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Obstacles to the Integration of SAP® Training in Academic Programs

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Abstract

In order to ensure academic programs of study prepare students for rewarding careers in industry, they need to expose students to the latest technologies and software tools they are likely to use. One of these software tools is Enterprise Resource Planning (ERP). A leading ERP solution used throughout industry is SAP® ERP. SAP® has partnered with universities through the SAP® University Alliance (SAP® UA) program by providing universities access to curricula and training free of charge, and options for affordable hosted software solutions. Implementing SAP® ERP within these programs of study has been met with some obstacles for faculty and universities. A study of SAP® UA faculty within the United States was conducted to identify these obstacles to SAP® ERP integration within academic programs and to identify possible solutions to these obstacles. This paper will present the results of this study.

Keywords: ERP, SAP®, Academic Programs, SAP® UA, University Alliance

Introduction

Academic programs of study need to use the latest tools and technologies to prepare students for 21st century careers. One of these technologies is Enterprise Resource Planning (ERP) software. Implementing ERP software in academic programs of study provides many benefits to academic institutions, students, and employers. Academic institutions benefit by demonstrating they are providing cutting edge technology training to their students and are preparing them for challenging careers that employ this latest technology that has become a necessity in many sectors of industry.

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Furthermore, students benefit from ERP software integration in academic programs by being exposed to this software. This exposure enables them to be much more prepared to work with software they are likely to use in their upcoming careers. If academic programs are able to successfully integrate ERP software throughout their curriculum, where students are engaged in the processing of actual transactions involving live ERP software that enable the implementation of business decisions, then students are more likely to benefit than those that are not exposed to such environments.

Employers also benefit by the implementation of ERP in academic programs for various reasons. First of all, employees that have already been exposed to current software require less initial training. Furthermore, they are more likely to become acclimated to their new environment much quicker than those that were not exposed to this software. Most of all, new employees that are already trained are more productive from the start and less expensive since they don't need a substantial amount of initial training to produce results for the company. Therefore companies, as well as students, benefit from the implementation of SAP® within academic programs of study.

Although there are limited choices of ERP software packages that are widespread in industry, their implementation and understanding is complex and requires extensive training and exposure in order to establish a good knowledge base. Therefore, ERP exposure that begins early in an academic program of study and progresses throughout a degree program is more likely to provide the exposure and knowledge students need to be successful after graduation.

One of these leading ERP software packages used throughout industry is SAP® ERP. It has been implemented in various sizes and sectors of industry. Its widespread use makes it an ideal software package to implement in degree programs of study. Many academic institutions have already implemented SAP® within their degree programs through the SAP® University Alliance (SAP® UA) program. Some of these implementations have been very successful, while some have resulted in failed attempts. If academic institutions are to be successful with their attempts to implement SAP® within their programs, then research in this area is needed to gain a better understanding of the causes of these failures.

To gain a better understanding of the implementation of SAP® within academic programs through the SAP® UA program, a study of SAP® UA faculty was conducted.

This study surveyed SAP® UA faculty perceptions of their SAP® ERP implementations utilizing an online survey instrument that consisted of demographic, open ended, and Likert-scale questions. The survey resulted in a 31% response rate. Fifty-five of the potential participants completed the survey. Email addresses of potential survey respondents were located by searching web sites of academic institutions with SAP® UAs and through a search of the SAP® UA portal. The survey was developed and administered online using Qualtrics, a web-based survey development and management tool. The respondents with at least one year of experience within the SAP® UA were asked to complete the survey.

One of the research questions for this study attempted to determine the areas that need the most attention within the SAP® UA program. Respondents were given six options to choose from. They were allowed to select one or more of these options. In addition, they were provided a method for entering text, if none of the options applied to them. Another research question attempted to determine the weaknesses of the SAP® UA program. This was an open-ended question that was meant to capture all of the possible weaknesses of the respondent's SAP® UA.

