Integrating an ERP System into the BSBA Curriculum at Central Michigan University - The School of Accounting Experience

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ABSTRACT

Many schools have (or are planning) some degree of Enterprise Resource Planning (ERP) integrated into their curriculum because of the global growth in the ERP market. This article updates and extends our earlier article (Hayes and McGilsky, 2007) that set forth the process and challenges of integrating ERP throughout a Bachelor of Science in Business Administration (BSBA) curriculum by demonstrating what can be accomplished in an accounting program when ERP is integrated across both the BSBA and accounting curriculum using a self-hosted ERP system and custom accounting cases written by trained accounting faculty. Such integration improves the perceptions of an accounting program and its students from a quality perspective. This article illustrates the possibilities of using ERP to reinforce accounting-domain-specific knowledge. We discuss the additional ERP knowledge accounting students gain under this model and include specific faculty-developed ERP exercises used in the accounting courses. The added value to students is evidenced by increased employment opportunities and starting salaries.

Keywords: ERP, Information Systems, Curriculum Design, Accounting Education, Business Education, and Faculty Issues

Introduction

An ERP system is a packaged software system that accumulates and integrates both a company's financial and nonfinancial data across various functions and business processes in a real-time environment through the same single integrated database, enabling managers and employees to share common data and practices across a company. As a result, an ERP system can help companies manage a vast array of business functions more efficiently (e.g., production planning, supply chain, inventory management, customer order management). Because implementing an ERP system was very costly in the 1990s and early 2000s, typically just very large companies used ERP. Since that time, implementation costs have dropped significantly, from between $50 to $500 million to less than $1 million. In addition, software vendors now offer full-scope ERP solutions to both small and medium-sized enterprises (SMEs) as well. The result is that an increasing number of all types and sizes of companies are using ERP software. SAP, the largest ERP software vendor, has seen steady growth in its SME business. Over the last few years, year-over-year revenue for *Business One*, its flagship ERP offering for small businesses, grew 20% with SMEs actually accounting for the majority of its 197,000 customer base (SMB Group, 2013).

Cloud computing, another recent and rapidly growing technology shift, also requires ERP expertise. This technology enables an organization to move its file storage, along with many of its applications, from its computers to the internet, serving essentially as a giant data center in a remote location. Using cloud technology, a company's data and processes are hosted remotely on the Web allowing access to the data from any internet connection (Drew, 2012). This enables companies to reduce

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their large upfront investment cost and then incorporate ERP software into their operations. Thus, the initial cost which used to be a barrier to entry into quality ERP software is almost eliminated with cloud computing for almost any size company. The upfront investment can be minimized further by hiring individuals who have gained experience in their college program using ERP software. This is an area where colleges, like Central Michigan University can gain a real advantage over other business programs, as discussed later in the results.

As the number of organizations using these technologies increases, *knowledge* of ERP systems is an important IT skill graduates need to possess (Kim, et.al., 2006). For accounting graduates, it is also imperative they gain practical experience using an ERP system to remain relevant in today's job. Having some knowledge of the complexities of ERP systems benefits their careers as auditors and leads to greater opportunities in consulting and industry. Thus, accounting faculty face the decision of *where* in the curriculum as well as *how* this learning should occur, a particularly difficult decision given today's environment of limited resources.

This article begins with a brief review and update of the BSBA ERP integration model set forth in our first article. It is followed by a detailed discussion of the additional ERP knowledge and skills accounting majors gain in our accounting program as a result of the ERP knowledge they now bring from their BSBA core courses into their upper-level accounting courses. Specific faculty-developed ERP exercises and projects used in the accounting courses are included. These cases illustrate how the use of ERP can reinforce accounting-domain-specific knowledge. Issues accounting faculty face when they attempt to implement this curriculum are presented, along with the added value our students receive from having ERP integrated into their curriculum.

