

## Using a Competency Standards Design to Teach the Challenge of Sustainable Rural Community Development

W. Sudsomboon

Mechanical Technology Program, Faculty of Industrial Technology,  
Nakhon Si Thammarat Rajabhat University  
1 Moo 4, Thangew, Muang, Nakhon Si Thammarat 80280, Thailand  
Email: weerayute\_sud@nstru.ac.th

**Abstract-** This study conducted to design a competency analysis profile on sustainable rural community development for industrial technology area, and to examine the essential competency standards in the view of graduate students. Participants were 10 graduate students as the owner's occupational. They were also attending the 5907201 Learning Management in Industrial Technology course, Master Degree of Industrial Technology program, Faculty of Industrial Technology at Nakhon Si Thammarat Rajabhat University. The instrumentation was a DACUM (Developing a Curriculum) job competency profile chart. The index of congruence was referred to validate a competency analysis profile. The qualitative and quantitative data was collected through community on-site observations, in-depth interviews, and document analysis. Data was analyzed by frequency and content analysis. The expert's candidate stated with the highest frequency yield that DACUM competency analysis profile on Local Civil Entrepreneurship, the second one frequency yield on Water Supply Officer of Subdistrict Administrative Organization, the third one frequency yield on Local Automotive Mechanics Entrepreneurship, and Sangwiman Pomelo Entrepreneurship and Hydroponics Vegetable Entrepreneurship, respectively. To extend, DACUM competency analysis profile are typically viewed as an individually to complete student's competencies. Hence, students did together in the experts area to complete each of occupational/competency standards.

**Keywords:** Competency Standards, Job Analysis, Learning Innovation, Sustainable Rural Community Development

### I. INTRODUCTION

In recent years, competency standards have been the focus of sustainable development as a country's national competitiveness. Most often, concern is addressed to improve knowledge, skills and attitudes of the challenges, as in, for example, involved in implementing the theory and practice of competency standards into the manpower planning. This point of view established in the 5907201

Learning Management in Industrial Technology on Master Degree course at Faculty of Industrial Technology (FIT), Nakhon Si Thammarat Rajabhat University (NSTRU), and guided the first one inspired question 'how do incorporate the use of competency standards into design of sustainable rural community development', and developed through steering documents with the industrial technology education area.

Currently, NSTRU meet to face growing demands for local sustainability rural and community development, due in part to external factors (e.g., tougher global competition, changing customer needs) and internal factors (e.g., quality management initiatives, internationalization efforts). According to the Rajabhat University Regulation, learning outcomes are defined as "statements of what a learner knows, understands and is able to do on completion of learning with sustainable rural and community development". The challenge emphasis on learning outcomes reflects a broader, ideological shift regarding the role of universities, increasingly perceived as serving 'leader of local university'.

Researchers begin generate the ideas 'how to employ the invention to teach the challenge of sustainable rural and community development', and done by analyzing the vision of FIT at NSTRU, which describes as a leader change local university. Discussions for competency standards design have been forthcoming, but they have pre-dominantly derived from this point of view focus on the development of competencies. This shift is generated idea with students for an emphasis on competency standards profile. Researcher as a lecturer convinced them by discussing what competency means in a context of sustainable rural community development and whether or not it entails a paradigm shift.

The purpose of this study was to design teaching and learning through competency standards in the sustainable rural community of industrial technology area in Nakhon Si Thammarat Province.

### II. THEORETICAL FRAMEWORK

"Competency" has numerous conceptualizes.

According to the Organization for Economic Cooperation and Development (OECD), competencies is conceptualize as the ability to meet complex demands by drawing on and mobilizing resources such as knowledge, skills and attitudes. Developing competencies is the ability “to tackle tasks analysis, going well beyond the basic reproduction of accumulated knowledge” [1]. This statement also emphasizes reflective sustainable rural community development, which implies the use of innovations to promote the localize competitiveness advantage. One feature of competency is action: competencies are targeted not only on school learning, but also on lifelong learning.

Learners are expected to take responsibility for their learning and for their actions: “Individuals who are reflective also follow up such thought processes with practice or action” [1]. In the analysis of Thailand occupational, competency is characterized as the ability to transfer theory knowledge into practice knowledge, skills and attitudes in appropriate contexts and situations. This notion of competency as the ability to apply knowledge and skills is new contexts involves a major change towards an emphasis on knowledge transfer to improve quality life. Competency is conceptualized as a shift from inert knowledge, skills, and attitudes [2]. This study conducted to design a competency analysis profile on sustainable rural community development for industrial technology area, and to examine the essential competency standards in the view of graduate students.

