Integration of ERP in Accounting Education: Enhancing the Experiential Learning of Accounting Information System

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ABSTRACT

Given the vast evolution of information technology (IT), and the seeming omniscience of Internet of Things (IoT), the future career prospect of accountants would also be altered in some ways. Accounting education underpins the career prospects of future accountants and accounting information system (AIS) is among the major syllabus in accounting education. More than any other subject, the pedagogy of AIS revolves around a set of dynamic tools and developments that force a different manner of course preparation and conceptualization. The current study evaluated the integration of Enterprise Resource Planning (ERP) into an AIS course at a Malaysian public university from the perspectives of undergraduate students. The findings suggest that students would very much benefited from the integration of ERP in AIS, enhancing their understanding of the business process cycle and how information technology assist with the automation and integration process. However, ongoing support needs to be provided to deal with classroom learning tasks as well as with administrative and technical issues.

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Contribution/Originality: This study contributes to the existing literature by providing insight and perceptiveness on how the integration of ERP will eventually enhance their understanding on the business process cycles and information technology and prepare the students to be “work ready” after graduation through the improvement of their capabilities and skills.
1. Introduction

The pervasiveness of information technology (IT) in businesses has altered the nature and economies of accounting activities. In particular, the emergence of cloud computing, eXtensible Business Reporting Language (XBRL) and business analytics in recent years have transformed the way business firms report financial performance and make business decisions. Consequently, there is a surge in demand for advanced IT skills among accounting professionals. Therefore, accounting professionals are prompted to integrate new and sophisticated technology into their practices to stay relevant (Janvrin, Bierstaker & Lowe, 2008). The current situation has persuade a renewed accounting education to globally.

Accounting education underpins the career prospects of future accountants. Among the core syllabus in accounting education is the accounting information system (AIS). The framework of AIS course is diverse and differ among higher education institutions. Among the common topics being covered in AIS syllabus are business process, systems documentation techniques, IT controls and IT audit. Majority of the AIS syllabus also include some type of software coverage with Access and Excel being the most taught. At a conceptual level, the future of AIS will not be very different from its present state.

The use of accounting software in class aligns with what students are likely to experience in the profession (Boulianne, 2014). Therefore, the importance of topics and to what extent information system should be contextualised within accounting education requires some improvements and modifications. Importantly, students should be educated on what the software should do rather than the software itself (Neely et al., 2015). As systems knowledge and understanding become more and more necessary tools for the accountant and auditor, accounting education will need to address this necessity. However, there are limited research that examines teaching innovations in AIS including what worked well and what did not work.

Given the vast evolution of information technology, and the seeming omniscience of Internet of Things (IoT), the career-relevant value of memorization may be limited to its role in examination. At best, this prioritization of memorization over analysis is an innocuous but banal use of a student's time; at worst, it runs counter to the dynamic, progressively updated set of analytical skills needed by both accountant and auditor of today and tomorrow. Professional accountants need to be able to think critically and analytically, make associations, detect anomalies, and apply conservatism; all of these skills rely mainly on understanding of processes rather than memory of specific standards. More than that of any other subject, the pedagogy of AIS revolves around a set of dynamic tools and developments that force a different manner of course preparation and conceptualization.

Despite being around since 1990s, Enterprise Resource Planning (ERP) is still very much relevant in business activities globally. ERP provides an integrated view of core business processes using common databases maintained by a database management system. ERP systems were designed to integrate silos of information from functional areas such as accounting and finance, human resource management, sales and distribution, project management and logistics to increase efficiency and enhance flexibility (Sanjay et al., 2013). The widespread usage of IT, especially ERP has indirectly expanded the role of accountants in the analysis and design, evaluation and use of information systems. Moreover, the revolution of industry 4.0 has results in increasing competitiveness in
dynamic and volatile markets. These, in turn, have a significant impact on industry and markets, while also affecting the direction of accounting education.