Limitations

There are some limitations of this study that are worth noting. One of these limitations is the limited number of potential participants that were invited to participate in this study. After attempts to obtain faculty email addresses from regional SAP® UA centers were not successful due to SAP®'s privacy concerns, email addresses for SAP® UA faculty were obtained through web searches of SAP® UA programs and through the SAP® UA portal. This approach made locating SAP® UA faculty emails difficult and likely resulted in a much smaller pool of potential participants than actually exist. Furthermore, since locating potential respondents was difficult, searches were limited to SAP® UA within the United States. Therefore, the results of this study may not apply to the entire population of SAP® UA faculty, since the study population was limited in scope.

Another limitation of this study is that it only uses the survey methodology to collect data from potential respondents. Other forms of data collection such as interviews of potential respondents would have produced more accurate results.

Furthermore, only 31% of the potential respondents completed the survey. A higher response rate would have produced more accurate results. Also, no method was available to determine the level of experience among the respondents prior to invitations being distributed. In the invitation and in the opening screen to the online survey, respondents were asked to complete the survey only if they met the one year of experience requirement.

Despite these limitations, a review of the data indicates that there are several obstacles to the implementation of SAP® within academic programs that should be of concern for faculty and administrators that are contemplating the implementation of SAP® within their programs of study. This paper will present the results of this study by categorizing and summarizing the responses obtained during the study. The authors believe this new knowledge will aid in decision making within academic programs, especially in business schools, since the majority of responses were obtained from faculty within business schools located throughout the United States.

Definitions

The terms discussed in this paper are defined as follows:

University Support- University support consists of financial, information technology, and administrative support to the SAP® UA program. Examples include information technology support, funds for travel to attend training, and release time to attend SAP® related conferences and training events.

UCC- SAP® University Competence Center (UCC) is a regional center that provides hosting service and support to member universities.

SAP® Processes- These are processes developed and implemented by SAP® and UCCs in support of member SAP® UAs.

SAP® Support- SAP® support consists of support such as providing access and support of SAP® software and core data used by SAP® UAs. This support also includes troubleshooting and workshops to SAP® UA faculty.

SAP® Teaching Skills- These are required skills that enable SAP® UA faculty members to be able to teach SAP® related curriculum developed by other SAP® UA faculty.

Teaching Skills- These are necessary skills that enable SAP® UA faculty to effectively teach SAP® curriculum and concepts. They include the ability to present complex concepts, develop additional course materials to supplement SAP® curriculum, and to assess student learning.

Computer Skills- Computer skills consist of skills on how to use the advanced features of operating systems, browsers, and other computer software and associated hardware.

Standardized SAP® Curriculum- Standardized SAP® curriculum is curriculum that is consistent across all UCCs and SAP® UAs. This also includes a common format and standardized assessment tools.

SAP® Implementation Complication- This is complication encountered during the SAP® UA implementation process. Examples of complications include complications caused by connection related issues, software conflicts, limited university support, and lack of faculty understanding of SAP® software.

Training Module- A training module is a curriculum module consisting of SAP® labs developed by SAP® UA faculty and made available to other SAP® UA members.

SAP® Lab- An SAP® lab is a physical classroom consisting of computers and SAP® client software used to conduct training.

Student Involvement- Student involvement refers to a student's involvement in SAP® UA events, participation in SAP® UA classroom exercises, assisting other students, and support of SAP® UA events.

Student Careers- Student careers are careers students will pursue after graduation of their programs of study.

SAP® Program Success- This is the successful implementation and operation of the SAP® UA program in a university setting. Successful programs are programs that have helped equip students with SAP® skills and the ability to be able to implement these skills in an industrial or business setting.

Literature Review

Understanding of ERP is considered essential for students who desire a career in business (Avyargi, 2011; LeRouge & Webb, 2004). Many universities have used ERP systems in business curricula to teach concepts of information technology and how it supports the integrated nature of business (Ayyagari, 2011; Fedorowicz et al., 2004, Sarfaraz et al., 2012, Jenab & Sarfaraz, 2012). They identified several challenges for integrating the SAP® ERP system into various business courses. The key obstacles identified included curriculum, student and faculty issues, and training and support.

