Using a Capstone Accounting Information Systems Course For Assessment and the Development of Team Skills

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Abstract

Oversight bodies have called for assessment of student outcomes, and employers of accounting majors have called for better skill sets, including the ability to work effectively in a team. This paper describes a required capstone course in the Accounting Information Systems (AIS) major that utilizes a field experience/team project to develop and assess students' skills. The course and the rationale for its components are described and detailed team project guidelines, sample projects, and assessment matrix are provided.

Introduction and Purpose

Assessment is a concern now facing most academic departments at colleges and universities across the United States. The assessment movement is growing and is now mandated in over 40 states (Gainen and Locatelli, 1995). Some form of assessment program is expected by the AACSB and regional accrediting bodies such as the North Central Association of Colleges and Schools and the Southern Association of Colleges and Schools (AAA, 1993). Committees of both the American Accounting Association and the Federation of Schools of Accountancy have had committees study assessment (AAA, 1993; Bayer et al., 1994).

Readers with comments or questions are encouraged to contact the authors via e-mail.

One practical solution to measuring outcomes assessment (a significant part of an overall assessment plan) is the establishment of a capstone course. Advantages that have been cited for such an approach include integrating subfields of the discipline and providing a systematic focus on outcomes of knowledge, skills and attitudes (Morley et al., 1992). This approach has been implemented at the authors' institution in its accounting information systems (AIS) major for almost ten years. The purpose of this paper is to describe the capstone course so that others might consider its appropriateness for their programs.

Along with growing pressures for assessment have been many other curriculum pressures, including the use of teams or

cooperative groups (Cottell and Millis, 1992, 1993; Ravenscroft et al., 1995) as a means of development of cognitive, communication and interpersonal skills. Both the AECC (1990) and the Perspectives "White Paper" (Arthur Andersen et al., 1989) have stressed the importance of such skills. An important feature of the capstone course to be presented is its use of teams, and the significance of the above mentioned skills to student and team performance (and grade).

Employers are demanding that their accounting and auditing professionals possess adequate backgrounds in computer science and information systems. The AICPA (AICPA, 1988), the Bedford Committee (AAA Bedford, 1986), the (then) Big Eight firms' "White Paper" (Arthur Andersen et al., 1989) and the Accounting Education Change Commission (AECC, 1990) have all supported the need for more information systems education. The authors' institution established a separate degree program in AIS in order to address this need and to fill significant demands by employers in its market area. The objectives of the capstone course required of all AIS majors are now described.

The Course Objectives

The objectives of the course are as follows (1) To increase the knowledge base and expertise of accounting students in the implementation phase of the Systems Development Life Cycle (SDLC); (2) To develop familiarity with the issues related to implementation of control systems as a part of the systems design effort; (3) To nurture the ability to adapt to the rapid changes that accountants face both from technological and organizational standpoints; and (4) To present the concepts of Business Process Reengineering (BPR) and Total Quality Management (TQM) and their impacts on the design and implementation of accounting information systems.

The Course Structure

Throughout the course it is emphasized that the systems implementation phase is the process of installing the newly designed system in place of the old one. This phase includes, but is not limited to, the following activities: reviewing the designed system, obtaining new hardware, developing and programming new applications, testing the programs, training staff and post implementation audit. It is expected that by going through the implementation phase, students will be exposed to the challenge of designing, coding, compiling, testing and documenting programs. The students are constantly reminded that they should maintain TQM and BPR perspectives throughout the analysis, design and implementation phases. This is extremely crucial because almost all the systems design methodologies mentioned in available textbooks direct students to automate a non-computerized system without spending any time on questioning the nature of the processes. Throughout the course the students are reminded that the systems design based on these new concepts will eventually result in attainment of higher productivity, reduction of cycle time and higher quality.

Consistent with Bloom's (1956) taxonomy, this class places more emphasis on application, analysis, synthesis and evaluation of knowledge gained in the earlier courses. Table 1 describes different skills that are addressed in the sources mentioned earlier and the pertinent areas of the course that utilize those skills.

