

Teaching Tip

Twelve Tips for Successfully Integrating Enterprise Systems Across the Curriculum

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ABSTRACT

The use of enterprise systems in business curricula is recommended for the purpose of demonstrating both an integrated view of the firm and the use of information technology to support the efficient and effective performance of business processes to achieve organizational objectives. Based on the experience of a core group of faculty at a private business university who integrated SAP into various business courses, the authors provide twelve tips for others who might want to do the same. The tips are presented in three categories: 1) curriculum issues, 2) training and outside support, and 3) student and faculty related issues. As more colleges consider inserting enterprise systems within their business curricula, effective planning and efficient use of time and resources in these areas will help to reduce start-up time and bolster success.

Keywords: ERP, enterprise systems, business processes, business curriculum, SAP

1. INTRODUCTION

One of the primary goals of a business education is to equip students with the knowledge and skills to "hit the ground running" when they begin their first jobs. Employers expect new hires to understand how companies function in today's economy, which requires knowledge of basic business processes and the technology used to support them. Students need to be able to transcend the traditional stovepipes of academic disciplines that have little correlation with the elaborate relationships needed to support business processes that frequently exceed traditional company boundaries (Antonucci and Muehlen, 2000). Without an appreciation of a company's internal business processes and workflow, it is especially difficult

for a newly minted graduate to grasp even more complex interorganizational supply chains and information flows.

A business process perspective dictates that students also be exposed to an enterprise-level view of data flows that correspond to these processes (Gelinas et al, 2004). While published case studies (e.g., Brown and Vessey, 2003; Volkoff, 2003), process models, and data flow diagrams give students a theoretical overview of a process, it is the authors' collective experience that students gain a better understanding of the real workings of a business through personal interaction and hands-on exercises.

Large-scale enterprise systems (ES) are well-suited to support the hands-on component of a business curriculum. There are two compelling reasons for this. First, the

complexity of large-scale ES such as SAP, Oracle Applications, or PeopleSoft, exposes students to the elaborate interdependencies involved in running a large business (Joseph and George, 2003). No amount of textbook explanation or case work can impart this message as well as personal interaction with such a system. Alternatively, coursework based on a single-user, easy-to-use ES downplays the critical role of technology in managing typical business complexity and supporting complicated intra- and interorganizational relationships. The second reason for integrating a large-scale ES across the curriculum is to imbue in students a deeper appreciation for the capabilities of ES than can be gained through readings, class lectures or discussion. Graduates who have first-hand familiarity with an ES become new employees who have a better understanding about any ES their hiring firm uses. If our educational goal is to equip students with knowledge and skills that match the needs of today's business environment, we as faculty must incorporate ES technology that closely replicates the processes and interactions students will encounter as they begin and advance in their careers.

Many colleges and universities have recognized the value of student ES experience. However, along with curricular benefit come integration challenges (Guthrie and Guthrie, 2000). Unlike some other recent technology innovations (e.g., distance learning, groupware, and Internet-based search tools), true integration of ES in a course will alter *course content* as well as *pedagogy*. It is especially beneficial when ES issues are intertwined with the content of business courses so students gain a full appreciation of the true impact of such systems on organizations (Fedorowicz, et al., 2005).

The purpose of this article is to provide guidance to faculty on ways to effectively integrate ES across the business curriculum in such a way as to accomplish the synergistic goals of (1) illustrating real-world business processes and (2) exposing students to the caliber of technology with which they will work in their careers. To do so, we offer twelve tips on how to support both the content and pedagogical challenges of ES integration. In the next section we describe our philosophy of learning from our efforts and those of others. We then describe our twelve tips in three categories or themes. The article concludes with an appeal for research on the inherent value of ES integration for classroom learning and career success.

2. LEARN FROM THE MISTAKES AND SUCCESSES OF OTHERS

Many business schools have acquired an ES with the intention of incorporating the system into new and existing courses. Their efforts have met with a range of success. What is clear from published accounts of these efforts is that ES integration is harder than expected (Fedorowicz et al, 2004; Farrell, 2001). Hensel and Alexander (2000, p. 6) summarized learnings from their project that might easily be applied to any curricular ES effort: "Three major lessons

were learned about projects of this sort, scope, and size. First, they cost more than ever imagined. Second, they take longer than ever imagined. Third, they take more effort than ever imagined." The implementation at our college is well represented by this quote. We note that many of our initial successes and failures parallel similar efforts observed at other adopting colleges and universities.

