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# Adding Value to the Core Business Curriculum: Innovative Use of IS Courses

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**ABSTRACT**

Over the past few years, our institution has been in the process of rethinking the structure of our College of Business curriculum. This is motivated by three major factors: Demands of industry for the inclusion of "soft skills" in our curriculum, the recent emphasis by AACSB on assessment of student learning, and dissatisfaction with the performance of the core MIS course. This paper describes our response to those pressures: a pilot curriculum that emphasizes skill development and assessment, content integration, and information technology concepts and use. Although early in the delivery of this new curriculum, preliminary results indicate that this newly structured curriculum effectively delivers MIS/IT content while simultaneously building students' soft skills. The remainder of this paper briefly describes the motivation for the changes, the structure of the new curriculum, and anecdotal evidence of the new program's effectiveness.

**Keywords**

Core MIS course, curriculum design

## INTRODUCTION

Institutions of higher education, and Colleges of Business in particular, have been under pressure in recent years to graduate students with better communication, thinking, and teamwork skills. Industry surveys indicate that business students should be skilled at such things as written communication, analytical/critical thinking, oral communications, computing technology, teamwork, etc. (Albrecht and Sack, 2000).

In response, the new AACSB guidelines encourage Colleges of Business to explicitly teach these skills and directly assess student learning in these areas (AACSB 2004). In the past, Colleges of Business could rely on indirect assessments of student learning, such as alumni and employer surveys, to show evidence that students were learning effectively. Now, AACSB requires colleges to also assess student learning directly through the use of such things as exams, projects, and written papers. While faculty generally agree that these skills are important, it is often difficult to find time in courses to explicitly teach and assess these skills.

Our core (taken by all business majors) MIS course has generally not been well accepted by students. The content of this course most closely follows IS 2002.1 from the 2002 model curriculum (Gorgone, et al., 2002), and includes such topics basic organizational and strategic uses of IS and brief overviews of various technologies such as networks and databases. Some of the major reasons for this dissatisfaction seem to stem from the fact that students don't see the relevance of the content. Because many of them take the course early in their junior year, they do not yet have a broad view of business from either an operational or strategic view. These students do not readily recognize the value that information plays in integrating business functions. Also, many students feel they need additional help in learning to use technology, rather than an overview of conceptual concepts. While students in this course have already taken the introductory computer literacy course, they, and some of our colleagues within the College, felt that they needed to improve their skills at using IT to help solve business problems. As a result, there has been an ongoing discussion within the College and Computer Information Systems Department regarding the content and placement of this course.

## PILOT CURRICULUM GOALS AND DESIGN PRINCIPLES

Based on the above concerns, our college recently began the development of a new core curriculum. The goals of the curriculum are to:

1. integrate technology into the curriculum
2. deliver IS content at the time most appropriate for maximum student learning
3. explicitly focus on writing, presenting, and thinking skills
4. integrate and reinforce course content across the curriculum

The curriculum, which we call the Technology Enhanced Core Curriculum (TECC), is focused on the seven core business courses taken by all College of Business majors. At this point, we have a cohort of 27 students taking courses together in this curriculum. Delivery of the pilot curriculum occurs over the course of three semesters. It is based on the following principles:

**Systematic teaching and reinforcement of skills**

The development of writing, presenting, and thinking skills takes place through the systematic teaching and reinforcing of those skills over time (Bean, 2001, King and Kitchener, 1994). This means that our expectations of performance of these skills must be made explicit to the students, and the teaching and application of these skills is integrated into students' coursework. For example, we don't just expect students to "think critically," we also give them an explicit model/framework for critical thinking, and then reinforce the application of that model through multiple assignments that progress in cognitive complexity over the course of several semesters.

**Students progress as a cohort**

To support this developmental approach, students progress through the TECC curriculum as a cohort, in lockstep fashion. Cooperative learning has been shown to be an effective way to develop deeper learning (Millis and Cottell, 1998), and cohorts foster cooperative learning. From a practical perspective, this means that professors teaching in the program can rely on the fact that certain skills were first introduced at a particular time for all students, and they can therefore effectively reinforce the development of the skill.