Integrating ERP into a BSBA Curriculum

In our first article, the three options dealing with *where* ERP concepts and applications could be covered in a BSBA curriculum, along with their respective advantages and disadvantages, were set forth. They are: (1) in a stand-alone, accounting-major ERP course; (2) in a stand-alone, general-business ERP course; or, (3) in several across-disciplines ERP courses. The model chosen at Central Michigan University integrates ERP coverage across several BSBA core courses. This has allowed departments to provide further in-depth ERP coverage to their majors in their respective programs if they felt their majors needed additional expertise, which is what the accounting faculty at Central Michigan University chose to do. An advantage of this model is that students are able to gain a better understanding of the cross-functional aspects of a business as they see the concepts carried across several business courses, including their major area of study. Another significant advantage is that the cost of teaching and implementing ERP is borne across all departments as well as the college, which is particularly beneficial in a period of limited academic resources.

ERP and the Undergraduate Business School Curriculum

Since the first article, some changes have been made in the ERP related segments of our BSBA curriculum. The BSBA curriculum in the freshman, sophomore, and senior years remains the same as set forth in the first article. However, in the junior year, the most unique aspect of the BSBA curriculum, students now enroll concurrently as a cohort in only three of the four semester-long business core courses (finance, management, and marketing). The fourth semester-long course, *Integrated Business*

Experience, is no longer required to be taken concurrently with the other three core courses. The purpose of the fourth course is to integrate the financial, management, and marketing concepts taught in the other three junior-level core courses, with an emphasis on showing that business processes must be integrated for an enterprise to run efficiently and effectively to reach its organizational goals. A unique characteristic of this course is that it is team-taught, with the faculty team meeting weekly to monitor how well the course is progressing. The purpose of the fourth course is partially accomplished by having students use ERP applications. Specifically, throughout the course, as different processes are being taught in class, students obtain hands-on practice using SAP software to execute common transactions that illustrate the different processes. Students also use ERPSim, a SAP business simulation package. Its use is scheduled to coincide with the business processes being discussed in class. The concurrent requirement of the fourth course was dropped for two reasons. First, it was decided that requiring four concurrent courses during a student's junior year made it difficult for them to complete their major courses in proper sequence. Second, after teaching it concurrently, faculty determined the fourth course could stand alone. Now the fourth course is *recommended (*not required) to be taken concurrently with the other three courses or it can be taken after completing the other three courses.

Overcoming the Challenges of Integrating ERP into the Curriculum

The following challenges faculty face when they consider an "across disciplines" integration of ERP were discussed in the first article:

1. Selecting and implementing an appropriate ERP software package;
2. Selecting and training appropriate faculty;
3. Developing the curriculum; and
4. Administering the ERP initiative.

In the section below, we provide updated and expanded information about two of these challenges. First, we discuss alliance programs that schools now have available to them when selecting an ERP software package. Second, we provide expanded information on pedagogy options faculty can consider when developing their curriculum.

Selecting and Implementing an ERP Software Package

Central Michigan University has continued to self-host SAP. However, for schools where self-hosting may not be an option, easier implementation options are now available. SAP, as well as many of the largest vendors of ERP software, have formed partnerships with schools in university alliance programs. Such programs have been described as win-win solutions for both industry and universities (Corbitt, et.al., 2009). In an alliance, member schools are able to participate in webinars, training, and conferences, depending on available faculty and university resources. SAP's University Alliance Program enables schools to either teach hands-on ERP in one course or develop a whole program using ERP concepts. By paying an annual fee, members access both SAP software and demonstration databases over the internet through university competency centers developed by the Alliance Program. The fee for accessing SAP through a university competency center is generally based on the number of users accessing the software and databases. The fee represents a small fraction of the cost a school would incur to independently purchase SAP and provide the personnel needed to maintain it. It should be noted that universities from around the world are able to participate in the SAP University Alliance Program. For

example, universities in the Asia-Pacific region access SAP software solutions through the SAP Asia-Pacific application hosting centre at Queensland University of Technology in Brisbane, Australia (R. Seethamraju, 2011).

Another advantage of joining an alliance is exposure to up-to-date ERP software. For example, SAP started a pilot program in 2011 with six U.S. universities within its University Alliance Program that provides business students with practical experience using the latest on-demand technology. The program also incorporates SAP's new cloud software for ERP into the curriculum of the selected universities (Adler, 2012).