Our college became a member of the SAP University Alliance (UA) and faculty began to work with SAP R/3 in Spring of 1997. A number of trial-and-error attempts at incorporating R/3 exercises into business courses followed (Fedorowicz et al., 2004). Rather than provide a chronology of our successes and failures, we offer twelve suggestions for how faculty at other colleges and universities might adapt our experiences to their own curriculum. These suggestions are oriented around three themes: curriculum and implementation issues, training and outside support, and student and faculty issues. Table 1 summarizes our themes and tips. Although we have yet to meet our ultimate objective of integrating SAP into all business disciplines, our success has been steady and incremental. Our goal in this article is to share our knowledge with our academic colleagues so they may be able to move up the learning curve more quickly.

3. CURRICULUM AND IMPLEMENTATION ISSUES

3.1 Tip 1: Go with What You Know

From the onset of the UA, SAP offered extensive training programs through its regional facilities. Faculty were encouraged to attend scheduled training programs to acquire a working knowledge of the modules they wanted to use in their own courses. These training programs would seem to be a good source of hands-on material for quick inclusion into existing courses. Unfortunately, that was not the case.

The training courses offered by vendors like SAP are designed for their corporate customers to point out the major features of each module and to help users navigate the system for a role-specific purpose. In addition, these courses are generic, in the sense that they are taught in the same way and cover the same material whether offered in Boston, Atlanta or Düsseldorf. This approach is necessary so a global company like SAP can provide the same training experience to all of its customers all over the world.¹ But just as many corporate customers want training on the system to be customized to reflect their unique circumstances and processes (Wheatley, 2002), a university-based instructor might expect similar tailoring. However, they find that they cannot take SAP training exercises and just drop them into a college course. Exercises must be redesigned and augmented to reflect course content and objectives.

Our first few efforts to integrate SAP into our courses were faculty demonstrations and student exercises that mainly involved the extraction of data from the IDES database that is provided with SAP installations at academic institutions.²

Attempts were also made to replicate exercises that faculty had completed in the courses that they took at SAP training centers. However, these approaches exhibited limited success for two reasons. First, the IDES database that the faculty members were using on campus did not contain the same data as the database at the SAP training centers, which had been specially configured for the training course exercises. Second, these exercises appeared to be “out-of-context” for the students because they could not appreciate how the data had come to be in the system, nor did they fully understand the business activities represented by the system.

To solve both problems we developed our own set of exercises to execute the transactions that make up basic business processes. The extensive exercise sequences cover the creation of records and entry of transactions for two specific business processes: the order-to-cash process and the purchase-to-pay process. Detailed instructions are given to the students to help them to complete these exercises. Our philosophy is to make the data entry steps as straightforward as possible while emphasizing the learning that can be gained through their descriptions and analysis of the steps that they are performing.

These exercises solved our two problems. We do not need to rely on the data in the IDES database because the students create the master data and generate transactions as part of the exercises. For example, they buy goods using an inventory record that they create and they sell them to the customer whose record they also create. Second, as the students work through the steps in these exercises, they begin to picture the process flow. In the order-to-cash cycle exercises, they create a sales order to represent a sale; they create an outbound delivery, record the picking of the order, and post the goods issue (shipment) to represent preparing and shipping the goods to the customer; they create a billing document; and finally they process the customer’s incoming payment for the goods sold.³

As the students complete each exercise, they are asked questions comparing their actions to textbook material. They are also asked to analyze their activity based on course learning objectives. For example, learning objectives around process documentation and internal control evaluation would be reinforced in an Accounting Information Systems course by having the students create a flowchart of the process represented by the SAP activities and then compare their representation to an illustration in the text for a comparable process. They also identify actions that act as controls on the process and evaluate the quality of the controls inherent in SAP functionality. These types of assignments give the students a close look at the details and complexity of SAP as well as asking them to step back and understand what they did and why they did it. These exercises force students to consider both “the forest and the trees” of hands-on work.

3.2 Tip 2: Practice Knowledge Diffusion

Enterprise systems are usually brought onto campus

through the efforts of one or a small number of faculty champions. To be truly successful in reaching across a curriculum, these champions must bring other faculty on board who are willing to teach about the impacts of ES in a broad spectrum of courses and disciplines. This necessitates familiarizing colleagues with a topic about which they may have little prior knowledge or interest. It will also require champions to accept the lead in developing and coordinating course materials. Champions do their best to encourage faculty to attend these workshops and to integrate SAP into their courses. In the end, each faculty member must decide how to respond.

