The Impact Analysis of Technical Assistance on Human Resources Development

— Ubon Institute for Skill Development (UBISD) in Thailand —

INSTITUTE FOR INTERNATIONAL COOPERATION
JAPAN INTERNATIONAL COOPERATION AGENCY

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FOREWORD

Since 1991, our country has been the world's largest donor of official development assistance (ODA). As the leading donor, Japan needs more than ever to provide clear information about our assistance and its impact in order to foster understanding and support for ODA in Japan and around the world.

The Japan International Cooperation Agency (JICA), Japan's agency for implementing technical cooperation, is aware of the importance of establishing and strengthening systems of evaluation, management and feedback in order to benefit from past experience in our present and future cooperation projects. With this in mind, we established evaluation guidelines for project-type technical cooperation in 1991 and have been studying guidelines procedures for evaluating other forms of cooperation. We must strive to evaluate projects objectively and accurately by expanding the variety of formats and viewpoints of our evaluative studies, such as follow-up studies, nation-by-nation evaluations, third-party evaluations, etc.

As one step toward improving our assessment and explaining our results in an easily understandable and accurate way, we conducted research in FY1994 to measure the mid-term and long-term impact of vocational teacher training projects implemented in Malaysia and Indonesia, and thereby attempted to develop quantitative methods for evaluating the impact of technical cooperation. This year we measured the impact of a vocational training project in Thailand as the second phase of our effort to improve the reliability and accuracy of our assessment methods. Our aim was to find even more objective and logical ways to conduct evaluations. This year's study focuses specifically on young workers in northeastern Thailand who are the direct beneficiaries of the assistance project, and places special emphasis on measuring the project's impact on their employment and income.

I would like to take this opportunity to thank, once again, Professor Hiromitsu Muta and Mr. Takahiro Saito of the Tokyo Institute of Technology, who have contributed a great deal by analyzing the on-site research results in this study, as they did on the previous one. I also want to express my sincere appreciation to everyone involved in the research for this project.

Finally, I would like to point out that the contents of this report represent the study team's research findings, and do not necessarily reflect the official opinions of JICA itself.

March 1996

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Table of Contents

Diagrams and Tables

List of Acronyms

UBISD	Ubon Institute for Skill Development
MLSW	Ministry of Labor and Social Development
DSD	Department of Skill Development
NISD	National Institute for Skill Development
ISD	Institute for Skill Development
PCSD	Provincial Center for Skill Development
KISD	Khon Kaen Institute for Skill Development

SUMMARY

1. Background and Objective of This Study

The impact of technical transfer often becomes evident after a project has ended, when "counterparts," the direct beneficiaries of the project, transfer newly-acquired technology to their co-workers and students by involving them in production activities. Evaluations undertaken upon the conclusion of a project often overlook impacts that become evident later. Such evaluations tend to focus on the running of the project; few include quantitative evaluations of the impact. Thus, there are new challenges to develop methods for quantitatively measuring and analyzing the results of technical cooperation projects in terms of project design and from a cost-benefit perspective.

2. Subject and Scope of Study (Ubon Institute for Skill Development)

This case study looks at the Ubon Institute for Skill Development (UBISD), with which Japan International Cooperation Agency (JICA) implemented a technical cooperation project for five years beginning in 1988. UBISD is a Thai government facility in northeastern Thailand for training young people in various vocational skills. Several forms of training are conducted at UBISD, including pre-employment training, skill improvement training and mobile training. This study focuses mainly on training courses aimed at providing opportunities for young people to learn vocational skills before their first job. Specific subjects of the survey were graduates, instructors and administrators of UBISD, and supervisors of businesses employing the graduates.

3. Guidelines for Impact Measurement

For this study, we analyzed UBISD's overall training activities as one system. We compared the system's inputs and outputs and evaluated efficiency by analyzing cost effectiveness. To do so, we calculated economic equivalents for all inputs, i.e., equipment, facilities, training materials, instructors and students. To assess the system's impact, we measured graduates' income gains and evaluated their subjective assessments as economic and non-economic impacts, which are the main goals of cultivating human resources.

4. Impact Measurement at UBISD

First of all, we measured the economic impact of productivity increases achieved through vocational training. Based on the premise that increased productivity is reflected in higher incomes, we measured UBISD's impact as the difference between the income of UBISD graduates and that of non-UBISD workers.

To determine the income of UBISD graduates, we used their answers to a questionnaire and adjusted for the difference between Ubon and Bangkok wages to create a profile of income relative to years of experience. In order to determine the income of non-UBISD workers, we assumed that they were working for the minimum wage, based on their responses to the questionnaire. Taking into account the average number of work days per month, employment levels (by level of education) in northeastern Thailand and seasonal fluctuations, we estimated the monthly pretax income of a non-UBISD worker as 2,578 baht.

The income difference between UBISD graduates and non-UBISD workers was referred to as the economic impact of the project. Assuming that the effects of training lasted ten years, we could estimate that in the ten years after training, the economic benefit received by each trainee would be 331,340 baht based on FY1995 current values.

Non-economic effects that may not be reflected in salaries were also measured and analyzed from graduates' answers to questionnaires. Graduates were asked to assess, on a scale of one to five, the non-economic impact of training. The total score served as a yardstick of the project's total impact.

5. Measuring UBISD's Costs

First, we calculated the total number of students per fiscal year by multiplying the number of students by the number of training hours (because UBISD offered training courses for different lengths of time).