Major class activities include the following:

Reading & Discussion

A course pack of contemporary materials and articles is used. The instructor provides a quick review of SDLC. The time spent on this coverage is not more than two weeks. To reinforce this concept, the students are asked to do a few cases related to the various aspects of systems design. The assigned cases all replicate real life situations. The students are asked to modify or redesign the assigned cases based on the specific questions asked in each case. These questions range from modification of conceptual

Table 1
Skills Desirable for Today's Accountants

Analytical Ability	Critically analyze and synthesize existing systems.
Written Presentation	Write various progress reports: a research report, homework, and the team project.
Oral Presentation	Present the team progress and final accomplishment.
Team Work	Perform and interact with other team members and experience group dynamics.
Research	Engage in research of contemporary issues of AIS.
Computer Application	Implement the designed systems by employing current software.

design to the design of record layout or report formats. After the coverage of SDLC, TQM and BPR materials are covered, and then specific information regarding the testing of systems is presented. Throughout this segment of the course, the students are constantly reminded about the reengineering and TQM issues. Students are encouraged to present radical and unique solutions to the cases introduced.

Team Project

The objective of the team project, which is the most important part of the course and which requires a significant time commitment on the part of students, is to nurture all the skills stated in Table 1. There are many positive points to team assignments. Among them are: (1) The team concept is one of the effective tools used in organizational development. Having this type of experience helps in placement of the students. (2) This type of assignment, which is normally large and complex, is accomplished through a team effort. Having been exposed to this type of group dynamics will give the students an added edge in today's work environment. (3) A sense of belonging and fellowship may motivate the students to learn and may lead to the more cooperative learning experience. (4) The instructor, having less work to grade, will be able to pay more attention to each team and provide timely and very personal feedback to each group.

However, some students may not find this experience to be as rewarding. Generally these team members, normally referred to as slackers, may create difficult and negative attitudes for the teams. This may result in motivational problems for more serious members of the team. Also, in a course with over 80 percent of the grade based on the team project, some may argue that individualized feedback is lacking from the process. In this type of situation, an instructor may wish to integrate a series of individual assignments in the course; we have chosen not to do so and to provide conflict resolution guidance for groups requesting it.

The project typically is done in teams of four students. The members of each team are selected by the instructor. Each team is expected to complete and present the final results of its project by following systems development methodology, i.e., systems analysis, design, implementation, testing, etc. In the interest of effectiveness, the students are asked to approach the problem systematically based on the fol-

lowing steps: (1) identify the facts of the system being analyzed; (2) identify the critical success factor for the organization; (3) define the problem faced as it is identified by the team; (4) determine alternatives available; (5) evaluate each alternative course of action; and (6) select a feasible plan of action.

Each team is responsible for finding its own sponsor (client) to support the project. This will allow the team a real life experience dealing with a client. This action by itself raises the self esteem of the team members and instills confidence in the ability of individuals to handle a real life case. The sponsors can be an industrial firm, a government agency, a university unit or other similar organizations. However, it may be more beneficial if the students are encouraged to select a public service organization. This would allow the students to develop a sense of community service and observe how their efforts (and profession) are valuable to the society.

Each team is provided with a guideline (see Appendix 1) in which the minimum expectation of the project is presented. Appendix 2 provides a sample of the projects that have successfully been completed in this class in the past several years. Our experience has shown that only one team (in almost ten years of the course offering) has not completed the project on time. Further, the student evaluations of this course show a tremendous sense of accomplishment. The overwhelming majority of students have rated the course as the best course they have ever had!

Research

Research is an essential part of the learning process. To encourage students to become familiar with this requirement, each one is asked to prepare a short report in the form of executive summary about a contemporary topic of information technology. They are required to search the most recent publications, namely the articles which are published in the last two years in a given area. Each of the students must pick a unique topic. The result of this assignment is presented to the class. This assignment is beneficial from many aspects. It will enhance the students' oral communication skills as well as utilize the skill of searching organized data bases such as ABI Inform. It will allow the students to communicate their work in a very concise and effective form. It also allows the entire class to become familiar with the most recent developments in information technology.