Integration of ERP systems into existing curricula is one challenge faced by most universities (Ayyagari, 2011; Pellerin & Hadaya, 2007). Researchers emphasize the importance of integrating concepts of Business Process Reengineering (BPR) with hands-on experience using ERP systems. Because ERP and BPR are so closely related, an understanding of both is critical for successful ERP implementation. This integrated approach enables students to focus on organizational transformation, not just on an ERP solution, and requires a level of critical thinking above simple point-and-click ERP training (Chen, Razi, & Rienzo, 2011; Davis & Comeau, 2004). Educators can facilitate a cross-functional view of business by allowing students to see how transactions in one functional area initiate events in related areas (Ayyagari, 2011).

Another challenge of integrating ERP systems into academic curriculum is the paradigm shift required for students and faculty to develop a process view of business activities versus the traditional functional view (Ayyagari, 2011; Boyle, 2007). One of the first curricular decisions that must be made is whether to integrate ERP concepts across multiple existing, functional courses, or to develop an IS, technical-oriented ERP curriculum (Chen et al., 2011).

Colleges often face opposition from administration and fellow faculty when attempting to include ERP concepts within existing business courses. To overcome these obstacles, Ragan et al. (2010) have outlined their successful process for integrating a set of ERP practice cases into an accounting curriculum.

Their experience revealed a high level of satisfaction among students and the strength of SAP® software to bring theoretical concepts alive. Boykin and Martz (2004) had a similar experience when integrating ERP into a logistics curriculum. Their quantified findings indicate that students exposed to ERP topics within logistics courses developed a more process-oriented mindset than those with a functional curriculum.

Industry has indicated that an understanding of ERP systems is desired, however, frameworks to outline the best approach to include ERP systems in education are needed (Antonucci et al., 2004; LeRouge & Webb, 2004). Boyle (2007) emphasized that no matter which approach is taken, it is imperative that curriculum designers identify the key ERP skills that industry expects from college graduates and work to incorporate these into their ERP programs. It is recommended that educators who teach in ERP programs ensure the content is current, relevant, and prepares students for positions in industry (Chen et. al., 2011). Boyle identified some key professional roles that graduates may play to include ERP administration, ERP analysis, and ERP development. In addition, courses and programs must continuously evolve to meet emerging ERP technology and industry needs (Atif et al., 2010; Boyle, 2007).

Because teaching BPR and ERP concepts simultaneously is extremely complex, a great deal of faculty expertise is required (Antonucci et al., 2004; Pellerin & Hadaya, 2007). Educators must understand the integrated nature of business processes, how BPR enhances organizational effectiveness, as well as the inherent complexities of ERP implementation. In addition to technical expertise, teachers must have knowledge of soft skills such as team development, project management, and interpersonal skills (Chen et al., 2011; Jeyaraj, 2010). Courses of this nature that teach students process-oriented thinking, higher order reasoning, and technical ERP implementation skills require a tremendous amount of training and preparation time on the part of faculty.

Fedorowicz et al. (2004) suggest that it is often difficult for students to learn SAP®'s ERP system within their discipline-specific classes. Typical accounting, finance, or logistics students, for instance, have little background in using a complex enterprise system. This compounds the difficulty that educators have teaching hands-on ERP exercises within their business disciplines.

Therefore, colleges should set realistic expectations when attempting to implement SAP® across the curriculum (Chen et al., 2011). There are faculty and students who will resist the idea of teaching and learning a new technology within their courses due to the significant changes required.

A champion of the integration of SAP® ERP into the business curricula can facilitate the change process (Fedorowicz, et al., 2004). A champion can bring other faculty on board who are willing to teach SAP® ERP systems in business courses and disciplines. Often, this requires the champion to accept the lead in developing and coordinating course materials. Mornar, Fertalj, and Kalpic' (2010) propose that rewards for successful implementation might help overcome lack of motivation which is often one of the main causes for the high rate of ERP system implementation failure.

While SAP® offers extensive hands-on training materials, Fedorowicz et al. (2004) experienced difficulty integrating the labs into existing courses. Many of the exercises had to be redesigned and supplemental materials created to achieve the learning outcomes. These educators stated that in many situations they had to develop their own exercises to reflect course content, particularly when attempting to teach both business processes and SAP® ERP topics. To reinforce these concepts and enhance critical thinking, faculty members at various universities have created new pedagogical approaches including simulations which present questions and analysis activities requiring students to relate the textbook material with the hands-on lab activities (Jeyaraj, 2010). These materials extend students' exposure to ERP systems and business processes beyond routine data entry and into more critical thinking (Herrington & Kervin, 2007).

