Required Knowledge of Cooperative Education Students: A Case Study of Modern Management Information Technology Curriculum, College of Arts, Media and Technology, Chiang Mai University

Ratapol Wudhikarn, Chiang Mai University, Thailand

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Abstract
Cooperative education (co-op) is an educational method, which combines typical academic study with real working experience. This academic method is propelled by two major associates: those of academic institute and professional company. The co-op operations, especially identification of required knowledge of co-op students, cannot be specified solely by academy or host company. Therefore, this study aimed to explore required knowledge of cooperative education students from both academic and professional perspectives. A research was studied on a specific curriculum, modern management information technology curriculum, College of Arts, Media and Technology, Chiang Mai University, Chiang Mai, Thailand and 14 associative companies in Thailand. All required knowledge sets were tentatively identified in constructed questionnaires by responsible academic institution, and then 42 surveys by working positions were distributed to all participating host organizations. After questionnaires were sent back and completely collected, then frequency analysis was calculated. The outcomes indicated that two proposed types of knowledge including non-sector knowledge and relevant sector knowledge were required. 16 from 17 suggested non-sector knowledge sets conformed to several past studies and were accepted by involved partners whereas 27 from 40 proposed related sector knowledge bundles were agreed by the same focused group. This studied approach can be applied with other related academic programs such as work integrated learning, internship, etc. aiming to improve or develop any curriculum involving with both academic and professional sides.

Keywords: Cooperative Education, Work Integrated Learning, Competency

Introduction

Nowadays, work integrated learning (WIL) is respected as a highly-successful study model for both students and host enterprises (Dressler and Keeling, 2004; Braunstein and Loken, 2004). Cooperative education (co-op) that is one distinctive type of WIL can also bring several advantages to participating students such as increasing confidence, creating a clear career objective, assisting success of graduation, making early income, etc. (Wilson, 1989). Co-op is mainly driven by association between academic institute and host organization. Generally, characteristics of co-op are (1) a university mostly provides theoretical and academic knowledge, and (2) a host enterprise mainly gives working skills or competencies. Nevertheless, in any case, provided knowledge, skills and competencies from both academic institute and enterprises must relate to philosophy of curriculum. However, curriculum is not able to be successful and widely accepted if it could not respond to requirements of organizations or career market. In other words, contained knowledge in co-op curriculum is needed to be designed for directly serving requirements of enterprises in order to correctly deliver expected students to those organizations. In the past few years, several empirical researches surveyed stakeholders of co-op program and identified required knowledge of co-op students including with leadership, language and communication, information technology, problem solving, etc. (Gault, Redington and Schlager, 2000; Cullen, 2005; Asgarkhani and Wan, 2007). Although there are some common knowledge sets from previous studies that universities can adopt for curriculum development, nevertheless, each academic institute still require to survey and design curriculum matching to specific requirements depending on local curriculum, economic, culture, politics, etc. Therefore, this study aims to survey and identify specific knowledge of co-op curriculum in developing country, Thailand. A case study was applied with modern management information technology (MMIT) curriculum, College of Arts, Media and Technology, Chiang Mai University.

College of Arts, Media and Technology is an academic institute of Chiang Mai University. There are four curricula; those of knowledge management (KM), software engineering (SE), animation (ANI) and modern management and information technology (MMIT). MMIT is a curriculum focusing on two major disciplines including information technology and management. It is also a co-op curriculum designed by focusing on creating knowledge for supporting public and private sectors as well as especially northern industrial estate of Thailand. The curriculum mainly concentrates on co-op program in order to deliver knowledgeable students matching with requirements of industry. Since the MMIT curriculum was created more than five years, therefore, the college was forced to improve the curriculum to conform to a regulation of Thailand qualifications framework. Hence, as mentioned in the beginning, the curriculum cannot be improved by just only internal opinion but also external reflection. Therefore, to provide knowledge and to develop the curriculum directly serving both academic and career dimensions, required knowledge of co-op students should be accepted by those both factions.

This study aims to identify required knowledge of co-op student of MMIT curriculum, College of Arts, Media and Technology, Chiang Mai University, Chiang Mai, Thailand. The remainder of this paper is separated into four sections, including literature reviews, research method, result and discussion and conclusion.