In our case, we developed the exercises described in Tip 1 as a “proof of concept” to promote SAP integration into a few initial courses. Once our initial exercises were in use in the classroom, we designed workshops around each one. Two day-long faculty workshops were created. The first includes an introduction to SAP and the order-to-cash process. The second focuses on the purchase-to-pay process. The faculty member presenting these workshops shares his PowerPoint slides, which include adaptations of SAP training materials and some SAP screen shots, to describe the SAP system. After each major element, workshop attendees complete related exercises. At several points during the workshops there is discussion about how to use the SAP system in the faculty members’ courses. Discussions cover how to use SAP effectively in a variety of courses and also how to coordinate SAP coverage among courses and majors.

These workshops illustrate the benefit of having campus experts or advocates leading efforts to diffuse ES into the courses of a broad spectrum of faculty. By providing exercises that are known to work in the campus environment, the more experienced users among the faculty spare less experienced faculty users the frustration of creating new exercises with inadequate knowledge of the underlying SAP infrastructure. In addition, the student experience is enhanced since the exercises have common themes that build a cohesive set of skills while minimizing topical overlap across courses.

3.3 Tip 3: Get it Straight From the Horse’s Mouth

Although not unique to the topic of enterprise systems, an invitation to local practitioners to speak to a class is one of the most powerful and easy ways to expose students to the realities of ES. As early as 1997, our faculty invited a number of individuals from well-known local companies to speak to classes on ES topics. The CIO of a large manufacturer spoke about how and why his company selected their ES vendor, and described the significant and painful, yet successful and beneficial, business process changes that the ES forced upon them. Professionals from a variety of consulting firms spoke on the differences among leading products, the role of external consultants in the implementation process, and how ES expertise can be outsourced to professional service firms. Business process owners spoke of their role in configuring an ES and how the system is used to support their particular business

process. Other external speakers covered a range of specialized topics within several courses.

In addition to adding credibility and raising the level of importance of ES as a course topic, these speakers give faculty an added stable of stories to enhance future class discussion. As will be seen in other tips, these are also invaluable contacts to aid faculty in more challenging and innovative course material development.

3.4 Tip 4: Don't Re-invent the Wheel or Make Others do the Same

Within your own college, there is no better motivation for sharing ideas than to reduce the investment of time and the frustration level of those who create their own SAP exercises. Faculty must be open to sharing exercises and assignments they have created or adapted from existing exercises, with other faculty who might find them relevant.

The same concept applies across institutions as well. In the past few years, there has been more widespread adoption of SAP in various parts of business and information systems curricula. There are many exercises available through the UA or through personal contacts made at workshops or meetings. For example, the UA sponsors a website named Innovation Watch for its members on which it has posted exercises and materials created by its "Plug and Play" grant recipients. Several of the academic business conferences also have tracks that include ERP curriculum ideas (for example, ISECON (Information Systems Education Conference), the Decision Sciences Institute conference, and the American Accounting Association conferences). Faculty are encouraged to share their own exercises and curriculum ideas through such outlets. Since there is now a critical mass of colleges using SAP in their curricula, but no established body of academic texts to support such integration, sharing proven materials with others looking for specific applications benefits everyone.

4. TRAINING AND OUTSIDE SUPPORT

4.1 TIP 5: New Training Approach, New Training Challenges

Fortunately, SAP's UA program has evolved the training process to make it easier for faculty to get the materials and help they need to more efficiently adapt training materials to their courses. Beginning in the summer of 2001, the UA began offering workshops that were specifically designed for faculty. These include courses such as an overview of the system with hands-on activities and curriculum materials to introduce faculty to R/3, a two week Business Process Integration course that offers a more in-depth understanding of how SAP works and supports business processes, a number of courses on the basic R/3 modules (accounting, materials management, production, etc.), courses on the Business Information Warehouse (BW) and more on SAP's mySAP Products (Strategic Enterprise Management [SEM], Customer Relationship Management [CRM], etc.)

These workshops are mostly offered in the summer and during winter break and are held in a number of US locations as well as Nova Scotia, Canada. Several formats are used to deliver the courses. Most are comprised of a modified SAP training course augmented by faculty led discussions about how the material might be used. All workshops are available to faculty from schools who have joined the UA and are offered free of charge.

