

## The innovation of academic administration in a private vocational college

Nawarat Sueksakit†, Pimprapa Amornkitpinyo† & Thanyatorn Amornkitpinyo‡

Saint John's University, Bangkok, Thailand†

Assumption University, Bangkok, Thailand‡

**ABSTRACT:** Vocational education requires an integration of theory and practice, technological, methodological and content up-to-dateness, and a strong alignment with the current labour market. However, not every vocational institution in Thailand has addressed these challenges. Hence, this study has been focused on re-developing the business computing major in a private vocational college in Bangkok, Thailand, to meet the current educational and job-market-requirements. The curriculum redevelopment was followed by its evaluation. The study included three steps: investigative (what innovation was required); developmental (innovative redesign); evaluative (assessment of the redesign). As a result of the curricular changes, there were four subjects introduced: 1) Basic Information and Communication Technology consisting of five metaverse learning activities; 2) Computer Graphics and Multimedia that included five Web site presentation activities; 3) Basic System Development that involved one Web site learning activity; and 4) Technology Innovation accomplishments incorporating six e-commerce learning activities. The evaluation was based on expert judgement and the redesign was ranked at the highest level.

### INTRODUCTION

Vocational education in Thailand faces many challenges, and the proper alignment of theory, practice and labour market requirements is one of the key issues. In the private vocational college under consideration, the teaching was organised according to the content of each individual subject. Based on the vocational school curriculum, some lessons of each subject were complicated and redundant, with the lecturer teaching the same lessons in the same way. This resulted in limited learning from the activities and bored students. Moreover, there was no integration of practical activities for students to utilise what they had learnt in the classroom to help them with their future career path [1]. This situation conflicted with the goals of vocational colleges in terms of three aspects related to their graduates' attributes and competencies: 1) desired characteristics (including morality, ethics, professional ethics, behaviour, personality attributes and intellectual skills); 2) core competencies and general competencies (consisting of communication, communication technology, learning and practice development, co-operation, knowledge of the scientific process, numerical integration and work management); and 3) professional competencies (such as knowledge-applying ability, practical professional skills utilisation and knowledge-to-career path integration) [2].

It is mandatory for vocational colleges to integrate the teaching with various aspects of knowledge from different fields [3-5] in order to help students connect the concepts of different studies. This makes students realise the benefits of their lessons, lessen the repetition of lessons in each subject and make the lessons more practical. Furthermore, it frees the lecturer to arrange the learning activities related to the current world's situation. Hence, students can improve their knowledge, skills and attitudes, and interact better and more productively with the world around them. This is related to the concept of vocational schools that focus on practicality more than theory [6].

In the 21st Century, information technology has been rapidly changing, which has led to an increased demand for digital technology workforce that is highly skilled and agile. For example, in Thailand, to respond to this demand, a business computing major as part of the vocational curriculum includes basic digital technology, which is essential for the 21st Century workforce [7].

In view of this situation, this study was focused on redesigning the subjects comprising the business computing major in a private vocational college in Bangkok, Thailand, by integrating knowledge across the subjects in the whole curriculum. It was expected that this redesign could lead to the development of curriculum management guidelines for institutional management teams and teachers in vocational schools to increase the efficiency of lectures in the future.

### OBJECTIVE OF THE STUDY

The main objective of this study was to redesign the business computing major in a private vocational college in Bangkok, Thailand, and to evaluate the redesign in terms of its suitability within the context of the current vocational education needs in Thailand.

## CONCEPTUAL FRAMEWORK

The literature consulted for this study related to several aspects of curriculum management, innovation and change, including:

- 1) incremental innovation [8];
  - 2) level of administrative innovation changes;
  - 3) limits of the innovation process [9];
  - 4) categories of integrated teaching and learning management;
  - 5) models of integrated teaching and learning across subjects [10];
  - 6) vocational certificate programme in business computing [2];
  - 7) five steps of integrated learning management;
- 7.1) defining the professional group,
  - 7.2) arranging the course structure,
  - 7.3) choosing the project,
  - 7.4) setting the goal competency,
  - 7.5) integrating the course lessons [6].

The research framework is shown in Figure 1.

