Development of the Accounting Information System as Teaching Content to Improve Information Technology Competency in Graduates

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Abstract:
The purpose of this study:This paper provided a summary of various previous studies on conceptual frameworks that highlighted only SIA content that needed to be developed so that graduates could provide many contributions in the company from the aspect of applying information technology according to the competencies required by the AICPA.

Methodology: The approach in developing student learning content was to use concept mapping to integrate various scientific disciplines related to information technology whose development was always dynamic.

Main Findings:The results of the study showed an approach to an information system learning content framework that involved computer science and accounting disciplines that were integrated and aligned with current needs based on the principle of mapping concept.

Through this development framework, students were expected to be able to understand an accounting activity within the company and apply aspects of information system knowledge in financial reporting activities.

Keywords: *accounting information systems, teaching content, graduate competency, information technology.*

1. INTRODUCTION

The accounting information system lectures require students' core competencies in their ability to apply, assess, design to utilize information technology to solve problems in accounting information systems. To achieve this competency, an understanding of the role of information technology is needed in the ideal accounting profession in the future so that the accounting profession is not only skilled in traditional bookkeeping problems, but can help the company's management -+9of the application of information systems applied. In short, the Information Technology approach responds to the challenges of each accounting according to Belfo and Trigo (2013):

1. Web Services & Internet of Services: Web Services related to communication via the internet that facilitates Enterprise Application Integration (EAI), such as electronic commerce (e-commerce)

with clients and suppliers. At present, these services build integration between different systems such as the Accounting Information System (SIA), operational systems and web applications. It is also expected that financial accounting information improves economic performance by reducing detrimental selection and risk liquidity.

2. Mobile devices: The mobile revolution through wireless technology brings changes to many aspects

of how to do business, providing significant data in real time and everywhere to help decision makers, influence communication between companies and their customers. This trend reveals the importance of m-commerce for organizations, etc., the importance of integrating their systems and performance data with SIA.
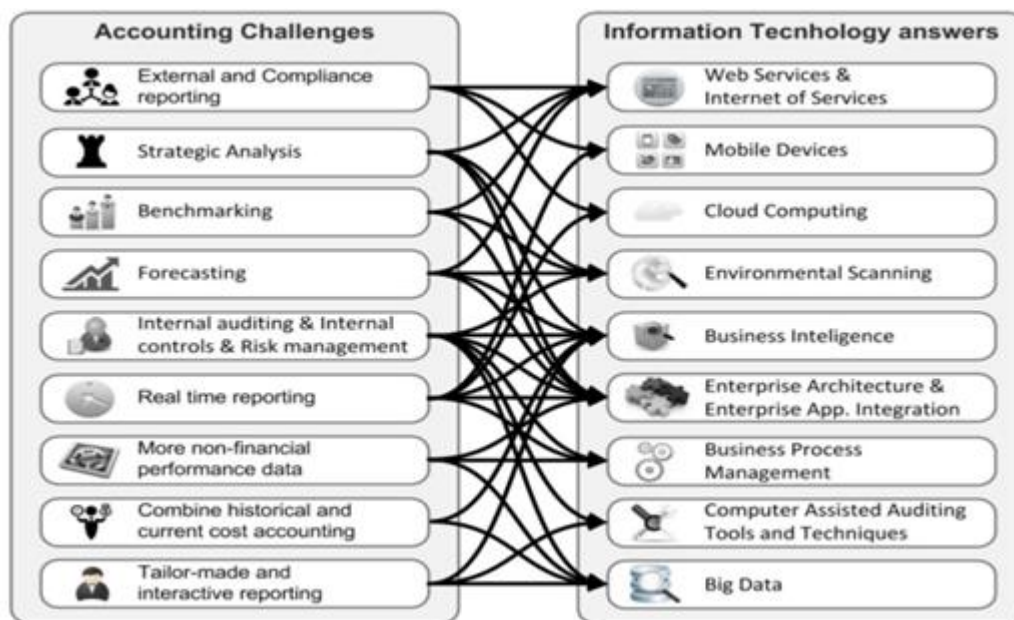

Figure 1. Challenges of Accounting and Information Technology Answers(Source: Belfa and Trigo (2013)

3. Cloud Computing: The use of web-based systems allows the application of web-based accounting software so that it can reduce accounting software at home. Technology answers can range from hosted solutions, online and on-premise mixed solutions or fully online accounting software, with cloud-based solutions, which means architecture based on Software-as-a-Service (SaaS), also known as Cloud Computing. Examples of these products are NetSuite Financials, Intacct Financial and Accounting Systems, SAP ERP Financials, Microsoft Dynamics GP, Epicor Financial Management or SAGE.

