

# **An In-depth Study on the Cooperation of Vocational Colleges and Companies in the DVT-Program to Identify Major Strongpoint in the Institution- Industry Linkages with Recommendation for the Enactment of the New Vocational Education and Training Act**

***Assoc. Prof. Dr. Krismant Whattananarong***

Department of Technological Education  
Faculty of Technical Education  
King Mongkut's Institute of Technology North Bangkok  
1518 Piboonsongkhram Rd., Bangsue, Bangkok 10800, Thailand  
E-mail: [krm@kmitnb.ac.th](mailto:krm@kmitnb.ac.th)

## **Abstract**

The purposes of this study were to identify the occupations needed for training and making occupational profiles, to investigate the perception of employers or enterprises, vocational teachers and administrators, current students on the DVT system and issues of vocational education and training, and to propose a narrative model of vocational education and training for drafting the bill of vocational education and training.

There were 7 response forms (Q1, Q2, Q21, Q3, Q31, Q4, Q41) used for data collection. The samples were 666 employers or enterprises, 390 teacher and administrators, and 624 students. The questionnaire Q1 was used for data collection from 408 employers or enterprises to gather their opinions pertaining to the occupation needed for training and making occupational profiles. A Delphi technique was applied for 3 times of data collection from 258 employers or enterprises by using Q2 to ensure the consistency of their responses. Conclusions were draw from the third response.

The Q21 was used for interviewing 114 employers or enterprises. There was one time data collection from 390 teachers and administrators by using the Q3 and from 161 teachers and administrators by using the Q31. The Q4 was used for one time data collection from 352 DVT students and 272 non-DVT students. The Q41 was used for interviewing 209 DVT students and 112 non-DVT students.

Data were analyzed by percentage, mode, mean, standard deviation, and a t-test statistic using the Statistical Package for the Social Sciences for Windows (SPSS/FW). A level of .05 was set to determine statistical significance. Results of the study indicated that the 12 occupations needed for training and making occupational profiles rated by the employers or enterprises are electrical technicians, automotive services technicians, electricians, automotive painting and finishing technicians, automotive collision repair mechanics and technicians, agrotechnology, refrigeration mechanics, factory automation, mechanical & maintenance, bookkeepers, drafting, and plumbers respectively.

The employers or enterprises, teachers and administrators, and students perceived the information given in the questionnaires and positively responded to the questions.

Majority of the samples agreed with the issue of regulations, mechanisms, and implementations of vocational education and training system given in the questionnaires.

There was no significant difference between the DVT students and non-DVT students on the perception of the vocational education and training system. The model of vocational education and training should be divided into school-based and work-based systems in which the linkage must be regulated by law. The mechanism should be feasible and autonomous. And the implementations should be cooperated between educational institutes and employers or enterprises. Taxes should be imposed and generated back to the employers or enterprises that provide training.

## Background and Rationale

Vocational education and training in Thailand has been conducted under two main agencies. They are the Department of Vocational Education (DOVE) and the Department of Skill Development (DSD). DOVE has 413 vocational and technical colleges under its jurisdiction throughout the country. DSD has its training institutes throughout the country too. Dove mostly deals with formal vocational education and training or school-based education. DSD deals with skill training, retraining, and upgrading in accordance with their skill qualification standards. The activities of these two departments are related to manpower development of the country. However, they are seemingly working far apart from each other. The DOVE is under the Ministry of Education. The DSD is under the Ministry of Labor and Social Welfare. The newly enacted Educational Act BE 2542 (1999) which declares 12 years of basic education with several reforms pertaining to vocational education and training (VET) has paved the way for drafting a bill of vocational education and training in which it will contribute to the benefit of the country.

During the economic growing years 1986-1996, Thailand experienced the shortage of technical manpower. The Federal of Thai Industries together with all manpower authorities concerned and embarked upon an extensive program in all fronts to address the situational problems. The problems are those occupations that needed training to fulfill the shortage, the competencies needed for those occupations or occupational profiles, and the method or model of training or retaining. The regulations, mechanisms, and implementations are also included as well. A positive outcome is the closer cooperation among the institutions and the enterprises. Many of them still in operation today but toned down because of the economic crisis. Another important development in the model of vocational training is the Dual Vocational Training System which (DVT) implemented under the Department of Vocational Education (DOVE) with technical assistance from the Government of the Federal Republic of Germany. This DVT program has been an endeavor as a model and mechanism in vocational training since the early 1980's pilot project on the apprentice-training center (ATC) at Ta Luang with collaboration of the Siam Cement Co., Ltd. It has grown into a nation-wide program.

The DVT programs under the DOVE are based on the network of full-timed vocational colleges reaching into the placement of a number of apprentices in various enterprises. In more cases, the enterprises are responsible in recruiting the apprentices by themselves as per set of agreed-upon regulations. This DVT system is still new to many

cooperating enterprises and there are still many hitches, ups and downs to be ironed out in time. One answer would be the enactment of the new VET Act to provide legal supports and procedures or regulations of the system.