In equipping future professional accounting with the desired advanced IT skills, it is essential for the teaching and learning of AIS to be improved. However, the extent of exposure of AIS software for accounting students is still an ongoing debate. A better apprehension on improving the learning experience using different modes of teaching technologies, for example in-class, computer labs or a combination of these or other modes (Apostolou et al., 2014) is crucial. Therefore, the current study focuses on the integration of ERP into AIS education for undergraduate accounting students as part of their hands on learning experience. This study provides two potential major contributions to the body of knowledge. Firstly, and in general term this paper highlights the issues relating to AIS education. Secondly, this study provides some experience of the integration of ERP in AIS education that would informs future adoption of related AIS software in the classroom.

2. Literature Review

Conventional accounting practices used to concentrate on bookkeeping and financial reporting with the main objective are the preparation and presentation of financial statements. These activities were driven by the need of financial information users (both internal and external) to obtain a ‘fair view’ of the firm. Over the years, the users information need have expand beyond the conventional needs and therefore technology too has evolve to cater the progression. Accounting services was first outsourced in the early 1920s between British Petroleum and Accenture. This has induced a major revolution of accounting services, from the bookkeeping function to the strategic management and decision making support.

While business practices and accounting services have developed and matured a great deal over the past centuries, the revolution of IT has disrupted the accounting profession by radically transforming the manner in which business is conducted. This new trend witnessed the emergence of AIS as a sub-discipline of accounting. Later on, AIS was developed across a much broader array of tasks in non-accounting divisions of organizations. The increased availability and sophistication of IT have certainly increased pressure on the accounting profession to do things differently. In the meantime, several business software solutions are being introduced in the market. Among them are ERP, which was developed to assists the integration and automation of business process such as accounting and finance, human resource management, sales and distribution, project management and logistics to increase efficiency and enhance flexibility (Sanjay et al., 2013).

ERP evolved from Materials Requirement Planning (MRP) and Manufacturing Resource Planning (MRPII) systems from the 1960s through to the 1980s. In 1990, the Gartner Group first developed the acronym ERP (Dahlen & Elfsson, 1999). In the 1990s ERP systems became the standard for replacing legacy systems in large and multinational organisations (Nazemi et al., 2012). In the 2000s ERP systems evolved from enhancing operational efficiency to supporting competitive advantage innovations and strategy (Sanjay et al., 2013). ERP systems share common data in a real time environment that enable management and employees to have a unified view of all business functions across all departments (Kumar et al., 2003), that is an enterprise-wide view.
ERP are known for its ability to manage large amounts of transactional and operational information. This data is typically used to forecast both short and long term production needs. Today’s on-demand consumption models paired with customers’ desire for highly customized products require real-time, or live, data. There is an enormous potential for real-time information exchange between the business layer and the production layer that could increase operational efficiency, and enable organizations to become more flexible and responsive to customized, changing demands. The latest market research report by Technavio indicates that the global ERP software market is expected to grow by more than 9% during the period 2019-2023 (Technavio, 2019). Moreover, the recent evolution of ERP into intelligent ERP with blockchain technology, cloud, artificial intelligence (AI) and machine learning, will further drive the adoption of ERP. Furthermore, based on a survey of practitioners, Abu-Musa (2008) finds that accountants also requires to have some knowledge on IT security and IT documentation techniques, and fraud and forensic techniques (Kearns, 2006), database architectures and computer-based analytical software (Hunton, Bryant & Bagranoff, 2004).

The widespread use of IT in organizations has expanded the role of accountants in the analysis and design, evaluation and use of information systems. Specifically, the sophistication and complexity of AIS requires the professional accountants to acquire an advanced IT skills. This situation has in turn stirred up the accounting education curriculum in effort to keep up with the advancement of IT. It is crucial for accounting programmes to incorporate sufficient IT knowledge and skills into the curriculum to meet the current demand of the corporate world. In parallel with the recent development in IT, it would be beneficial for accounting students if the application of AIS software are embedded in the AIS syllabus.