Assessment

Assessing whether students learned the objectives of the accounting information systems program is done with multiple methods in this semester long capstone course taken at the end of the students' program. Table 2 is a matrix which maps out the particular skill and learning objective with the component of the course and the particular assignment designed to document whether the student has met that objective.

The focus of the course and the majority of the grading points is the culminating team project done in the field with a client organization. Successful projects are ones in which the team produces a product that is better than that which could be done individually, students interact professionally with the client, and the product of the team project demonstrates that students are competent in the knowledge base of SDLC, BPR, TQM, and design and implementation issues of accounting information sys-tems. An important technique is to have multiple evaluators of all the written and oral pre-sentations. Evaluators include the client, the students' peers in the class, as well as the instructor.

Teams must also have their systems projects tested by another team who then must produce a report on the program (see F in Appendix 1). This expectation of excellence has certainly contributed to the high regard the business community has for the AIS program and its graduates.

Conclusion

As a result of the many changes which

Table 2
Assessment Matrix

Skill	Learning Objective	Instructional Approach	Evidence	Evaluator
Analytical Ability	Critically analyze and synthesize existing systems Demonstrate understanding of the concepts of SDLC, TQM and BPR	Reading and Discussion --- Team Project	Case analyses including redesign of the cases --- Written team project report	Instructor
Written Presentation	Effectively communicate in writing to the instructor and client the results of your analysis of information systems issues	Team Project	Written progress reports, research reports, homework, and team project	Client Instructor
Oral Presentation	Pesent the team progress and final accomplishment Present results of AIS research in contemporary issues	Team Project --- Research Report	Oral report to the class	Instructor Peer Review
Team Work	Contribute effectively to the team, such that the product is better than that which could be done by an individual	Team Project	Interaction with a small group in the field experience	Instructor Peer Review
Research Skills	Effeciently research contemporary issues in AIS	Research	Research reports demonstrating effecient use of resources	Instructor
Computer Application	Effectively use computer software to design and implement a system	Team Project	Written manual including systems documentation	Instructor Client Peer Review

have occurred in the nature and scope of accounting and auditing practice, many organizations are recommending more information systems education. Further, many recent articles and reports have stressed the importance of outcomes assessment and also team skills in accounting education. This paper presents information concerning a capstone accounting information systems course that is utilized for both assessment and the development of team skills at the authors' institution. The authors' institution accepts the team project as evidence of a culminating integrative experience for students; this seems to the authors to be a far more useful experience for students than a traditional use of a thesis course as an acceptable culminating experience.

Implications for Future Research

The value of assessment as a systematic gathering of data about students' competencies is that the information is used by others in the department to improve the program. Team projects should be retained and shared over time with new students so that the high expectations of the program are made clear, as well as with faculty who should continuously evaluate how the courses they teach are integrated into this capstone experience. It is more difficult to quantify "improvement in the program" with this instructional approach than with multiple choice norm based exams; however, the authors believe that the team field experience has been a successful strategy in developing as well as assessing students' team skills.

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Appendix 1
Guidelines for Project Development and Implementation

A. Each project is graded by using the following standards:

1. Using systems analysis and design methodology including but not limited to: Problem definition; Data flow diagrams; Systems flowcharts and descriptions of the procedures; Cost/benefit analysis; Implementation plan and testing; and Post implementation audit
2. Documentation quality and completeness which includes reference and user's manual
3. Presentation
4. Client's (the sponsor) approval

B. The following format is suggested for your report:

1. Title page
2. Acknowledgment (if any)
3. Executive summary (not exceeding two pages)
4. Group interaction report (report on group dynamics)
5. Reference manual's title page
6. Table of contents
7. Description of the client's organization
8. Problem definition
9. System description (including DFDs and system flowcharts)
10. Program description (by use of procedure flowcharts)
11. Program listing
12. Database listing (if applicable)
13. Acceptance reports (sample of designed reports, screens, etc.)
14. List of the controls integrated into the system
15. Description of hardware and software to implement the system
16. Appendix (Test plan and testing logs and results, Schedule of interviews, Flowchart of the existing system, and Other pertinent documentation)
17. User's manual (Title page, Table of contents, and Manual)
18. List of references used (if any)

A copy of your project must be submitted on the day of presentation. This copy will not be returned to the team. Therefore, it is necessary that each member make his/her personal copies prior to the final presentation.