Dove colleges have also come up with an organized on-the-job training system (OJT). One good example is the collective efforts (linkages) of agricultural colleges in sending students for OJT with commercial agricultural establishments in groups for a training period of 25-55 days and revolving the year round. The DVT program is presently with 20,636 apprentices in 3,090 participated enterprises, representing some 15 per cent of the total VET students. The programs currently offer courses in industrial trades, retailing and business administrative assistants, hoteling, garments and jewelry. DOVE is expanding these programs hoping to reach the benchmark of 50 per cent.

The Department of Skill Development (DSD) in the mean while has successfully proceeded in passing the Training Promotion Act BE 2537 (1994) and the setting up of the Skill Development Fund. The Training Promotion Act allows the enterprises setting up their own training centers that must be registered with the DSD, and further stipulates that the training cost incurred with previously approved programs could be calculated at 50 per cent deductible before income tax. After 5 years of working with these laws, only 46 companies made the registration and very few could make progress with the tax reduction or the proposed training cost reimbursement, simply because of strict bureaucracy and the newness of the practice. The Skill Development Fund has the first blessing of the Thai government in granting the first initial sum of 1,000m Baht into the Fund. This Fund is presently only used for giving training loans to those in needs for further training with the payback term of 6 to 24 months. The DSD, after 5 years of experience with the first Training Promotion Act, is now in the process of making the second enactment. The new Act proposes to impose a training levy of one per cent of the monthly payrolls. However, the size of the company and the upper ceiling monthly wage for this training levy are to be decided upon with the by-law. The enactment procedure is now at the midway and about to be presented to the parliament.

The VET reforms at DOVE and the new Training Promotion Act together with the working of the Skill Development Fund, when put together, would have a far-reaching effect for VET reform in Thailand. There are some issues needed to be regulated and implemented in the system of vocational education and training. This study was conducted to investigate the appropriate linkages between educational institutes and enterprises and the grounds of vocational education and training in order to use as the principles of drafting the bill.

## Purposes of the Study

The primary purpose of this study was to identify top 12 priority of occupations needed for training and making occupational profiles. The second purpose was to investigate the perception of employers or enterprises, vocational teachers and administrators, current students on the DVT system and issues of vocational education and training. The issues are the regulations, mechanisms, and implementations of vocational education and training system that fit to the current needs and long term requirements of Thailand. A final purpose was to propose an appropriate model of

vocational education and training for drafting the bill of vocational education and training.

## Research Questions

1. What are the top 12 priority occupations needed for training and making occupational profiles?
2. What are the perceptions of the employers or enterprises, vocational teachers and administrators, and current students on DVT system and the issues of vocational education and training? The issues are the regulations, mechanisms, and implementations of vocational education and training system.
3. What is an appropriate model of vocational education and training as perceived by the subjects of this study?

## Limitations of the Study

During the course of this investigation, some limiting factors were encountered including the following:

1. The scope of this study was limited only to find the solutions to the situational problems as specified by the MSF and GTZ. These organizations were involved in drafting the bill of vocational education and training. The study team transformed their situational problems to research problems in which they were accepted by the organizations that sponsored this study.
2. This study was limited to the time and schedule proposed by the MSF and GTZ.
3. The instruments used in this study were questionnaires and interview forms developed by the researchers.
4. Unrelated items in the questionnaires and interview forms were removed when using inferential statistics for computations.
5. Data that were not pertinent to synthesizing of the solutions were not analyzed.

## Basic Assumptions

This study was based on the following assumptions:

1. It was assumed that the perceptions of the employers or enterprises, vocational teachers and administrators, current students on DVT system and issues of vocational education and training could be measured.

2. It was assumed that the subjects of this study provided accurate perceptions that were recorded on the instruments.

3. It was assumed that data gathered from the randomly selected samples were normally distributed.

4. It was assumed that research methodology and Delphi technique were appropriate to find the solutions.

5. It was assumed that the instruments used in this study posted an acceptable level of validity and reliability.

6. It was assumed that the Thai language instruments used in this study were accurate and valid and the translation did not change the meanings.

## Definition of Terms

For the purpose of this study, the terms were defined as follows:

ATC (Apprenticeship Training Centers) is defined as a center for apprentices and have the environment similar or nearly similar to the real world of work for the entire training period. It is a work-based system known as the DVT system. The trainers and responsible persons within the ATCs must be capable of delivering the real training by already having further education, training and experiences of their tasks.

Dual Vocational Training (DVT) is defined as a method or model of work-based system of vocational education and training of the Federal Republic of Germany.

DVT students are the students study in the DVT programs.