The sharing of ideas and exercises among faculty members teaching SAP® ERP courses is suggested by Fedorowicz et al. (2004). They are confident that the expansion of available teaching resources will minimize the time required of faculty to customize materials as well as reduce their level of frustration teaching this complex topic. Even though there are many hands-on lab exercises provided through SAP® UA's, there are limited academic textbooks that integrate ERP system and business process concepts. Davis et al. (2004) discuss the need for packaged teaching materials that should include management cases with textbooks and hands-on ERP lab exercises. The availability of these pre-developed, integrated teaching materials would greatly simplify the adoption of enterprise systems in management education.

To university administrators, faculty time is money, so funding is always a concern, and investing in ERP curriculum is not cheap (Boyle, 2007). Resources are needed to secure access to the ERP system, train faculty, develop teaching materials, and support faculty and students with the problems they encounter when using the ERP system. In a comprehensive study conducted by Rosemann and Maurizio (2005), students experienced major issues with the complexity of the SAP® system and lab exercises. Simulation games have proven to be an effective way to simplify student learning of the SAP® ERP system (Seethamraju, 2010). Student learning of technical SAP® software skills improved as did understanding of business processes when an ERP simulation game was included.

According to Rosemann and Maurizio (2005), application hosting solutions from SAP® are reliable and have eased some of the burden related to financial and technical system support. However, while UCCs do an effective job of providing access to and maintenance of the ERP software, Fedorowicz et al. (2004) identified the need for help desks for faculty and students who encounter problems with SAP® exercises. Appropriately trained staff that can assist faculty and students with SAP® ERP problems requires a financial investment. Any university that incorporates SAP® into the curriculum must be prepared to provide a high level of support to students and faculty alike.

Methodology

This study surveyed faculty in SAP® UAs located throughout the United States. The respondents completed an online survey developed and deployed through Qualtrics that consisted of open-ended, Likert scale, and demographic questions.

The participants were identified through web searches of SAP® UAs and through the SAP® member portal. Participants were invited through email. The invitation letter and the opening screen for the survey informed potential participants they must be at least 18 years of age and SAP® University Alliance faculty with at least one year of experience in a UA to participate in the study. Since only full-time university instructors were invited to participate in the study, all potential participants were expected to be at least in their 20s.

The participants gave their consent to participate by clicking on the link in the invitation letter to go to the survey. They were reminded in the opening screen that they could refuse to participate at any time by closing their browser.