Correspondingly, in 2006, the Malaysian Institute of Accountants (MIA) and Ministry of Higher Education together with the local institutions of higher learning have established “Hala Tuju 2 Program Perakaunan” report (Jabatan Pengajian Tinggi, 2007). The objective of the report is to ensure that accounting programmes offered by local universities are in line with the global developments within the profession. One of the important points agreed by the committee is for all public universities to have a minimum of three AIS courses in the structure of an accounting programme. These courses include an introduction to IT, AIS, and system analysis and design.

Although there are several existing literature on AIS, studies on the integration of IT (AIS software) in accounting education is still limited and scanty (Chayed & Best, 2005) especially those in the developing economies such as Malaysia. Given the multitude of generic and technical skills that accounting students must acquire, it would be insightful to understand the outcome of IT integration in AIS syllabus. IT integration in AIS syllabus using ERP requires a redesign of the curriculum, rather than an ad hoc approach. ERP entails that accounting function should integrates with all the other functions in an organisation such as marketing and sales, manufacturing, logistics and human resource management.

The aim of integrating IT into the accounting curriculum is not to produce “technically minded boffins” who have personal love affairs with the computer. The goal is to produce “hybrid accountants”, whom are capable of evaluating IT issues such as strategic alignment, value delivery, resource management, performance measurement, and risk management in some depth and thereby, bridging the “information-technology gap” for themselves. It is important to understand that these knowledge and skills
development approaches only need to focus on key topics, their business objectives and their business impacts. Finally, concerted efforts from all relevant parties are necessary to fully integrate the IT knowledge and skills into the existing accounting curriculum.

Despite the significance of IT in particular AIS to the accounting profession, accounting educators are not moving aggressively enough to develop sufficient IT competencies at tertiary level. In Malaysia, the responsibility to integrate IT into the accounting curriculum often rests on the shoulders of a small group of junior AIS lecturers (Ismail, 2003). Ismail, Tayib and Salim (2005) also points out the significant shortage of trained academic accountants with both accounting and IT interests and skills to make significant improvements in the accounting curriculum. Therefore, the efforts to integrate IT into other areas of accounting such as financial accounting, management accounting, auditing, and taxation remain an issue among local universities.

A study by Boulianne (2014) compared the knowledge acquisition of students who completed a case study using software with students who completed the same case study manually. The findings indicate that the hands on benefits of using the software provided learning benefits and enhanced the classroom experience. This indicates that students should have some exposure to this type of software in the Accounting curriculum to better prepare them for the expectations of employers. This study corresponds with an earlier study by McDowall and Jackling (2006) in which they found that integrating accounting software provides students with a more accurate reflection of what occurs in organisations where they will eventually work and better prepares students for the business world and accounting profession.

On the other hand, it has been argued that accountants should only concentrate on the “information” (I) part, which they are best at, and leaving the “technological” (T) aspect of the “information technology” to the IT or information system professionals. Many also fear that blending accounting education with IT knowledge would eventually produce “halfbaked, half-cake” accounting graduates. However, in keeping up with rapid technological advancement, accountants need not only have a good understanding of business information requirements but also information system processing capabilities in order to create and sustain competitive advantage of the organisation they work with. The accounting profession needs to expand their reporting functions beyond the scope of traditional AIS. Accountants need the knowledge and ability to analyse not only financial but also non-financial information, using appropriate technology, and convert those results into predictive tools. Thus, a new generation of accountants, in addition to the already strong accounting and business backgrounds, also require adequate IT knowledge and skills to add value to any organisation.