Enterprises or employers are the owners or management level persons in the private sector, which their businesses participate in the DVT programs with nearby vocational or technical colleges.

GTZ (Gesellschaft fuer Technische Zusammenarbeit) is defined as a German organization that assisted DVT programs in the Department of Vocational Education.

Human capital is defined as the investment of enterprises on their manpower and human resources development that needed for their businesses.

MSF (Mongkut Sabha Foundation) is defined as a non-profit organization found by King Mongkut Institute of Technology North Bangkok.

OJT (On-the-Job Training) center is defined as an independent body taking in trainees from any applying applicants from institutes within the country with school-

based system. Within the OJT centers the trainees would be working with the simulated environment of the world of work in their line of work and disciplines. The centers will also coordinate any further OJT at the enterprises in their networks. The trainers and responsible persons working in the centers must be trained and have experiences with the real world of work.

Vocational and technical colleges are the vocational institutes under the jurisdiction of the Department of Vocational education (DOVE), Ministry of Education (MOE) which offer a Dual Vocational Training (DVT) programs.

Vocational teacher and administrators are persons who were assigned to teach or administrate the DVT programs in their colleges.

Vocational education and training (VET) is defined as the programs to educate people become employable or able to perform a specific task needed for their work. The work could be a paid employment, an unpaid employment, and self employment.

## **Significance of the Study**

This study was conducted according to the needs of the GTZ and MSF with the agreement of the DOVE. The two organizations sponsored this study and were involved in drafting the bill. It collected, compiled and analyzed data among the enterprises or employers, vocational teachers and administrators, and students. Comparison between the perceptions of DVT students and non-DVT students would indicate the difference of attitudes of the students. The findings of this study are significant in that it will be used as the grounds of drafting the bill and making occupational profiles.

## **Research Design**

This survey research was designed to investigate the solutions to the research questions. After analysis of the situational problems, the research questions were formulated. They were formulated to find the priority of occupational training and making of occupational profiles, the perception of employers or enterprises, vocational teachers and administrators, and current students toward the DVT system and vocational education and training. The narrative model of vocational education and training in Thailand as perceived by the subjects for drafting the bill of vocational education and training was also included. Survey research using a Delphi technique seems ideally suited to this study. Questionnaires and interview forms were the instruments used to obtain personal fact, opinions, and perceptions (Kelingner, 1986, p. 586). The study dealt with employers or enterprises that participated in the DVT programs with near by vocational and technical colleges, teachers and administrators who were assigned to the DVT programs, and current vocational students who were in the DVT program and were not in the DVT program. The non-DVT vocational students were used as a control group. The chairman of MSF, DVT project manager, and research coordinator made contact both personally and officially with the administrators of the Department of Vocational Education (DOVE) and colleges for the cooperation to access names and

address of the DVT participated enterprises. Names of the colleges, teachers and administrators that were assigned to the DVT programs were given to the research team by the DOVE. There were 39 colleges were selected for this study.

## Instrumentation

The instruments used in this study were 7 questionnaires developed by the researchers, 3 of which questionnaires were also designed for data collection by interview. The subjects provided their responses on the questionnaires and interview forms. The subject responses were verified 3 times by a Delphi technique. Details of each instrument are as follows:

**1. The first questionnaire (Q1)**, a response form for occupational profile, was designed to obtain data from employers, vocational teachers and administrators. There were 34 occupations in the questionnaire. The subjects provided data by ranking the given occupations in 3 level of priority, from 1 to 3, the most needed occupations to the least. The occupations were for middle management and/or vocational specialists, technicians, skilled workers, and assistant or semi-skilled workers who were between minimum daily-wage workers and the professionals. The Q1 was divided into 2 part. Part 1 contained of 34 given occupations in which the subjects ranked them. Part 2 was designed to gather opinions of the subjects by marking in an appropriated box on the occupational priority. This questionnaire gathered data to answer the question of what occupations should be selected for training to meet the most need of society and making occupational profiles. Data would be useful to further study on Vocational Qualification or VQs as well.

**2. The second questionnaire (Q2)** was designed to obtain opinions, observations and recommendations from the point of view of the cooperating employers or enterprises. It provided information pertaining to the DVT system and vocational education and training that should be used as the principles of drafting the bill. Then the questions were given to gather their perceptions and opinions. The Q2 was divided in to 7 sections pertaining to the three issues of the research questions, regulations, mechanisms, and implementations. Details of the Q2 are as follows:

### **Section 1: General Status**

- 1.1 Your Roles (6 items)
- 1.2 Your Immediate Reflection of the DVT Experience (12 items)

### **Section 2: Principles**

- 2.1 Vocational Qualifications (VQs) (5 items)
- 2.2 Basic Principles that should be considered (3 items)

### **Section 3: Apprenticeship Training Center (ATC) and On-the-Job Training Center (OJT)**

- 3.1 Characteristics (2 items)
- 3.2 The Factors that promote their Establishment with the Enterprises (9 items)