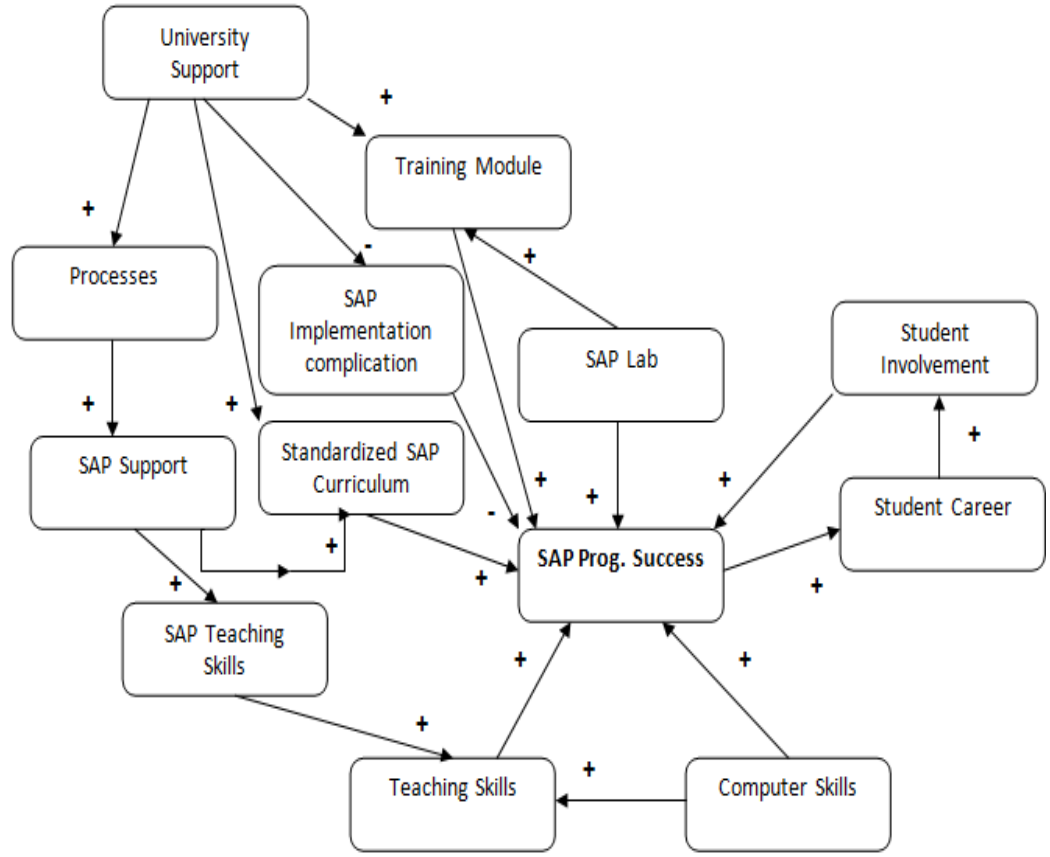
Participation in the study was strictly voluntary. The survey instrument was purely anonymous. To prevent others not invited from completing the survey, it was password protected. The data gathered during the study was analyzed in aggregate form.

The data collection period was set for two weeks and later extended an additional two weeks, since the response rate had not reached the planned 30% or more response rate. Follow-up emails were sent to all participants during the data collection period to remind them of the invitation to participate. When the survey period closed, the data was downloaded and analyzed in aggregate form using Excel and statistical analysis software. This analysis identifies the factors and their impact on each other that can be presented by a labeling graph used for analytical assessment (Fumani & Jenab, 2013; Jenab et al., 2012).

Findings

As shown in Figure 1, SAP® Program success depends on a variety of factors. Analysis of the faculty survey data revealed that most of the factors analyzed had a positive direct impact on the SAP® Program success.

Figure 1: Cause and Effect Model



H1. University Support has a significant effect on SAP® Program Success.

University support consists of financial, information technology, and administrative support required for the SAP® UA program to succeed. University support influences many of the other factors displayed in Figure 1 that have a direct influence on the SAP® Program success. For example, if university support exists, processes at the university level lead to support of SAP® programs and software, which in turn leads to improved SAP® teaching skills and enhancement of faculty teaching as a whole. Therefore, improved teaching skills will have a direct influence on SAP® program success.

Also, financial support will have a positive effect on program success. Financial support is required of the university to pay an annual fee to an SAP® University UCC.

For the annual fee, each SAP® UA member university will receive hosting services, access to SAP® software systems, and technical support from either the UCC in Chico, California or Milwaukee, Wisconsin. Each university that is an SAP® UA member is provided technical support by either the UCC in Chico or Milwaukee, which greatly reduces the complexity associated with SAP® implementations.

Since the UCCs, do not provide applications support for faculty and students using the SAP® UA curriculum, further funding of information technology and support services is required by SAP® UA member universities. To adequately support students and faculty members working with the SAP® systems, campus lab facilities and help desk operations are essential. A university's willingness to invest in information technology and an internal SAP® help desk function has a significant impact on the success of faculty and students, and the SAP® UA program overall.

Support from administrators is essential to the success of the SAP® UA program at any university. Lack of investment in technology or training and support of people can be serious obstacles to SAP® UA program success.

H2. SAP® processes have a significant effect on SAP® Program Success.

These are processes developed and implemented by SAP® and UCCs in support of member SAP® UAs. SAP® has developed the SAP® UA program that includes many processes to support SAP® UA members. One of these processes is the hosting of SAP® software by UCCs. UCCs are regional centers that provide hosting services and technical support to member universities.