**Required notebook computers used in class**

The integrative use of information technology in a curriculum is dependent on the easy availability of the technology. If we expect students and faculty to make effective use of technology to support learning, computers and appropriate software must be available when needed. To address this problem, we set aside funds to assist all students in the purchase of a standardized notebook computer. Students have the computers with them at all times, and are often called upon to use them during class sessions.

**Teach MIS content when most effective**

The "normal" content of a core MIS course cannot be effectively delivered at any single point in the curriculum. Some topics and concepts can be learned early in a business curriculum, while others are better learned after other core business courses are completed. In addition, many of our colleagues feel that students need to be taught skills beyond those covered in our introductory computing course taken at the freshman level. To provide learning opportunities appropriate to the level of the students, we broke the core MIS course into three components (see Figure 1). One component is taught each of the three semesters of the TECC program.

**Use MIS courses to integrate content and focus on skills**

Integration of core business content across the curriculum, although a laudable goal, is a labor-intensive process. As stated by Hershey (2002, p. 480), fully integrated business programs are often unsuccessful because of the extensive workload placed on the faculty. To accomplish our goal of a more integrated curriculum, we developed a less labor-intensive model, with the IS courses serving the integrating role each of the three semesters. Rather than requiring each professor teaching in the TECC program to communicate with every other professor, we can accomplish this through communication primarily with the MIS professor. This also allows the MIS course to focus on the longitudinal development of the various skills discussed above. By

taking on the role of integration and skill development, the MIS course is viewed by the rest of the college as a key component of the business curriculum.

While each of these principles is an important component of the success of the TECC program, this paper focuses on the last two.

## ADDING VALUE TO THE BUSINESS CURRICULUM THROUGH THE MIS COURSE

Many within the IS discipline are concerned with ensuring that a course focused on IS topics and concepts is included in the core business curriculum in the face of suggestions by others outside the discipline that this content is not core to a business education (Ives, et al., 2002). While at our institution there has not been pressure to eliminate the MIS course, there is still a feeling that we need to justify our place in the curriculum, particularly when many students felt our core MIS course did not add significant value. The CIS department felt that we could show more value if we had the ability to deliver the various portions of our content at the appropriate times.

At the same time, as stated above, there was recognition that the College of Business needs to focus more on communication, technology, and thinking skills in our curriculum. We recognized that we could potentially add value in numerous areas by developing three different courses, taken in sequence. Each of these courses would be primarily an IS course, but would also serve the function of integrating and reinforcing content from other core business courses through the inclusion of integrative IS projects. In addition, each of the three IS courses would also build writing, thinking, presenting, and group/teamwork skills, taught and reinforced through those same integrative projects. The key to adding maximum value is the design of assignments, projects, and exams to include as many learning goals as possible.

### Explanation of the curriculum model

The goal of this pilot curriculum is to provide an environment conducive to change, where a small group of faculty can make changes quickly and easily. However, we never intended this to be a fully controlled laboratory experiment. We are simply modifying too many things at once to quantitatively analyze causality.

The business core curriculum addressed in this pilot program contains those junior and senior level courses taken after students have been admitted to major. Before any student is admitted to our junior-year core coursework, he or she must complete various accounting, statistics, computer literacy, and general education courses. These courses provide a foundation of technical skills upon which the junior-level business core builds.

The TECC curriculum is designed to teach skills in an integrative, developmental fashion. Models or frameworks are introduced for each of the skills early in the curriculum, students are given practice with the skills in the core courses (particularly the IS courses), and rubrics based on those models or frameworks are used to assess students' performance and provide them feedback. Research has shown that students' develop skills most effectively when this type of approach is used (Johnstone, et. al, 2002).

### Content of the three IS courses

The IS courses contain several major components:

1. Development of IS usage skills, such as database and advanced spreadsheet skills
2. Introduction to key IS concepts and topics, such as ecommerce and the use of IT for competive advantage
3. Major integrative events that are critical to the development of thinking, problem solving, and communication skills. These integrative events require the application of multiple skills, and some also require the integration of content knowledge from several courses.

A diagram of the three-semester curriculum is contained in Figure 1.

