

**A Tracer Study to Aid Re-evaluation of the Second Vocational Education Project
of Asian Development Bank (Loan No. 441-THA[SF]) in Thailand**

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Abstract

The purposes of this study were to examine and compare vocational training, employment/career, and socio-economic improvement between the project-assisted institute graduates and non-assisted institute graduates, to evaluate and compare the educational development between the project-assisted and non-assisted institutes, and to identify skill requirements, use of current technology, and future trends perceived by employers. The project-assisted institutes were the 10 technical campuses of Rajamangala Institute of Technology (RIT), namely; Bangkok, Northern, Southern, North-Eastern, Thewes, Khon-Kaen, Tak, Nonthaburi, North Bangkok, and Uthenthawi Technical Campus. They were provided a loan assistance (No. 441-THA[SF]) by The Second Vocational Education Project of Asian Development Bank (ADB) from the fiscal year 1980 to December 1986. The non-assisted institutes were the 10 technical colleges under the Department of Vocational Education (DOVE), namely; Chiang Rai, Lumpoon, Samut Sakorn, Pathumthani, Udon Thani, Ratchasitharam, Don Muang, Minburi, Nakhon Nayok, and Surat Thani Technical College. They are similar and located nearby the project-assisted institutes. The instruments used in this study were four questionnaires designed for each group of samples, scaled from four to one, very high to very low, and an interview form designed to obtain first-hand data. The four groups of samples included 727 project-assisted institute and 812 non-assisted institute graduates, 60 employers, 206 project-assisted institute and 235 non-assisted institute teachers and administrators, and 627 project-assisted institute and 470 non-assisted institute current students. About 10 percent of the respondents were interviewed to obtain first-hand information and to crosscheck the data from questionnaires. The findings of this study revealed that both the project-assisted institute graduates and non-assisted institute graduates placed a high value on their vocational training, current employment/careers, and their socio-economic status. However, vocational training assisted by The Second Vocational Education Project of ADB produced a measurable

positive impact on the employment/careers and socio-economic status of the project-assisted institute graduates over the non-assisted institute graduates. The employers rated the aspects of skill requirements, current technologies, and future trends in the use of technology at a high level of importance. The selected items were categorized by the three groups of vocational competencies, namely; domain knowledge, technical skills, and work habits and attitudes. The employers rated the importance of work habits and attitudes significantly higher than domain knowledge and technical skills. They confirmed this conclusion when they gave the interviews. They also rated their use of technology at present as probably higher than in the future. They pointed out that the quality and adequacy of technology and manpower in their business in the next 10 years would be slightly lower than now. Educational development in the project-assisted institutes included in the area of student enrollment, curricula and instruction, quality of graduates, teacher development, and industry linkages and all were evaluated by the current students, teachers and administrators. The project-assisted and non-assisted institutes were compared in all areas. Overall educational development in the project-assisted institutes was rated higher than in the non-assisted institutes. However, there was no significant difference in student enrollment between the project-assisted and non-assisted institutes as rated by the groups of teachers, administrators and current students. The area of industry linkages in the non-assisted institutes was rated higher than in the project-assisted institutes.

Introduction

The Asian Development Bank (ADB) provided a loan (agreement number 441 THA (SF)) for development of vocational education to the Government of Thailand which was utilized to in implementing The Second Vocational Education Project carried out by the Institute of Technology and Vocational Education (ITVE) (now known as Rajamangala Institute of Technology (RIT)) from the fiscal year 1980 to December 1986. The Second Vocational Education Project was designed as a follow-up the Vocational Education Project. The first project provided assistance to four regional Technician Training Campuses under the supervision of the ITVE of Ministry of Education (MOE).

There were six other provincial technical institutes under the responsibility of the ITVE which were not assisted under the first project. According to the records of the Office of the Auditor General, the total disbursements to project activities from project commencement on 1 October 1979 to 30 September 1987 totaled 642.26 million baht. Three hundred million baht (15 million US \$) of this amount constituted 100% of the loan from the ADB for the project. The Thai Government provided the remainder of the project funding. Additional details of project spending and the condition of the schools involved before the implementation of the project can be found in ADB Report No. THA: Ap-27 Appraisal Of The Second Vocational Education Project In Thailand, November 1987.