There are, however, challenges associated with this new approach. First, the workshops are either one or two weeks long. This means that the faculty's institution must pay for travel and lodging for any faculty who attend the workshop. The faculty member must also commit to one or two full weeks of training, rather than a few days.

There are usually several offerings during each training week, so several faculty may attend from an individual institution and each take different courses. The choice of faculty and the courses they take should be made judiciously (Becerra-Fernandez et al., 2000). The goals should be to make sure faculty receive the "right" level of training, and that the college's needs are being met without unnecessary duplication. We have found that it is most beneficial to support faculty attending these workshop who are most likely to a) incorporate what they have learned into one of their courses in the near-term and b) be willing and able to present what they have learned to other faculty.

4.2 Tip 6: Outsource Non-Core Competencies

In the first years of the UA program, all of its members were 'self-hosted'. This meant that each school had to devote substantial resources to installing and maintaining their own instance of R/3. Appropriate servers had to be acquired, technical staff had to be trained on how to manage the system and had to devote part or all of their time to SAP issues, and outside consultants were hired by many schools to help maintain the system at acceptable levels of effectiveness and efficiency. This made an SAP initiative quite expensive. This level of effort was especially burdensome for schools that did not have the participation of their information systems department. In many successful SAP initiatives, information systems students and faculty have been instrumental in maintaining the system (Joseph and George, 2003; Corbitt and Mensching, 2000). In addition, many schools found that after their technical staff had been trained and received some experience with the system, they were hired away by local companies who were able to offer higher salaries than the school could afford.

To get around these difficulties, the UA began to develop a technical support program in which any school's SAP initiative could be hosted by a 'University Competency Center' (UCC). Today, there are five UCCs across the United States. Each UCC has all of the SAP software supported by the UA. Member institutions register and use the subset of the software that they need for their classes and for which they have licenses. The UCC provides access to SAP software (via the Internet) for use by the member

institution, conducts regular system maintenance, creates student accounts, and staffs a faculty help desk. However, member institutions are responsible for their own exercises, course materials, and help for their students.

SAP will no longer allow new members to host their own SAP installations. All institutions that are new to the UA program must join a UCC.

4.3 Tip 7: Develop and Maintain Helpful Relationships

As faculty take more training in SAP's products and become more familiar with the system, they will develop an understanding of the system's logic and will be able to extend their exercises, solve many of their own problems, and respond to error messages from the system. But they will still need assistance, from time to time, to solve errors in exercises and to obtain inspiration as to what exercises to develop. We have found it very helpful to develop relationships with SAP trainers, more seasoned faculty in the UA program,⁴ and with local expert users in firms that use R/3.

SAP trainers are a tremendous resource to cultivate. They can help with customizing data and assignments, with responses to system error messages, and by providing the codes and steps needed to compile and write certain standard reports. Knowing who has what expertise is critical to obtaining a timely response to a question or problem. Trainers have been willing to help when given well specified questions in their specific training domain. Because SAP trainers conduct the UA faculty workshops, it is still possible to forge these relationships.

Local business people have expressed great interest in our use of R/3 in classes, predominantly for what it is providing their potential future employees. The side benefit of their interest is that they are willing to offer their expertise and time for relevant problems or issues that may be hampering our efforts to integrate SAP successfully. These experts are invaluable for their input into what kinds of exercises would be most relevant to the students in light of what is done in business today. Membership in the regional ASUG (SAP Users Group) is very useful for establishing relationships with local experts.

Our Office of Corporate Relations has been helpful in identifying and nurturing these corporate contacts. These relations may start with a meeting among the university Office of Corporate Relations, faculty, and, from the organization, recruiters, and representatives from IT, supply chain, and enterprise systems. The next step is often to identify speakers for classes and student organizations. Organizations with alumni, who have or will be recruiting students, and those organizations who foster community service and outreach will be most helpful.

4.4 Tip 8: Ask for Help

Creating and implementing SAP course modules that go beyond the basic business processes can be a challenge for most faculty.⁵ For example, creating and implementing a

module that surveys the subject of logical access security is probably within the capability of most faculty members who teach IT Auditing. However, complementing that module with hands-on exercises, especially those that involve accessing data from a large-scale ES, is beyond the reach of most auditing faculty. We have found that collaboration with industry experts can be quite helpful in such cases.