In order to accomplish this research, it is essential to understand the characteristics of competency analysis have the following:

#### A. Rationale for designing occupational competency analysis profile

Occupational/competency analysis profile identifies the essential behavior model for professionals to carry out a task or mission. This behavioral model includes motive, characteristic and skill or knowledge of the fundamental characteristic. Specially, competency refers to the performance that a person has to implement in order to work effectively, especially when adequately playing a role or undertaking a task/mission. Furthermore, it can be observed and measured [3]. Thus, competency is not only the aggregation of knowledge, skills, and attitude, but also a dynamic concept of putting action into practice. In particular, it also means to accomplish the purpose of learning outcome under a specific need.

In order to achieve the goal of the 5907201 Learning Management in Industrial Technology effectively, what needs to be done first is an analysis of the content of the competency in education and training so that the items and occupational standards concerning measuring competencies can be determined for promoting sustainable rural community development.

#### B. The function of occupational/competency standards

The implementation of occupational/competency standards should be based on social demands, and the competency analysis process identifies whether students have attained the competency standards proficiently. The purpose is to let students devote themselves to the effect of globalization and revolutions in technology within sustainable rural community development [4]. The main purpose of competency analysis profile is to analyze one occupation to improve a learner understand and approach in the content deals of work habit, work situation, and workplace. The essential have to integrate knowledge, skills and attitudes that he/she posses [5].

#### C. The DACUM process

DACUM was derived from the phrase “Developing A Curriculum” and DACUM approach was created in July 1968 in British Columbia, Canada. It is a competency-based approach to curriculum development and places the emphasis on the learners gaining ability to meet specific objectives formulated according to a set of standards [4]. DACUM is based on three assumptions as follows: 1) Expert workers can define and describe their job more accurately than anyone else; 2) Any job can be effectively described in terms of the tasks that successful workers in that occupation perform; and 3) In order to be performed correctly, all tasks demand certain knowledge and attitudes from workers [4] (Norton, 1991).

The DACUM process consists of four components namely: 1) the selection of workshop participants; 2) the DACUM workshop; 3) data analysis; and 4) the development of the course. The participants in the workshop should be experts in their respective areas of specialization, articulate and forward thinking [5] [6].

### III. METHODS

#### A. Design

The 2 days DACUM workshop was held in August 2013 at Mechanical Technology program, FIT, NSTRU. Researcher also included the occupational of sustainable rural community development in Nakhon Si Thammarat province underlying the *ibstpi* competency standards model [7] that proposes a common framework, as shown in Figure 1, to be followed by each statement of the owner’s occupational refer to develop standard. Researcher was moderator explained about the overview of competency standards framework.

#### B. Participants

Participants were 10 graduate students as the owner’s occupational. They were also attending the 5907201 Learning Management in Industrial Technology course on Master Degree of Industrial Technology program, Faculty of Industrial Technology at Nakhon Si Thammarat Rajabhat University in the semester of 1/2013. The students’ have been previous experienced each of occupational more than 10 years, such as civil

entrepreneurship, agricultural entrepreneurship and civil servant officer.

### C. Instrumentation

The instrumentation was a DACUM (Developing a Curriculum) job competency profile chart. The 5 occupational/competency analysis profile consisted of 1) local civil entrepreneurship; 2) local automotive mechanics entrepreneurship; 3) agricultural entrepreneurship; 4) and 5) The procedure was conducted with designing competency analysis profile process as shown in Figure 2.

Researcher identified the general areas of job responsibilities called duties (typically 8-12 per job), then specified tasks (competencies) performed in connection with each duties (typically 7-12) [8]. Modified and structured small group brainstorming techniques are used to obtain the collective expertise and consensus of the training instructors. High quality task and duty statements usually result from this interaction. Researcher is a trained DACUM facilitator and conducted the workshop.