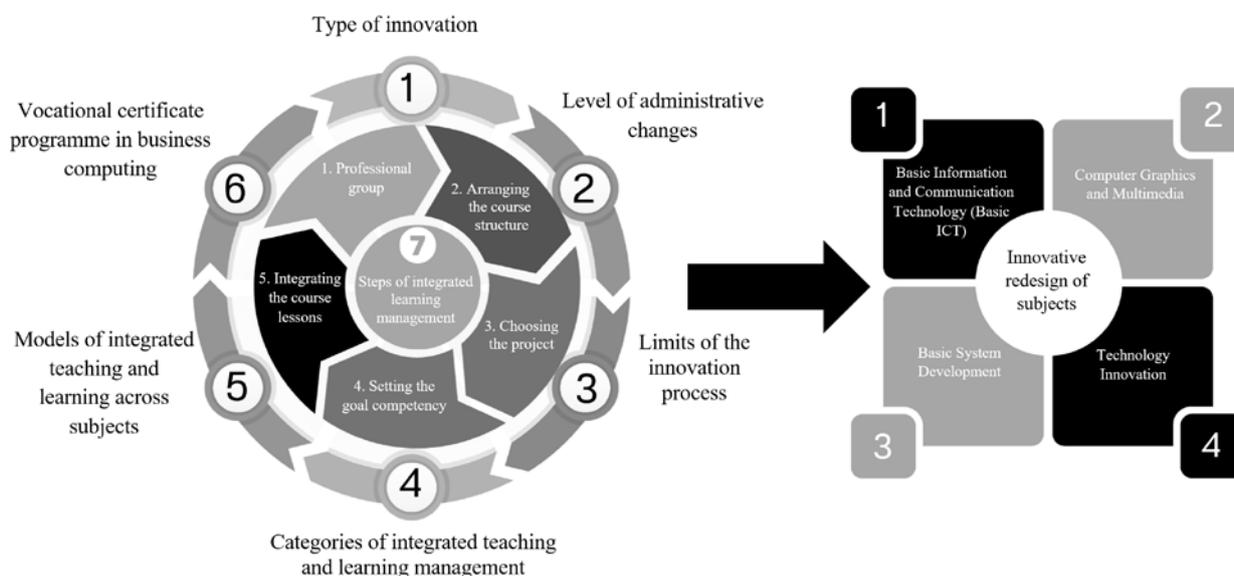


Figure 1: Conceptual framework.

## RESEARCH METHODOLOGY

This study included three research steps as follows:

Step 1: As mentioned above, a literature review that related to several, broader aspects of curriculum management and change in vocational education, and specifically in vocational colleges in Thailand.

Step 2: The redevelopment of the computer business major in a private vocational college. The certificate of vocational education consisted of 22 credits for core performance subjects in the first year. The basic vocational competency courses required students to study for 21 credits, whereas the specific professional competency subjects required 24 credits. In addition, elective professional competency subjects required 18 credits. Professional competency development projects were taught in the second and third years.

The researchers redesigned the business computing major by integrating 20 subjects relating to the basic vocational competency, specific professional competency and elective professional competency, and professional competency development projects. This resulted in four sets of subjects. They also designed activities for each course. A focus group consisting of seven experts was then asked to review the draft innovation. Four of the selected experts had computer-related majors, whereas the other three had educational administration majors. In addition, all experts had five years or more experience in teaching or institute administration. Based on the feedback obtained from the focus group, the redesigned major was adjusted according to their suggestions, before it was evaluated (Step 3).

Step 3: Evaluation of the redesigned major in terms of its suitability.

The researchers adjusted the study methods in view of the focus group's advice, and presented the adjusted version to a second expert group that were not part of the focus group.

## RESEARCH TOOLS

Questionnaires, adjusted according to the focus group's advice, were administered to the second expert group. The questionnaires incorporated close-ended questions with a five-point Likert scale and open-ended questions. They were used as the data gathering tool to check content validity and determine the index of item objective congruence (IOC).

The consistency between the questions and the intended purpose was measured by the experts' opinions on each question, with +1 indicating consistency, 0 - not sure and -1 indicating lack of consistency. All the questions were rated as +1, hence they were consistent with the intended purpose. A five-point Likert scale was used in this study, from 5 indicating the highest rating to 1 indicating the lowest [11]. A sample of the suitability evaluation form is shown in Table 1.

Table 1: Suitability evaluation form of subject set 1: Basic Information and Communication Technology (Basic ICT).

Evaluation list	Suitability level				
	5	4	3	2	1
<b>Subjects</b>					
• 20001-2001 Computer and Information for Careers					
• 20204-2001 Basic Operating System					
• 20204-2003 Computer and Maintenance					
• 20204-2005 Introduction to Computer Networks					
• 20204-2009 Ethics and Computer Laws					
<b>Learning activity set</b>					
1. Presentation of computer equipment, computer networks and computer maintenance					
2. Information search for computer equipment, computer networks and computer operating systems					
3. Report preparation on computer equipment, computer networks and computer viruses					
4. Maintenance of computers, computer networks, computer equipment and computer operating systems					
5. Web site presentation on computer ethics and law concerning the use of images, data, copyrighted programs and cybersecurity regulations [12]					

### Data Analysis

A computer was used to complete this part of the study by determining the means, standard deviation of the appropriateness of the subject and learning activities in each subject set, as well as suggestions in the written form and table. In this evaluation, the second expert group had no suggestions, so they were not included in the written form and the table. The actual scale used to rank the suitability of the redesign was more granular with the following five levels: 4.50 - 5.00 indicating the highest suitability, 3.50 - 4.49 - high, 2.50 - 3.49 - medium, 1.50 - 2.49 - low, 1.00 - 1.49 - indicating the lowest suitability.