4. Environmental Scanning: Scanning of the environment can be defined as the acquisition and use of information about events, trends, and relationships in the organization's external environment, knowledge that will assist management

in planning future programs of the organization's actions. The organization still ignores external information. However, it is still important to make strategic decisions. So, it is important to develop a system that can look for external information that can be used to help the organization.

5. Business Intelligence: By handling a large amount of information, BI helps organizations not only at a strategic level, but also at a tactical and operational level, providing useful insights that help not only on decisions but also middle managers, offering dashboards created. BI often engages processes such as data mining, process mining, statistical analysis, predictive analysis or predictive modeling, which can support management accounting analysis tools such as forecasting, or management support, such as identifying and analyzing strategic choices, decision

support, strategic management accounting or risk management business. Accounting intelligence is a type of business intelligence specialist, expression which means a set of technologies used to extract, analyze and present information from accounting and ERP applications.

6. Enterprise Architecture & Enterprise Application Integration: Providing a holistic view of the company is the most important characteristic of enterprise architecture. This higher system integration brings together information from previously unrelated domains. Among other aspects, corporate architecture must provide an integration framework that sits on top of individual architecture and guidelines for defining and establishing interoperability requirements. Usually, corporate architecture design is very dependent on the integration of various applications so that they can share information and processes freely. This is usually called the Enterprise Integration Application (EAI) keyword. EXtensible Business Reporting Language (XBRL) contributes to that goal. XBRL, an XML-based language, is a standard that is available and globally free to exchange business information, allowing general expression needed in business reporting. Integrated and diverse architecture enables several accounting challenges presented such as strategic analysis, benchmarking, forecasting, internal audit, internal control, risk management, real time reporting and a combination of more non-financial data.

7. Business Process Management: Some authors emphasize the importance of the process of calling them 'strategic assets'. For example, Kaplan and Norton refer to "Map Strategy", with intangible assets that affect company performance by improving internal processes that are most important in creating value for customers and shareholders. Preferably, an important part of information must be included to enrich reporting, including different types of data, such as certain performance data originating from the workflow of all the main processes. Dematerialization of the process makes it possible for BPM to support the delivery of non-

financial data for accounting information systems. Whether at the operational level, or at the strategic level, process management also administers performance indicators and other types.

8. Computer Assisted Auditing Tools and Techniques (CAATTs): Auditors need Computer Assisted Audit and Engineering Tools (CAATs) to improve capabilities and productivity. Many of these tools and techniques can be implemented at a minimal and relatively easy cost, ranging from maximized use of office suite software to Audit Command Language (ACL) and Interactive Data Extraction and Analysis (IDEA) for data extraction and analysis. These tools can be used to perform various analytical procedures on various financial data including ledger entries, payroll and debt data accounts and trial balance calculations for flag outliers, miscalculations, or suspicious.

9. Big Data: Large companies always produce large amounts of data. company business manages several businesses. Accounting and financial information from different businesses around the world join large non-financial data. However, today, businesses of all dimensions tend to produce more data than they did in the past. According to Phil Ostwalt, partners in KPMG, as more and more business activities are captured electronically, it is important to ensure that companies have the right technology and resources to manage data analysis and the big data challenges inherent in all compliance arenas. Internal audit, internal control and risk management are areas where large data can represent important answers. This large amount of data brings new and special foreign challenges to most developers. big data techniques that are important for answering these challenges.

Based on this accounting challenge, we need a better understanding of the role of information technology through learning methods, one of which has been implemented in Indonesia is the Project Based Learning approach. Research through the PBL method from a descriptive qualitative approach conducted by Laturette (2012) and NurdionoNurdiono, et al (2019) concluded that the

PBL method can help students understand accounting information systems in the real world, understand more and are more suitable. Therefore, through the application of this model it is expected that the role of the lecturer as an educator can arouse learning interest, learning motivation and student participation in the learning process.

