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# Developing Higher Education Curriculum to Reinvent Nakhon Sawan Rajabhat University as University for Sustainable Local Development: Case of Bachelor of Education in Computer and Industrial Education Program

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## Abstract

*Nakhon Sawan Rajabhat University is a non-profit public institution of higher education located in the city of Nakhon Sawan, Thailand was founded in 1922. The Faculty of Education has been organizing teaching and learning to produce computer teachers for more than 10 years and namely the major was changed according to presented technology and development. The purpose of this research was to develop a Bachelor of Education curriculum in Computer and Industrial Education in the Sandbox format with the concept of competency-based curriculum development and guidelines for the implementation of the Thai Qualifications Framework for Higher Education. Researchers used both qualitative and quantitative research methodology in conduct the research. Using Mean and Standard Deviation to describing the data was used. The results of this research show the consistent of curriculum development and detailing in this paper. Thus, the result of this paper is part of the whole completed work.*

**Keywords:** Higher Education Curriculum, Reinventing University, Nakhon Sawan Rajabhat University, Sustainable Local Development Organization

## Introduction

Globalization has changed things drastically in all directions. Higher education is also inevitably affected, although higher education institutions do not want to change it at all (Tatiyalapa, 2011; Weerathavorn, 2011; Marshall, 2010). Higher education must deal with reengineering changes that are total changes, adjusting the crisis as an opportunity to develop under the expectations of society (Kongpetpradit & Chantuk, 2016; Yaviraj, 2015; Thumkosit, 2001; Robbin & Coulter, 2008). Therefore, characteristics of changes in higher education in the 21 st century such as area less university and instructor-free classes (Weerathavorn, 2011; Franz & Cox, 2012; Hilmi, 2016), the management that extends to entrepreneurship (Weerathavorn, 2011; Chatmalathong, et al., 2017). As a result of the reengineering of higher education abroad, many higher education institutions have been shut down because both universities and personnel unable to adapt. (Christensen, et al. 2011), thus these affecting Thai higher

education in a short time and possibly severely to the point of shutting down of Thai higher education as well ([Rohitsathien, 2018](#)). The creating acceptance of adaptation to university personnel who have lost their traditional status ([Ash, 2009](#); [Robbin & Coulter, 2008](#)) in the context of Thailand in accordance with the expectations of the people and the needs of society ([Weerathaworn, 2011](#); [Kerdphu, 2018](#)). The study of curriculum and learning development can respond to one's development to be ready for such situations to meet the goals of the National Education Plan 2017–2036 which indicating the direction of national development under the vision of the strategy is “Stable, Prosperous and Sustainable”, that aiming to develop the country towards “Thailand 4.0” and has set an important objective in education that for development of system and management a quality and efficient education system and process in showing in Strategy 2 of Nakhon Sawan Rajabhat University which is Production and development of manpower, research and innovation to build the country's competitiveness by it aims to produce manpower with essential skills and competencies that meet the needs of the job market and the country's economic and social development.

Nakhon Sawan Rajabhat University is a non-profit public institution of higher education located in the city of Nakhon Sawan, Thailand was founded in 1922 as Fundamental Agricultural Teacher Training School and received its present name in 2004. The university is officially accredited by the Ministry of Education of Thailand and offers study programmed across multiple disciplines such as education, information technology, engineering, arts and design, business administration, health science, and agriculture. The university serves the creating of the local community. Nakhon Sawan Rajabhat University provides academic services. The graduates can work in a team, and they are efficient in engaging technology. They should have honesty; meanwhile, they bristle with a voluntary heart to the local community with has two main campuses: City campus and Yan Matsi campus. Yan Matsi campus is located close to Phahon Yothin Road at Tambon Yan Matsi, Payuhakiri District, Nakhon Sawan province. The campus away from the main campus of 14 km, which has 197.6 acres. Currently,

landscape architecture and building design include a master plan area to prepare for a perfect university. Some buildings have already been constructed, such as lecture and agricultural research labs building, lecture and product design operations building, food processing research and quality inspection building, Local Wisdom Learning Center building, and innovative and technological building.