Literature reviews

WIL is an education paradigm that integrates traditional study with work experience. WIL is higly acknowledged that it can create several benefits for educated students and enterprises invovlving in the program (Dressler and Keeling, 2004; Braunstein and Loken, 2004). WIL includes several process patterns such as internships, co-op, community service, work place learning, experiential learning, etc. However, among those WIL approaches, co-op has been highly identified that it can bring more advantages. Co-op fulfills the gap between theory and practice. The program provides several potential advantages to students, host enterprises and universities. For the students, co-op creates several opportunities such as increasing learning performance, improving self-confidence, gaining money, getting working experience, clarifying career goals, etc. (Dressler and Keeling, 2004; Wilson, 1989; Mariani, 1997). For host companies, co-op gives opportunities for enterprise to improve coporate image, to save labor cost, to select and hire skilled employees and to participate with academic organizations (Braunstein and Loken, 2004; Reeve, 2001). Finally, univerities can also obtain several benefits from co-op program such as curriculum and staff development, research and relationship opportunity with industry, reputation and marketing enhancement (Weisz and Chapman, 2004; Calway and Murphy, 1999).

As previously mentioned, co-op program is mainly driven by cooperation between academic institute and host firm. The curriculum cannot be sucessfully fulfilled if it is designed and created by only academic perspective, since required knowledge of student can be dissimilar between academic institute and host company. Therefore, several researches investigated expected knowledge of co-op students from companies as described in Table 1.

Table 1. Expected knowledge of co-op students

Author	Expected knowledge from associated company
Cullen (2005)	General knowledge, computer, initial knowledge on working field, writing, communication, data collection, data input, technical knowledge, information technology, problem-solving
Asgarkhani and Wan (2007)	Communication, relationship management, teamwork, leadership, positive thinking, self-development, mentor, customer focus, problem-solving, rapid learning, systematic management, innovative idea, ethics, multi-skills working, strategic thinking

From literature reviews, there was a lot of identified knowledge expected and required from host organization. Nevertheless, most of studies specifically focused on general knowledge of co-op students, especially in developed countries such as New Zealand, Australia, etc. Therefore, this study aims to deeply investigate on both general knowledge of co-op students and also specific knowledge of focused curriculum in developing country such as Thailand.

Research methods

A questionnaire was conducted in order to collect all required knowledge of cooperative students from entire host companies associating with MMIT curriculum. The questionnaire was designed by separating into two main parts, including general information and required knowledge of cooperative student. The first part, general information section, aimed to examine initial data of student, mentor and associated host firms. The remainder of questionnaire mainly focused on investigation of required knowledge of co-op student. This part was divided into two parts by different knowledge; those of non-sector knowledge and MMIT-sector knowledge. The non-sector knowledge is general knowledge that does not directly relate to the philosophy of curriculum such as communication, language, calculation, leadership, service-mindedness, etc., whereas the MMIT-sector knowledge is the knowledge specified following philosophy of the curriculum. In the non-sector knowledge section, 17 sets of general knowledge were provided following expected identities of institute and selected knowledge from past studies (Cullen, 2005; Asgarkhani and Wan, 2007; Tanloet and Tuamsuk, 2011; Yildirim, 2007). The proposed general knowledge was classified into 5 parts including primary, personal, collaborative, managerial and teaching knowledge. For MMIT-sector knowledge, 40 knowledge bundles were initially identified in survey document mainly following philosophy of curriculum. Therefore, the questionnaire provided all required non-sector knowledge and MMIT-sector knowledge for academic perspective. Therefore, respondents could select required knowledge from the provided lists, and also identify their expected knowledge for real workplace sector.

The created questionnaires were planned to be transmitted to all 14 participating companies from 42 cooperative students. After the survey forms were completely replied and collected, obtained data were classified, and then analyzed. After all previous processes had been completed, final results were summarized and concluded. Therefore, the process method of this research can be presented as in Figure 1.