One faculty member collaborated with the SAP systems administrator at a local company to create a curriculum module for the IT Auditing course. Working closely together, they developed a module that included a class presentation by the systems administrator on the subject of logical access security. This presentation was followed by a hands-on workshop and the assignment of exercises that asked the students to create user accounts and user profiles, assign the profiles to the users, and test those accounts and profiles to determine that the desired level of access control had been achieved. The corporate partner also benefits from this type of arrangement. The company received positive exposure to potential new hires in the IT Audit classes. The SAP systems administrator benefited as she was able to achieve one of her professional growth goals by developing and delivering the class presentation. Other SAP exercises for the IT Auditing courses have been created with the assistance of staff from the local offices of the Big Four.

Outside expertise is widespread in local industry. Companies are eager to consult with faculty on developing realistic hands-on exercises because they are aware that students in these classes will then be better prepared as potential employees. Companies are very open to working with faculty to ensure that students receive a broad and accurate exposure to current approaches to working in their area of expertise. A major benefit of this interaction is that class exercises augment and update standard textbook treatments that often depict stovepiped working arrangements.

5. STUDENT AND FACULTY RELATED ISSUES

5.1 Tip 9: Have Realistic Expectations

Integrating SAP into business classes is ambitious for two reasons. First, many faculty who teach traditional business disciplines, such as accounting and finance, do not typically have the IT training or background common to information systems faculty. Second, students majoring in accounting and finance may not be inclined in general toward hands-on IT assignments. Both faculty and students, however, must accept that career paths in these traditional business disciplines are inevitably entwined with information systems in organizations.

Once a school decides to integrate SAP in their curriculum, it is wise to start with the small group of champions who are enthusiastic about learning, and then teaching with SAP. They should start with simple exercises at first, incrementally increasing the extent and depth of what they

do, and how they integrate it. At first, one cost accounting professor in our group used the same exercise material that others were using around the order to cash cycle, and focused on the reports that could be derived from the activities, and how they could be used to support management decisions. In subsequent semesters, however, she developed a more comprehensive assignment around cost center exercises that could be more meaningfully integrated into the cost management concepts of the course. Careful planning and incremental development assured that there has been steady forward progress in the appropriate use of SAP in the course.

In addition to having realistic expectations about what adopting faculty and their students can do with SAP in the short term, a college should be realistic about how prominent SAP can be across the curriculum. There will be faculty who do not embrace the notion of learning a new technology, let alone changing their syllabus to accommodate a hands-on assignment. If faculty are forced to adopt SAP, the result can backfire. If students perceive a time-intensive assignment to be not fully supported by their instructor, or find that their faculty member cannot help them with the assignment, the students will become very frustrated, and maybe even hostile toward the application. This then has a negative effect in subsequent classes where they may also have an SAP assignment, and also on their overall view of SAP and ES when they start working. It is better for students to not have the exposure to the software than to have them experience it in a way that taints their view of this and perhaps other technology that is prevalent in and beneficial to many business organizations.

5. 2 Tip 10: Let Students Learn from Their Mistakes

Students may feel anxious about doing an SAP assignment, because they are not sure if they have the “right” answer. They may not comprehend exactly what they are trying to accomplish in the system. Some faculty have found it useful to give students check figures for an assignment. For example, for a cost center accounting assignment, the professor provided a spreadsheet that indicated the entries, adjustments, and final balances for each cost center. If students did make mistakes, they would not obtain the same numbers as the professor indicated. Rather than take points off because of having a wrong number, the instructor decided to use the students’ mistakes to their advantage. If a student could figure out what he or she had done wrong, and why his or her number was different from the number on the solution spreadsheet, the student could still get full credit by explaining why the number was different. This approach results in the student learning much more about the system than if he or she had followed the directions perfectly and had arrived at the “right” answer. It takes the focus off the navigation and keystrokes and places it more on understanding how the system works.

Many traditional homework assignments have “correct” answers and methods of solution. SAP assignments demonstrate the many alternatives open to its users by strictly limiting acceptable input in some cases and by

allowing unlimited choices in others. This frustrates students while exposing them to real-world experiences. Intense scrutiny of SAP’s foibles also diverts student attention from gaining a “systems” level exposure to ES by focusing on minutiae and details. This is why assignments must be more than keystroke exercises, and need to be carefully tied to learning objectives.