### **Section 4: The VET Autonomous Central Body**

- 4.1 Principal Characteristics (2 items)
- 4.2 The Composition of the VET National Council (2 items)
- 4.3 Goals and Tasks (2 items)

### **Section 5: What should be enacted into the VET Act with regard to the DVT**

- 5.1 The Tripartite Apprenticeship Contract (1 item)
- 5.2 The Benefits the Enterprises would receive (5 items)
- 5.3 The Benefits for the Apprentices (5 items)

**Section 6: The Skill Development Fund (SDF)**

- 6.1 Payroll Tax (4 items)
- 6.2 The Broad Concepts of Utilizing the Skill Development Fund (3 items)
- 6.3 To Offset the Payroll Tax as a Burden (1 items)
- 6.4 Some Options for the Payroll Tax (3 items)

**Section 7: Annex**

- 7.1 Some Suggestions and/or Recommendations from the Enterprises
- 7.2 Special Requests

The subjects provided their responses by marking in an appropriate box based on their perceptions and opinions. Each item was design to gather data for synthesizing to find solution to the research problems. Thus, data were various in a nominal scale.

**3. The third questionnaire (Q21)**, a response form used as an interview form for employers or enterprises, was designed to obtain first hand data and cross check with the Q2. There were twelve rating scale items, which asked the point of view of the employers or enterprises. It used a 10-point response scale, scaled from 1 to 10, not important to very important. The employers or enterprises indicated their degree of concern for each item by making in an appropriate box. The data were in an interval scale.

**4. The fourth questionnaire (Q3)** was designed to obtain opinions, observations and recommendations from the point of view of the vocational teachers and administrators. The items and information that could gather information form the subjects were selected from Q2 and provided the information that should be used as the principles of drafting the bill. Then the questions were given to gather their perceptions and opinions. The Q3 was divided in to 5 sections pertaining to the three issues of the research questions, regulations, mechanisms, and implementations. Detains of the Q3 are as follows:

**Section 1:** General Status (10 items)

**Section 2:** Vocational Qualifications (VQs) (6 items)

**Section 3:** Apprenticeship Training Center (ATC) and On-the-Job Training Center (OJT) (7 items)

**Section 4:** The VET Autonomous Central Body

- 4.1 Principal Characteristics (2 items)
- 4.2 The Composition of the VET National Council (2 items)
- 4.3 Goals and Tasks (2 items)

**Section 5:** What should be enacted into the VET Act with regard to the DVT

- 5.1 The Tripartite Apprenticeship Contract (1 item)
- 5.2 The Benefits the Enterprises would receive (5 items)

The subjects provided their responses by marking in an appropriate box based on their perceptions and opinions. Each item was design to gather data for synthesizing to find solution to the research problems. Thus, data were in a nominal scale as in the Q2.

**5. The fifth questionnaire (Q31)**, a response forms used as an interview form for vocational teachers and administrators, was designed to obtain first hand data and cross check with the Q3. It was divided into 5 sections as follows:

**Section 1:** General Information (5 items)

**Section 2:** Benefits gained from DVT program (10 items)

**Section 3:** Important point needed to be included in the VET Act (4 items)

**Section 4:** The VET national Autonomous Central Body (4 items)

**Section 1** was asked to fill up the demographic variables of the subjects. **Section 2 to 4** were used rating scale items, which asked the point of view of the teachers and administrators. It used a 10 point response scale, scaled from 1 to 10, not important to very important. The subjects indicated their degree of concern for each item by making in an appropriate box. The data were in an interval scale.

**6. The sixth questionnaire (Q4)** was designed to obtain opinions, observations and recommendations from the point of view of the current DVT and non DVT students. The Q4 was divided in to 4 sections pertaining to the three issues of the research questions, regulations, mechanisms, and implementations. Details of the Q4 are as follows:

**Section 1:** General Status (4 items)

**Section 2:** The feelings about the matter in each statement (2 items)

**Section 3:** Basic principles that should be considered in the VET Act (3 items)

**Section 4:** The benefits for the apprentices (5 items)

**Section 1** was asked to fill up the demographic variables of the subjects. Items in the **Section 2 to 4** were asked the point of view of the students. The subjects indicated their perception and opinions by making in an appropriate box. The data were in a nominal scale.

**7. The seventh questionnaire (Q41)**, a response form used as an interview form for the DVT students and non DVT students, was designed to obtain first hand data and cross check with the Q4. It was divided into 3 sections as follows:

**Section 1:** General Information (5 items)

**Section 2:** Student Expressions (9 items)

**Section 3:** Suggestions

**Section 1** was asked to fill up the demographic variables of the subjects. **Section 2** was used rating scale items, which asked the point of view of the students. It used a 10 point response scale, scaled from 1 to 10, not important to very important. The subjects indicated their degree of concern for each item by making in an appropriate box.