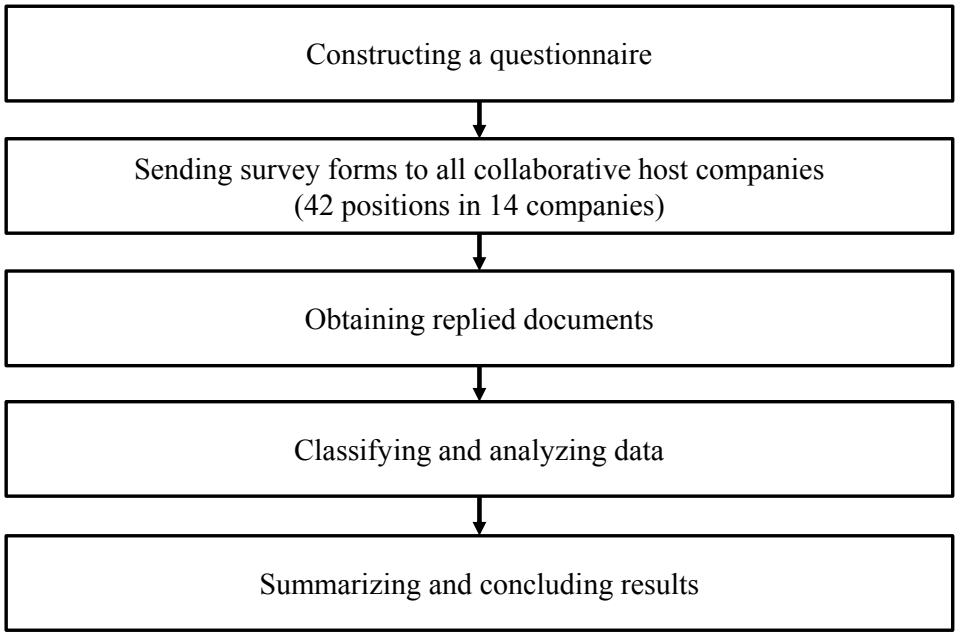

Figure 1: The research processes of this study

Results and discussions

The questionnaires were created following the structured details identified in the previous section and then were spread out to all participating host organizations. Thence, 29 survey forms from 11 companies were sent back to a researcher. A reliability of collected survey was tested by Cronbach's α test. The α coefficient for overall result was 0.9181. This obtained result implied that the survey results was excellently consistent and highly reliable. Various non-sector knowledge and MMIT-sector knowledge were selected and identified by several focused respondents. Therefore, to specify which bundles of knowledge were required, an average score was applied for selecting essential knowledge. Only knowledge identified which had score greater than 2.00 (a three-level Likert-type scale: 3 - essential, 2 - neither essential nor inessential and 1 - inessential) was selected to be required knowledge of co-op students of MMIT curriculum. The expected knowledge can be presented as in Table 2. Moreover, some identified knowledge, especially non-sector knowledge, which conformed to former studies is also presented in Table 2.

Table 2. Identified essential knowledge by associated host companies

Knowledge	Relating study
1. Non-sector knowledge	
1.1 Primary knowledge	
English language	-
Communication and presentation	Cullen, 2005; Asgarkhani and Wan, 2007
Information technology and computer	Cullen, 2005
Calculation	-
Problem solving	Cullen, 2005; Asgarkhani and Wan, 2007; Tanloet and Tuamsuk, 2011
1.2 Personal knowledge	
Positive thinking	Asgarkhani and Wan, 2007
Responsiveness	-
Adaptability	Tanloet and Tuamsuk, 2011
Continuous improvement and self-development	Asgarkhani and Wan, 2007
Leadership	Asgarkhani and Wan, 2007; Tanloet and Tuamsuk, 2011
1.3 Collaborative knowledge	
Teamwork	Asgarkhani and Wan, 2007
Involvment	-
Team communication	-
1.4 Managerial knowledge	
Service-mindedness	Tanloet and Tuamsuk, 2011
Organization responsiveness	-
1.5 Teaching knowledge	
Teaching mentoring and assessment	Asgarkhani and Wan, 2007; Tanloet and Tuamsuk, 2011
2. MMIT-sector knowledge	
2.1 Information technology and information system knowledge	
Computer programming literacy	-
Computer programming design and analysis	-
Web programming	-
Software development	-
Computing systems	-
Operating systems	-
Computer networks	-
Information system literacy	-

Knowledge	Relating study
Database management	-
Information technology system development	-
Multimedia programming	-
Security of network and database	-
2.2 Technology tools	
Office systems (e.g. MS Office)	-
Web development software	-
Digital camera	-
Photo editor software	-
File sharing (e.g. dropbox)	-
Video conference	-
Social network (e.g. facebook)	-
Online encyclopedia (e.g. wikipedia)	-
2.3 Industrial and business management	
Enterprise resource planning (ERP)	-
Knowledge management	-
Quality assurance	-
Introduction to industrial management	-
Strategic management	-
Key performance indicator (KPI)	-
Customer relationship management (CRM)	-

From questionnaire analysis, 16 general knowledge sets were selected from all 17 provided competencies and 10 essential groups of knowledge related to other past studies. For MMIT-sector knowledge, 27 specific knowledge bundles directly relating to the philosophy of curriculum were identified as essential knowledge from 40 proposed knowledge packages.