The concept and structure of teaching accounting information systems has undergone dramatic changes in recent years. In managing accounting information systems, accounting professionals have traditionally dealt with organizations, controlling and processing financial information. The key technology areas for accounting professionals must focus on the evolutionary state in which information activities that increase the attention of accountants according to Sandra and Stacy (2012) are:

1).Repair or replace existing systems

2).Integrating new and existing systems

3).Use technology to present better information users

4).Produce better information to help make decisions

5).Determine appropriate investments in information technology

6).Determine how information systems support the company's strategic goals

7).Analyze how information systems support the organization's value chain

Based on the description above, it requires an SIA teaching content that refers to the needs of the role of accountants in the future, especially related to the integrated aspects of corporate information systems. In this paper we discuss learning needs and content that need to be included in the accounting information system curriculum based on some previous studies.

Sandra and Stacy (2012) approached the broader context of the systems approach and provided 3 main foundations that led to SIA education into the curriculum trend, namely: accounting, technology and emerging trends. The challenge in SIA education according to Sandra and Stacy (2012) is on a systems approach that can be classified as follows:

1. The transaction cycle approach, which focuses on recording economic events and their flows in the monthly, quarterly, or annual report cycle.

2. Business process approach, which is defined as the displacement of the transaction cycle approach and its emphasis on how information can be captured from the entire area of the organization, not just accounting.

3. Blended approach, which incorporates elements of all elements of the transaction cycle approach and some characteristics of the business process approach. This can be done by incorporating the concept of non-financial information that emphasizes internal reports rather than externally.

The literature review and descriptive research through interviews, discussions and questionnaires by accounting information system educators, Doost et al in the Review of Business Information Systems concluded that consistency and non-uniformity in teaching accounting system information courses may not be necessary because more practice is very needed in the dissemination of knowledge in the study of accounting information systems. According to Anggarwal (2012) it is important for accounting students to understand digital accounting processes, data management, automated reports, digital fraud and forensic accounting. Therefore, the SIA lecture must be able to help how data and documents flow and how controls are placed in the risk mitigation process. Pedagogy in SIA teaching also includes traditional methods namely: rules of the game, case studies and videos. The SIA teaching curriculum material in the context of the AICPA (American Institute Certified Public Accountant) includes 5 main competencies as written by Anggarwal in the paper Challenges of Teaching Accounting Information Systems, namely:

a. Decision modeling (Decision modeling): use case analysis

b. Risk Analysis: use the rules of the game

c. Leveraging technology (Leveraging technology): use cases

d. Measurement (Measurement): use videos and demonstrations

e. Reporting: using hand skills.

Further research on business use and solution accounting software in SIA courses can provide additional insights into the various approaches and challenges faced by SIA faculties. According to Richtermeyer and Kovar in the Business Information

Systems Review concluded that increasing understanding of the relationship between approaches and pedagogy of various types of technological problems brought into the classroom can help SIA educators achieve effective plans to weigh just how many new theories, applications, and technologies are suitable for them .