The questionnaires were verified for content validity by a panel of five experts from the DOVE using content validity ratio (CVR) (Lawshe, 1975: pp. 563-575) and validated for reliability using alpha coefficients. Thirty subjects of each sample group were used for try-out for each questionnaire. The Statistical Package for the Social Sciences for Windows (SPSS/FW) was used for computing the reliability coefficients of the questionnaires. The acceptable results are in Table 1.

**Table 1: Reliability Coefficients of the Questionnaires**

<i>Questionnaires</i>	<i>Alpha Coefficients</i>
Q1 for the employers or enterprises	.8455
Q2 for the employers or enterprises	.8754
Q21 for the employers or enterprises	.9181
Q3 for the vocational teachers and administrators	.8031
Q31 for the vocational teachers and administrators	.9195
Q4 for the vocational students, both DVT and non DVT students	.6970
Q41 for the vocational students, both DVT and non DVT students	.8209

The instruments used in this study were developed in Thai language. To assure that the translation to English did not change the meanings, the researchers and a panel of experts translated the Thai versions to English versions and translated the English versions to the original Thai versions. The Thai instruments used in this study were determined to be accurate and valid and that translation has not changed meanings. The researchers and research assistants administered the questionnaires and conducted interviews in November and December 1999.

### Population and Samples

The sample of this study included the employers or enterprises that participated in the DVT programs with near by vocational and technical colleges, teachers and administrators in the colleges who were assigned to participate in the DVT programs. The current vocational students who were in the DVT programs and non-DVT students used as a control group were included in this study. There were 3090 employers or enterprises, 202 colleges, and 20,636 DVT students in the 323 DVT programs. Seven hundred employers or enterprises were selected for the samples of this study. They were randomly selected by proportional sampling through out the country. There were 39 colleges were selected from the colleges that had over fifty DVT students. Ten teachers and administrators were randomly selected from each college. Ten DVT students and non-DVT students were also selected from each college. The sample sizes of this study were computed by using Yamane method at 5 percent errors. The expected and the actual sample sizes in each group of this study are in Table 2.

**Table 2: Sample Sizes of the Expected and Actual Samples**

<i>Sample Groups</i>	<i>Expected Size</i>	<i>Actual Size</i>
Employers or enterprises	700	666
Vocational teachers and administrators	390	390
DVT students	390	352
Non-DVT students	390	272

### Data Collection

A letter explaining the purpose, need and importance of the study and questionnaires Q1 were mailed to each 700 employer or enterprises. An addressed, stamped envelope was included for return of the questionnaires to the researchers. Also on-site visits were arranged by research assistants in each college to collect data from the near by DVT participating employers or enterprises using Q2 and Q21, an interview

form, in their workplaces. Using Q3, Q31, Q4, and Q41 collected data from teachers and administrators, and students in the selected colleges. The interviews were also arranged and research assistants in each college collected data from the samples. Table 3 displays the names of colleges and number of questionnaires sent for data collection.

**Table 3: Names of Selected Colleges and Number of Questionnaires Used for the Samples**

<i>Names of Colleges</i>	<i>Q3</i>	<i>Q31</i>	<i>Q4 (DVT+Non DVT)</i>	<i>Q41 (DVT+Non DVT)</i>
1. Ta Luang	10	5	10+10	5+5
2. Rayong	10	5	10+10	5+5
3. Nakorn Sri Thammarat	10	5	10+10	5+5
4. Surat Thani	10	5	10+10	5+5
5. Minburi	10	5	10+10	5+5
6. Kanjanapisek Manhanakorn	10	5	10+10	5+5
7. Pathum Thani	10	5	10+10	5+5
8. Samut Songkram	10	5	10+10	5+5
9. Petchaburi	10	5	10+10	5+5
10. Samut Prakan	10	5	10+10	5+5
11. Donmuang	10	5	10+10	5+5
12. Chonburi	10	5	10+10	5+5
13. Chonburi Tech.	10	5	10+10	5+5
14. Pranakorn Sri Ayudhaya	10	5	10+10	5+5
15. Ayudhaya	10	5	10+10	5+5
16. Samut Sakorn	10	5	10+10	5+5
17. Kanchanaburi	10	5	10+10	5+5
18. Kanchanaburi Tech.	10	5	10+10	5+5
19. Nakhon Pathom	10	5	10+10	5+5
20. Nakhon Pathom Tech.	10	5	10+10	5+5
21. Nakhon Panom	10	5	10+10	5+5
22. Ubon Ratchathani	10	5	10+10	5+5
23. Ubon Ratchathani Tech.	10	5	10+10	5+5
24. Udon Thani	10	5	10+10	5+5
25. Udon Thani Tech.	10	5	10+10	5+5