The Faculty of Education, Nakhon Sawan Rajabhat University has been organizing teaching and learning to produce computer teachers for more than 10 years, firstly within Bachelor of Education program (5-year program) in a combined format consisting of many major subjects until the preparation of qualification standards has therefore been separated into a Bachelor of Education program (5-year program) in Computer Education. The curriculum was revised in 2011 and continued to be revised to the Bachelor of Education Program (5-year program) in Computers and Educational Technology and was revised again in 2015, and revised two more times in a 4-year teaching format, namely the Bachelor of Education Program in Digital Technology for Education with 1 academic year of teaching practicum and the Curriculum revised in 2021 with 1 semester of teaching practicum. Upon the development concept “Essential skills” are an important element in the curriculum that consists of 3 sub-skills as follows: 1) Common skills, 2) Technical skills, and 3) Specific skills, so that graduates can create innovations to raise the level of Thailand's economy from sustainable middle income. According to the policy reform Thailand 4.0 for “implementation guidelines” for the project to create a new breed of graduates, there is a clear sequence of the project to select universities in many fields that have experience in implementing the new graduate program to serve as a mentor and advise on curriculum design for universities participating in the project, the training team determined by the project ad hoc subcommittee organized “Training the Trainer” for mentor universities on the principles of designing higher education curricula based on learning outcomes (Outcome Based Curriculum), starting with “skills that necessary” for all 3 skills. The mentor university creates a Non-Degree curriculum for developing teachers in charge of the

curriculum under the help and support of monitoring and evaluation of participating universities in creating a Non-Degree curriculum to develop manpower according to the needs of the sector production, government and community services, and society after the COVID-19 situation according to the principles of Outcome Based Learning Design (OBE) learned from the coaching of the mentor university ([Office of Academic Administration Chulalongkorn University, 2023](#)).

Competency-based Education is an approach which used as an institutional process that shifts education from focusing on what academics believe for all graduates need to know to an education that focuses on what students feel they need or think they need to know in order to be able to it can be applied in a variety of and complex situations effectively, that is education which management in focuses on competencies, focuses on or places importance on the product/desired characteristics of learners (Competencies are linked to the needs of the business sector that are specified or defined in detail by the behaviors expressed by employers and professional groups/experts). Therefore, this mention attempts to describe or elaborate a purpose or goal rather than merely mention a learning objective or behavioral objective. Curriculum development in response to such educational management must focus on the specific abilities of the learners or competency-based curriculum that such a curriculum must show details that ensure that graduates at a certain level have the skills and competencies they need. Thus, in the development of this type of curriculum, there is a set of competency criteria that the learners should perform or competency criteria in various areas that the learners must demonstrate in each. Each level of education or class. The skills and abilities in each class are defined as continuous, starting from the basic skills and abilities and progressing to a higher level ([Watcharawiwat, 2001](#), [Si Mahasan 2002](#); [Kaya & Akdemir, 2016](#); [Takong, 2003](#)).

## Methodology

The purpose of this research was to develop a Bachelor of Education curriculum in Computer and Industrial Education in the Sandbox format of Nakhon Sawan Rajabhat University in Thailand with the concept of competency-based curriculum development and guidelines for the implementation of the Thai Qualifications Framework for Higher Education, B.E.2565 (Bachelor Degree) that are effectively linked to the needs of the labor market and can be applied in a university context by using Research and Development research method based on the participation of administrators and faculty members of the Faculty of Education, students, alumni and graduate users in every step of the research process. The research was carried out in 4 steps as follows:

Step 1: Fundamental data analysis and curriculum aim setting – this is the step in which the researcher conducts research and development of the competency of computer and industrial arts teachers meet the research objectives and use the research results to define desirable characteristics, objectives and learning outcome standards, which are regarded as setting goals and focus in the development of this curriculum.

Step 2: Development(draft) Bachelor of Education curriculum in Computer and Industrial Education in the Sandbox format – this is the step in which the researcher conducts research and development (draft) innovation communication curriculum. which covers both the content determination course description formulation of approaches/learning management strategies and formulation of approaches/strategies for measurement and evaluation.

Step 3: Evaluation and improvement (draft) of the Bachelor of Education curriculum in Computer and Industrial Education in the Sandbox format – this is a step in which the researcher examines the quality of the curriculum in terms of suitability and feasibility. by experts and bring various suggestions to improve, the details of each step of which are shown in Table 1.