The 10 RIT technical campuses under the development program of the project are located in Bangkok and provinces, namely; Bangkok (Bangkok), Northern (Chiang Mai), Southern (Songkla), North-Eastern (Nakorn Rachasima), Thewes (Bangkok), Khon-Kaen (Koen Kaen), Tak (Tak), Nonthaburi (Nonthaburi), North Bangkok (Bangkok), and Uthenthawi Technical Campus (Bangkok). The project was closed on 15 April 1987. It was evaluated as successful in the Project Completion Report (PCR) of the ADB that was circulated in July 1987. The Project was judged to have contributed to the development of educational infrastructures, including provision of new technician courses, additional equipment for existing courses, curricula improvement and formulation, and upgrading the quality of teachers and administrators. However, the PCR concluded that while a preliminary assessment confirmed those positive outcomes, an evaluation of the long-term impact of the project was needed.

A decade later in July 1997, the financial crisis in Thailand and the depreciation of the Thai baht marked the beginning of a downturn in economic growth and a change in the borrowing status of Thailand. Many studies indicated that the low level of skills and weaknesses in the educational system have made and continue to make it difficult to increase productivity, compete internationally, and adopt new technologies for developing emerging industries. Moreover, a high dropout rate, low enrollments, and

budget constraints for vocational education are additional effects of the current economic difficulty.

As cited by the ADB report, there were a number of obvious inefficiencies limiting the productivity of vocational education and training that needed to be addressed to increase the cost-effectiveness of educational investment. The ADB recently provided a 500 million US \$ Social Sector Program loan, which became effective on 17 March 1998. The loan provisions included specific reform measures and various activities designed to address key policy priorities and systematic issues in the labor market, in social welfare, in education and in health.

In January 1998, a Post Evaluation Mission (PEM) of the ADB concluded that the Project had generally achieved its immediate objectives and was well on its way to achieving its long-term objectives. However, an impact study was needed to indicate an overall success of the Project. This re-evaluation study was seen as desirable, timely and appropriate by the ADB. The Mission informed the Government of the proposed re-evaluation study of the project, which would be undertaken more than 10 years after completion of the project. This re-evaluation study was conducted with the intention of determining the efficiency of education in responding to current demands for skilled labor and use of emerging technologies, and the improvements needed in the preparation of technical personnel. The findings from this study indicated the impacts of the project on vocational education development in the areas specified by the ADB and provided essential information that should be useful in insuring the productive use of the current and any future loans.

Objectives of the Study

The primary objective of this study was to determine and compare the extent of vocational training, satisfaction in employment/careers, and socio-economic improvement of the project-assisted institute graduates and non-assisted institute graduates. The second objective was to determine and compare educational development of the project-assisted and non-assisted institutes as perceived by teachers, administrators, and current students. A final objective was to identify

employers' skill requirements for today's work, their use of current technology, and their planning for perceived future trends.

Methodology

This survey research was designed to investigate the employment, careers, and socio-economic status of the project-assisted institute graduates, to evaluate the educational development of the Project-assisted institutes, to investigate the employers' skill requirements, and to compare the educational development of the project-assisted and non-assisted institutes in Thailand. Survey research seems ideally suited to this study. Questionnaires and an interview form were the instruments used to obtain personal facts, opinions, and perceptions (Kerlinger, 1986, p. 386). The study dealt with tracing the graduates from the 10 project-assisted campuses of RIT and 10 technical colleges under the Department of Vocational Education (DOVE), Ministry of Education (MOE), which were used as a control group during the project-assisted period, 1980-1987. The 10 technical colleges are similar and located nearby the project-assisted campuses of RIT, namely; Chiang Rai, Lumpoon, Samut Sakorn, Pathumthani, Udon Thani, Ratchasitharam, Don Muang, Minburi, Nakhon Nayok, and Surat Thani Technical College. The consultants and researchers made contact personally and officially with the present 20 campus directors and registrar to access name and addresses of those graduates. This process was time consuming, but it was accomplished with cooperation from the Planning Department of DOVE and RIT. There were about 1,000 names and addresses of the graduates of the 10 project-assisted campuses of RIT and 1,000 of the graduates from the 10 technical colleges of DOVE. The study gathered data from the graduates, employers, teachers and administrators, and current students by using separate questionnaires. An interview form was used to gather first hand information from the employers, employers' associations, chambers of commerce and industry, alumni association, and crosscheck information from the project and control groups.

