

The Development of Professional Certification in Taiwan--Some Strategies for Promoting Students' Professional Capability

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ABSTRACT: *Some paradigms from both of Germany and Japan were showed that enforcing on human resource development and putting the professional certification system into practice could increase nation competence after Second World War. Economic development based on manpower possessing technique & professional skills are forming a society of technology advanced and total certification, which leads the country to totally powerful and prosperity and now as a mirror for those countries desirable to develop its own professional certification system.*

The professional certification system aims at insuring the prepared workforce and easily meeting the demands to flexibly be employed in labor market. Hence, this paper at first explored the importance of professional certification system. Secondly, explaining its definition theoretically. The elegant content of professional certification system ought to be profession, quality, and efficiency. A valid professional certification system depends on completed related law and acts. Therefore, an aspect of current situation in Taiwan on this issue was introduced and so was making problems analysis afterwards. Finally, we gave some points of view on the development of professional certification as well as creative models in the future for reference.

1 INTRODUCTION

Facing the new century, the main driven-force on development of professional certification system is practiced in many developed countries to focus on insuring the quality of production and enforcing on professional technique for labor and to meet the need of globe competition.

The information of human resource development from Unites Nation indicates that the key of nation's industrial development was based on prefect technical evaluation system among developed countries. In fact, the professional certification system leads the people in learning achievement of professional technique and identities the product quality in business process including: Design, manufacture, quality control, marketing, and service. Obviously, so many new paradigms formed around the world in last three decades. For example:

- Running both a perfect skill evaluation system and life long education system are increasing higher development in professional certification in Japan.
- Setting a strongly technique-based industry gained high quality product in German and France.
- Enforcing on characteristic of technique-based reached the top of the world on watch production in Smithland.
- Focusing on professional technique in communication technology formed a new paradigm on economic development in Finland.

Rethinking about the developed situation from those countries, the driven-force on nation's development comes from professional certification. However, this system had been setting the stable continuous development mechanism in those countries.

Professional certification identifies the occupational ability and enhances works' productivity. At the same time, it also has high benefits in industry and society. According to Yearbook of Labor Statistics-ILO 2001, skills and knowledge are the engines of economic growth and social development. We assist individuals to become employable through training, skills development and education. This assistance is crucial to improve and sustain their productivity and income-earning opportunities at work. It serves to enhance their mobility in the labor market and offers the potential for increased career choices (ILO,

2004). However, no technique will be effective unless it suits the particular circumstances (Probst, Raub & Romhardt, 2000).

The professional technical qualification system in Taiwan, opposite to other developed countries, was developed well. For example, the skill testing certification, began in 1974, was running very reliable in enterprise. Nowadays, Taiwan's strength of manufacturing technique in globe industrial component was top of the world particularly in high-tech industry. Due to the range of professional technical certification is no limited, this paper focuses on students who learn in engineering education system.

2 THE CONSTITUENT OF PROFESSIONAL CERTIFICATION

A. Definition, function and effect

The meaning of "occupation" can be regard as someone who carries on a job or duty (CLAEY , 1994). The category of occupation with view points in need of ability on mental and physic, can be divided into 5 levels as follow: professional level, technical level, skilled level, semi-skilled level, and unskilled level.

The certification system means any achievement of learning by test or evaluation, including specified test, professional test and skilled workers test held by Exam Yuan or Vocation Training Bureau in Taiwan. On the other hand, the meaning of skill testing system is a standard evaluation for labors to ensure the skill level and corresponds to national skill evaluation system. However, the meaning of professional certification is to evaluate the special person's professional knowledge and skill based on technical criteria. Each eligible candidate who passes the test can get professional certification from authority. The functions of both certification and license can be thinking as:

- A tool evaluates occupational technique for employees.
- Marking assurance of working quality is on productions and services.
- Identify the public safeties.
- Facilitate employment safety for talents.
- Enhance effectiveness when working.

The influence of certification and license system include:

- Concrete basement of modernization in nation
- Prompt living satisfaction of citizens
- Enlarge nation's competition

B. Professional certification managed by law

Professional certification ensures the public safety; effect for exerts who needs a registration, certification, and license. "Registration "and "Certification" admit one individual possess qualification and ability to engage in its specialization job, but "License" engages in professional just title and issues from government (MOE, 1993).

Professional technological capability presents personal performance particularly in profession, quality and efficiency. Having professional technical certification could be regard as having equivalent prepared labor force. The acquirement of professional technique depends on certain skill-standard effect and skill test's style. Therefore, the person who holds professional certifications that work performance can certain profession average, reach certain quality when production and do their job efficiency.