**Table 1 The stages of Bachelor of Education in Computer and Industrial Education in the Sandbox format Curriculum Development**

Research Process	Objectives	Methodology	Information Source	Output
Step 1: Analysis of basic data and determination of curriculum objectives	1. To study the competencies of innovative communicators. 2. To determine the objectives of the curriculum / desired characteristics / standards for student learning outcomes.	- Study documents and research - Group discussion	- Documents and research - Administrators and faculty	- Desired characteristics of graduates
		- Study documents and research - Content analysis - Analysis of main duties in the job - Group discussion and workshop techniques	- Framework for educational qualification standards - Goals, vision, main mission - Job description of the position	Required features - Competencies of computer teachers/ curriculum objectives/desired characteristics/ learner learning outcome standards in curriculum documents
Step 2: Developing (draft) curriculum	To develop the curriculum outline	- Analyze the course structure Educational management plan and courses that are currently being taught - Workshop	- Thailand undergraduate curriculum documents - Administrators and faculty	(Draft) curriculum
Step 3: Evaluation and improvement (draft) curriculum	To check the quality of the curriculum in terms of suitability and feasibility by reviewing it from experts and bringing in various suggestions for improvement. (draft) the curriculum to be appropriate	- Interview experts - Interview a representative	- Experts - representative with experience of not less than 3 years	Draft curriculum that has been evaluated for appropriateness and consistency.

### Results

The purpose of this research is to develop the curriculum. This must produce graduates with the ability to reflect the learning outcomes that occur to students and reflect on the local community or society within the framework of the curriculum, there will be topics that will be used to present research results as follows:

Competency of computer teachers, the results of the study of the competency of computer teachers found that graduates of the Bachelor of Education program in Computer and Industrial Education, majoring in Computer Education, must have the following desirable characteristics:

1. Have morality and ethics and have appropriate professional ethics.

2. Have expertise in computer science/digital technology for teaching and disseminating innovation systematically in both theory and practice.
3. Have intellectual skills that cover information literacy skills Synthetic analytical thinking skills as well as problem-solving skills.
4. Have interpersonal skills and responsibility.
5. Have skills in numerical analysis, communication, and the use of information technology knowingly and efficiently.
6. Have appropriate practical skills in the teaching profession.

Bachelor of Education Program Department of Computer and Industrial Studies Major in Computer Studies.

In terms of subjects, a survey was conducted to study the appropriateness of the courses from user agencies and their actual use in teaching at the basic education level. In terms of major subjects only, it was found that the category of required major subjects was found to be number one: Operating System and Educational Applications, it has a Mean of 4.13 and a Standard Deviation of 0.93. Next in order are: Computational Science Learning Management at the Primary and Secondary levels, it has a Mean of 4.11 and a Standard Deviation of 0.99. Next in order are: Computational Thinking for Education, it has a Mean of 4.06 and a Standard Deviation of 1.01. Next in order are: Computer Programming for Teachers, it has a Mean of 4.03 and a Standard Deviation of 0.93. Next in order are: Database Systems for Education, there was a Mean of 4.01 and a Standard Deviation of 0.83. Major subjects were chosen: 1) Major subjects were chosen in teaching. Number one is: Game Theory Course for Creative Media Learning, it has a Mean of 4.05 and a Standard Deviation of 0.87. Next in order are: Professional Competency for Technology Teachers has a Mean of 3.95 and a Standard Deviation of 0.90, next in order are STEM Education for Technology Teachers has a Mean of 3.82 and a Standard Deviation of 0.97, and 2) the major is Computer and Technology. Number one is: Unplugged Computer Course, it has a Mean of 4.23 and a Standard Deviation of 0.92. Next in order are: Basic Robotics for Education, it has a Mean of 4.14 and a Standard Deviation of 0.82. Next in order are:

Application Development for Technology Teachers, it has a Mean of 4.04 and a Standard Deviation of 0.89. The program also offers the 2 options program which is Bachelor program and Bachelor + Master program for students who has perform their study in high distinction.

### Conclusions

At present, the Faculty of Education, Nakhon Sawan Rajabhat University offers the Bachelor of Education program, 4 years, with 9 majors including Early Childhood Education, English Language, Thai language, Mathematics, General Science Education, Social Studies, Digital Technology for Education, Physical Education, and Primary Education; Graduate level in Master of Education major in Educational Administration, Curriculum and Instruction, Computer Education, and Educational Research and Evaluation; and the Doctor of Education program in Educational Administration.