C. Each team member also needs to complete the Peer Evaluation Sheets. Peer Evaluation Sheets are due twice. The first one is due after your Second Team Report. The second is due at the time of final presentation.

D. Each team needs to elect a project leader at the first meeting. Project leaders and the instructor will meet weekly to discuss the project's progress. The project leader is responsible for answering questions about status of the project, difficulties with the client and team members (if any), problems with implementation, assignment of individual team members, time table, etc.

E. Presentation of your project is also a very important step. It is essential that all members of the team participate in the presentation. Each presentation is limited to 30 minutes. As a minimum, the following parts should be covered in your presentation: (1.) Problem definition, (2.) Value of the proposed system to the user(s), (3.) Functional description of the proposed system (an overview), (4.) Interaction with sponsor, and (5.) Team reflections on the project

F. Your systems must be tested by another team besides your own. Part of your grade depends on the test results report submitted by the other team. Thus, you are responsible for having your program tested on time so that the tester team can submit their report on time!

Appendix 2
Sample Projects

Midsize Manufacturing Company

Client Operations: A medium size automotive parts supplier which has grown from a one division company to a multi-divisional corporation.
Problem Identified: The company, which has employed 800 employees in nine different plants, has difficulties with its time and attendance procedures in the payroll function.
Team's Contribution: Created a system that is less time consuming to operate, more user friendly and could store the information in more economical and concise format. The team used COBOL.
Benefits: The system's maintainability has been increased. It also has resulted in higher productivity gains. Eventually the system was implemented in all nine divisions of the company.

Energy Consulting Company

Client Operations: A nuclear energy consulting firm. The contracts are accepted for jobs that contain several tasks per job.
Problem Identified: The client needed a system in which their costs would be captured within each task of a job. This information will be the basis for invoicing their customers.
Team's Contribution: The team designed all the input / output documents, e.g. invoice, contract requirement summary, task spend plan summary, billing rate schedule, labor rate schedule, cost distribution summaries, cost report and service analysis of employee hours and dollars. The team used dBase IV to implement this system.
Benefits: The system implemented has reduced missed information on invoices. It also has reduced the time necessary for preparation and printing of the invoices.

EQUIPMENT LEASING COMPANY

Client Operations: A leasing company engaged in leasing office, manufacturing, medical, dental and graphic equipment.
Problem Identified: Each lease agreement must be tailored to meet the specific customer's needs. Due to increasing sales volume, the client is overwhelmed with routine paper work as a large amount of documents are needed in this type of business. All information is available to everyone without any restriction.
Team's Contribution: The team designed a leasing documentation system that has alleviated the above problems through automated documentation. It also designed sales and marketing reports, only available to authorized managers and staff members. The team used dBase IV and a word processing package to solve this problem.
Benefits: The system has eliminated many redundancies which were inherent in the manual system. It also has increased the productivity of staff who where engaged in manual activities.

STORAGE COMPANY

Client Operations: The client specializes in the storage of golf carts, boats, automobiles, recreational vehicles and other miscellaneous items. Other services, such as delivery, powerwashing and winterizing, are also available on a limited basis.
Problem Identified: The company does not have an effective method of tracking and monitoring its customer accounts. It does not have any information on storage availability and customer billing, release liability and the inventory on hand.
Team's Contribution: The team created seven modules to address the above problems. As part of that, query, maintenance, and expense tracking subsystems were created. The team used dBase IV.
Benefits: The client has stated that "after reviewing your computerized software package, we realize how more efficient and more productive our company can operate."