3 CURRENT STATE OF PROFESSIONAL CERTIFICATION SYSTEM

A. Multiplies profession testing form country occupational certification system.

The occupational certification system was diversity in Taiwan. This system includes: Skill testing that runs for skilled worker, special examination for professional & technologists sponsored by The Examination Yuan, and specified occupation & special skilled examination held by government or related association.

Table 1 Current state of professional certification in Taiwan

Item	Sponsor	Classification	Notes
Skill testing (ST)	Employment & Vocational Training Administration (EVTA)		<ul style="list-style-type: none"> ▪ Divided into A, B, C grade. ▪ Occupational classification on skill testing: 147 items ▪ Eligible qualification: total 2,558,069; A—7532, B--279,505, C--2,271,032 (EVTA, 2004a).
Civil Service Examination (CSE)	The Examination Yuan (EY)		<ol style="list-style-type: none"> 1. Persons qualified in the national exam. 2. Senior exam. 3. classified position for civil servant 4. Junior Exam. 5. Elementary Exam. 6. Special Exam. 7. Special Exam. For Professional & Technologists (SEPT).
Specified Occupation & Special Skilled Examination (SOSSE)	Government or related Association.		Depend on occupational classification(Include: Mastery electricity, mastery water, technician of gas & fuel in tube, skill testing of computer, boiler operator, technician in waste water, automatic maintainer, automatic inspector, accreditation on IT ability...etc.)

Resource: EY (2004).

B. Implement occupational certification for need of labor market

The classification of occupational qualification can be showed as follow:

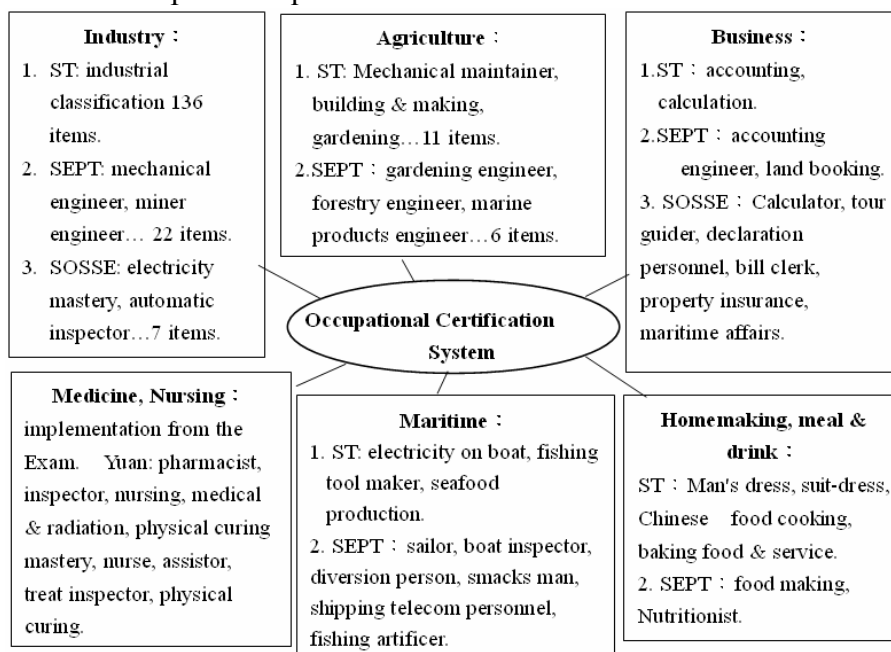


Figure1. The occupational certification system in Taiwan

Resource: Revised from EVTA (2004a); EVTA(2004b); EY (2004).

C. Enhancing skill testing for in-school students

For to courage in-school students pass skill testing and to constitute a value-add of certification society, some strategies that consist of pull and pushing force as follow:

- Adding more score of professional subject on enter examination of technologic & vocational school to encourage student passing skill testing.
- Implementing apprenticeship program in vocational high school encourages student to gain practice skill and technical certification.
- Establishing a diverse qualification system is equal to literacy qualification. The Ministry of Education will coordinate among the Examination Yuan, Personnel Administration, and EVTA.
- Assisting each certification issue, leads technician to get a better job.
- Coordinating with the Examination of Yuan, discuss amend of special occupation and turn appoint office salaries regulations, promote scholar certification equivalent to nation's examination level.