Options other than using SAP also exist. For example, Oracle offers *MySQL's*. Microsoft's *Great Plains* software, available for SMEs, is also offered in an educational version that can be used in a university setting. Other software available to SMEs, which faculty could consider using as well, include Microsoft's *Navision* and SAP's *Business One* and *Business by Design.*

Developing the Curriculum

Once faculty agree *where* in the curriculum ERP concepts will be covered, *how* those concepts should be taught needs to be decided. Incorporating hands-on ERP skills into the curriculum should be considered for several reasons. First, Ayyagari (2011, p. 123) notes "advances in pedagogical approaches place emphasis on active learning, or learning-by-doing. Pedagogical approaches based solely on lectures are criticized as these approaches make students passive learners (Bok, 1986)." Second, not only has active learning gained prominence among educators, but students actually tend to seek opportunities where they can apply their knowledge to simulate realistic situations (Auster, et.al., 2006). Also, courses that allow students to become familiar with ERP software position a business school as one that balances theory and application (Adler, 2012). How the hands-on experience will be offered must also be decided. For example, whether a commercial ERP system, such as SAP, will be used for the experience. Strong, et. al. (2006, p. 747) found "...recruiters have said that the particular (ERP) package does not matter; it is the enterprise systems concepts learned by students that are valuable to companies and that knowledge is transferable." Ayyagari (2011, p. 124) noted, however, that Strong et al. (2006) "did not provide any guidance on the options educators have if they don't have access to commercial solutions like SAP." Schools that do not have the significant resources needed to use a commercial ERP system may be satisfied with the use of textbook ERP cases and no live system interaction. Ayyagari (2011, p. 123) found using a "simple role-playing exercise and related hands-on component using OpenERP," a free ERP option, to be a viable alternative to using a commercial ERP system. Several pedagogy options exist for providing a hands-on experience and are reviewed below.

One method of incorporating ERP concepts and skills into a course is through the use of regular lectures accompanied by lab sessions. During lectures, the concepts of business processes and ERP systems are discussed. During labs, software demonstrations are shown, and students obtain hands-on experience by performing various tasks using ERP software. Schools opting for hands-on learning using a commercial system can choose either a live ERP system hosted by another university (e.g., a SAP competency center) or self-hosting.

Various types of educational material can be used in the classroom. One possibility is a hypothetical company case. Cases bridge the problem of weak or nonexistent databases with showing students how an ERP system works. Cases can be developed by the faculty teaching the course, or faculty can use one developed at other schools. Cases developed at other schools include Fitter Snacker,

Quazi Computers Company, and RF Clothing Company, which can usually be obtained at a reasonable price from the developing school. Faculty who develop their own company case may want to consider using their case in more than one course since developing one requires a great deal of research and planning. For example, the faculty at one school used its hypothetical company successfully in two of its junior level core business courses (Johnson, et.al., 2004).

One benefit of learning ERP in a SAP environment is that a number of pedagogical aids have been developed and are being used to enhance the application of knowledge. In fact, a significant amount of development has been done to produce SAP simulation games that allow students to leverage their knowledge of ERP into business decisions. ERPsim, which debuted in 2009, consists of a number of simulation games based on the SAP platform. Competitions involving ERPsim are held worldwide. Using ERPsim, students make business decisions that are implemented in SAP and monitored from production planning to sales and collections, and then to the financial statements. With an ERP simulation game, each student team operates a firm using information, transactions, and reports provided by the ERP software (Leger, 2006; Seethamraju, 2011). ERPsim and the necessary training to run the game are available from HEC Montreal (Seethamraju, 2011).

A third option involves going beyond using hypothetical cases to conducting all class project activities in partnership with an actual company; the goal being to reflect a demanding and complex ERP project environment (Pellerin, et.al., 2008). This option may not be feasible for most schools though since it involves partnering with an actual company and working with the company's employees. Although it can be a very beneficial learning experience for students and faculty, just replicating an actual company's situation may prove difficult since companies may be reluctant to share their data with students, even historical data, due to privacy concerns. From a faculty perspective, firms using ERP software have been willing to provide training and faculty internships to most interested faculty. Often these internships are undertaken during a sabbatical and can vary from a few weeks to six months in duration. Faculty often work with IT auditors on live systems and gain knowledge that can be shared on campus.

