. The business/organization must meet the following requirements:

- It has employees
- It offers a service or produces a product
- It has a variety of financial needs

The student then created a profile of the business/organization. The following elements of the business/organization were addressed in the profile:

- Name and location
- Purpose
- Mission statement
- Number of employees
- Location of employees (business may have more than one site)
- Summary of various financial needs

Spreadsheet Examples Assignment

The student was asked to create five spreadsheets that are related to tasks that might need to be completed for their organization. One of the spreadsheets was to be a payroll register. The other four spreadsheets were of the student's choice. All of the spreadsheets were to be done in a professional manner (margins, headings etc…) At least one of the spreadsheets was to have a chart (graph) using some of the data.

Software Selection Assignment

In this phase of the semester project, the student investigated software appropriate to their organization. They then made a recommendation as to what software package should be purchased to support the major function or functions of the organization. In making the recommendation, they were to compare at least two software packages in terms of features, hardware requirements, price, limitations, etc. Based upon the findings, the student made a recommendation as to what should be purchased. They provided all supporting documentation and a plan for implementation of the software, including installation, training, and data transfer.

The student then made a formal presentation to their boss (the class) summarizing their recommendation.

Intranet Assignment

Each student set up an Intranet site for their organization with many required elements such as tasks, polls, databases and linked documents. They then wrote a
paper summarizing the value of an intranet to their organization.

Database Assignment

The student created a database to store employee information of their organization. The required information for the organization included areas such as payroll, scheduling, and human resources evaluation data. The project was completed in Access and included all the tasks required to define the necessary tables, forms, queries and reports. The students were given specific queries and reports to perform relevant to their specific organization's database. They were also required to write a user's guide for the database.

Introductory Information Systems Literacy Course Summary

While the course was taught in the individualized format presented here, another regular section of the course was run where students followed a prescribed outline of the course work as defined in the textbook. All assignments were taken from the book and students were given multiple choice tests from the publisher. Students from both sections were surveyed at the beginning and the end of the course. They were asked about their knowledge of Computer Information Systems in general and spreadsheet and database work specifically. In those three areas, the students in the individualized section of the course reported that they learned more than the students in the regular section.

Seventy four percent of the students in the individualized section felt that the course was somewhat challenging as opposed to 38% of the students in the regular section. Students need to be challenged. Research has shown that this can be an essential part of the learning process (Martin, Hands, Lancaster, Trytten & Murphy, 2008).

Students in the individualized section of the course reported that they did spent more time working on the course material than did the regular section. Perhaps this is because they were more interested in the course content? (Hoffman & Blake 2003)

The individualized section reported a higher enjoyment level than the regular section. Although this is not a critical element of the analysis of the course structure, it makes the course a bit easier to teach and somewhat more rewarding to the author.

C++Programming Course (undergraduate level)

Ninety percent of the students in this course had no programming background, with this being their first coding course. Therefore, a few small programs were first required in order to teach some very beginning tasks, such as assignment statements, if statements and loops. The semester project was assigned to students at week four in the fifteen week semester. Since these students were beginning programmers, it was a challenge to this author to come up with a project that allowed the students to choose their on area of interest, and thus create their own data set.

C++ Project

Students wrote a menu driven program that was broken up into phases. At the completion of the project, each student's project performed the following tasks utilizing the data of the students choice:

- Read data from data files
- Wrote data to data files
- Implemented various class structures
- Manipulated data in multi-dimensional arrays, including inserting, deleting and modifying
- Coded various error checking functions
- Coded various search functions
- Coded reports
- Wrote user's and programmer's guides for the project

C++Course Summary

At the completion of this course, students reported that they were very proud of the large coding project they had written. Again, most of them had no previous programming experience. A number of the students said that they spent a great deal of time on the project, but because of the individualized data, the extra time was something they did not mind. They reported that they felt that the project was more interesting to work on because of the data being of interest to them. This author has taught beginning programming for many years, and always included a large project such as this one. But this is the first time that each student designed their own data set. Success was achieved from both types of projects, this individualized type and the projects in which all students manipulated exactly the same data set. But it must be noted that the students who defined their own data completed additional functionality in their code beyond what was required.

Database Management (Senior level)

Most students in this course are seniors and applying the topics to their area of interest should not be a problem. In fact a database project does lend itself to easy individualism. But what was not expected was the fact that many of the students went well beyond what was required in the database project. They reported that they just could not "put down" the project.

Initially the students were to come up with a real world database project that could be completed in a 15 week semester. The students were asked the following questions about their proposed database project:

- What is the central focus of the database?
- Why was this topic selected?
- What kinds of things will this database be able to do?
- What kinds of information will the database provide for the user?