2. LITERATURE REVIEW

2.1 Position Of Accounting Information Systems In Company Information Systems
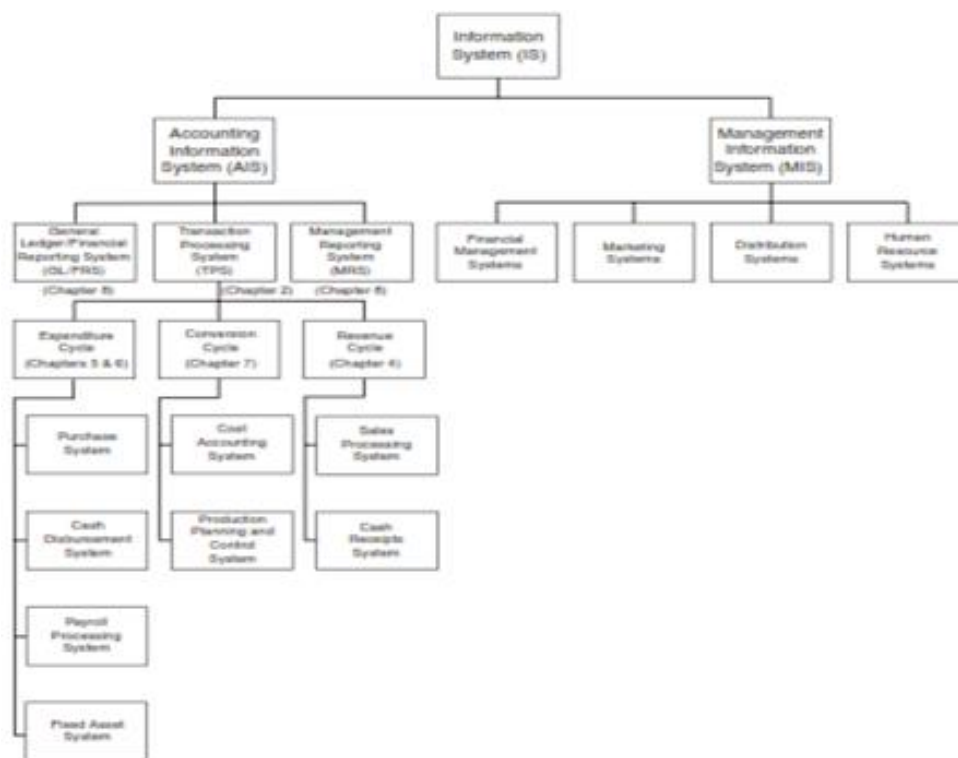

Figure 2. Position of SIA in Company Information Systems(Source: Hall (2006))

The position of SIA in company information systems is shown in the figure above according to James Hall (2006), where SIA is part of an information system that oversees 3 functions, namely GL / PRS, TPS and MRS.

2.2Career In The Accounting Information System

The role of accountants in managing accounting information systems relating to information technology according to Hall (2006) includes 3 main functions, namely:

1. Accountants as users

In many organizations, the accounting function is the single largest user with regard to information technology and as an end user, accountants must provide a clear picture of the accounting needs of professional services that design the system

2. Accountants as system designers

An appreciation of accountants' responsibility for system design requires a historical perspective that uses computers as business information equipment. The responsibility for the system is divided into 2 things, namely the accounting function is responsible

for the conceptual system which involves the specification of criteria to identify delinquent customers and information that needs to be reported. Meanwhile, another function is IT professionals who are responsible for the physical system which is a method for capturing and presenting information.

3. Accountants as system auditors

In terms of auditing, accountants express opinions about the fairness of the company's financial statements. As an auditor, accountants can perform two functions, namely: external auditing or often called independent auditing and internal auditing assigned to the company. Career opportunities abound for those with a strong foundation in SIA, including traditional calling of financial accounting and managerial accounting, as well as careers in the field of consulting and information systems auditing and security.

Key questions or objective should be written

3. METHODOLOGY

This paper used the literature study method, namely by making a summary of previous research regarding the development of the teaching information system accounting content, so conclusions could be drawn that can be recommended. To implement the development of learning content, this paper discussed the development of SIA teaching content with a mapping concept to achieve the intended learning goals.
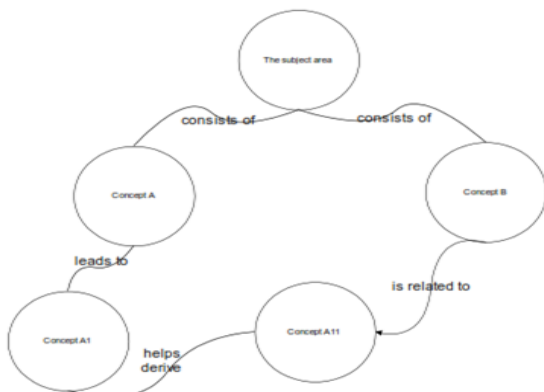

Figure 3. Structure of the Mapping Concept (Source: Raval and Shimerda in the Integrating SIA Course ContentUsing Concept Maps)

Novak (1998) and Barusman,Andala Rama Putra and Tina MB Virgawenda (2019) defines concepts as regularities that are felt in events or objects, or records of events or objects, designated by labels. For example, there are various forms and kinds of things we call chairs, but once a child has a concept chair, the child will label correctly almost anything with a seat, back, and legs as a chair (Macnamara, 1982). The concept mapping methodology was developed using Ausubel's theory of meaningful learning, which shows that meaningful learning is a process in which new information is related to relevant aspects that exist from an individual's knowledge structure.