ERP and the School of Accounting Curriculum

The accounting faculty who teach our ERP-designated accounting courses are members of the college ERP faculty team. Team members receive training both on campus and from SAP. The SAP training can be undertaken with the University Alliance Program where classes are often free (except for the cost of travel). Classes outside the SAP University Alliance (directly from SAP) are designed for corporate IT professionals and generally have a high price tag. Faculty do utilize the direct SAP training, but this training is used as a last resort when the material is not available on campus or through the University Alliance. As discussed in the first article, the accounting faculty who were trained in SAP were also charged with implementing ERP coverage using SAP within the applicable upper-level accounting major courses; *Accounting Systems and Controls*, a junior-level required course, and *Advanced Topics in Managerial Accounting*, a senior-level elective course. They have been able to focus on more than ERP navigational skills and the financial accounting module in these courses, because of the foundation knowledge in ERP all accounting majors receive in their BSBA core courses.

Among the common criticisms of accounting curricula at the university level is that it lacks opportunities for real-world application. In other words, the classroom is often a mediocre substitute for the real world of accounting practice. ERP systems, such as SAP, offer a bridge to more realistic

applications. ERP systems allow students to configure controls in a realistic, complex environment selecting parameters for accounting practices such as grace periods, discounts, and dunning procedures in the billing application. At an even higher level, students can create a company, select a chart of accounts and define the currency type, as well as selecting many other company parameters giving them configuration experience beyond what is available in less sophisticated systems. While some configuration is available in other systems, familiarity with SAP gives students an accelerated head start in the likely event of employment with a user of SAP or of another ERP system.

Accounting Systems and Controls (Required Course)

In the required *Accounting Systems and Controls* course, students enhance their knowledge of ERP systems by learning how ERP can best be utilized by *accountants*. Two specific learning outcomes of this course are: (1) students will be able to employ technology to problems they are likely to encounter in their professional lives, including the configuration and design of ERP systems and electronic commerce; and (2) students will be able to configure portions of the financial and managerial accounting modules of SAP R/3 ERP systems and implement NetWeaver portals. NetWeaver portals extend ERP functions to a web interface by running in a web browser. By using a web interface, users can view web-based data, such as market news or information from the company's intranet in the same browser with their ERP session.

The implementation of ERP is accomplished in this course through the completion of eight 50-minute exercises in a computer lab, plus about four out-of-class hours. Students must have access to a networked computer and the graphical user interface (SAP GUI) which provides access to the back end ERP system. Internet service must also be available to access a browser based ERP user interface. Each student requires an individual account on the system which is established by the system administrator. Because the course meets in a networked computer lab for 15 Fridays (in additional to 31 regular class sessions), there are seven lab sessions available for other technology projects. This allows the course to integrate some important Excel skills along with the ERP.

Each of the eight ERP exercises, all using SAP software, begins with a brief theory overview describing the project followed by an introduction to the step-by-step procedures of the project. After about 5 - 10 minutes of guidance, students are released to continue through the project at their own pace. The projects begin with explicit instructions but gradually remove the "training wheels" as students gain experience. To reduce the tendency of students to tune out the exercise and simply make the keystrokes, questions are inserted which require them to describe the objects in the ERP systems by going to the *Help* files or making inferences from the objects on the screen. At the conclusion of the project, students submit their written answers to the project questions. The students' entries in the ERP system may also be reviewed for conformity with the exercise. A description of the exercises is provided in Table 1.

TABLE 1
Description of Projects in *Accounting Systems and Controls*

Exercise 1*: Business Workplace*. The first ERP project orients students to the physical working environment in the ERP system. Because the ERP system integrates many processes, an area is needed to receive communication and work items as well as to process documents that were sent from other people or from the ERP applications. The working environment provides a place to receive mail and communication and has common folders where information can be published for a

work group. The main student activity involves viewing the objects in the workplace, examining help files and writing up findings. In examining the help files, students learn that the work environment is used to notify employees when documents or transactions require their approval and that the workplace is the center of communication.

Exercise 2*: Company Code & Master Records.* This exercise allows students to become familiar with steps in configuring and implementing an ERP financial accounting system. During the case, students create a new company, assign a fiscal year end, create a chart of accounts and make a number of configuration selections. The objects are created using the ERP facility that a consultant would use when setting up a new company and not the production environment that a typical user would see (students have administrator access to the system). The students also learn about the object hierarchy necessary to maintain an orderly roll up of information from lower-level entities to higher-level entities.