4 PROBLEM ANALYSIS

Since 1960s, Taiwan's industry faces a rapidly changing environment, from labor intensive, asset intensive, technological intensive, and knowledge intensive. In 2003, the labor force participation rate was 57.3%, unemployment rate was 4.99%; employment structure on agriculture was 7.3%, industry 34.8%, service 57.9%(DGBASEY , 2004). Nowadays, some problems appear as follow:

Table 2. Problem Analysis for professional certification

Item	Problem analysis
Policy	<ul style="list-style-type: none"> ▪ Manpower training was not focusing on long term in requirement of employment and cultivates unfavorable technique. ▪ The content of occupation technology change rapidly. It lacks efficiently criteria to evaluate. ▪ The criteria of skill testing were not fitting the need of enterprise.
Education	<ul style="list-style-type: none"> ▪ Curriculum in vocational high school more concerns in entering higher education system. ▪ Skill testing for in-school student just identify enter level in market; It seem takes up employment limited. ▪ Technological and vocational education was more generalization to limit the development of professional certification.
Society	<ul style="list-style-type: none"> ▪ Seeking higher diploma instead of professional certification was a popular value in society. ▪ Thinking the originality similar to productivity, does not like to learn professional technology.
Industry	<ul style="list-style-type: none"> ▪ Industrial structure was changed particularly in manufacturing proportion. Technological requirement changes in quantitative. ▪ Occupational nature was changing to make technician missing when work.

5 RETHINKING ABOUT THE PROFESSIONAL CERTIFICATION SYSTEM

The trend on development of professional certification system will be reformed particularly in the era of knowledge-based, focusing on innovation, speed, quality, and professional knowledge reuse, increasing the competition on globe market.

Table3. The content of professional knowledge and technique

Characteristic	Content
Tacit	Hard to express with literacy and report
Complexity	Need to each domain's technology, expert or resource.
Special attribute	Appling specific, professional, and additional specific manpower or machinery equipment.
Empirical	Possessing similar knowledge domain with experience.

Resource : Simonin (1999).

A. Professional technical competence connected to performance

Professional technique is equivalent performance from points of view in capability, but consider as an iceberg structure. Iceberg above takes on working performance opposite to professional technical competence. Even though capability is uncertain, job’s performance was requested. Figure 2 takes on ideas that professional technique equivalent occupation ability.

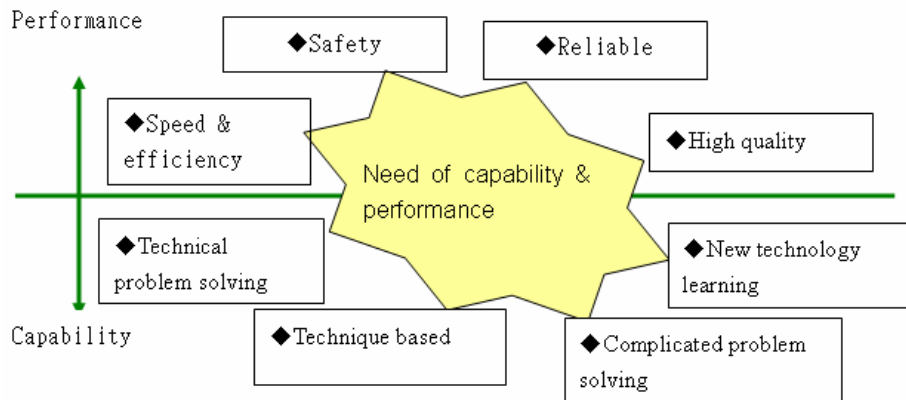


Figure2. Conceptual mapping of professional capability

B. The key points on promoting professional technique are creativity and problem solving

Professional technique composes by technical creativity, skill/technique, and capability in problem solving. Technologies creativity takes on highly relative to knowledge economy environment. Technique delegates individual professional ability that have already possessed. On the other hands, problem-solving ability presents personal wisdom and need of capability requisite from labor market.