Nevertheless, using AIS software without the necessary understanding of the underlying theories and concepts may not achieve learning outcomes (Lane & Porch, 2002). Moreover, any potential benefits of using AIS software may be lost if students have a negative attitude towards the software (Lane & Porch, 2002). Therefore, a careful consideration of the learning outcomes for using AIS software is important for successful integration into the curriculum. Meanwhile, accounting regulatory body, professional body, practitioners and educators must adopt an appropriate vision for the future and take leadership roles in their areas, assess the current state of affairs, help to develop a plan to address the problems and obstacles, and a monitoring programme to encourage progress.
3. Research Method

The study was conducted with collaboration with SmartLab Accounting Sdn Bhd, one of the ERP system provider in the northern region of Malaysia. The purpose of this study is to gain some insight on the integration of ERP in accounting education, particularly in AIS course. The focus of the integration is on exploring and understanding how theoretical accounting and auditing principles may be implemented in practice in a real-world ERP environment. This experimental study was conducted in a classroom setting in one of Malaysian public university for students of Bachelor in Accountancy. The AIS unit was a core course for Bachelor in Accountancy. The course was taught in a two hour lecture and one hour tutorial format. The course typically had an enrolment of between 100 and 120 students. Among the topics being covered in the course are accounting information systems, internal controls, business processes, systems development and information system audit. Students were expected to adopt a critical approach on the role of information systems on the accounting function to understand the critical nexus between the accounting and information systems functions.

The AIS unit as taught in Semester 2, 2019 had the following learning outcomes:

i. Construct documents for accounting information systems based on the requirements of specific economic and business process

ii. Identify and devise controls to prevent computer fraud, abuse and threats in the digital age

iii. Operate the information systems for transaction processing in various cycles including sales and receivables, purchase and payables, production, human resource and payroll, general journal and budget and reporting cycles

iv. Analyse economic information and the prime results from accounting information systems

v. Analyse threats to each of the process cycles and apply the internal control procedures to overcome the threats

vi. Design chart of accounts for accounting information systems

For students to be able to achieve the learning outcome, 'analyse economic information and the prime results from accounting information system', the teaching staff had to design a hands-on assessment task. The AIS course had traditionally used an accounting software package to achieve this learning outcome, either MYOB or QuickBooks. The course assessment tasks included a test (20%), ERP lab assignment (20%) and final exam (60%). Students learnt about ERP from the lab assessment activities. The assessments were designed to provide students with hands-on ERP activities. The overarching aim was for students to develop an understanding of the relationships between business processes and the concepts of ERP. The ERP assessments contributed to the learning outcomes 1, 3 and 4.

The ERP lab assessment was a self-practice assessment which was made available for the students from week 1 of the semester. It required students to use ERP online materials provided to them in their own time and attempt a number of given activities and questions. The introduction of ERP was demonstrated to the students by a guest speaker who was an ERP industry expert. Student support also included a step-by-step manual guide book and online video tutorials. Students could also access the practice sets in their own time. In addition, computer labs were booked and lab demonstrators were provided to assist students on their hands-on experience with ERP throughout the whole semester.
Students were asked to complete an online survey on their experiences of using ERP during the second last week of the semester. Surveys were conducted on a voluntary basis and the identity of survey participants was anonymous. This was to ensure that students were free to express their opinions and that they did not feel there would be any implications on their grades. Apart from the survey, the students were also asked to write a reflective essay to provide their input regarding the integration process and outcomes. The results of both the survey and reflective essay were used to inform decisions about the appropriateness of using ERP software in this course and how ERP could be further integrated into the program to improve the curriculum.

4. Result

This section is divided into two parts: from the students perspectives and from the instructor perspectives.

4.1. From the students’ perspectives

The findings from the survey showed that a large portion of students reported enjoying the ERP experience. A small number, fifteen percent (10%), of participants was not satisfied with the ERP assessment and recommended that the assessment not be used in the future. The reason behind the dissatisfaction of this small group of students may be partly explained by the student’s difficulty in using the instructions for the assessment. Twenty six percent (26%) of students needed clarification and more detailed information about the assessment task.