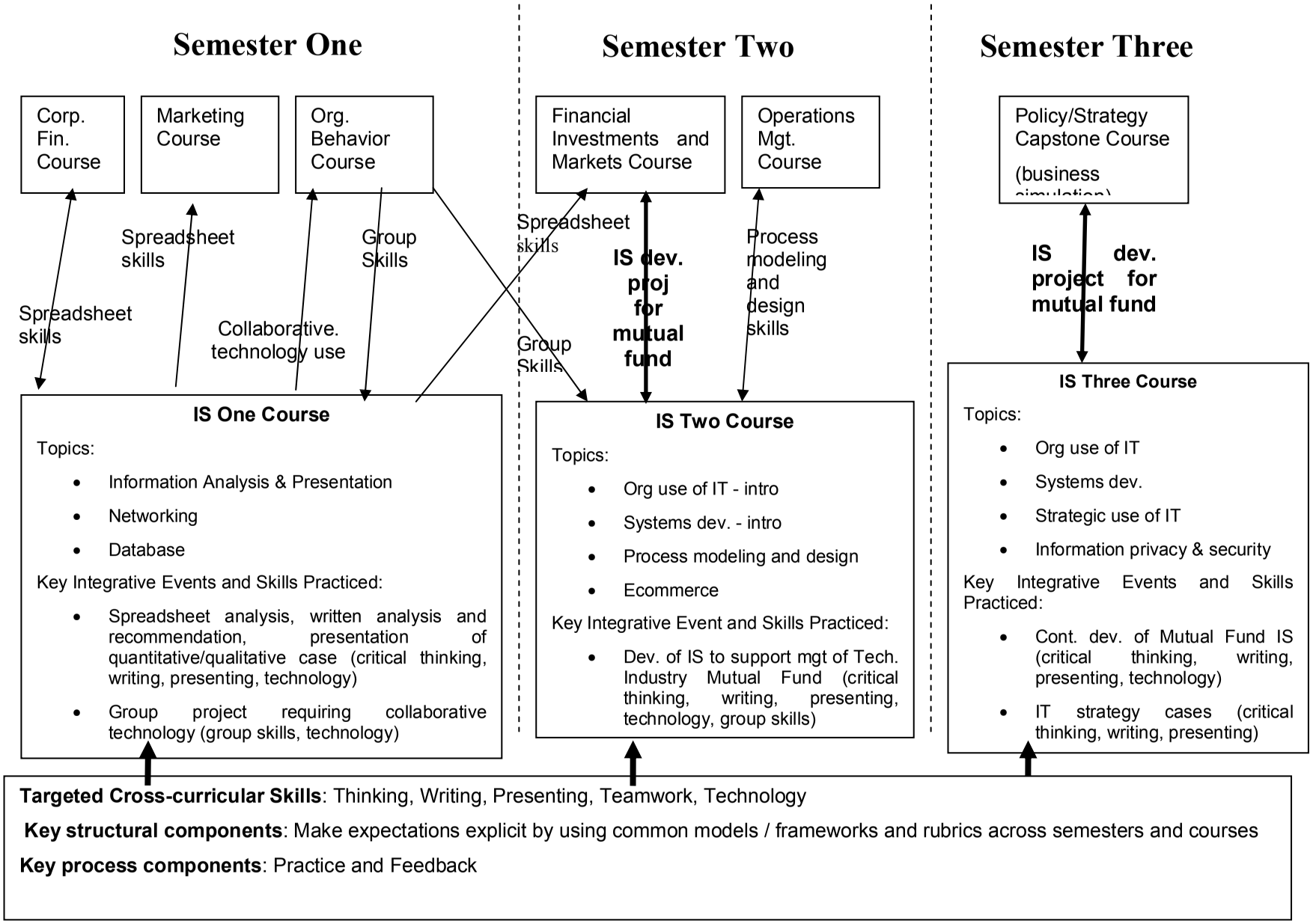


Figure 1: TECC Curriculum Model

### *IS One Course*

The first semester IS course is taken during the same semester as three other core business courses: Corporate Finance, Organizational Behavior, and Introduction to Marketing.