4. RESULTS ANDDISCUSSION

4.1 Analysis Of Text Book Contents

Badua (2008) conducted research on 15 SIA topics such as the table below:

AIS and Accountants
Auditing Computerized AIS
Computer Fraud and Security
Control and Security
Control for Computerized AIS
Databases and Data Modeling
Documentation
E-Commerce
Systems Study: Planning and Analysis
Elements and Procedures of GL Systems
Introduction to Data Processing
Systems Implementation and Maintenance
Systems Study: Systems Design
AIS Technology
Transaction Processing

Table 4.1. 15 SIA Topics in the study (Source: Badua (2008)

The results showed that the number of pages devoted to a particular topic differed significantly across textbooks in 6 of 15 topics. These include: computer fraud and security, documentation, e-

commerce, system planning and analysis, introduction to data processing, and SIA technology. The different coverage of the topic implies that textbooks place different emphasis on the topic. One book may be lighter in the scope of a particular topic than the other. Therefore, it can be said that some textbooks may be weaker or stronger than others in the depth and rigidity that they cover certain areas. One can argue that the pace of innovation contributes to the number and diversity of SIA topics, and that there is disagreement among authors for which topics are more / relatively most important to each other in the SIA curriculum. As a result, significant differences in the scope of the topic of the book suggest that there might be a lack of consensus among SIA faculty, which manifests in the books they write.

4.2 Symbol Content Analysis

The final analysis carried out in this paper is based on an analysis of the contents of the syllabus of 65 SIA programs offered between 1997 and 2007, collected by Badua (2008) using Google web search. The focus of this analysis is to complete the faculty survey data and of course the textbook used in the previous analysis. Surveys documented lecturers' perceptions and aspirations, textbooks reflect resources that have the potential to inform or influence what is taught, but syllabi only, which is seen as a contract between instructors and students, which is arguably the proxy closest to what is actually taught in of course. In addition, the use of Badua for Google to detect and identify syllabus producing documents which is likely to be the most influential for faculty looking for a blueprint for their own SIA program because this is a document that will appear from that search. Overall, the literature and reviews of institutional efforts to influence SIA programs, faculty opinions, and course material in the form of textbooks and of course syllabus, suggest that the rapid proliferation of SIA topics indicates the need for special consideration when designing the SIA curriculum. these considerations need to balance accommodation

from more stable topics with the ability to discuss new topics that are relevant. Fogarty (1991) recommends different models that are used to structure study programs and courses in disciplines where there is a proliferation of different topics. At one extreme is a fragmented model, where a small number of very closely related topics are taught in several separate, narrowly focused courses. At the other extreme is a connected model, where a spectrum of diverse topics is taught in one course. According to the newspaper, not extreme is usually feasible, because of the loss of the macro perspective in the fragmented model, and the heavy demands on the faculty in the connected model. In contrast, other models lie between the two proposed extremes. These include nesting, sharing, and sequencing instruction models.

4.3 Competency Of Aicpa

AICPA (www.aicpa.org) has suggested a very comprehensive list of competencies that most accounting professionals need whether professional people are practicing in public accountants or some other area. AICPA's core competencies are divided into three major groups; The following are some of the very related accounting information systems (AICPA, 2013):

1. Broad business perspective competency
• Strategic for critical thinking. Critical thinking includes the ability to link data, knowledge and insights together from various disciplines to provide information for decision making. Being in tune with the 'big picture' perspective is a component that is needed for success.
• Management of resources. Individuals entering the accounting profession must be able to apply management and human resource development theory to human resource problems and organizational problems.
• Research. Individuals preparing to enter the accounting profession must have strong research skills to access relevant guides or

other information, understand and apply them.

2. Personal competence

• Problem solving and decision making. Professional accounting is often asked to distinguish the true nature of the situation and then determine the principles and techniques needed to solve problems or make judgments. Thus, individuals entering the accounting profession must display effective problem solving and decision making skills, good insight, and judgment, as well as innovative and creative thinking.

• Communication. Professional accounting is called upon to communicate financial and non-financial information so that it can be understood by individuals with diverse abilities and interests. Individuals entering the accounting profession must have the skills needed to provide and exchange information in a context that is meaningful and with the right delivery.