Instrumentation

The instruments used in this study were four questionnaires, scaled from four to one, very high to very low, and an interview form developed by the researchers. Survey

research typically employs questionnaires, such as the ones used in this study, to determine the opinions, attitudes, preferences, and perceptions of persons of interest to the study (Borg, 1987). The questionnaires also included the following demographic data on subjects who responded: gender, levels of education, and employment in Section 1, the area of general and personal information of each questionnaire. The interview form was used with the questionnaires. The subject responses were provided on questionnaires and interviews. The questionnaires were verified for content validity by a panel of experts and validated for reliability using alpha coefficients. Thirty subjects of each sample group were used for try-outs of each questionnaire. Details of the instruments are as follows:

1. The first questionnaire (Q1) was designed to obtain data from the graduates. The questionnaire items were clustered or grouped into 5 sections, or areas, pertaining to the purposes of the study so that they could be used to compare areas between the graduates of project and control groups. There were 5 sections in the Q1. Section 1 consisted of 9 items, which were grouped as general information. Section 2 consisted of 16 items, which were grouped as the area of vocational training. Section 3 consisted of 7 items, which were grouped as the area of employment/career. Section 4 consisted of 5 items, which were grouped as the area of socio-economic improvement. And Section 5 consisted of 5 open-end questions, which were grouped as the area of free opinions. The Section 1 asked the graduates for the demographic information. The Section 2, 3, and 4 used a four-point response scale, scaled from 4 to 1, very high to very low. The respondents indicated their degree of concern for each item by marking in an appropriate block. Section 5 asked the graduates for their ideas and suggestions on vocational training, employment/career, and socio-economic improvement.

2. The second questionnaire (Q2) was designed to obtain data from employers. The questionnaire items were clustered or grouped into 5 sections. There were 4 items, which were grouped in the Section 1 as the area of general information. Sections 2 consisted of 3 items, which were grouped as the area of the competency requirements. Section 3 consisted of 6 items, which were grouped as the area of current technologies.

Section 4 consisted of 6 items, which were grouped as the area of future trends. And Section 5 consisted of 6 open-end questions, which were grouped as the area of free opinions toward industry linkages, skill requirements, current technology, and future trends.

3. The third questionnaire (Q3) was designed to obtain data from instructors and administrators. The questionnaire items were clustered or grouped into 7 sections, or areas, pertaining to the purposes of the study so that they could be used to compare areas between the teachers and administrators of project-assisted and control groups. There were 5 items were grouped in the Section 1 as the area of general and personal information. Sections 2 consisted of 6 items, which were grouped as the area of student enrollment. Section 3 consisted of 8 items, which were grouped as the area of curriculum and instruction. Section 4 consisted of 8 items, which were grouped as the area of the quality of graduates. Section 5 consisted of 6 items, which were grouped as the area of teacher development. Section 6 consisted of 5 items, which were grouped as the area of industry linkages. Section 7 consisted of 3 open-end questions, which were grouped as the area of free opinions.

4. The fourth questionnaire (Q4) was designed to obtain data from current students. There were 5 items were grouped in the Section 1 as the area of general and personal information. Sections 2 consisted of 10 items, which were grouped as the area of student enrollment. Section 3 consisted of 8 items, which were grouped as the area of teaching and learning management. Section 4 consisted of 6 items, which were grouped as the area of student expenditure. Section 5 consisted of 8 items, which were grouped as the area of quality of students and graduates. Section 6 consisted of 3 items, which were grouped as the area of free opinions.

5. An interview form was designed to obtain first hand information from the employers' associations, chambers of commerce and industry, and alumni associations and used to crosscheck information from 10 % of the questionnaire respondents. The interview form was verified for content validity by a panel of experts.

The Statistical Package for the Social Sciences for Windows (SPSS/FW) was used for computing the reliability coefficients of the rating scale items of each questionnaire. The acceptable results are in Table 1.