The SAP® Community Network (SCN) is the vehicle that SAP® has created to support faculty members and students at UA institutions. The SCN is one of the most extensive, collaborative online communities in the world, yet, it often falls short of providing solutions to SAP® curriculum questions and problems in a timely manner. The SCN relies on members to support other members. Faculty and students must wait for a colleague or peer from another university or an SAP® UA employee to pick up the request for help and respond.

This is often too little, too late for faculty or students who are "stuck" on a particular problem and can't proceed to the next exercise until the problem is resolved.

H3. Standardized SAP® Curriculum has a significant effect on SAP® Program Success.

The availability of standardized SAP® curriculum has a direct influence on SAP® program success. Standardized SAP® curriculum is curriculum that is consistent across all UCCs and SAP® UAs. This also includes a common format and standardized assessment tools. Respondents indicated the lack of standardized SAP® curriculum as being a major obstacle to the success of their SAP® UAs. The lack of standardized SAP® curriculum created confusion for students and faculty.

While SAP® has standardized some of the UA curriculum with a common format using the Global Bike Inc. (GBI) scenario, more standardization of assessment tools would reduce confusion for instructors as well as students. Cisco Systems® has successfully developed a standardized curriculum, structured training, and standardized assessment tools through its Cisco® Academy. Before faculty can teach any Cisco® curriculum, they must attend training and take assessments developed by Cisco®. Faculty members within Cisco® Academies are not required to develop curriculum or the assessments that would accompany them. There are stark differences between SAP®'s and Cisco's training programs, when it comes to standardization and support.

H4. SAP® Implementation Complications has a significant inverse effect on SAP® Program Success.

These are complications encountered during the SAP® UA implementation process. Examples of complications include connection related issues, software conflicts, limited university support, and lack of faculty understanding of SAP® software. Complications during the implementations of SAP® UA results in negative effects on SAP® program success. Furthermore, other factors can lead to complications that ultimately lead to negative effects on SAP® program success. For example, the lack of university support can lead to SAP® implementation complications, which has a negative effect on SAP® UA success.

The lack of university support to fund training or to provide technical and other support will result in faculty with limited knowledge attempting to implement a program they know little about. This of course is likely to lead to implementation complications that will ultimately result in limited success of the SAP® program.

H5. Training Modules have a significant effect on SAP® Program Success.

An SAP® training module is a curriculum module consisting of SAP® labs developed by SAP® UA faculty and made available to other SAP® UAs. Support for SAP® provided by the university that allows faculty time to prepare course materials and funds travel for SAP® training will have a positive effect on the creation of standardized SAP® curriculum.

Since SAP® relies on faculty within SAP® UAs to develop SAP® training modules for students to use within their courses, there is a lack of consistency in the development and look of all training modules developed by faculty, especially outside the core ERP system such as Supply Chain Management (SCM) and Customer Relationship Management (CRM) modules. This study identified a common perception that consistency between training modules is needed. Also, a need for more training modules exists, especially short training modules that can be implemented in shorter sessions to give instructors more flexibility.

Another problem identified is the lack of detail explanations as to how to resolve problems with labs. The majority of training modules provide detailed step-by-step procedures on how to complete labs, but some of them do not provide a good connection and detailed explanations of how they relate to business concepts. Therefore, instructors especially those that are not experts in SAP®, are likely to struggle relating the labs to business concepts covered within their business courses. Furthermore, there are a limited number of textbooks that integrate SAP® curriculum, making it more difficult for instructors to select textbooks that can bridge the gap between standard business process concepts and SAP® training modules.

H6. SAP® Support has a significant effect on SAP® Program Success.

SAP® support includes such things as providing access and support of SAP® software and core data used by SAP® UAs. This support also includes troubleshooting and workshops to SAP® UA faculty. Although UCCs provide training and support, both areas are limited. There are a handful of courses that faculty can take in person or through webinars, usually offered twice a year. The training is offered in a condensed format, making it difficult for some faculty to keep up. Also, retention of the materials becomes a challenge during rapid training sessions.

Longer training sessions that can be offered online would be well received by faculty new to the UA program. Since SAP® support has a significant effect on SAP® UA program success, this problem area should be carefully addressed through various training options.