## RESULTS

In this research, four subject sets and four learning activity sets were considered. The researchers integrated these four subject sets to cover four semesters, which meant that students would study one subject set per semester.

Subject set 1: Basic Information and Communication Technology was integrated with regard to four subjects:

- 1) Computer and Information for Careers;
- 2) Basic Operating Systems;
- 3) Computers and Maintenance;
- 4) Introduction to Computer Networks;
- 5) Ethics and Computer Law.

These subjects are shown in Table 2.

Table 2: Subject set 1: Basic Information and Communication Technology (Basic ICT).

Code subjects	Subjects	Credit	Hour/Week	
			Theory	Practice
Basic vocational competency group				
20001-2001	Computer and Information for Careers	3	1	4
Professional competency group				

20204-2001	Basic Operating System	3	2	2
20204-2002	Computer and Maintenance	3	2	2
20204-2005	Introduction to Computer Networks	3	2	2
20204-2009	Ethics and Computer Laws	2	2	0
Total		14	9	10

In this subject set, the following five learning activities were included: 1) presentation of computer equipment, computer networks and computer maintenance; 2) information search in regard to computer equipment, computer networks and computer operating systems; 3) report preparation in regard to computer equipment, computer networks and computer viruses; 4) maintenance of computers, computer networks, computer equipment and computer operating systems; and 5) Web site presentation on computer ethics and laws concerning the use of images, data, copyrighted programs and cybersecurity regulations.

Table 3 shows the learning activities for subject set 1.

Table 3: Learning activities for subject set 1: Basic Information and Communication Technology (Basic ICT).

Learning activity set		20001-2001	20204-2001	20204-2002	20204-2005
1.	Presentation of computer equipment, computer networks and computer maintenance	✓	✓	✓	✓
2.	Information search for computer equipment, computer networks and computer operating systems	✓	✓	✓	✓
3.	Report preparation on computer equipment, computer networks and computer viruses	✓	✓	✓	✓
4.	Maintenance of computers, computer networks computer equipment and computer operating systems	✓	✓	✓	✓
5.	Web site presentation on computer ethics and law concerning the use of images, data, copyrighted programs and cybersecurity regulations [12]	✓	✓	✓	✓

Subject set 2: Computer Graphics and Multimedia were integrated into six subjects: 1) Art Elements for Computer Works; 2) Graphics Programs; 3) Web Site Creation; 4) Production of Print Media; 5) Multimedia Programs; and 6) Animation Programs, as shown in Table 4.

Table 4: Subject set 2: Computer Graphics and Multimedia.

Code subjects	Subjects	Credit	Hour/Week	
			Theory	Practice
Specific professional competency groups				
20204-2006	Art Elements for Computer Works	3	2	2
20204-2007	Graphics Programs	3	2	2
20204-2008	Web Site Creation	3	2	2
Elective professional competency group				
20204-2109	Production of Print Media	3	2	2
20204-2110	Multimedia Programs	3	2	2
20204-2111	Animation Programs	3	2	2
Total		18	12	12

Subject set 3: Basic System Development involved four subjects: 1) Programming; Database Programs; Computer Programming; and 4) Mobile Applications.

These subjects are shown in Table 5.

Table 5: Subject set 3: Basic System Development.

Code subjects	Subjects	Credit	Hour/Week	
			Theory	Practice
Specific professional competency groups				
20204-2004	Programming	3	2	2
Elective professional competency group				
20204-2105	Database Programs	3	2	2
20204-2107	Computer Programming	3	2	2
20204-2112	Mobile Applications	3	2	2
Total		12	8	8

In subject set 2: Computer Graphics and Multimedia, and subject set 3: Basic System Development, the learning activities were as follows: 1) designing print media, such as logos, brochures and name cards; 2) 2D animation design; 3) Web site design; 4) developing programs and databases for calculating print media expenses; 5) 2D animation development; and 6) application and database development, and presenting them on Web sites, as shown in Table 6.

Table 6: Learning activities for subject set 2: Computer Graphics and Multimedia and subject set 3: Basic System Development.