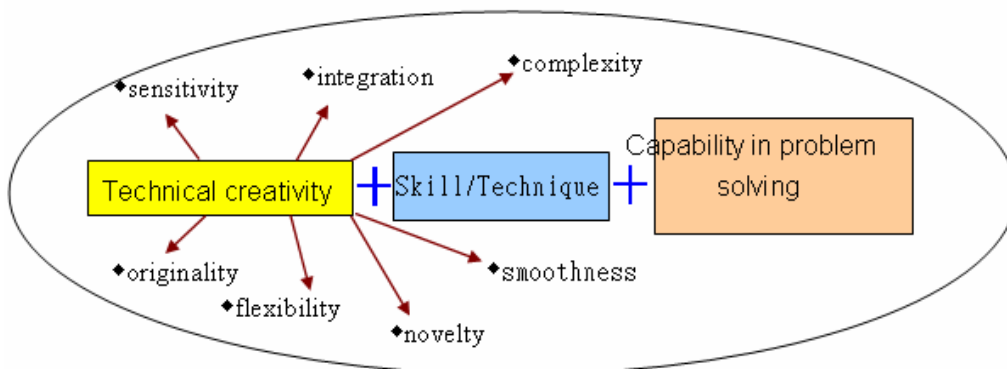


Figure3. The constituent of professional technique

6 STRATEGIES FOR PROMOTEING PROFESSIONAL TECHNIQUE FOR ENGINEERING STUDENTS

A. Continuous promoting teacher’s professional technique

Four elements compose professional technique were tacit, complexity, special attribute and empirical. Due to professional technical development leads by quality, speed, flexibility, and innovation in new century, should develop personal professional technique.

For enhancing the benefit of professional technique at labor market, we should consider with two dimensions as "Performance from Core Competence ", and "Improving criteria of professional certification ". In other words, professional technology need to create individual's value create as value-added at industry. Obviously it can enhance powerful personal competitive at market.

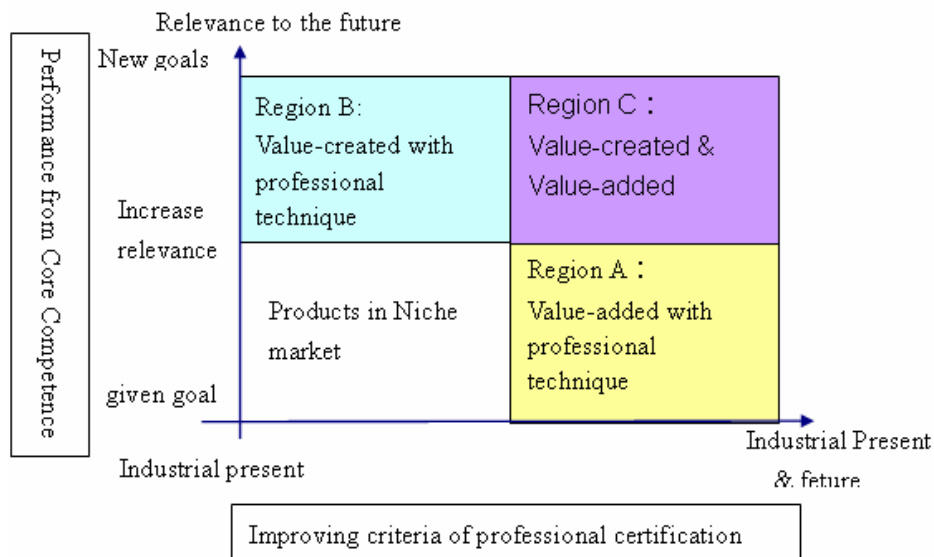


Figure 4. Value-added with professional technique
 Resource: Revised from Probst, G. Raub, S., & Romhardt, K. (2000).

B. Increasing the student’s core competence on professional technique

Technological and vocational education act as critical role in development of professional certification during the era of knowledge economy. For example, figure4 shows that polytechnic face five environment as: knowledge-based environment, technology-based environment, professional certification society, E-technological & cultural environment, and international accreditation environment. Improving curricular practice of technology and professional education should be put a priority position.

For ensuring student take up employment competition, we need to establish professional certificate. At the same times, construct technological criteria to meet the need of talent flowing in labor market; establishing a reliable accreditation mechanism ensures the professional technical ability for learner; strengthening regional or global professional certification agreement, increase international flowing ability for gradated students.