5. 3 Tip 11: Provide Good Customer Support

Any faculty member who incorporates a hands-on SAP assignment (or any technology related assignment) into his or her course should be prepared to provide a high level of support to students. Unlike traditional homework problems, a student who runs into a problem in an SAP assignment may literally not be able to go further. For example, if the student receives an error message that posting (i.e., completing a transaction) is not allowed in the current period, it could be because the posting period has not been opened yet.⁶ The faculty member who gets an angry e-mail from a student that something has happened must be prepared to address the issue immediately.

SAP exercises can be very frustrating for students who are not familiar with the complexity (and rigidity) of such a system. Many students make what they consider to be a small mistake from which they can sometimes not recover. The faculty must emphasize that things have to be done in an exact way to make sure the appropriate data are entered in the right place, and in the right format. If the faculty member catches a student’s mistake early, he or she can usually provide a solution (or workaround) to prevent future major problems. This requires however, that the students contact the faculty member when they have a problem, and that the faculty member responds in a timely way to rectify the matter.

There are many ways to support students to minimize their frustration, and limit the time demands on the faculty. If the college has the resources, a graduate student with some SAP experience can be used to provide assistance to other students during established SAP help hours. Our college has an accounting learning lab where a graduate student is available during certain times during the week for students in any major to come in for SAP help.

Another approach is to use a discussion board (our faculty use Blackboard to support our courses on-line) to allow students to post questions so the faculty member can answer the question there, rather than answering individual e-mails from students that may contain the same questions over and over. That way all students have access to the information in a timely way. McCombs and Sharifi (2002/2003) describe a similar approach using an on-line forum for students to make comments and ask or answer questions. They award students credit for contributing to the forum, and plan to use the content of the forum to build a knowledge base to be used in subsequent classes.

The key here is to provide support to the students in a way that is accessible, reliable, and useful. If students feel like

they have nowhere to turn when they are having problems, they are likely to respond with ill feelings toward the software, and toward the faculty member who gave them the SAP assignment. It is most beneficial to give the students strategies for trying to diagnose and fix their own problems. Showing the students how to generate relevant reports can help them determine if they have the right information in the system. They also should use the "display" functionality after they have "created" a master record or transaction. More significant learning takes place if the students can spend some time analyzing what they did, detect what was wrong with it, and correct it themselves.

5. 4 Tip 12: But What Does it Really Look Like?

One of the programmatic goals of a business curriculum should be to impart a basic understanding of common business processes. Enterprise systems enforce this understanding when they are used to illustrate the flow of information and goods throughout the business. However, these systems are inevitably complex and complicated to learn, so the typical student finds it difficult to "see the forest for the trees" when completing even basic business actions within the software. As a result, a common complaint among student users is that they do not see how a particular hands-on exercise relates to what they are learning about operations, or accounting, or information systems, in their coursework.

To counter this problem, we approached an international company with local headquarters to help us create a video of how SAP R/3 is used in a common business process at their firm. We interviewed a number of employees at a large distribution center, filming employee interviews as well as product workflow to demonstrate how products are acquired, warehoused, sold, and shipped. The video shows details of the business activities performed at the distribution center which included receiving inventory, quality inspection, placing goods in bulk storage, moving goods to forward picking, receiving and input of customer orders, picking goods, packing and shipment, and finally loading of shipments by FEDEX. At each step, the corresponding procedures in SAP are described and the relevant SAP screens are displayed. The video depicts the entry of data, the printing of documents, and the audit trail of data that is stored by the SAP system.⁷

Creating a video to provide an essential tie-in to the real world is not a huge undertaking. In this case, the video was produced by faculty with no prior video production experience, with assistance from campus video support staff. Filming at the site took less than two days, with most of the filming completed in one full day. Video support staff then edited the material down to twenty minutes. The video was made in VHS format for classroom use, or could be viewed through a link over Blackboard for outside-of-class viewing.

The video has been tremendously successful in the classroom. For both faculty and students, it completes the

picture of how the business processes and the SAP system fit together. It is used in a number of courses that cover business processes, including Accounting Information Systems, where the focus is on understanding business process, internal controls within business processes, and the role of enterprise systems in supporting the process and its control requirements. It is also used in the required Business Process course in the MBA curriculum. Similar to those in the AIS course, the MBA students focus on understanding business processes and the role of enterprise systems in supporting those processes. In addition, the MBA instructors engage their students in discussions of business process reengineering and matching as-is and to-be business processes with the features of the enterprise system.