The IS One course focuses on the following:

- Information analysis and presentation using spreadsheet and database tools
- Writing skills
- Presentation skills
- Intermediate/Advanced Technology skills (spreadsheet, database, and learning when to use each).

IS content topics covered include:

- Networking
- Database – relational database theory and design

Some class time was used to teach the effective use of spreadsheet and database tools so that they could analyze data to help in the solution of business problems. Several cases were used as homework exercises, focusing on such topics as pivot tables, scenarios, and the development of queries in MS Access. In addition, class time was spent discussing how to choose the right tool for the task at hand.

Rather than just requiring writing and presentation assignments, these skills were explicitly taught and reinforced in the class. One class period was devoted to a workshop presented by the director of the university writing center, who worked through a sample case with the students and helped them better understand the "writing values" important to a business curriculum. Portions of several other class sessions were used to critique anonymous student writing. Additionally, a detailed rubric was used in grading all writing assignments, so students received explicit feedback regarding their writing. Methods such as these are pedagogically sound (see Angelo and Cross, 1993 for more information), and should result in improved student writing over time. Similar work was done to explicitly teach presentation skills and build upon the knowledge the students gained in their required course on business presentations.

All writing and presenting was done in the context of IS content to maximize the learning of that content. In fact, it is the combination of these communication exercises and content topics that leads to deep thinking on the part of the students. Students actually learn the content better when they have to write about and present the material to others (Bean, 2001). What was given up in quantity was more than made up for in the quality of the learning.

A major integrative assignment was used to weave together the teaching of writing, presenting, and technical skills. Students were given a case that described an open-ended business problem with no single correct solution. It included both quantitative data and a description of several behavioral and strategic issues. To analyze the various options presented in the case, students developed a fairly extensive spreadsheet model. They had to choose which spreadsheet tools were appropriate for the analysis. Then, they were asked to consider the behavioral and strategic issues in the case and make a recommendation about which option was best for the firm. Their written recommendations were typically about 2,000 words in length, and included a discussion of their assumptions, an interpretation of their quantitative analysis, and a full discussion of the qualitative issues in the case.

Once the students received feedback on the written analysis, they prepared an individual oral presentation based on their analysis. These presentations were made to groups of four other students, were scheduled outside of normal class times, and each lasted approximately 8-10 minutes with a few more minutes reserved for questions. All of these individual presentations were taped and evaluated using a standardized rubric. The videotaped presentations were then converted to MPEG format, burned to a CD, and returned to the students along with the feedback.

While this is but one example of several integrative assignments used in the first semester course, it demonstrates the ability to get multiple uses out of a single assignment or project. It required the use of technology skills to complete the quantitative analysis and critical thinking because there was not a single correct answer to the case. It also provided an opportunity to develop writing and presenting skills.

### *IS Two Course*

In the IS Two course, students have a richer set of skills and knowledge on which to draw, allowing for even more integrative experiences than possible the first semester. During the second semester, the students take a second course in Finance, this time one on financial investments and financial markets. They also take an Operations Management course.

The IS Two course introduces substantially more MIS content than what was covered in the first semester. At this point, students are somewhat more knowledgeable about the operation of business, making coverage of these topics more meaningful to the students. IS content areas include:

- Organizational use of IT
- Systems development
- Ecommerce
- Privacy/security
- Introduction to the strategic use of IT and IT/business alignment

In this course, a model for critical thinking was introduced. Specifically, Susan Wolcott's and Cindy Lynch's "Steps for Better Thinking" was used, which draws on other cognitive frameworks such as King's and Kitchener's "Reflective Judgment" model (King and Kitchener, 1994). Students practiced using the model to complete thinking exercises based on IS content. For example, when the topic of IS strategy was introduced, students were also given a copy of Carr's article, "IT Doesn't Matter," (Carr, 2003) and several contrasting articles. They were asked to analyze the issues using the "Steps for Better Thinking" model and then express in writing whether they felt that IT could still be used to gain competitive advantage. This provided the basis for a rich class discussion on competitive advantage, strategy, and IT. It also provided an opportunity to practice writing and critical thinking, as there is obviously no single correct answer to this question. Similar assignments are used for such topics as the privacy of corporate email and the tracking of web browsing.