<i>Names of Colleges</i>	<i>Q3</i>	<i>Q31</i>	<i>Q4 (DVT+Non DVT)</i>	<i>Q41 (DVT+Non DVT)</i>
26. Nakhon Ratsima Tech.	10	5	10+10	5+5
27. Nakhon Ratsima	10	5	10+10	5+5
28. Nakhon Ratsima Tech.	10	5	10+10	5+5
29. Phitsanulok	10	5	10+10	5+5
30. Bung Phraphitsanulok	10	5	10+10	5+5
31. Phitsanulok Tech.	10	5	10+10	5+5
32. Chiangmai	10	5	10+10	5+5
33. Chiangmai Tech.	10	5	10+10	5+5
34. Lumpoon	10	5	10+10	5+5
35. Songkhla	10	5	10+10	5+5
36. Hadyai	10	5	10+10	5+5
37. Phuket Tech.	10	5	10+10	5+5
38. Phuket	10	5	10+10	5+5
39. Bangkok	10	5	10+10	5+5
<b>Total</b>	<b>390</b>	<b>195</b>	<b>780</b>	<b>390</b>

**Table 4: Number of Returned Questionnaires which were Useable**

<i>Questionnaires</i>	<i>Q1</i>	<i>Q2</i>	<i>Q21</i>	<i>Q3</i>	<i>Q31</i>	<i>Q4 DVT+Non DVT</i>	<i>Q41 DVT+Non DVT</i>
<b>Number</b>	408	258	114	309	161	352 + 272	209 + 112

## Data Analysis

Data were analyzed by descriptive statistics and inferential statistics using the Statistical Package for the Social Sciences. The following procedures were thoroughly carried out.

1. **Returned questionnaires (Q1)** from the employers or enterprises were analyzed to find the priority of occupations by ranking from high to low frequency. The analysis results were presented in a form of rank order. There were 34 occupations in rank order. These procedures were used to answer the first research question.

2. **Returned questionnaires (Q2)** from the employers or enterprises were analyzed to assess the perceptions on the issues of vocational education and training by using percentage and ranking from the data. Mode was used to compute the relevance of

the responses for Delphi technique. Mode of each choice or alternative of each item was certified as the most relevance of the subjects to that item. This criterion was used when data were in nominal scale. There were three rounds of data collection in the use of Delphi technique. After data were analyzed from the first round of data collection using mode, the results were sent with the questionnaire back to the subjects and asked for responses again. This was the second round of Delphi data collection. The subjects could insist their responses or change their responses based on their own decisions when they viewed the other responses from mode and the ranked alternatives of each item. When the subjects sent the questionnaires to the researchers, data were analyzed again. Then the questionnaires were sent back to the subjects for the third round of Delphi data collection. Results from the analysis of the third round responses were used for synthesizing to answer the second research question. There were 258 responses in the first round of data collection. The second round and the third round were 172 and 155 responses respectively.

3. **Returned responses forms (Q21)** from the employers or enterprises were analyzed to assess the perceptions on the issues of vocational education and training by using mean and standard deviation. Data were in a 10 point-rating scale. Results of data analysis were reported in the form of Tables.

4. **Returned questionnaires (Q3)** from the teachers and administrators were analyzed to assess the perceptions on the issues of vocational education and training by using mode of each choice or alternative of each item. Mode was certified as the most relevance of the subjects to that item. The alternatives were ranked by mode. This method was used when data were in nominal scale.

5. **Returned responses forms (Q31)** from the teachers and administrators were analyzed to assess the perceptions on the issues of vocational education and training by using mean and standard deviation. Data were in a 10 point-rating scale. Results of data analysis were reported in the form of Tables.

6. **Returned questionnaires (Q4)** from the students were analyzed to assess the perceptions on the issues of vocational education and training by using mode of each choice or alternative of each item. Mode was certified as the most relevance of the subjects to that item. The alternatives were ranked by mode. This method was used when data were in nominal scale. The subjects were divided into two groups, DVT students and non-DVT students. Their responses were separated for data analysis.

7. **Returned responses forms (Q41)** from the students were analyzed to assess the perceptions on the issues of vocational education and training by using mean, standard deviation, and a t-test statistic was used to compare between the mean scores of DVT students and non-DVT students. Data were in a 10 point-rating scale. Results of data analysis were reported in the form of Tables

Quantitative mean score of each item was classified to match with qualitative values as follows:

1. Mean scores of 1.00-2.00 means the least agreement or very low level.
2. Mean scores of 2.01-4.00 means less agreement or low level.

3. Mean scores of 4.01-6.00 means moderate agreement or moderate level.
4. Mean scores of 6.01-8.00 means much agreement or high level.
5. Mean scores of 8.01-10.00 means the most agreement or very high level.