Researcher taught that a precise language to specify performance. The precision involves the consistent use of an "action verb" as the beginning word. The action verb, also called active verb, was a transitive verb had the meaning of acting, performing, or executing, and always provides important information about the content of a competency. An action verb was usually used to describe skill, competency, basic academic ability, educational objective, curriculum design, learning assessment, learner profile, curriculum vitae, and recruitment advertisement. An action verb also needs an object. The object, a noun or a noun phrase, is the performing target of the action verb. Aside from this, it may need to specify the condition or circumstance to increase precision. Hence, a competency statement had the form of "action verb + object + condition" that can be proposed in Figure 3 [5] [6].

The index of item objective congruence (IOC) was referred to validate a competency analysis profile. The 5 experts were discussed.

### D. Data Collection

The qualitative and quantitative data was collected through community on-site observations, in-depth interviews, and document analysis. First of all, researcher was moderator explained about the overview of skills standard framework in this study. Then, started at 1) Occupational title was synonymous to job title, which specifies the domain of competency standards. 2) Critical work function, equivalent to collective competency, was the major responsibility in a job area. 3) Key activity, synonymous to a single skill, is the major duty or task involved in carrying out a critical work function. 4) Performance indicator provides information on how to determine when someone was performing each key activity competently. 5) Technical knowledge was the

related knowledge needed to perform the key activity. 6) Employability knowledge and skill was a general competency used to improve performs the key activity.

All measurements expert summary scores were obtained from individual participants. Learning outcomes were associated with correctness of the DACUM competency analysis profile. The quality of the summaries was assessed as the existence and correctness of relations among competency standards. Experts' were accepted by a questionnaire for important duty and tasks analysis through DACUM process.

### E. Data Analysis

Data was analyzed by frequency and content analysis. The triangulation method was referred to validate competency standards in the sustainable rural community of industrial technology area in Nakhon Si Thammarat Province.

(Creswell, 2008). For instance, the triangulation method was the strategies that conducted to collect data of corroborating evidence from different individuals (e.g., DACUM workshop and experts' panel discussion), types of data (observations and in-depth interviews), and methods of data collection (e.g., document analysis and in-depth interviews) in description and theme in this study.

## IV. RESULTS

**TABLE I:** THE OVERALL OF DACUM COMPETENCY ANALYSIS PROFILE

No.	Occupational	Duties	Tasks
1	Local civil entrepreneurship	10	45
2	Local automotive mechanics entrepreneurship	8	32
3	Water Supply Officer of Subdistrict Administrative Organization	6	36
4	Sangwiman Pomelo	5	23
5	Hydroponics vegetable	6	27

**TABLE II:** INDEX OF ITEM OBJECTIVE CONGRUENCE (IOC) OF

DACUM COMPETENCY ANALYSIS ADMINISTERED IN THIS STUDY

No.	Occupational	IOC
1	Local civil entrepreneurship	1.00
2	Local automotive mechanics entrepreneurship	0.80
3	Water Supply Officer of Subdistrict Administrative Organization	1.00
4	Sangwiman Pomelo entrepreneurship	0.80
5	Hydroponics vegetable entrepreneurship	0.80

**TABLE III: A questionnaire for important duty and tasks Analysis through DACUM process**

Duty and Task Statements	Importance Mean ( <i>M</i> )
1. Local civil entrepreneurship 10 Duties and 45 Tasks	4.82 4.54
2. Local automotive mechanics entrepreneurship 8 Duties and 32 Tasks	4.38 4.03
3. Water Supply Officer of Subdistrict Administrative Organization 3 Duties and 34 Tasks	4.57 4.13
4. Sangwiman Pomelo entrepreneurship 5 Duties and 23 Tasks	3.96 3.49
5. Hydroponics vegetable entrepreneurship 9 Duties and 49 Tasks	3.78 3.43

## V. DISCUSSIONS AND CONCLUSIONS

The expert's candidate stated with the highest frequency yield, and a questionnaire for important duty and tasks analysis through DACUM process found that the first yield on Local Civil Entrepreneurship ( $M = 4.82$ ), the second one frequency yield on Water Supply Officer of Subdistrict Administrative Organization ( $M = 4.57$ ), the third one frequency yield on Local Automotive Mechanics Entrepreneurship ( $M = 4.38$ ), and Sangwiman Pomelo Entrepreneurship ( $M = 3.96$ ) and Hydroponics Vegetable Entrepreneurship ( $M = 3.78$ ), respectively.

To extend, DACUM competency analysis profile are typically viewed as an individually to complete each of competencies. Hence, students did together in the experts area to complete each of occupational/competency standards. These essential duty and task statement need to all items. Also included in the task verification questionnaire was the list of competencies required of competency standards in the sustainable rural community of industrial technology area in Nakhon Si Thammarat Province.