The primary integrative experience in the IS Two course is based on a project jointly assigned with the Financial Investments course. Students assume the role of stock analysts working for a mutual fund management firm. They must analyze a technology company and then recommend whether the mutual fund should invest in the firm. Their recommendations are made both in writing and in a presentation to the "mutual fund manager." This provides an opportunity for the students to learn about a particular portion of the IT industry, apply investment concepts from their Finance course, and practice their writing and presentation skills.

After the students all make their recommendations, the professor in the Finance class (the "mutual fund manager") uses a virtual investment account to create a portfolio of all the recommended stocks. This portfolio then becomes a virtual mutual fund that is tracked by the students in the Finance class.

In phase two of the project, the students must develop an information system to provide reporting information on the mutual fund. Such information as industry and stock allocations, net asset value, and fund and stock performance must be reported on a daily basis. In groups of four, the students apply the concepts they learned about systems analysis and design to develop a basic information system to track this data. The relative merits of the various system designs are then discussed in class. While the grade for this portion of the project is assigned to the IS Two course, the data generated by the systems are used to manage the portfolio in the Finance class. The students become very interested in the performance of their mutual fund, and the real-time nature of the economy and financial markets provides rich opportunities for discussion within the Finance class.

The systems development project provides opportunities to integrate content from the Operations Management (OM) course as well. The OM course includes a module on project management. As part of the project, student groups are required to develop a project plan, including a work breakdown structure and PERT and Gantt charts. Of course, group skills, initially introduced the semester before, are used in this project also.

Finally, the systems developed by the students are typically based on either a spreadsheet or database (or combination of both) to analyze and present the needed information. This reinforces the technology use skills attained the semester before.

At the end of the IS Two course, students have experienced a number of writing and critical thinking assignments focused on MIS content. They have also experienced, at least in small way, the process of developing an information system to support the business process of managing a mutual fund. This project provides a rich opportunity to integrate content and skills taught in other courses both during the same semester and the earlier semester. By the end of the second semester, students have learned much of the content typically covered in a core MIS course, but they have learned it through an integrative process that provides opportunities for critical thinking, writing, and presenting.

### *IS Three Course*

The third semester IS course is taken at the same time as the core Management Policy and Strategy course, which uses business cases and a business simulation game as important components of the course. The IS Three course is only two credits, compared to three credits each of the previous two semesters. Content areas included in this course are:

- Strategic use of IT, competitive advantage, and business/IT alignment
- Organizational use of IT
- IS management

While the first two topics were introduced the semester before, these topics are covered in more depth here. The IS Three course uses some IT strategy cases as vehicles to practice critical thinking and writing in the context of learning IS content. However, much of this course is devoted to the continuation of the mutual fund project begun the previous semester. Students take over the role of mutual fund managers during this semester. Each of the seven groups creates and manages its own mutual fund. Each group must design processes to make investment decisions, track mutual fund performance, and report that performance on a regular basis. This requires extensions to the information systems that the groups developed the semester before. The information requirements become much more extensive during this semester. Groups not only need to report information for "internal" use, but also for reporting to their (virtual) customers. Additionally, groups must monitor the environment, looking for news items, company reports, etc. relevant to their investments.

## ADVANTAGES OF CURRICULUM

From an IS content perspective, the major advantage of this approach is that students learn IS topics at a point in the curriculum when those topics are meaningful to the students. The integrative events also make the content seem "real" to the students, rather than a series of topics that lack relevance to them. By explicitly making the links across courses, students develop an appreciation for the integrative nature of information systems. The emphasis on critical thinking, writing, presenting, and technology, and group skills across the three semesters provides extensive opportunities for student skill development and assessment.

From a resource perspective, the integration of skills and content does not depend on the coordinated efforts of all the faculty members involved. This reduces the communication overhead and intensive effort required of fully integrated core business programs. Instead, coordination and integration in our model is primarily the responsibility of the IS professor. This is fitting, however, as IS topics are uniquely suited for serving this integrative purpose. In fact, many of the topics are best taught in this integrative fashion.