6. CONCLUSIONS AND A CALL FOR RESEARCH

Enterprise system integration is heavily time and resource-consuming, and is a source of great frustration on the part of faculty and students alike. Our purpose in compiling these tips is to provide guidance to those struggling with the challenges these efforts portend. When successful, the effort greatly improves the *content* and *pedagogy* of a business education. Students gain a better understanding of the true nature of business processes, and come away with a concrete skill that has immediate benefit in their initial jobs.

Industry has responded very favorably to the programs in which we have integrated SAP, both in terms of providing support and in wanting to hire our students. In return for their help, companies gain entry level employees with considerable enterprise system awareness. This presents a win-win situation for faculty who make the effort to reach out to these corporate partners, as we benefit from their SAP expertise, and they benefit from having a more sophisticated labor pool from which they can recruit.

Much remains to be learned about the extent of the impact of ES integration in a curriculum. Little research has been published that measures the effects on student understanding of course material and their broader knowledge of business issues. Employers, career services and placement offices would benefit from knowing if and how much this coverage affects employment opportunities and pay scales. Other issues related to best practices in teaching methods and learning assessment are open to study. As we continue to learn more about improving student education around ES, we urge our colleagues to use the opportunity to conduct field and experimental research to measure the true benefits of our work in this area.

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8. ENDNOTES

- ¹ Attributed to an SAP trainer.
- ² The IDES database is a partially populated sample database used in SAP training classes. It may also be included in any installation, should the purchasing organization want a "sandbox" for testing and training. Specially configured versions of the IDES database are used in courses conducted at SAP training centers.

³ The instructor needs to make it clear that in a real-life situation, different people complete each step in a process (i.e., sales clerks do not execute shipments or create billing documents).

⁴ See tips 2, 4, and 5.

⁵ Adjunct faculty currently working in industry, or those full-time faculty with recent industry experience, may have the relevant experience.

⁶ A posting period equates to an accounting period. SAP only allows transactions to be posted in one open period, typically a month. As a result, the instructor or system support staff needs to close the period at the end of each month so that students are able to enter transaction data on the first day of a new month. This is the type of system maintenance performed by UCC staff.

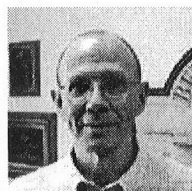
⁷ The video is available for nonprofit, educational use. For a copy, please send your contact information to Joe Gelinias at ugelinias@bentley.edu.

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Table 1: Summary of Three Themes and Twelve Tips for Integrating an Enterprise System into the Business Curriculum

THEME 1: CURRICULUM ISSUES

Tip 1: Go With What You Know

Adapt SAP training exercises that are meant for targeted corporate users, to make them appropriate for business education.

Tip 2: Practice Knowledge Diffusion

Have campus experts present materials to other faculty and allow discussion about how the exercises can be used in different parts of the curriculum.

Tip 3: Get It Straight From the Horse's Mouth

Invite local speakers to talk about their SAP experience, lending credibility and substance to your curriculum efforts.

Tip 4: Don't Re-Invent the Wheel or Make Others Do the Same

Use exercises written by others, and make your exercises available to others.

THEME 2: TRAINING AND OUTSIDE SUPPORT

Tip 5: New Training Approach, New Training Challenges

Take advantage of the faculty workshops which comprise SAP's new training approach for University Alliance members, but use your resources and time wisely.

Tip 6: Outsource Non-Core Competencies

Use a UCC to host your application so you don't need to worry about the technical issues and can focus on the curriculum issues.

Tip 7: Develop And Maintain Helpful Relationships

Build a network of SAP experts among trainers and corporate people.

Tip 8: Ask For Help

Ask an expert for help in designing an appropriate assignment, to make the use of SAP most relevant for particular courses.

THEME 3: STUDENT AND FACULTY RELATED ISSUES

Tip 9: Have Realistic Expectations

Don't try to do too much too fast, or expect everyone to embrace curriculum integration of SAP.

Tip 10: Let Students Learn From Their Mistakes

Help students to think about what they are doing by not focusing so much on getting the right answer as understanding what they may have done incorrectly.

Tip 11: Provide Good Customer Support

Be available to help students struggling with their SAP assignments.

Tip 12: But What Does It Really Look Like?

Create and use visual aids to help students understand how SAP relates to real business activities.