Finally, the SIA study will also help us to understand business processes from an accounting perspective; business processes are a very common way of conducting SIA courses. AICPA core competencies are skills that are recommended as a minimum set of skills desired to enter into the accounting profession. This competency is in the form of on-line resources available to all interested parties. Then the author has classified competencies into sub-regions that are relevant to and impact the SIA program.

4.4 Design OfSia Course Content

Based on previous research, it can be known that the success of lecture content depends on the ability of stakeholders to determine the factors that predict the success of the program. The design of the Accounting Information System course content as examined by Lallo and Selamat (2013) is outlined below:

1. Needs of entrepreneurs,The dimensions aim to determine the core needs of graduate accounting entrepreneurs, which are divided into three sub-dimensions, namely, core knowledge, business

environment and personal and interpersonal skills. a). Core knowledge, consisting of: the ability to deliver technical capabilities and soft skills to learners, the ability to acquire knowledge of specific business functions of the organization, the ability to have sufficient planning that supports the functions of accounting software applications, the ability to automate applications, include appropriate programming languages, the ability to effectively communicate in supporting accounting application software, and the ability to develop learners to become knowledgeable future facilitators. b). The business environment, which consists of: the ability to acquire specific industry knowledge, organizational-specific knowledge, general business environment, organizational ethics and other SIA organizational environments. (Jones, Peter and Daphne Comfort, 2018). c). Personal and Interpersonal Skills (PIS). This dimension consists of ten items, namely: the learner's flexible ability from one job to another, self motivating ability, creative thinking skills, critical thinking skills, the ability to build work teams, communication skills between people.

2. Professional Association

This is the second main dimension of the questionnaire designed to obtain information that is considered important by accounting professional bodies in relation to the development of course SIA content. This section contains six items that can describe the influence of professional bodies in SIA on the development of content courses.

3. Learning environment

The first is the current technology of the second country learning approach, the last sub-dimension is participatory learning and teaching methods, namely: a) Current technology b) Learning Approach (LA). c) Participatory Learning and Teaching Methods.

4. Information Technology Knowledge Components.

The component of technological knowledge consists of: a). GeneralKnowledge Technology (gitk). b). Knowledge Control Information Technology

(ITCK). c). Competency Information Technology (ITC).

5. Characteristics of instructors

In this part of the questionnaire, the researchers utilized ten items to measure the moderate effects of

instructor characteristics in developing course content.

6. Development of SIA content courses

Based on the discussion above, the last part of the research questionnaire was designed to obtain information about the SIA content course.
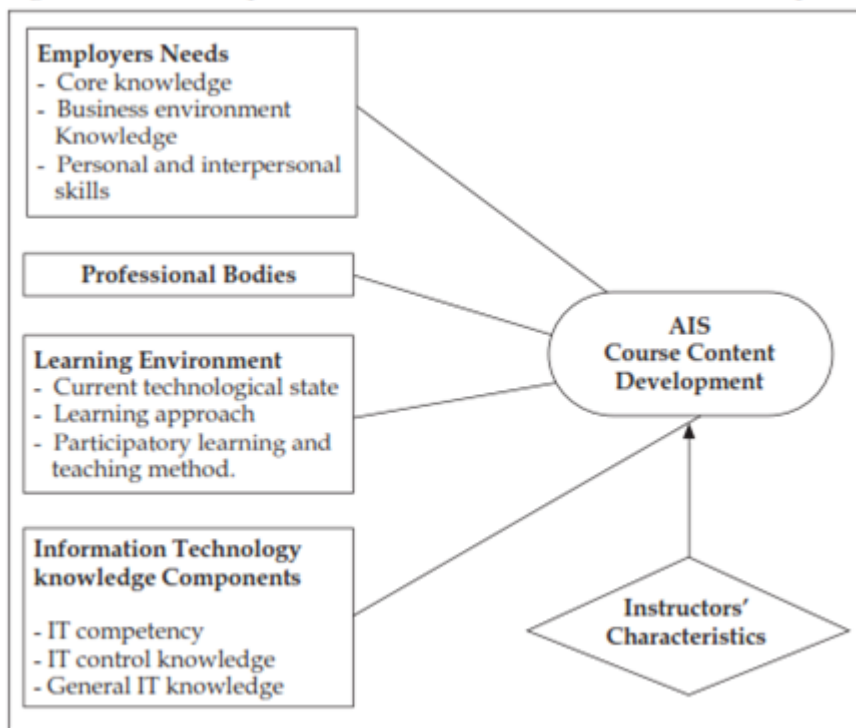