While it is early in the process, we are beginning to see evidence that this is an effective approach. Although there have been numerous direct assessments of student learning in this curriculum, it is difficult to make comparisons to our regular curriculum. Many of the skills focused on in the TECC program are simply not systematically taught or assessed in the regular curriculum. We are relying on the fact that the pedagogical theories on which this curriculum is based on have shown to be excellent ways to teach skills and develop deep thinkers.

Anonymous surveys of the students after the first semester also indicate that they appreciate the new format. 85% either strongly agreed or agreed that having a class that focused on developing their technical skills (the IS One course) was important to their learning. 89% either strongly agreed or agreed that they felt they were learning more than students in the regular curriculum (they do discuss their coursework with other students). When asked if they would recommend this new curriculum to their friends, all but one student would do so.

Course evaluations for the IS One course were also very good. Students rated the course significantly above the average for the college on the "amount learned" in the course, with a score out of 3.65 compared to 3.2 (out of 4) for the college average. Compared to other sections of the MIS course taught the same or previous semesters, the difference was even greater. Students tend to rate the amount learned in those other sections at less than 3.0. Written comments included in the course evaluations were also quite positive, with students indicating that although they felt the course was a lot of work, they felt it was very worthwhile. These comments are in strong contrast to comments normally received in the course, where students often complain that they don't see the relevance of the material and felt that the class did not impart useful knowledge.

There is also an indication that students skills, particularly their writing skills, are improving. Assessments made using the writing rubric indicate that students' writing is improving from one semester to the next. The number of writing errors has been reduced, and organization and clarity has improved. The consistent use of a writing assessment rubric allows us to track the performance of students over time. While quantitative comparisons across writing assignments are difficult due to the

differences in length, purpose, etc., students are submitting better organized, more grammatically correct papers than they did at the beginning of the program.

Additionally, there is a strong consensus among the professors teaching the various other core courses in this curriculum that students are performing at a higher level in all the than their peers in the non-TECC courses. When common exams or quizzes were used, TECC students performed better than their peers in the regular sections. Undoubtedly this is due to many factors, including simply a Hawthorne Effect. Further, we cannot discount the fact that all students in the TECC program have a notebook computer with them at all times. Simply having the technology available all the time provides numerous opportunities to improve their technical skills and enhance their learning.

Perhaps the strongest indication of the success of this pilot curriculum is that the college, through a unanimous vote at a recent faculty meeting, agreed to continue with its development. There is a strong consensus across the college that this curriculum should become our standard curriculum. There is now an appreciation for the role that the core IS course(s) can play in integrating content and developing skills. Although one might expect resistance to expanding the number of credits devoted to IS content in the business core, this is not a major concern of the faculty at this time. Now that the course adds value through the teaching of that content while developing skills and integrating other topics, the courses are seen as critical components of the curriculum.

## OBSTACLES AND CHALLENGES

While there is a consensus that this new curriculum should be further developed and adopted as our standard curriculum, there are obstacles to making this happen. First, creating a lock-step business core will make scheduling difficult for many of our students, who tend to be non-traditional and/or part time students.

Another significant obstacle to the expansion of this program is the need to keep class sizes small. Thoroughly assessing student writing, even with the use of a common rubric, takes a significant amount of time. Additionally, thorough class discussions of critical thinking-related cases works better with smaller classes. We feel that a maximum class size for the IS courses as they are currently designed would be 35 students, and it would be optimal to have no more than 30. While most of our class sections are within this range, this curriculum would place a definite upper limit on class size in the future.

Besides having enough resources to teach this curriculum, it's also critical that the right resources are applied. Teaching an integrative course that emphasizes skill development requires relatively broad business knowledge and a strong repertoire of teaching methods. Not all professors are suitable for this unless they receive training. We recognize that we will have to invest in faculty development as well as carefully consider our new hires in the IS department if we are going to expand this model.

Finally, although numerous institutions now require students to buy computers, this is of course a significant cost to students. In our surveys of the TECC students, they indicated they thought having the computers always available was an important factor in their learning. We are investigating funding models that may make it possible to broaden this requirement to all business majors, and will continue to assess the necessity of this component of the TECC program.

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