Table 1

Reliability Coefficients of the Questionnaires

Questionnaires	Alpha Coefficients
Q1 for the graduates	.7634
Q2 for the employers	.7155
Q3 for the teachers and administrators	.8782
Q4 for the current students	.8143

The instruments used in this study were developed in Thai language. They were verified for content validity by a panel of experts. 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 back to Thai again, then compared the meanings of the translated Thai version to the original Thai version. The Thai instruments used in this study were determined to be accurate and valid and that translation had not changed meanings. The researchers and research assistants administered the questionnaires and conducted interviews in June and July 1998.

Population and Samples

The population of this study included the graduates, instructors, administrators, and current students from the 10 project-assisted campuses of RIT as the project groups and 10 technical colleges of DOVE as the control groups. The samples of the project and control groups were randomly selected. Sudman (1976) recommends a minimum of 100 subjects in each major subgroup when conducting survey research. The sample sizes in each major subgroup of this study are in Table 2.

Table 2Sample Sizes of the Project and Control Groups

Sample Groups	Project Groups	Control Groups
	Sample Size	Sample Size
Graduates	727	812
Teachers and administrators	206	235
Current students	627	470
Total	1,560	1,517

There were 2,500 questionnaires administered to the project and control groups. The returned questionnaires totaled 1,560 from the project groups and 1,517 from the control groups. The applicable samples of employers, employers' association, chambers of commerce and industry, and alumni associations were purposively selected to elicit requisite information. The applicable sample sizes are in Table 3.

Table 3Sample Sizes of the Applicable Samples

Samples	Sample Sizes
Employers	60
Employer's associations	7
Chambers of Commerce	6
Chambers of Industry	4
Alumni associations	7
Total	84

Sixty questionnaires were returned from the employers. The other sample groups were used only for interviews. The numbers of sample respondents from interviews are in Table 4.

Table 4Numbers of Sample Respondents from Interviews

Samples	Respondents
Graduates from the project group	71
Graduates from the control group	73
Employers	16
Teachers and Administrators from the project group	22
Teachers and administrators from the control group	24
Current students from the project group	47
Current students from the control group	41
Employer's associations	7
Chambers of commerce	6
Chambers of industry	4
Alumni associations	7
Total	318

The samples used for interviews were about 10 percent of the questionnaire respondents from the graduates, teachers and administrators, current students of project and control groups, and about 25 percent from the employers. The other sample groups were 100 percent used for interviews.

Data Collection and Analysis

A letter explaining the purpose, need and importance of the study and questionnaire (Q1) was mailed to each of the graduates. An addressed, stamped envelope was included for return of the questionnaire to the researchers. Also on-site visits were arranged to collect data using the Q1 and interview form in the graduate workplaces. The employers responded to the Q2 and interviews in their workplaces during on-site visits. Using the Q3 and Q4, researchers collected data from teachers and administrators and current students during campus visits. The interviews were also

arranged and researchers gathered data from 10 percent of the samples of current students, teachers and administrators on the campuses during campus visits. The other sample respondents were interviewed in their workplaces. The researchers and research assistants collected data in this study. Data were analyzed by using the Statistical Package for the Social Sciences for Windows (SPSS/FW). The mean scores 3.50 to 4.00, 2.50 to 3.49, 1.50 to 2.49, and 1.00 to 1.49 were set to very high, high, low, and very low extended levels respectively. A level of .01 was set to determine statistical significance. The results of computations are in Tables 5 to 15.

Table 5

Mean Scores, Standard Deviations (SD) and Extended Levels in Each Area Rated by the Project and Control Graduates

Areas	Project			Control		
	<u>M</u>	<u>SD</u>	Levels	<u>M</u>	<u>SD</u>	Levels
Vocational Training (VT)	2.80	.31	High	2.81	.31	High
Employment/career (E/C)	2.72	.333	High	2.73	.36	High
Socio-economic improvement (SI)	2.71	.43	High	2.78	.40	High

As presented in Table 5, the project graduates rated the areas of vocational training, employment/career, and socio-economic improvement at a high level. The mean scores of the areas of vocational training, employment/career, and socio-economic improvement were 2.80, 2.72, and 2.71 respectively, which were at a high level.