According to outcomes, both non-sector and MMIT-sector knowledge were essential for real-working organizations. Although some knowledge sets specified by academic institute were probably unnecessary to real-working sectors, but most of them were still essential. Moreover, general knowledge that was rarely provided and taught in courses and classrooms was still identified as required knowledge conforming to several previous studies (Cullen, 2005; Asgarkhani and Wan, 2007; Tanloet and Tuamsuk, 2011). Nevertheless, some of non-sector knowledge sets were not similar to the past studies because this researched case was specifically studied in developing country, Thailand, and general knowledge such as English language is highly essential and required. Therefore, in future, the institute should consider these empirical results and apply them along with its academic perspective to improve the curriculum in order to reduce unnecessary courses and resources and deliver exact co-op program to effectively serve host organizations.

Conclusions

Nowadays, co-op is widely accepted as one of successful educational forms. This study approach delivers not only academic knowledge but also working experience to attended students at the same time. Therefore, co-op can provide several advantages which cannot be found in a typical education such as giving career opportunity and creating income between studying. Nevertheless, the co-op strengths could not occur without well-organized association between two major stakeholders; those of academic institute and host company. Therefore, a quality co-op curriculum should be designed, developed and operated from both collaborative partners. Nevertheless,

generally co-op curriculum is initiated mainly from academic perspective, and it probably could not properly respond to working situation. In order to inclusively provide required knowledge of co-op students, the curriculum should be designed to serve requirements of both academic and professional perspectives. Therefore, this study aimed to survey required knowledge of co-op student with a real case study of MMIT curriculum, College of Arts, Media and Technology, Chiang Mai University. The required knowledge was surveyed and identified from both academic institute and professional perspective. The outcomes show that required knowledge of co-op program contained both non-sector knowledge and sector knowledge. Some general competencies were common knowledge such as calculation, communication, information technology, etc. relating to other past studies. Therefore, it confirmed that general knowledge was crucial and still required by host organizations. For sector knowledge, curriculum could deliver all required working knowledge, and moreover some academic courses were over supplied from professional perspective. In conclusion, this study aimed to improve the co-op program by finding required knowledge from all cooperative partners. This approach could properly deliver expected knowledge of students exactly serving curriculum philosophy and professional expectation. Moreover, the results of this study also identified non-sector knowledge that can be applied to other general co-op programs, whereas sector knowledge that could not generally be adopted to other curriculums, but it is still able to be applied to improve the focused curriculum in the future.

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References

Asgarkhani, M. & Wan, J. (2007). Key Attributes for Success within the ICT Job Market: A Case Study of ICT Students' View. *20th Annual Conference of the National Advisory Committee on Computing Qualifications*.

Braunstein, L.A. & Loken, M.K. (2004). Benefits of cooperative education for students. *International Handbook for Cooperative Education: An International Perspective of the Theory, Research, and Practice of Work-Integrated Learning*, 237 - 245.

Calway, B.A. & Murphy, G.A. (1999). Career progression of cooperative education graduates in a co-op based information technology degree program: A review of the final report of 1998 (Murphy and Murphy). *11th World Conference on Cooperative Education*.

Cullen, M. (2005) Environmental Science Cooperative Education. *Asia-Pacific Journal of Cooperative Education*, 6(2), 1-6.

Dressler, S. & Keeling, A.E. (2004). Benefits of cooperative education for students. *International Handbook for Cooperative Education: An International Perspective of the Theory, Research, and Practice of Work-Integrated Learning*, 217-236.

Gault, J., Redington, J. & Schlager, T. (2000). Undergraduate business internships and career success: Are they related? *Journal of Marketing Education*, 22(1), 45-53.

Mariani, M. (1997). Learn more, earn more, prepare for the workplace. *Occupational Outlook Quarterly*, 3-11.

Reeve, R.S. (2001). *Employee' guide to work-integrated learning*. Boston: World Association for Cooperative Education.

Tanloet, P. & Tuamsuk, K. (2011). Core competencies for information professionals of Thai academic libraries in the next decade. *The International Information and Library Review*, 43, 122-129.

Weisz, M. & Chapman, R. (2004). Benefits of cooperative education for educational institutions. *International handbook for cooperative education: An international perspective of the theory, research and practice of work - integrated learning*, 247-258.

Wilson, J.W. (1989). Assessing outcomes of cooperative education. *Journal of Cooperative Education*, 25(2), 38-45.

Yildirim, O. (2007). Discriminating emotional intelligence-based competencies of IT employees and salespeople. *Journal of European Industrial Training*, 31(4), 274-282.