Learning activity set	20204-2006	20204-2007	20204-2008	20204-2109	20204-2110	20204-2111	20204-2004	20204-2105	20204-2107	20204-2112
Subject set 2: Computer Graphics										
1. Designing print media, such as logos, brochures and name cards	✓	✓		✓	✓	✓				
2. 2D animation design	✓	✓	✓	✓	✓	✓				
3. Web site design	✓	✓	✓	✓	✓	✓				
4. Developing programs and databases for calculating print media expenses	✓	✓	✓	✓	✓	✓				
5. 2D animation development	✓	✓	✓	✓	✓	✓				
Subject set 3: Basic System Development										
6. Application and database development and presenting them on Web sites	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Subject set 4: Technology Innovation involved the integration of five subjects: 1) Internet Business; 2) Schedule Programs; 3) Statistical Package Programs; 4) Project; and 5) Use of Software Packages, as shown in Table 7.

Table 7: Subject set 4: Technology Innovation.

Code subjects	Subjects	Credit	Hour/Week	
			Theory	Practice
Elective professional competency group				
20204-2101	Internet Business	2	1	2
20204-2103	Schedule Programs	3	2	2
20204-2106	Statistical Package Programs	3	2	2
Professional competency development project				
20202-8501	Project	4	*	*
Elective Subject				
20216-2003	Use of Software Packages	3	1	4
Total		15	6	10

Subject set 4 consisted of six activities: 1) e-commerce shop creation utilising ready-made programs on social media; 2) on-line ordering system development; 3) creating performance reports using ready-made programs; 4) on-line search engine marketing (SEM); 5) presenting the operation results of e-commerce systems; and 6) e-commerce innovation and invention competition. The details of this part can be seen in Table 8.

Table 8: Learning activities for subject set 4: Technology Innovation.

Learning activity set	20216-2003	20204-2101	20204-2103	20204-2106	20202-8501
E-commerce					
1. E-commerce shop creation by utilising ready-made programs on social media	✓	✓			
2. On-line ordering system development	✓	✓	✓	✓	
3. Creating performance reports using ready-made programs	✓	✓	✓	✓	
4. On-line search engine marketing (SEM)		✓			
5. Presenting the operation results of e-commerce systems	✓	✓	✓	✓	✓
Innovation and technology portfolio					
6. E-commerce innovation and invention competition	✓	✓	✓	✓	✓

The suitability/appropriateness of the redesigned subject set and the accompanying learning activities was carried out by the second group of experts. The results of this evaluation are shown in Table 9.

Table 9: Suitability/appropriateness of the subject sets and learning activities.

Subject set	$\bar{X}$	SD	Appropriateness level	Learning activity	$\bar{X}$	SD	Appropriateness level
1. Basic Information and Communication Technology	4.91	0.23	Very good	Subject set 1	4.80	0.41	Very good
2. Computer Graphics and Multimedia	4.88	0.31	Very good	Subject set 2	4.63	0.53	Very good
3. Basic System Development	4.86	0.31	Very good	Subject set 3	4.57	0.79	Very good
4. Technology Innovation	4.69	0.76	Very good	Subject set 4	4.81	0.37	Very good

As shown in Table 9, the overall suitability of the redesigned subject sets and the learning activities was ranked at the highest level.

## CONCLUDING REMARKS

The business computing major in the private vocational college under consideration, had four subject sets: Basic Information and Communication Technology; Computer Graphics and Multimedia; Basic Systems Development; and Technology Innovation. The selected experts agreed on these subject sets since the researchers integrated subjects that were related to one another in order to make the learning activities consistent with the same subject set. This helped students to utilise the knowledge that they gained from each subject set to further their career path and become more innovative.

For example, subject set 1 (Basic Information and Communication Technology) consisted of five sub-subjects, which were considered as the basic vocational competency with regard to business computing majors [2].

The learning activities in subject set 1 had five activities as shown in Table 3 above, and each learning activity was aligned with the subject competency, subject description, and the relevant objectives for the five subjects [2].

Based on the expert judgement obtained in this research, the suitability score regarding the redesign of subjects and learning activities of the business computing major was at the highest level. This was due to the integration of the concept of the Office of the Vocational Education Commission, Thailand, into the redesign [6]. Furthermore, the learning activities in each subject set were designed to be consistent with the digital literacy competency as stated by the Ministry of Digital Economy and Society, Thailand [13]. Thus, students could apply their knowledge to work efficiently in the present-day work setting, as implied in the study of Wongtha et al about the development of activities involving the application of project-based learning using digital technologies [14].

In this study, four-part lecturer guidelines were prepared, including: a) course structure design; b) course introduction; c) course content; and d) activity to apply project-based learning in the subject. The student guidelines consisted of three parts: a) introduction; b) community contribution preparation; and c) integrated activities. In addition, the manual also included information about learning credits, objectives, processes, tools (i.e. information sheets), activity sheets, worksheets and evaluation criteria.

The students' perception regarding the integration of project-based learning into the learning activities using digital technology was shown to be at an excellent level. The students were satisfied with the integration at the highest level. Moreover, the community's satisfaction regarding the integration was shown to be at a good level.

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