Exercise 3*: General Ledger - Document Control, Field Status, Posting Period Variants, Document Types, Number Ranges & Posting Keys*. The objective of this exercise is to grant access to the necessary input fields and implement data entry controls for the new company created in exercise 2. The students learn that the risks of both missing and incorrect data can be reduced by configuring proper input controls in the ERP system. Controls over when transactions are posted and document numbers are also put into place.

Exercise 4*: Customizing SAP Customer Master Data.* Customer master records, including contact and credit information, are an essential source of information within an enterprise. Without them, marketing and receivable collection strategies cannot be implemented. In this assignment, students begin to establish credit policies as well as controls over customer account creation.

Exercise 5*: Tolerance Groups for Customers.* In this project, students continue the configuration of the new company by creating accounts receivable and cash collection policies that will apply to customers. These policies define company tolerances for late, over and underpayments on account. To be able to manage credit sales, students must configure the ERP system for the contingencies associated with cash collections on account.

Exercise 6*: Purchases Cycle & Vendor Master Records.* The new company will purchase a variety of raw materials and sub-assemblies from outside suppliers as well as from other subsidiaries of the parent company. In order to perform the purchasing function, students set up defaults for vendor records and establish terms of payment to vendors.

Exercise 7*: Queries.* The purpose of this exercise is to demonstrate how an ERP system can facilitate accurate financial reporting. Students assume the role of an internal auditor and conduct a cutoff test of purchases. This test verifies that all receipts of goods are recorded as liabilities in the correct period. To do this, students execute a basic query and output the results to Microsoft Excel for further analysis and printing.

Exercise 8*: Enterprise Portal.* Portal is a browser-based user interface for an ERP system, specifically SAP. Often a browser is the preferable way to access a system because it is platform independent and allows users to connect from any computer capable of running a browser, eliminating the need to install client side software. Due to the tremendous popularity of browser-based user interfaces, Exercise 8 involves the set up and configuration of a Portal account allowing browser access to the back end ERP system.

Advanced Topics in Managerial Accounting (Elective Course)

A recent study by the Institute of Management Accountants (IMA) identified long term strategic planning and process improvement as two important tasks its members perform. IMA members also

reported the most important skills needed to succeed in their profession deal with computer/technology/networks, accounting software, and teaching/speaking/communication. Managerial accountants are no longer needed just for their computational skills. Instead, they must be able to help managers interact with a company's ERP system to minimize the time needed to create an analysis (Boer, 2000). Specifically, they must be able to:

1) help managers formulate the problem and identify relevant data for analyzing it;
2) suggest sources of data to help with the analysis;
3) present other external data that could add relevant information to the decision process; and
4) help personalize reports for each respective manager incorporating only the specific information each respective manager needs (Boer, 2000).

This requires accounting faculty teach students to become adept at designing alternative ways of presenting information to managers. Incorporating ERP enables this to happen. With ERP, "*accountants will no longer stand at the back of the corporate ship, issuing delayed reports about the history of the voyage. Instead, they'll be on the bridge with the CEO, offering real-time cost information to help steer the ship into the future*" (Kaplan, et.al., 1998, pp. 109-110).

In *Advanced Topics in Managerial Accounting*, students apply the basic concepts of managerial accounting to business problems and communicate their findings in a manner that helps solve the problem. How an ERP system can significantly increase the quality and quantity of information and data available to aid in this problem solving is emphasized. ERP coverage is incorporated through a series of exercises that are supplemented with some manual examples. A description of the exercises is provided in Table 2. At least one week is allocated to the strategic use of ERP systems in managerial accounting, and at least two weeks are devoted to the value of using ERP software for information gathering. As noted above, because students already possess a significant foundation in ERP at this point, the discussion and projects related to using ERP systems can be advanced.

TABLE 2

Description of Projects in *Advanced Topics in Managerial Accounting*

Exercise 1*: Review Navigation Process.* Navigating through the menu structure of the SAP software is briefly reviewed, including glossaries for help and definitions of important terms (e.g., company codes). The communication ability of SAP, by using messages between parties in the software, is also reviewed.

Exercise 2*: Installing a New Company.* When an ERP system is installed in a company, a configuration of the processes is done to optimize or improve the performance of a particular function, such as sales within an entity. Students complete a partial, abbreviated configuration of the revenue cycle for a company. When the SAP assignment is finished, students are given a manual exercise to identify some of the nonfinancial data that can be extracted from the transactions recorded through the system. See Figure 1 illustrating the manual exercise.