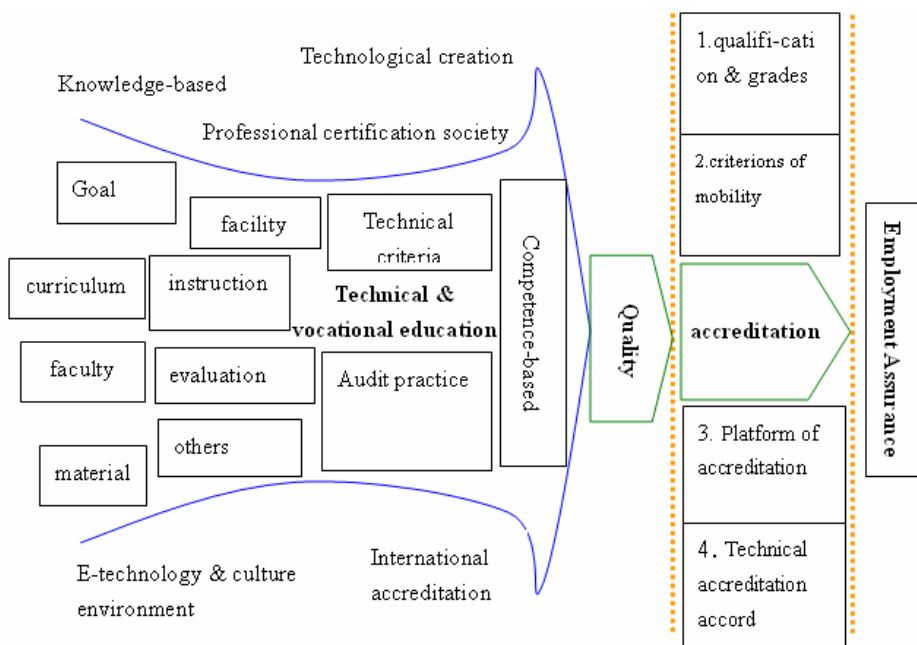


Figure 5. Strategy for promoting professional technique in polytechnic level.
 Resource: Revised from Rau & Chang(2003).

C. Forming technical program as a developed strategy

Designing a professional technical course in higher education could refer to conceptual mapping in picture 6. This picture presents higher education by technical core competitive power, transform for professional technical course's construct. Each department curriculum of school could use this process to develop as follow:

1. Leading with methodology of V-TEC, DACUM, or DELPHY develop curriculum. As gasp environment pulse, we need to get opinion from industry.
2. Doing occupation analysis for professional curriculum if possible relative to duty, and task on job.
3. Forming curricular technological program with methodology of convergence and divergence is very important.
4. Implementing competence-based curriculum promote students' professional capability.
5. Considering professional technology change rapidly, enforce on continuous improving curriculum.

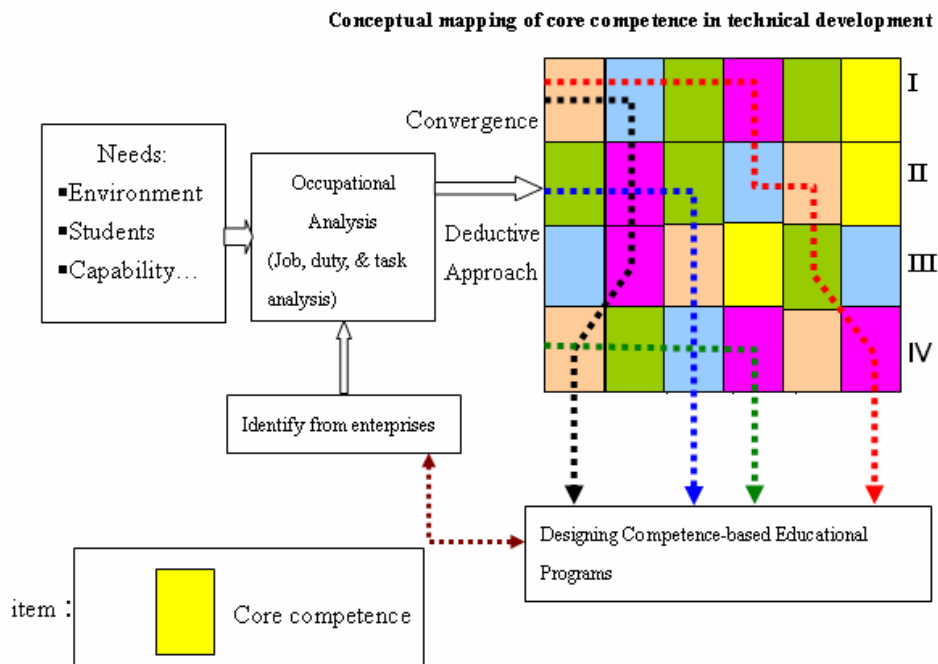


Figure 6. A developmental strategy in technical program

D. Offering professional technical program for undergraduate student

Taiwan's technical training system run by 13 public vocational trainings centers, and act for number of citizen institutes that implement enterprise training. The disciplinary concept, theory and practice of competence-based training are popular since 1980s in Taiwan. However, competence-based training program designs extensive application in on-the-job training and off-the-job training. For example, Fletcher (1997) brings up a process of competence-based training, can be referenced.

Professional technology is becoming manpower have-prepared labor force and the root of industrial development. No doubtable, higher education system should act as more active role to ensure quality of labor force forever.

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