The importance of competencies as rated by respondents and the mean rating was calculated for each competencies item. Items with a mean rating of 4.0 to 5.0 were considered essential to the automotive technology competency analysis profile. Items with a mean rating of 3.78 to 4.82 were classified important. Furthermore, the specifically designed it cross the competencies by applied from entry level.

The finding was employed based on a competency-based learning that using tasks analysis, competency statement creates, maintains, and reproduces meaning. By researching in this study on the DACUM competency analysis profile with especially instructional strategies, it was increased that students' competencies could make their content ideas explicit and develops an

occupational/competency standards of the content through the challenge of sustainable rural community development at Nakhon Si Thammarat province.

The future research is critical for learning innovation for comparing the instructional strategies that support the individual students' knowledge representation. Sample size is another limitation of this study.

## ACKNOWLEDGEMENT

The researcher would like to thank experts' candidate Dr. Roipimjai Pecthkul, Assist. Prof. Sataporn Chantawee, Mr. Montri Rueangpradap, Mr. Wittaya Wongklang and Mr. Parinya Mompiboon and all participants from the Faculty of Industrial Technology, Nakhon Si Thammarat Rajabhat University for their valuable, assessment and suggestion.

## REFERENCES

- [1] Organization for Economic Cooperation and Development (OECD), 2005. [On line] Available at [www.oecd.org/dataoecd/34/6/34711139.pdf](http://www.oecd.org/dataoecd/34/6/34711139.pdf)
- [2] M. Lyle and S. M. Spencer, "Competency at work: models for superior performance", Massachusetts: John Wiley & Sons, Inc., 1993.
- [3] International Labour Organization (ILO), What is Competence?, 2002. [On line] Available at <http://www.iol.org/public/englesn/region/ampro/cinterfor/complab/xxxx/1.htm>
- [4] B. Mansfield and L. Mitchell, Aurora University. 2003, In: Michelin Career Center, Norton, R.E. (Eds.), [On line] Available at <http://www.dacumohiostate.com/SCID.htm>
- [5] R. E. Norton, "SCID systematic curriculum and instructional development", Workshop Manual, Center on Education and Training for Employment, Columbus: The Ohio State University, 1991.
- [6] R. E. Norton, [On line] Available: <http://www.dacumohiostate.com/SCID.htm>
- [7] J. D. Klein and R. C. Richey, "Improving individual and organizational performance: The case for international standards", Performance Improvement, vol. 44, no. 10, pp.9-14, 2005.
- [8] M. C. Grattan and S. B. Trevvett, "Writing competency-based frameworks: A workbook for teachers", Virginia Department of Education, 2005.
- [9] W. Sudsomboon, "Applications of competency-based education: In the context of diversity and change", The Journal of King Mongkut's University of Technology North Bangkok, vol. 20, no. 2, pp.370-381, 2010.
- [10] W. Sudsomboon, "A Development of Competency Analysis Profile on Automatic Transmission Service Course for Training Undergraduate Students," The Journal of King Mongkut's University of Technology North Bangkok, vol. 19, no. 1, pp. 43-54, 2009.