Table 6

Analysis of t-test of Each Area between the Project and Control Graduates

Areas	Project		Control		df	t	P
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>			
Vocational Training (VT)	2.80	.31	2.81	.31	1537	-.503	.615
Employment/Career (E/C)	2.72	.33	2.73	.36	1525	-.909	.363
Socio-economic improvement (SI)	2.71	.43	2.78	.40	1534	-.492	.623

The t -test analysis reported in Table 6 indicates that there was not a significant difference between the mean score of each area rated by the project and control graduates. With the t -statistics of $-.503$ and p of $.615$ in the area of vocational training, t -statistics of $-.909$ and p of $.363$ in the area of employment/career, and t -statistics of $-.492$ and p of $.623$ in the area of socio-economic improvement, the scores of the three areas rated by the project and control graduates failed to reflect a significant difference at the $.01$ level ($p > .01$).

Table 7

The Correlation Matrix for Multivariate Correlation Analysis

Variables	VT		E/C		SI	
	Project	Control	Project	Control	Project	Control
VT	1	1	.242**	.299**	.416**	.067
E/C	-	-	1	1	.322**	.323**
SI	-	-	-	-	1	1

** . Correlation is significant at the 0.01 level (2-tailed).

As presented in Table 7, the project assisted institute graduates responses to the three areas of questionnaire Q1 showed positive correlation coefficients between VT and E/C, VT and SI, and E/C and SI. However, the correlation between two variables does not imply causality. The analysis only revealed that the variables were correlated at the significant level of $.01$. It indicated that increasing the extent of vocational training would increase the satisfaction of employment/career and socio-economic improvement and the higher satisfaction of employment/career the higher satisfaction of socio-economic improvement. For the control graduates, there was no significant correlation between the vocational training and satisfaction of socio-economic improvement but the other variables were correlated at the level of $.01$.

Whereas correlation analysis provides a summary coefficient of the extent of relationship between two variables, regression analysis provides an equation describing the nature of the relationship between the two variables. In addition, regression analysis

supplies variance measure to assess the accuracy with which the regression equation can predict values on the criterion variable (Kachigan, 1986).

Table 8

Multiple Regression Analysis of the Project and Control Group

Regression Analysis	Project Group	Control Group
Multiple R	.471	.433
R Square	.222	.188
Adjusted R ²	.220	.186
Standard Error	.3826	.3867
General Equation	$SI' = .519 + .488VT + .304E/C$	$SI' = .752 + .416VT + .269E/C$
Standardized Equation	$Z'_{SI} = .345 Z_{VT} + .236 Z_{E/C}$	$Z'_{SI} = .303 Z_{VT} + .233 Z_{E/C}$

In Table 8, project group, multiple R of .471 yielding an R² of .222 would suggest that about 22.2% of the variance in socio-economic improvement (SI) could be predicted from variation in the set of vocational training (VT) and employment/career (E/C) (predictor variables) taken as a whole. Again, no interpretation of causality was appropriate since the predictor variables were not manipulated, but only observed for their values “as they fell.” The standardized beta weight for the vocational training measure was found to be .354, while that for the employment/career measure was found to be .236. Squaring these values yields .1253 and .0556 respectively. The conclusion is that vocational training accounted for somewhat more than two times (2.25) as much variance in the criterion measure as employment/career, as these variables were measured in this study.

In table 8, control group, multiple R of .433 yielding an R² of .188 would suggest that about 18.8% of the variance in socio-economic improvement (SI) could be predicted variation in the set of vocational training (VT) and employment/career (E/C) (predictor variables) taken as a whole. The standardized beta weight for the vocational training measure was found to be .303, while that for the employment/career measure was found to be .233. Squaring these values yields .0918 and .0542 respectively. The

conclusion is that vocational training accounted for somewhat more than one time (1.69) as much variance in the criterion measure as employment/career, as these variables were measured in this study.

Table 9

Mean Scores, Standard Deviations, and Extended Levels of Each Area Rated by the Employers

Areas	<u>M</u>	<u>SD</u>	Levels
Skill requirements	3.25	.30	High
Current technology	2.91	.29	High
Future trends	2.81	.43	High

As presented in Table 9, the employers rated the area of skill requirements, current technology, and future trends at a high level. Mean score in the area of skill requirements was higher than the mean score of the area of current technology and future trends. The skill requirements are vocational competencies, which were categorized into three groups of competency, namely; domain knowledge, technical skills, and work habits and attitudes.