Figure 4. Conceptual Development of Teaching Content SIA Framework(Source: Lallo and Selamat(2013))

4.5 Development Integration With Concept Mapping

In developing concept maps for integrating SIA lecture content, this approach is to first identify concepts in accounting. These concepts are then matched with related concepts in information systems and information technology. In addition, it is determined that accounting output is all several types of information. This high-level map is then used to further illustrate the detailed concepts involved. The identification of concepts in the concept can proceed in two directions. One is to remain in the discipline and the other is to connect all disciplines.

The example in figure 5, presented an integration of the development of SIA learning

content with a mapping concept (mapping concept) where the topic developed was adjusted to the instructor characteristics of the concepts of Lallo and Selamat which cover the needs of users, professional associations, learning environments and information technology components. The end result of developing this mapping concept is expected to be a match between aspects of the information system and the expected accounting work as an example so that transaction processing functions into accounting information can be well understood by accounting learners.
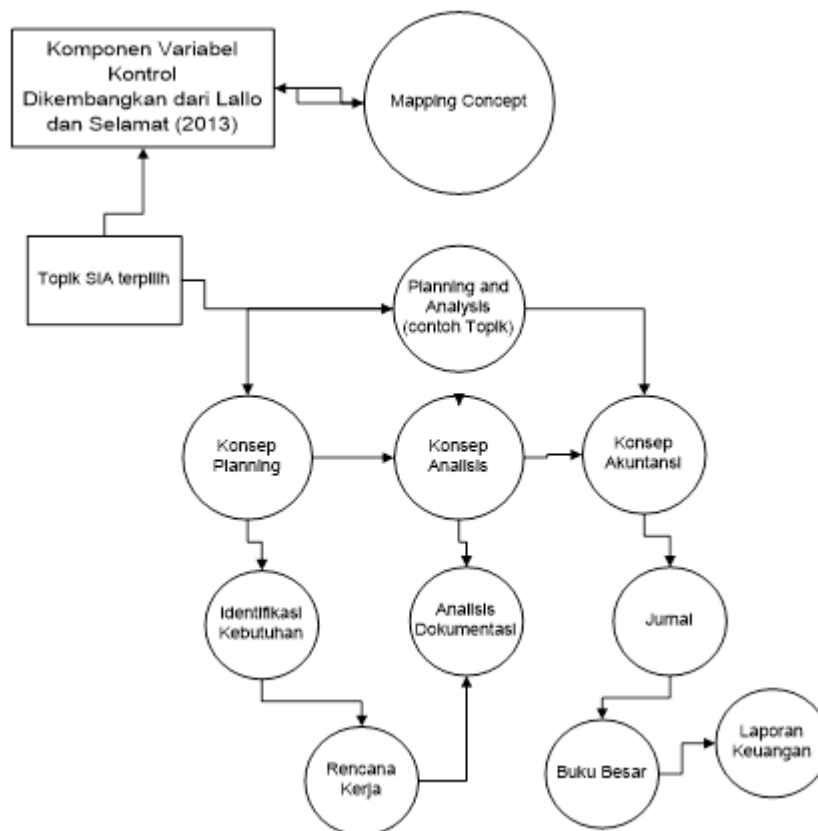
Figure 5. Integration of Concept Mapping in the SIA Learning Model

5. CONCLUSION

Teaching accounting information system subjects when faced with the challenges of the development of information technology is a very complex problem that requires a method of integration in a clear path.

1. Evidence from previous research has shown that the success of lecture content depends largely on the ability of stakeholders to determine the factors that predict the success of the program.

2. The concept of mapping proved to be very useful in teaching multidisciplinary programs such as SIA. The basic idea is to make use of what students have understood well. This will increase the comfort level of students with new concepts that must be learned and thus increase the relevance and effectiveness of the SIA lectures.

5.1 Suggestions For Next Research

1. This paper presents the most important relationship between challenges and technological responses, which shows the way for future research in order to improve the alignment between technology and organization, in this particular case the support of management accounting and management information systems.