8. **Suggestions and answers** from the open-end question were analyzed by using a content analysis method. The contents were classified by the issues of the research questions, regulations, mechanisms, and implementations of vocational education and training. The suggestions and opinions of each group of the samples were reported in a form of description.

## Findings

1. The 12 occupations that need training and making occupational profiles rated by the employers or enterprises are electrical technicians, automotive services technicians, electricians, automotive painting and finishing technicians, automotive collision repair mechanics and technicians, agrotechnology, refrigeration mechanics, factory automation, mechanical & maintenance, bookkeepers, drafting, and plumbers respectively. They pointed out that the government should declare the occupational priority for training and making occupational profiles.

2. The employers or enterprises and vocational teachers and administrators strongly agreed with the information given in the questionnaires. Their perceptions of agreement were confirmed by the interviews and the Delphi technique. They placed a high value of agreement with the given information that could be used for the grounds of drafting the bill.

3. The students rated at a high level on the perception of vocational education and the DVT system. However, there was no significant difference between the DVT students and non-DVT students on the perception of vocational education and training system in Thailand.

4. The issues of regulation, mechanism, and implementation of vocational education and training system in Thailand were placed a high value for drafting the bill. The model of vocational education and training should be proposed and agreed with involved parties before proceeding to the drafting process.

5. The DVT system was rated as a good model that should be applied to fit the needs and culture of Thailand. Model of vocational education and training of other countries should be studied and applied as well.

## Conclusions

The following conclusions are based on the findings of this study.

1. The employers or enterprises wanted the government to declare the occupations that in need of training and making occupational profiles.

2. The employers or enterprises, teachers and administrators, and students perceived the information given in the questionnaires and positively responded to the questions. Majority of the samples agreed with the three issues purposed in the questionnaires; regulations, mechanisms, and implementations of vocational education and training system. There was no significant difference between the DVT students and non-DVT students on the perception of the vocational education and training system.

3. The model of vocational education and training should be divided into school-based and work-based systems in which they must be regulated by law. The employers and enterprises pointed out to the issue of regulations, mechanisms, and implementations as follows:

**Regulations:** The Vocational Education and Training Act should be promulgated as soon as possible. The government should enforce the laws transparently and equally to every enterprise. They had willing to support the bill. The Act should state the necessary means to vocational education and training especially in the mean of equity of the students. They agreed with the DVT system but the system needed adjustment for Thai culture of work.

**Mechanisms:** The body of responsibility for vocational education and training should be comprised of three parties, government, private enterprises, and teacher and parent associations. The body should be autonomous but administrated under the government policies. The ultimate responsibility must be the government. They had willing to supports the vocational education by the law and under a certain condition that it would not harm their business.

**Implementations:** The Vocational Education and Training Act should be feasible to implement and clear to the practitioners. The involved parties were the channels of implementations. The government must play a key role in the term of policy maker. The enterprises and educational institutes play a role of executors to implement the policies under the mechanisms stated in the law. The teacher and parent associations play a role of supporters. An annual report or program evaluation of vocational education must be conducted before the end of fiscal year and used as a tool for annual support from the government.

The teachers and administrators pointed out to the issue of regulation, mechanism, and implementations as follows;

**Regulations:** The DVT system will work effectively when there is a clear regulation for practitioners. The Vocational Education and Training Act must state the processes in dealing with the employers or enterprises clearly. The government as a policy maker must state the policy clearly. They would like to see the same understanding in the rules and regulations of the involved parties.

**Mechanisms:** They need a sufficient budget to run the programs. The present mechanism needs more improvement both in term of regulations to function the programs and facilities to manage the programs. They also need more training in vocational program management. They hesitated to point out that the DVT system could solve the situational problems of the country. The method or process, which is the mechanism of the system, needs adjustment to fit the Thai culture.

**Implementations:** They played a part of the implementations. They need more training in research and evaluation of the vocational programs. They had strong feeling that the DVT programs would be effective in that the government have to play a key role in implementing the system. They pointed out that they could not see the sufficient benefits of the enterprises participated in the present DVT system at these moment. This could be the major problem of the lack of cooperation from the enterprises. The linkage should be established by laws.

The suggestions and comments of both the DVT and non-DVT student were described by a content analysis method. The students pointed out to the issue of regulations, mechanisms, and implementations as follows:

**Regulations:** They wanted to make sure that when they graduate they could find a job and got pay in a standard pay scale by law. They wanted to work and study to earn some income but the work should be related to the field of their study. The work contract must be followed strictly. By laws, they could receive some benefits as an employee of the company.

**Mechanism:** They wanted to understand the system of vocational education and benefits of the DVT system compare to the others. They have seen the lack of cooperation between the educational institutes and the enterprises. They had a feeling that the enterprise only wanted to protect their businesses and no sincere to train them.