Exercise 3*: Standard Reports.* All ERP systems have some standardized reports available that are generated in real time as transactions are recorded. The objective of this assignment is to illustrate the need for students to be aware of what is available in an ERP system so they can assist management in doing a better job as efficiently as possible. Students drill down to the appropriate segment of the entity for the proper report. When drilling down to the segment required in the exercise, a report showing the standard budget compared to actual data, including calculated variances, is provided.

Exercise 4*: Reporting for Lower Levels of Management.* Some ERP software has flexibility in preparing other types of reports at different levels of detail. This assignment illustrates how SAP is able to generate information for various levels of management in these other reports using tools included in the SAP software system.

Exercise 5*: Non-Financial Data.* Along with the ability to change the detail level of a report, an ERP system provides the opportunity to add other nonfinancial data to a report by being able to query the relational (table) organized database usually found in an auxiliary database (e.g., data warehouse). In this assignment, students learn how to query data in a table organized data warehouse to get information that requires some manipulation to derive. Because of the lack of an optimal database, pivot tables are constructed to help students do a manual query problem by using Access and Excel.

Exercise 6*: Better Reporting.* The last objective in the coverage of ERP systems is to illustrate the importance of good reporting with all the tools available (e.g., graphics). Its purpose is to impress upon students the need for accountants to prepare useful reports if they want to provide the best service to managers. The assignment is currently done in Excel, not SAP. However, in the near future it is expected that much of this reporting will be taught using SAP's recently acquired Business Objects, a very robust reporting software tool.

FIGURE 1
Example of Exercise in ACC 521

Part 1 - Illustrate Data Needed for Managing an ERP System

Divide the class into groups of three to four students and for the traditional accounting software used by organizations, assign each group one function, such as sales, expenditures, or payroll. Instruct students to create a list of data collected by the software that are not required to generate financial statements. For example, entering a customer's number and selecting the merchandise and quantities ordered to process a sales invoice are not directly required to prepare financial statements. Capturing the customer's zip code is not required to record a sale, but does enable management to analyze sales by geographic regions.

Note to instructors: Traditional accounting software focuses on capturing the account and amount information about economic events so debits/credits can be recorded in the system. With this information, the software generates GAAP-based financial statements. Accounting software could be classified as elementary ERP systems if it performs functions other than accounting and statement preparation. Does your software maintain a perpetual inventory or monitor credit limits for customers? If the answer is "yes," the software contains multiple modules and can be considered an ERP system. When students think about other data, they will think about problems of implementing an ERP system, particularly the modeling of the database-Part 2 of this exercise.

Part 2 - Data Modeling a Perpetual Inventory

Now instruct the students to prepare a list of types of data that they believe a retail business (e.g., Kroger food store) would need in its inventory. Then have students address each of the following issues for the business, instructing them to make any necessary additions or changes to their list. Have students begin each statement with "Your client…"

- Sells an item in different units (e.g., each, dozen, pounds) with different sales prices for each
- Frequently substitutes other items if an item is out of stock

- Automatically reorders an item when the quantity on hand falls below a reorder point
- Does not charge sales tax on certain items (according to state law)

Note to instructors: What data does a business require for its inventory? At a minimum, a business should have a perpetual inventory that contains a part number, description, quantity on hand, and sales price for each item. Yet some businesses have very unique needs that need to be handled by the ERP system. This exercise is designed to illustrate how complex a seemingly simple business application can be. Most students' perception of inventory is based on the retail businesses they frequent, where most items are sold in a single quantity for a single price. We need them to think beyond their own experiences to learn from this exercise.

Challenges for Accounting Faculty Teaching ERP

It should be noted that technology departments outside accounting are often sensitive to what may be perceived as encroachment onto their technological turf, so one issue that accounting faculty may face when trying to adopt ERP curricular items is claims by other academic departments that accounting is not a technology discipline. This often leads to a natural division of labor: accounting teaches theory and computer science (CS) and/or management information systems (MIS) teaches technology. This division often leaves accounting faculty in the position of needing to understand both the ERP technology (to teach within the ERP environment) and the accounting theory that underlies the transaction processing cycles (to teach internal control, financial reporting, and auditing). Other departments may argue that accounting's ERP-designated courses should focus on internal control, financial reporting, auditing, and other more native subjects. If this attitude exists, it may be difficult for accounting faculty to develop materials or adopt published ERP resources, as many other resources may have already been adopted by the computer science (CS) or management information systems (MIS) faculty. As a result, accounting faculty may find that they are often constrained to developing ERP curricular materials internally to avoid both conflicts with other departments and competition for the use of published ERP materials.