Table 10

Mean Scores, Standard Deviations, and Extended Levels of Each Competency Rated by the Employers

Competencies	<u>M</u>	<u>SD</u>	Levels
Domain Knowledge	3.00	.38	High
Technical Skills	2.95	.26	High
Work Habits and Attitudes	3.21	.35	High

As presented in Table 10, the employers rated work habits and attitudes as more important than knowledge and skills. These findings indicated that the employers highly needed employees with good work habits for today's work. Domain knowledge was important second to good work practices and attitudes. The skill competency was last when compared to the others. However, the vocational competencies needed by the

employers were expected to be at a high level. A paired samples t -test was computed to find the difference between the competencies in Table 11.

Table 11

Paired Samples t -Test for Today's Work Competency Needed by the Employers

Categorized by Vocational Competencies

Competencies	Paired Differences		
	df	t	p
Pair 1 Domain Knowledge-Technical Skills	59	1.462	.149
Pair 2 Domain Knowledge-Work Habits/Attitudes	59	4.425	.000
Pair 3 Technical Skills-Work Habits/Attitudes	59	6.285	.000

Examination of the paired samples t -test reported in Table 11 indicates that there was a significant difference between domain knowledge and work habits and attitudes, and between technical skills and work habits and attitudes at the level of .01 ($p < .01$). Work habits and attitudes were rated as the most important and highest requirements for today's work. They include work ethics and efficient work practices, which the employers expect from their employees.

Table 12

Mean Scores, Standard Deviations, and Extended Levels of Each Area Rated by the

Project and Control Teachers and Administrators

Areas	Project			Control		
	M	SD	Levels	M	SD	Levels
Student enrollment	2.98	.35	High	2.91	.38	High
Curricula and instruction	2.42	.35	High	2.31	.38	High
Quality of graduates	2.90	.36	High	2.71	.51	High
Teacher development	2.10	.42	High	1.98	.42	High
Industry linkages	2.07	.53	High	2.21	.48	High
Overall areas	2.50	.29	High	2.43	.30	High

As presented in Table 12, the teachers and administrators of the project and control groups rated the areas of student enrollment, curricula and instruction, quality of graduates, teacher development, and industry linkage at a high level. The overall areas of educational development were rated at a high level.

Table 13

Analysis of t-Test of Each Area in Educational Development Rated by the Project and Control Teachers and Administrators

Areas	t-test for Equality of Means				
	Project n	Control n	df	t	p
Student enrollment	206	235	439	1.905	.057
Curricula and instruction	205	231	434	2.849	.005
Quality of graduates	206	233	437	4.397	.000
Teacher development	205	235	438	3.067	.002
Industry linkages	205	234	437	-2.972	.003
Overall areas	206	235	439	2.473	.014

Analysis of t-test, reported in Table 13, indicates that there was no significant difference at the .01 level ($p > .01$) in the area of student enrollment. With a t-test statistics of 1.905 and p of .057, the scores of student enrollment area failed to reflect a significant difference at the .01 level ($p > .01$). However, a significant difference exists in the scores of curriculum and instruction, quality of graduates, teacher development, and industry linkages between the two groups. With significance set at the .01 level, the difference in the two groups was found statistically significant with $p < .01$ in the four areas. In overall areas there was no statistically significant difference between the two groups. The findings indicated that the quality of curricula and instruction, quality of graduates, and teacher development in the projected-assisted institutes were rated higher than the same areas of control group. The area of industrial linkages in control group was rated higher than in the project-assisted institute group.

Table 14

Mean Scores, Standard Deviations, and Extended levels of Each Areas Rated by the Project and Control Students

Areas	Project			Control		
	<u>M</u>	<u>SD</u>	Levels	<u>M</u>	<u>SD</u>	Levels
Student enrollment	2.87	.31	High	2.90	.30	High
Teaching and learning management	2.81	.39	High	2.59	.45	High
Student expenditures	2.85	.47	High	2.72	.48	High
Quality of students and graduates	2.59	.39	High	2.45	.31	High
Overall areas	2.78	.24	High	2.67	.26	High

According to the mean scores in Table 14, the extent of each area and overall areas of educational development in the project-assisted and control institutes were rated at a high level.