**Implementations:** They wanted to work in a safety environment with good work atmosphere in which they could learn and be able to develop their knowledge, skills and attitudes toward work. The training in the workplaces should be meaningful to their career and ensure their good fortune. The educational institutes should assign an outstanding teacher for practical training. The teacher should be able to help the students when they faced a problem in training.

## Recommendations

Based on the results of this study, the following recommendations are made.

1. There should be profiles of occupations that fit to the need and culture of Thailand. Vocational qualifications and occupational standards used in the profiles should be imposed by law. The need of occupational training should be studied and updated regularly to fit the current need.

2. By the year 2002 (B.E. 2545) and in accordance with the Education Act B.E. 2542, every vocational trainee will be given more basic education as required by law in equivalence to Grade 12. In the upper secondary education, there should be choices of general, comprehensive and technical or vocational education. A trainee in the technical or vocation school will therefore have two alternatives. The first choice is a school-based (or knowledge-based) stream whereby the trainee would undergo VET training not less than 20 per cent of the total learning time. These trainees in their final year of Grade 12 may have to undergo some form of on-the-Job training at some OJT centers. The second choice is a work-based (or the skill-based) stream whereby the trainee would undergo training not less than 60 per cent of the total learning time. During the basic skill training

process, education and training can be delivered under the school workshop scheme, and a further training period with the enterprise or industry-institution scheme with real production or real on-the-job experience. This skilled-based stream is better suited with the establishment of the Apprenticeship Training Center (ATC) at or with the enterprises. This is known as the DVT system. DVT-Trainees need not attend these OJT Centers.

3. The OJT Centers are to function as an independent body taking in trainees from any applying applicants from institutions within the country with school-based system in batches, each batch for example for an OJT period of one month or more. The cooperating institutions would have to rearrange their learning schedules to fit in with the OJT timetables. Within the OJT Centers the trainees would be working with the simulated environment of the world of work in their lines of work and disciplines. The centers will also coordinate any further OJT at the enterprises in their networks. The trainers and responsible persons working in the OJT centers must be trained and have experience with the real world of work.

4. The Apprenticeship Training Centers (ATC) are training centers for apprentices and have the environment similar or nearly similar to the real world of work for the entire training period of 1-3 years. Again the trainers and responsible persons within the ATCs must be capable of delivering the real training by already having further education, training and experience for their tasks. The total numbers of OJT centers will far exceed the ATC centers in the long run as the OJT centers will have to cater for students and trainees from technical colleges mainly of the knowledge-based, within the country. The ATC centers are for apprenticeship training only, thus fewer.

5. It will be absolutely necessary to have the cooperation with the enterprises in establishing these centers and that will require legal supports for sustainability.

6. The mechanism to establish and administer these centers needs to be defined and implemented with the setting up of the Skill Development Fund (SDF). Such a scheme is quite universal in several countries that have reached a certain plateau of development whereby the public, the private and the trainee sectors join hands in carrying out the building of the national Human Capital.

7. It has already been proven that the investment for the Human Capital is as important as the capital investment and with a great rate of return on investment. Every multi-national company knows this fact quite well and will therefore go ahead with it with their own resources. The small and medium size companies do however have difficulties with their cash flow and must be specially assisted by the operational modes of the Skill Development Fund.

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1. Prof. Boonyasak Jaijongki, Chairman of this research project
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3. Assoc. Prof. Dr. Krismant Whattananarong, Researcher of this research project

### Bibliography

British Training International, Department for Education and Employment, Meeting Global Skill Needs, occupational standards and competence-based qualifications in the UK undated document, 20 pages.

Borg, Walter R. (1987). Applying educational research. New York: Longman.

Department of Vocational Education.(1999). Annual Report of the Department of Vocational Education 1989-1991. Durusapa Printing Press

Department of Vocational Education. (1998) . DOVE Statistics 1998. Kurusapa Printing Press.

Department of Vocational Education, DVT Office. Documents from DVT Office 1998-1999.

E. Wayne Courtney. (1995) Human Resources Cooperatives and Collaborative, Model for Thailand (Private and Public Sectors), Bangkok.

Kachugan, Sam Kash. (1986). Statistical Analysis. New York: Radius Press.

Kerlinger, F.N. (1986). Foundation of behavioral research. New York: Holt, Rinehart, and Winston.

Krejcie, R.V. and Morgan, D.W. (1970). "Determining sample size for research activities," Educational and psychological management. Vol. 30, pp. 607-610.

Lawshe, C.H. (1975). "A Quantitative approach to content validity," Personnel psychology. No. 28, pp. 563-575.

Malee Tugsakornwongse (1998), Opinions of Trade and Industry Students Towards the Implementation of Dual Vocational Training System at the Certificate Level in Technical Colleges. Master degree thesis in Adult Education at Srinakharinvirot University, Bangkok.

Warapan Noisuwan, (1996). A Study of VTE-Industry Cooperation in Thailand. Bangkok.

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