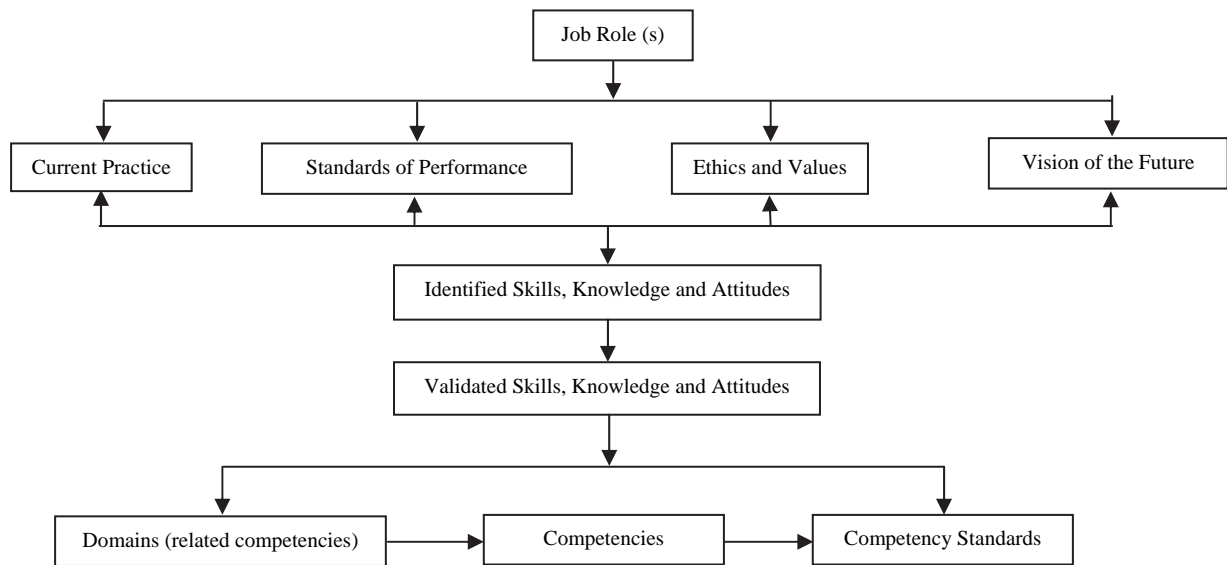


Figure 1: The *ibstpi* competency standards model [8]

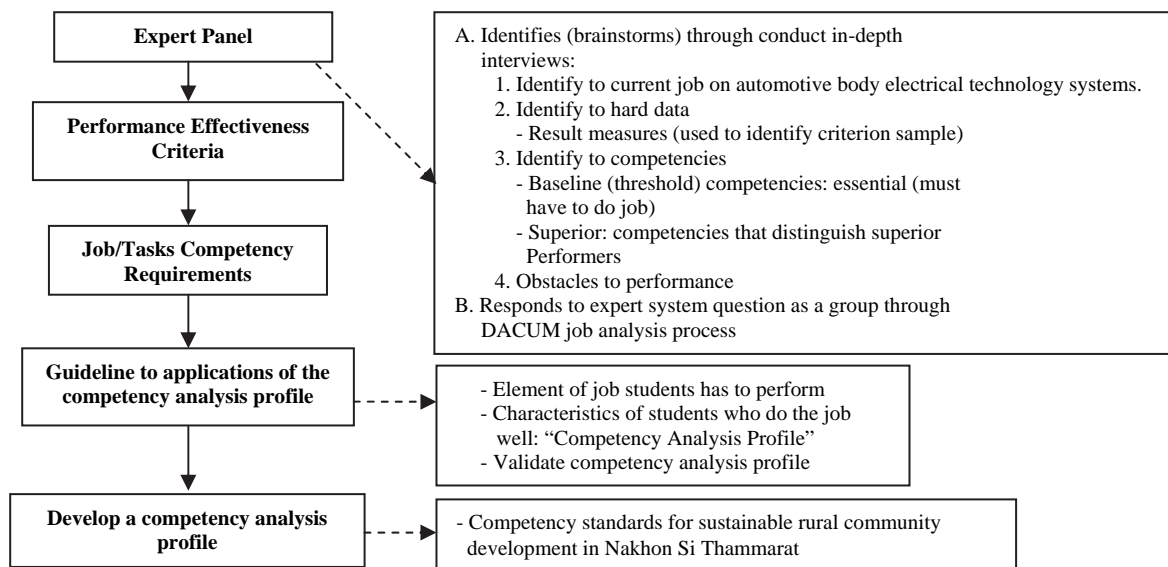


Figure 2: Designing of Competency Analysis Profile Process [2]

**TABLE III:** A questionnaire for important duty and tasks analysis through DACUM process

Duty and Task Statements	Importance Mean (M)
1. Local civil entrepreneurship 10 Duties and 45 Tasks	4.82 4.54
2. Local automotive mechanics entrepreneurship 8 Duties and 32 Tasks	4.38 4.03
3. Water Supply Officer of Subdistrict Administrative Organization 3 Duties and 34 Tasks	4.57 4.13
4. Sangwiman Pomelo entrepreneurship 5 Duties and 23 Tasks	3.96 3.49
5. Hydroponics vegetable entrepreneurship 9 Duties and 49 Tasks	3.78 3.43

*Note.* Important duty and tasks analysis were rated on a 3-point scale.  
Essential = 5, Important = 3, and Not Important = 1.