Table 15

Analysis of t-Test of Each Area in Educational Development Rated by the Project and Control Students

Areas	<u>t-test for Equality of Means</u>				
	Project <u>n</u>	Control <u>n</u>	<u>df</u>	<u>t</u>	<u>p</u>
Student enrollment	627	470	1095	-1.417	.157
Teaching and learning management	627	470	1095	8.745	.000
Student expenditure	627	470	1095	4.325	.000
Quality of students and graduates	627	470	1095	6.255	.000
Overall areas	627	470	1095	7.423	.000

Analysis of t-test, reported in Table 15, indicates that there was not a significant difference between the scores of student enrollment rated by the two groups. With the values of t and p in Table 15, they failed to reflect a significant different at the .01 level

($p > .01$). However, there was a significant difference at the .01 level ($p < .01$) in the area of teaching and learning management, student expenditure, quality of students and graduates and overall areas between the two groups. The current students rated the three areas and overall areas of educational development in the project-assisted institutes higher than the current students rated educational development in the control institutes.

Findings

The findings of this study are as follows:

1. The project-assisted and non-assisted graduates rated their vocational training, employment/career, and socio-economic improvement at a high level of value (Table 5).
2. There was no significant difference in vocational training, employment/career, and socio-economic status between project-assisted and non-assisted graduates (Table 6).
3. There was a positive significant correlation between vocational training and employment/career, vocational training and socio-economic improvement, and employment/career and socio-economic improvement of the project-assisted graduates (Table 7).
4. There was a positive significant correlation between vocational training and employment/career, employment/career and socio-economic status, but no significant correlation between vocational training and socio-economic status of the non-assisted graduates (Table 7).
5. There was a significant relationship between the predictor variables and criterion variable when vocational training and employment/career were predictor variables and socio-economic improvement of the project-assisted graduates was a criteria variable.

About 22.2 percent of the variance in socio-economic improvement accounted for variation in the set of vocational training and employment/career of the project-assisted graduates. Vocational training accounted for somewhat more than two times

(2.25) as much variance in the criterion measure as employment/career, as measured in this study (Table 8).

6. There was a significant different relationship between the predictor variables and criterion variable when vocational training and employment/career were predictor variables and socio-economic improvement of the non-assisted graduates was a criterion variable.

About 18.8 percent of the variance in socio/economic improvement accounted for variation in the set of vocational training and employment/career of the non-assisted graduates. Vocational training accounted for somewhat more than one time (1.69) as much variance in the criterion measure as employment/career, as measured in this study (Table 8).

7. The employers rated employee skill requirements, use of current technology, and perceived future trends at a high level of importance (Table 9).

8. There was a significant difference in today's work competencies needed by the employers when categorized by the competency of domain knowledge, technical skills, and work habits and attitudes. The employers rated work habits and attitude competencies significantly higher in importance than domain knowledge and technical skills. There was no significant difference in their ranking of importance of knowledge and skills (Table 10 and 11).

9. The teachers and administrators rated educational development of both the project-assisted and non-assisted institutes as having progressed significantly within the last ten-year period (Table 12).

10. There was a significant difference in educational development as evaluated by the project-assisted and non-assisted teachers and administrators in the areas of curricula and instruction, quality of graduates, teacher development, and industrial linkages. There was no significant difference in the area of student enrollment and overall (Table 13).

The project-assisted teachers and administrators rated the areas of curricula and instruction, quality of graduates, and teacher development higher than the non-

assisted teachers and administrators rated those areas. The non-assisted teachers and administrators rated industry linkages higher than the project-assisted teachers and administrators did (Table 12 and 13).

11. The current students rated the educational development in both the project-assisted and non-assisted institutes as highly improved within the period of the last ten years (Table 14).

12. There was no significant difference in educational development at their institutes as evaluated by the project-assisted and non-assisted current students in the area of student enrollment. However, there were significant differences in the areas of teaching and learning management, student expenditures, and the quality of students and graduates. The current students at the project-assisted institutes rated these three areas and their institutes overall significantly higher than the current students at the non-assisted institutes did (Table 15).

Implications

The results of the research conducted for this study indicate that the vocational training in the project-assisted institutes made a larger impact on the socio-economic status of graduates and their families even though there were no significant difference between the socio-economic status of the project-assisted and non-assisted graduates. A possible explanation of why the project-assisted and non-assisted graduates have the same socio-economic status may be that the pay scales of the employers, both in private and public sectors, are not much different. The pay scales are basically based on the levels of education. Since, the quality and acceptability of the project-assisted graduates are based on the quality of education in the institutes; they were rated at a higher level than the non-assisted institutes, making it easier to obtain satisfactory positions and to carry out their work responsibilities. In the area of student enrollment, which was not significantly different, a possible explanation is that both project-assisted and non-assisted institutes are under the jurisdiction of the Ministry of Education and are under government supervision; thus, their institutional policies of enrollment/admission and regulations are the same.