Table 1 summarises students’ perspectives about their experience of using ERP. Students generally enjoyed the teaching material. The ERP assessments allowed students to access and practice ERP free of charge and enhance their resume for their future careers. However, some students found it difficult or time consuming to familiarise themselves with the ERP user interface. Some required more detailed instructions for using the software which suggests that the software is not intuitive and requires specific instruction.

Table 1: Student perspectives on using ERP

| Benefits                                                                 | Issues and limitations                                                                 |
|-------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| Students in general enjoyed this ERP assessment task as they believed it would help them in finding jobs. | The instructions for doing the assessment could have been clearer.                     |
| The resources (e.g. manual and video tutorials) were useful.            | Some students found it difficult to use ERP interface to find particular links, and to know where to go for additional help. |
| The opportunity to work with ERP free of charge was appreciated, as it is not feasible for many people to access ERP free of charge. | Lack of basic computer lab facilities.                                                  |
| Students found that materials provided for their hands-on experiences of ERP are useful including the demos and videos. | The hands-on session was in a large group, a smaller groups would be preferable.        |
4.2. From the instructor perspectives

There were a number of challenges in integrating ERP in teaching AIS. The implementation was particularly challenging when delivering ERP to students in a mass lecture. The first challenge was the amount of time and effort needed for the design of ERP assessments and developing the teaching materials. Teaching AIS using ERP requires a redesign of the curriculum, rather than an ad hoc approach.

The clarity and the level of detailed information that needed to be provided to students played a critical role, especially as it was a self-practice task. The teaching team (from the university and Smartlab Accounting) mitigated this challenge by providing a number of interactive learning materials such as step-by-step manual, online demonstrations, and video tutorials.

Students’ computer literacy was another challenge. While the instructor assumed that all students knew how to use computers for accessing ERP, many students had difficulty in doing some basic computer tasks such as activating their user IDs for the first time, changing their password, or saving their files for future use. While support was provided to students through alternate weekly face-to-face consultation for 2 hours, a large number of students’ issues had to be resolved through long emails, WhatsApp and telephone conversations. It is important for the instructor to be resourced with technical and pedagogical support to achieve the learning outcomes effectively and efficiently.

5. Conclusion

Among the significant findings from the current study is the level of training that needs to be provided to the lecturer as the class instructor. It is essential to properly develop skills and capabilities of academics that will be involved in teaching ERP content in the classes. The instructor require training in both the software and how to effectively develop assessment tasks including marking. Integrating ERP into the curriculum requires that the instructor establish a clear and compelling learning outcome for students. Introducing students to business functions and business processes, exposure to ERP systems, implementing case studies, providing hands on ERP module training are valuable skills for the workplace. However, it was out of the scope of this current paper to investigate the specific roles and skills that need to be considered for effective training of ERP instructors. Future studies therefore can investigate such roles, and suggest specific strategies that for developing academics capabilities for teaching ERP software to the undergraduate and/or postgraduate students.

It is also found that students were very keen to use ERP as part of the curriculum for developing skills and capabilities that make them more ‘work ready’ after graduation. Students in particular enjoyed the exposure to ERP, as they were hoping this knowledge would add their chance to find a job after graduation. However, given the size of ERP software and their capabilities, the question is to what extent the content of ERP should be integrated into an undergraduate or postgraduate course. Future research is needed to investigate factors that would impact how much ERP content should be integrated into existing courses. Lastly, although ERP provides a lot of resources for academic teaching and learning, it is found that these resources have very limited flexibility to be adopted and/or changed for different courses and for different institutions. This is a challenging issue for instructors, especially for larger environment, and therefore future
research is needed to investigate alternative ways for structuring and preparing resources for teaching ERP content in accounting information system courses.

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Conflict of Interests

The authors reported no conflicts of interest for this work and declare that there is no potential conflict of interest with respect to the research, authorship, or publication of this article.

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