Assessment

As discussed in the first article, one of the responsibilities of the ERP Director of the SAP University Alliance Program is to assess both our ERP-designated business courses as well as the SAP Academy. The Director's position in the College of Business has been an ongoing one since the late 1990s when the first courses integrated SAP. The current Director is a member of the MIS faculty. He receives a reduced teaching load and a stipend each semester for serving in the position. Assessment is done using a variety of evaluations, including faculty, student and alumni opinions, as well as feedback from companies that use SAP. The data is monitored by the ERP Director and the ERP faculty team and is used to drive improvements to the ERP courses. As a result, the content and position of courses continue to evolve and adapt as discussed above.

One way educators judge the quality of their programs is by the success they have in placing their students in full time positions. Central Michigan University is a regional university, so recruiters have come primarily from Michigan companies and periodically from companies located in Ohio and Indiana. However, this has been changing significantly in the last few years according to the Associate Director of

Student Career Services at Central Michigan University. He now sees companies coming from as far away as California, Texas, Iowa, Minnesota, Pennsylvania, and Vermont to recruit our graduating business students. According to what he has documented, this change is directly correlated to the SAP training students receive at Central Michigan University, which is more extensive than students receive at other schools. He believes this training has not only aided the placement of business students with SAP concentrations, but also the placement of other business majors due to the SAP training they receive in their BSBA core courses.

The starting salaries of a program's graduates are another indicator of the quality of a program. As discussed in our first article, the starting salaries of the first group of business students who took at least one ERP-supported class using SAP software (May, 2008 graduates), compared to the starting salaries of those graduates holding the same major who had taken no ERP course, were higher by approximately $250 in one major to $9,600 in another major. This comparison was able to be made when the new curriculum was first implemented using starting salaries of recent graduates under the old curriculum and starting salaries of recent graduates under the new curriculum. However, since all business graduates now take ERP-supported classes, this comparison can no longer be made. The ERP Director now is able to monitor the average starting salaries of graduates who accept SAP-related jobs with those who accept jobs requiring a business degree, but no SAP experience. Frank Andera, the current ERP Director, estimates in recent years this difference in starting salaries, for all business majors, was about $10,000 higher for graduates who accepted SAP-related jobs. A recent statement by Darren Smith, the Director of Information Technology for General Motors Company (GM), helps to substantiate the Director's estimate.

According to Central Michigan University's Office of Alumni Relations (Centralight, 2014, p. 37), "*GM is in the middle of one of the largest transformations in corporate history, one in which thousands of new employees are being hired in new software development centers in the U.S. Graduates with a knowledge of SAP, a global enterprise software system, which is emphasized at CMU, are being snapped up."* Smith stated in the article (Centralight, 2014, p. 37), "*Four out of five students GM hires for SAP-related jobs are from CMU."* In the last two years, GM has hired more than 25 SAP trained students from CMU. As the quality and reputation of Central Michigan University's program has improved so have the career opportunities and starting salaries of its graduates.

Conclusion

The global growth in the ERP market has made accounting faculty, as well as other business faculty, realize the need to integrate ERP into their curriculum. The dilemma faculty face is where to include these topics in the curriculum. A model that integrates ERP across a variety of core BSBA courses allows different departments within the college to provide further in-depth ERP coverage to their majors if they deem it important. At Central Michigan University, the accounting faculty found further quality is provided to accounting students under this model as the students are able to go beyond just a basic understanding of an ERP system to obtain advanced ERP knowledge and more hands-on experience in their accounting courses. For accounting faculty who are able to convince their Dean and business colleagues that this is the best model, it is also a cost effective way to ensure all accounting students are exposed to cross-functional business processes and develop needed ERP skills as the costs of implementing and teaching ERP are borne across all departments as well as the college.

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