According to the employers' responses about critical employee competencies, competencies involved work habits, work ethics, and attitudes were rated higher than knowledge and skills. A plausible explanation why the employers wanted employees with high basic work competencies seems to be widespread difficulties caused by lack of discipline, loyalty, and ethics, and poor basic work skills of their employees. Employees' basic work skills and attitudes could be enhanced during their period of study in the institutes. Employers generally felt the knowledge and skills could be upgraded and retrained later. The employers also estimated their needs for quality and adequacy of technology and manpower in the next 10 years would be slightly lower than now. This seems to indicate a lack of confidence in the value of graduates from the schools over those trained in the employers' enterprises in addition to a general pessimism about the Thai government's ability to stimulate recovery of an economy now approximately one year into recession. Although recovery was predicted within the next two to three years, most employers interviewed said they were not planning for expansion and development of their businesses in the next 10 years. This result was consistent with another national survey examining the results of another joint project of the Thai Government and the ADB focused on workforce development which is currently underway and slated to complete in the year 2000 that involves an investment of US\$153 million which was reported on in the June 17 1998 issue of the Bangkok Post.

Discussion

Based on the results of this study, the following issues are made:

1. To reduce duplication of functions, policies, missions, and programs of the many technical and vocational education and training (TVET) institutes in Thailand, the roles of RIT and DOVE under MOE, and TVET agencies under other ministries should be differentiated and coordination among government agencies should be improved. A high-level, high-profile TVET national body should be established to coordinate TVET policies, modernize technical and vocational education and training utilizing information technology, and facilitate implementation through networking existing departments,

technical schools and colleges, enterprise training centers, skill development centers, and non-profit organizations' training centers.

2. Considering the lessons learned recently from the financial failures in the region, investment decisions that involve significant amounts of loan funding should be research based and care should be taken to not rely solely on the opinions of administrators in government agencies involved or on their concerns for building staff, controlling large budgets, or personal career advancement.

3. As the technical colleges in the control group under the Department of Vocational Education (DOVE) were rated measurably lower than the project-assisted campuses of RIT in the areas of curricula and instruction, quality of students and graduates, and teacher development, any financial assistance to the technical colleges under DOVE should be structured to insure the improvement of these weak areas in their programs.

4. Attention and resources should be directed to the establishment of effective programs to provide critical liaisons between vocational institutes and industries, especially in the provinces, to enhance their ability to cooperate in educational programs.

5. In-service training programs should be developed and promoted to provide instruction in: basic work habits and attitudes, domain knowledge, and technical skills intended to improve the quantity and quality of mid-level (technician) and advance-level members of the workforce to an international standard of technical excellence.

6. Current enrollment in the colleges studied averages only about ten percent female because of the focus on "heavy" technical work. In the light of current national development needs and in order to establish greater gender equity any new assisting projects should be geared towards establishing service industry courses in such areas as fashion, tourism, and hotel management.

7. Employees' basic work skills and attitudes, including work coordination training and ethics should be enhanced during their period of study in the institutes

through specific course work. This will require upgrading teacher's skills in these areas so that they can serve as models.

8. Teaching and learning management, curricula, and syllabus design should incorporate international curricula, teaching and learning management focused on providing manpower for a mid and long-term vision for development of a high quality of life for Thai citizens. This effort should be led by government and structured according to government long range planning as well as being responsive to the needs of employers and students. For this, the Singapore model of skill development, which has created the most productive workforce in this region, the new German workforce development model, the Danish model of life-long learning and skill development, and the Taiwan model for developing entrepreneurship, as well as other effective programs, should be explored for adaptation.

9. The terms and planning for any future development program should include "continuous auditing" measures to determine it's impact and effectiveness on educational development throughout the project period and not just after project completion.

10. For effective implementation, new programs approaches should incorporate retrieval of important facets of Thai identity and culture which have been dispersed during the recent period of rapid development.

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