Furthermore, technical support was a major concern of many respondents in the study. Some indicated a slow response from their UCC as an issue. If students are stuck on a lab and an instructor at a UA cannot resolve the problem, the instructor's only other option is to search the web or ask a faculty member at a UCC for help. Since UCC faculty members have other teaching, research, and service duties, they are often slow to respond to requests for help.

H7. SAP® Labs have a significant effect on SAP® Program Success.

An SAP® lab is a physical classroom consisting of computers and SAP® client software used to conduct training. As discussed above, university support has a positive effect on SAP® Program Success. Universities that support UA provide labs, course release time or other incentives that enable faculty to create additional training modules, which ultimately leads to the success of the SAP® program.

SAP® labs also allow students to work in groups or individually to complete training modules. These labs are essential, since they bring students, faculty, and SAP® training together in one location. Therefore, when carefully managed and fully utilized they become centers of SAP® learning and knowledge sharing. If labs are not available for students, they would need to download and setup the SAP® client software on their own machines. This often results in software conflicts and other compatibility issues arising on students' individual computers, especially for Apple computer users (Khoury, Jenab, & Cox, 2014).

H8. SAP® Teaching Skills have a significant effect on SAP® Program Success.

These are required skills that enable SAP® UA faculty members to be able to teach SAP® related curriculum developed by other SAP® UA faculty. As depicted in Figure 1, SAP® support will enable faculty to attend courses offered by UCCs that are carefully designed and tested. Furthermore, as previously discussed above, more SAP® support is needed as are more flexible training options. Additional SAP® support will lead to improved SAP® teaching skills, which ultimately leads to a positive effect on SAP® program success.

Before program success is positively impacted, UA faculty must be able to gain the teaching skills they need to be able to present the complex concepts to their students. Support from SAP® can also go so far as giving faculty the opportunity to learn additional skills. Universities must provide funding for faculty members to take advantage of SAP® learning experiences. Also, they must develop their teaching skills through peer-observation, seminars, and other forms of faculty professional development.

H9. Teaching Skills have a significant effect on SAP® Program Success.

These are necessary skills that enable SAP® UA faculty to effectively teach SAP® curriculum and concepts. They include the ability to present complex concepts, develop additional course materials to supplement SAP® curriculum, and to assess student learning. As noted above, it is imperative that faculty develop these essential skills. Developing these skills will also benefit the other programs besides UA programs faculty are involved in.

Most of all, students as well as their future employers will benefit from this improved teaching. Therefore, large employers of UA students should invest in UA programs by giving to UA programs in various ways, such as expert advice, internships, and monetary support that would allow students to attend UA conferences and other professional events.

H10. Computer Skills have a significant effect on SAP® Program Success.

Computer skills consist of skills on how to use the advanced features of operating systems, browsers, and other computer software and associated hardware. Faculty members' computer skills and troubleshooting abilities have a direct effect on their teaching skills and on SAP® UA success. Survey respondents indicated that SAP® is a difficult software package to learn. If faculty have limited computer skills, they are likely to struggle with the complexity of the software.

Furthermore, they will not be able to troubleshoot data entry problems, resolve connection or hardware related issues that may arise as students attempt to complete labs. If their computer skills are weak, their ability to resolve students' lab related issues will be more difficult. Most of all, their ability to teach a software-based program of study like SAP® is dramatically impacted, which will lead to negative effects on SAP® program success.

As indicated in the survey responses, the vast majority of UA implementations are within College of Business programs of study.

Traditional business programs, with the exception of management information systems programs, have not focused on faculty computer skills needed for UA implementation and teaching. Therefore, faculty with limited computer skills are likely to struggle during the implementation phase and while teaching SAP® labs.

Since computer skills have a significant impact on business faculty members' ability to teach such a complex software package, universities need to carefully consider the impact implementing SAP® will have on faculty and on programs of study. An assessment of faculty and students' computer skills should be performed to determine if the necessary skills are present and if they are not they will need to determine what additional training or changes in the program are needed. It is essential that universities select the proper faculty members to teach the SAP® courses. Those who have a willingness to spend time practicing exercises and learning the software along with the right mix of technical skills and knowledge are required to successfully teach the SAP® UA courses.