2. The development of a set of concept maps and their use in SIA courses can provide considerable insight into the value of the proposed approach. Research designed in the form of experiments on groups of students who participated in the SIA recovery with concept maps and groups of students attended lectures with traditional teaching materials. Breakthrough insights can be obtained by conducting studies in the use of concept maps to teach accounting for non-accountants such as managers who are not familiar with accounting details.

REFERENCES

1. AICPA. 2013. Core Competency Framework for Entry into the Accounting Profession (The Framework) dari http://www.devriesonline.net/pmwiki.php/Main/AICPACoreCompetencyFramework, di akses 02 Februari 2016

2. Aggarwal, A. Challenges of Teaching Accounting Information Systems, diaksesdari http://webapps.roanoke.edu/businessweb/SEINFORMS%202011%20-%20Proceedings/proc/p110429002.pdf, tgl 08 Februari 2016

3. Badua, F. 2008. Pedagogy and the PC. Journal of Education for Business, 83 (5), 259-264.

4. Barusman, Andala Rama Putra and Tina MB Virgawenda (2019), Supply Chain Strategy and Service Recovery as an Antecedent of Customer Loyalty for Insurance Company, International Journal of Supply Chain Management, Vol 8 No. 5

5. Belfo, F. &Trigo, A. 2013. Accounting Information Systems : Tradition and Future Directions, Procedia Technology 9 : 536 – 546.

6. Callaghan, J,. Peacock, E & Savage, A.,2012. Assessment of An Accounting Information Systems Curriculum : An Analysis of International Federation of Accountants' International Education Guideline No. 11, The Review of Accounting Information Systems 4 (1), 1-12.

7. Doost, R.K.,McCombs, G.B.,Sharifi, M., 2013.The State Of Teaching Accounting Information Systems: Is There A Gap ?The Review of Business Information Systems 7 (3). 61-70

8. Fogarty. 1991. Ten Ways to Integrate Curricula, Educational Leadership, 49(2), 61-66.

9. Hall, J. 2006. Accounting Information Systems. South Western Cengage Learning, Sixth Edition. 7 -12.

10. Jones, Peter and Daphne Comfort (2018). Sustainable Consumption and the Leading US Retailers. Indonesian Journal of Corporate Social Responsibility and Environmental

11. Management http://ijcsrem.org/index.php/ijcsrem Vol. 1, No. 1, pp. 1–15

12. Lallo, N.Y., &Selamat, M.H.,2012. Developing Accounting Information ystem Course Content for Iraqi Higher Education Institution: An Instrument Design, International Journal of Business and Social Research (IJBSR), 2 (1),66 – 81.

13. Lallo, N.Y., &Selamat, M.H.,2013. Developing Standardised Accounting Information System (SIA) Course for Iraqi Higher Education: A Conceptual Framework. Asian Journal of Business and Accounting 6(1), 39 – 58.

14. Laturette, K. KeberhasilandanManfaatMetodePembelajaran Project Based learning bagiMahasiswadalam Mata KuliahSistemInformasiAkuntansi. http://multiparadigma.lecture.ub.ac.id/files/2015/05/KRA2-PAK015.pdf, di akses 02 Februari 2016

15. Macnamara, J.T. Names for things: A study of human learning, Cambridge, MA: MIT Press, 1982.

16. Macur, K.M., 2011. The Curricular Content of Information Systems, The Review of Accounting Information Systems, 2 (3), 11-20.

17. Novak, J.D. 1998. Learning, Creating, and Using Knowledge: Concept Maps as Facilitative Tools in Schools and Corporations, Mahwah, NJ: Lawrence Erlbaum Associates.

18. NurdionoNurdiono, et al (2019). CSR disclosure impact on corporate market performance of Indonesia listed Companies (ID) in trade sectors. Academy of Accounting and Financial Studies Journal Volume 23, Special Issue 1, 2019 1 1528-2635-23-SI-1-354

19. Raval, V., &Shimerda, T.A., 2013. Integrating SIA Course Content Using Concept Maps, The Review of Business Information Systems6, (3), 85 – 96.

20. Richtermeyer, S.B. &Kovar, S.E. 2012.AIS Education : Incorporating Trends In Technology Into The Curriculum. Review of Business Information Systems 5 (4).1-12.

21. Riner, H.S.,Stinson, T.A. 2014. A Study Of Curriculum Issues Related To Teaching Accounting Information Systems, The Review Of Business Information Systems8 (1), 47-52