From the history of the preparation of the above teacher curriculum. The researcher used the teacher production of Singapore in a comparative study which although it was not taken as the main issue in the research objectives but it can be used for analysis to see the picture of teacher production systematically. In every major subject other than just the Computer Education major that the researcher has developed. In summarizing the research results of the Bachelor of Education program, the current education arrangement has students going out to practice professional experience from Years 1 - 2 in the second semester and having them go out to practice professional experience in Years 3 - 4 in Semester 1 and return to study and reflect on learning results in the second semester, only for students admitted from 2021 onwards. Incidentally, from the critique of the teaching profession by the Teachers Council in collaboration with the Council of Deans of Education of Rajabhat Universities across the country. The learning outcomes framework for the course has been defined. The annual level for students in the teaching profession consists of 17 competencies. Teacher professional experience training for students in the revised curriculum will return to professional experience training for 1 academic year as in the past. As a result, in the

curriculum improvement section, changes in the arrangement of major courses are also required. Returning to the organization of teacher education in Singapore. You will see the path to becoming a teacher as follows.

If you wish to become an Early Childhood teacher, after completing the Certificate in Early Childhood Education you can become an early childhood teacher which is in line with England which has Level 2-3-4-5, namely Level 4 + Level 5 Diploma in Early Learning and Childcare or Level 3 Diploma in Early Years Education and Care (Early Years Educator), etc.

If you wish to become a Primary School teacher, complete the Diploma in Education, which will enable you to teach at the primary level in Grade 1, also known as Key Stage 1 (KS1).

If you wish to become a Primary School teacher and Secondary School teacher, you must have completed 1) a parallel bachelor's degree in Liberal Arts/Education or Science/Education or 2) completed another degree and then studied the Postgraduate Diploma in Education, which will focus on teaching and learning management and there are subjects studied at the secondary level, O Level/A Level according to the Cambridge model, etc.

In this regard, in studying/ organizing teacher education Singapore, if studying at the bachelor's level in the teaching field. There will be a process for training professional experience for teachers every year but it will be shorter than in Thailand. For example, 1st year students in Singapore will have 1 week of vocational experience in school, while in Thailand they will have 3 weeks of vocational experience in school, or 4th year students in Singapore will have 2 months of vocational experience in school while Thailand provides vocational training in schools for 1 semester or 1 academic year, "Why does Thai education lag behind?" is an interesting topic to study and study in great detail.

In addition, in the production of teachers to production issues. The issue of developing continuous learning or lifelong learning is an important issue. In developing the Sand Box Bachelor of Education curriculum this time, the content of the curriculum may not be new to the subject. Because in each subject it is necessary to use it in educational institutions

but organizing teaching methods to develop student competencies is important. The researcher has studied and sought information on the management of courses in other fields of study that are in the form of cooperative education in Thailand and abroad. make it visible that the use of teaching and learning for the teaching profession requires modification and development of the process. This can be summarized as an example as follows.

At present, the field of study has been organized in the form of learning at schools/educational institutions and entering the classroom to discuss. From the first-year level, such as computer programming courses for education. The main goal of learning this subject is not just knowing and being able to write programs but it must be able to be used to provide learning for students in programming schools. The instructor has designed the teaching by content, the subject of programming. Study through online MOOCs that are generally available. The student must submit a certificate of completion in the online lesson for grading. The student must go out to school to observe the teacher's behavior in teaching computer programming (in observing student behavior, one must find an assessment form), students must see what learning programming helps them, such as knowledge, attitude, and skills in what areas, and how they can relate what they learn to use in their daily lives. Students then come to present in classrooms at the university to discuss what each student has encountered. In addition, students have been given increased competency in media production. According to the teaching profession, it can enable students to learn to produce media for teachers or educational personnel.

In Years 2 and 3, students will have higher skills because they have been exposed to the learning process in real school. The field allows students to gain additional experience in school during school holidays. (The university is closed for the semester and the branch allows students to carry out additional professional work in the months of May to June) so that students can see and understand the brit of the educational institution before the start of the basic education semester (May). Actions such as This gives students a better understanding of the school/ educational institution. Since the planning meeting

School curriculum Courses of study in learning subject classroom preparation Analyzing student data to plan teaching and learning. Student assistance planning (Currently, majors and students A system to help students at risk has been developed for Rian Roi School. and the school is using it in the current academic year), etc.

Teaching and learning management, implementation of curriculum development, and developing the potential of teachers; it is important to organize sand box education, universities (administrators, professors, students), schools (administrators, teachers/professors, educational personnel, students) and other organizations such as community enterprises, learning centers, temples, etc. are important forces and drivers which at present the field of study through cooperation with the Faculty of Education, there is a good relationship that will jointly organize education and develop students to become quality personnel of the country. which in the near future There will be cooperation with the Nakhon Sawan Provincial Administrative Organization to develop digital capabilities for the elderly through the Technology Center, etc., the department will bring students to work to learn how to work in real conditions has real communication competency really encountered problems and solved them.

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