H11. Student Careers have a significant effect on SAP® Program Success.

Student careers are careers students will pursue after graduation from their programs of study. The ideal situation is for a student to secure employment in their chosen field of study immediately after graduation.

Successful implementation and operation of a program in a university setting can be determined by students' ability to find employment in the chosen field of study. Successful UA programs are programs that have helped equip students with SAP® skills and the ability to be able to implement these skills in an industrial or business setting.

If students are unable to find employment that utilizes the SAP® skills they gained in the UA program, then the success of the program is questionable. The program's and the university's reputation would be negatively affected. The UA program will likely suffer in the end as fewer and fewer students enter the program, knowing they may not find employment after graduation. The opposite would be true if students are able to find employment after graduation that allows them to implement the skill they gained in the UA program.

Graduates of UA programs that are able to find work in their field of study would be more willing to support their former UA program and may even hire future graduates of the program. They may even contribute their time and financial resources to the program. Therefore, it is quite apparent that student careers have a significant effect on SAP® program success.

H12. Student Involvement has a significant effect on SAP® Program Success.

Student involvement refers to a student's involvement in SAP® UA events, participation in SAP® UA classroom exercises, assisting other students, and support of SAP® UA events. SAP® program success leads to successful careers as students graduate, which is likely to lead to student involvement in industry as previous SAP® program graduates give advice, financial support, and jobs to future students, which would lead to additional involvement of future students. This student involvement leads to further SAP® program success, creating a continuous circle of improvement and further success.

Conclusions

This study revealed that successful implementation and management of UAs is dependent on a variety of interrelated factors. In most cases these factors have a positive effect on the other factors, as depicted in Figure 1. Understanding these factors and how they relate to each other is an important first step in assessing whether or not implementing a UA is the right move for a program or a university. Administrators and faculty who do not attempt to understand the relationship of these factors to one another will not make the most informed decisions and may expend resources and time implementing a UA only to later realize that they are not ready for such an endeavor.

It is not always a lack of understanding when program is initially conceived that can lead to failure in implementing an SAP® UA academic program. Changes in administration can also have a tremendous impact on the success of SAP® UA academic programs. Leadership styles, philosophies, and management styles differ as do goals, objectives, and priorities from administration to administration. Changes in the midst of SAP® UA program implementation can have a detrimental impact on program success. These unexpected administrative changes can occur, which impacts University support and thus the success of the SAP® UA program.

Once the decision is made to implement a UA within a program of study, universities must support the program from the beginning and throughout the life of the program. They must allocate resources, ensure faculty are trained, and provide technical support when needed. The success of the UA depends on the support universities provide.

Another critical ingredient in the success of a UA is the support provided by SAP®. SAP® should invest more resources in an effort to standardized SAP® curriculum and faculty training. Training programs need to be available throughout the year and be available in different formats. Labs should make every attempt to establish a better connection to business concepts. Furthermore, SAP® should develop a system where a help center is staffed throughout the day to answer questions and to resolve student difficulties faculty cannot resolve. Most of all, they should model their training program after other successful programs such as the Cisco Academy® training program.

An additional conclusion that can be drawn from this study is that SAP® is a difficult software package to teach and requires a significant commitment from faculty who decide to implement it. Faculty must be able to learn the software quickly and develop problem-solving and troubleshooting skills in order to help resolve student difficulties in a timely manner. Furthermore, they must develop their problem solving skills to be able to help resolve student difficulties. Most of all, they must be proactive and determine what essential skills they lack and take steps to gain those skills. The success of the UA program will depend on faculty members' ability to teach, their knowledge of the software, and on their ability to solve the types of problems they are likely to encounter.

Although this study identified the effects of various obstacles to the success of UA program and how they relate to one another, more research is needed to quantify the level of support needed from universities and SAP®, and what processes need to be put in place to maximize the success of the UA program. Furthermore, a better understanding of student and faculty retention of SAP® processes within a business context is needed. Also, further research into the effectiveness of UAs and similar programs is needed to determine if they are worth the effort and financial investment required for success. prepare students better than other on the job training programs employers participate in?

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