Database Phase I Requirements

- All tables are to be defined (keys, constrains, etc…)
- All input forms for the tables are to be completed.
- At least one sub form must be present
- All forms are to have the same "professional look"
- All forms are to have a header area
- A main form must be present to link all other forms
- Descriptive names are to be used for all field names on the forms
- Two types of forms are to be represented (column and tabular)
- Buttons must be present on all forms to control input (add, delete, save, etc..)
- At least three pull down lists must be present
- All forms are to have close and search buttons
- Relationship screen must be completed
- records must be entered in each table

Phase II Requirements

- Create at least 8 reports

- Add functions to at least two of the reports (sum, count etc.)
- Create a form with buttons on it for all of the reports
- Create at least one update query that will be run from a button on a form.
- Create at least one delete query that will be run from a button on a form.
- Create a macro that will be run from a button on a form
- Create a pop up form showing information of the student's choice
- Define a form that automatically opens when the database starts
- Add an option box to one of the forms
- Make sure that at least one of the forms comes from a query
- Create a query screen containing data in a tabular format that allows the user to do custom searches. Create a button to access this screen
- Create a user's guide and a programmer's guide

Database Course Summary
The database students far exceeded the author's expectations in terms of the quality of the projects. Because the students were creating real projects for real users, getting it "right" was essential. This does add a great deal of extra work for the instructor. But the reward of seeing the student's success far outweighs the additional time spend. The students were excited about the work and related that in class on a daily basis.

It must be noted that there were other section of the database course offered in which students created exactly the same project (same table structures, queries, etc.) Although there was no significant difference in student grades, there was a significant difference in the excitement in the classroom. A number of students who created the individualized project reported that they intended to specialize in database work in the future.

Knowledge Management (Doctoral level)
Allowing students in this course to apply their assignments to an area of their choice was quite simple. All of the students were working professionals and were able to focus on an organization of which they were currently or previously employed. This was an excellent teaching opportunity. The concepts of Knowledge Management were applied by each student in a very different area using many different techniques. With each phase of the

semester project, the students reported their particular organization's challenges as they related to the required Knowledge Management tasks. The project assigned is as follows:

Phase I
The student performed a knowledge based SWOT analysis of their organization. Students were asked to define the business strategy their organization maintains and how it was aligned, if at all, with knowledge management?
The summary of the SWOT analysis is as follows:
- Strengths - What is done well?
- Weaknesses - What needs to be improved upon?
- Opportunities - What opportunities are being missed because of poor knowledge management?
- Threats - What are the threats if conditions are not improved?

The student was also to write a short summary of the technology that existed in their organization.

Phase II
The student performed a Knowledge Audit on the area of their organization that was defined in phase I.

The steps of the knowledge audit were as follows:
- Define Goals
- Identify Constraints
- Determine the Ideal State
- Select the Audit Method
- Perform the Audit
- Document the Audit

The student was to summarize what was going well, what needed to be done better and why, and what technology might be applicable to support on going and new knowledge management initiatives

Phase III
The student was to create a blueprint for solving the knowledge management issues that arose in the knowledge audit. They were to map out what direction they would take to make knowledge creation, sharing, etc. better.
- What steps would be taken to promote knowledge sharing?
- What hardware and software would be implemented? (what is already there or what must be purchased)

- What cultural issues must be dealt with?
- What is the makeup of the knowledge management team?
- What measurement will be used to determine the success of the knowledge management initiative?

Knowledge Management Course Summary

This course design proved to be very successful. In most cases, the students reported many of their findings to their superiors and their peers at their place of employment. In a number of cases, this lead to actual knowledge management initiatives being instituted in the student's organization. These were doctoral students and one would expect a high interest level in the topics, but the excitement that was generated when each gave their final presentations, was not expected. This was extremely rewarding for this author.

3. CONCLUSION

There are many right ways to teach Information Systems courses. Designing a semester project that is relevant to the student has been extremely successful in the courses referenced in this paper. Students were very proud of their results and often went well beyond what was required in the project.

The students were happy to apply the technology to what interested them. One of the drawbacks to this approach is that because of the instructor's individual time given to each student's project, it could limit the topics that can be covered.

Support for faculty is one issue that has not been addressed in this paper and must not be ignored. Although it is not a conclusion, it is a recommendation that institutions must provide support for those instructors who are willing to spend the additional time needed to work with students who are all each creating a different project. This support could be in the form of controlling class size and limited course preparations. If the support is not there, the success of any such course can not be assured. (Gopalakrishnan, 2006)

Those teaching a course such as this must be very organized and attentive to the students. A policy of answering the student's email within 24 hours is extremely important. Students need to feel that the instructor is accessible. A study done by Yang and Cornelius also supports the concept that the students must receive feedback on a timely basis. (Yang, 2004) Help was available and given when needed. One student in the database class said; "Without a doubt this was one of the best classes I have ever taken. The teacher was readily available; she responded to my emails fast."

Information Systems are in every phase of our lives. The students need to see that this is the case. The approach described in this paper can be used for almost any Information Systems course and thus help to promote the "IS" area of study while keeping the interest of the students. This author's experience has shown that when the student is interested, he will work harder and perhaps learn more.

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