Next, we divided training expenses into the categories of direct and indirect expenses. Direct expenses include outlays for materials that are consumed during the school year and capital outlays for materials to be used in the long term. Since consumption-related outlays were paid by the Thai government, figures were taken from annual UBISD activity reports showing expenses for labor, facilities and materials. We calculated each year's actual capital outlays from the yearly budget, taking opportunity cost and machine durability into consideration. Capital outlays from Japan included the dispatch of experts and research groups, donated machine parts, expenses arising from counterpart training, as well as grant assistance invested

at the earlier stages of the project. Capital outlays from the Thai side included the construction of staff housing and the purchase of equipment.

Indirect expenses included study-related expenses for students during training, and the loss of potential income by students during training (opportunity cost). The total indirect expenses were 38,584 baht (38,078 baht per individual student).

6. Cost Effectiveness Analysis

Looking at UBISD as an investment opportunity and comparing it with other such opportunities, we can conclude that it is a valuable project. The societal rate return per student was 9.60% based on a calculation of economic impact minus expenses. The current value came to 56,593 baht per student.

If we look at the cost effectiveness of Thai contributions alone, excluding Japanese contributions, the rate return for all activities through FY1995 was 30.6%, with a current value of 169,707 baht. In other words, for the Thai government UBISD was an investment that yielded more than 30% annual interest. Training one worker created potential earnings of 170,000 baht in the future, based on current values.

But it is more important to assess how UBISD training served to enrich individual students' lives than it is to simply measure societal cost effectiveness. Though the indirect expenses of 38,078 baht were relatively high, these costs were outweighed by the expected economic impact: a personal rate return of 49.7%, or a current value of 197,459 baht. It is clear that students can expect a favorable return on their investment if they can find a way to pay the indirect expenses.

7. Non-Economic Impact

We conducted a survey to study three types of non-economic impact: "personal impact," "social impact," and "evaluation of graduates by others."

In the personal category, respondents said they "gained knowledge/skills needed for work" and "were able to find work quickly," revealing that UBISD achieved its main objectives of providing training opportunities and helping to find skilled jobs for unemployed young people in northeastern Thailand. Moreover, the program promoted a work ethic, as evidenced by respondents who said they had gained "enthusiasm for work" and "respect for rules and regulations." Also mentioned were side benefits; some students said they "made more friends."

In general, the survey found that although there was some social impact (impact on surroundings), it was relatively small compared to the personal impact. This

may be because UBISD graduates' skills were not dramatically higher than those of other workers at the initial time of employment, so they had little impact on other workers.

When non-economic impact was compared by region, we found that in general, UBISD's impact on workers was greater in Ubon than in the Bangkok area. The output of the UBISD graduates working in the Bangkok area was the same as the output for those graduates working in Ubon. However, UBISD graduate were in a less competitive position in the labor market in the Bangkok area than they were in the Ubon labor market.

In the Bangkok area was not as great as the impact on workers around Ubon. Though UBISD's output for Bangkok-area workers was the same as that for other workers, UBISD graduates were in a less competitive position in the urban area surrounding Bangkok.

Finally, when we asked supervisors at companies employing UBISD graduates if they were superior to other workers, we generally received favorable evaluations in every area. The graduates were especially praised for being obedient, following rules and possessing a valuable work ethic. In other words, one could say that when supervisors evaluated the non-economic impact on graduates, knowledge and skills were less important than graduates' fundamental attitude as workers.

8. Project Evaluation and Recommendations

First of all, we found that UBISD was generating ample returns on investment in terms of economic impact. In this study we were not able to examine ripple effects such as passing on skills to other workers or transferring technology to other instructors or students when counterparts move. Therefore, we believe the actual cost effectiveness to be even higher than what was found here.

Furthermore, since the social returns on investments made by the Thai government alone are extremely high, we consider UBISD's continuing vocational training activities as a meaningful investment likely to increase productivity in the country's northeastern region. From Japan's standpoint as a donor, the project can also be positively assessed as having created investment opportunities. From the standpoint of UBISD students, taking courses at the center also represents a good investment likely to increase their incomes as long as they can manage the indirect expenses.

Also, induction analysis made it clear that impact, rather than expenses, was the key element in determining the institute's success. If UBISD is to improve the

return on investment and the productivity of northeastern Thailand, efforts must be made to improve the quality of UBISD graduates.

Lastly, in the analysis of non-economic impact, we found that the most outstanding trait of UBISD graduates was their fundamental work ethic, while their level of knowledge and skill was less superior. Although UBISD is currently fulfilling its goal of cultivating skilled workers, in the future, UBISD must gradually shift its training toward more advanced vocational education.

9. Lessons and Suggestions Regarding Study and Analysis Methods

This study primarily used questionnaires, supplemented by interviews and statistical data. Though the response rate was less than five percent for mailed questionnaires, if the questionnaires are appropriately prepared, the method of distributing them in advance and then collecting them in person is effective even in developing countries where questionnaires are not common.

In order to improve the response rate and gain the required information with minimum effort, it is best to make the questionnaire simple. By understanding the area's conditions through exhaustive preliminary research, it is possible to design a suitable study and an appropriate questionnaire. Through continuous monitoring of a project and effective use of local personnel, it should be possible to achieve excellent results from the study with minimum investment.

If a project is to be evaluated after it is finished, it is best to design a project with post-evaluation in mind in order to improve analytical accuracy, by specifying from the planning stages such items as theme, subjects, monitoring methods, record keeping, preservation of data, etc. In the case of the UBISD project, though overall goals and project goals were set, there were no specific qualitative or quantitative standards to assess invested resources, expected results, external influencing factors, standards for judging success and ways of measuring the achievement of those standards. If these items are established during the project design stage, monitoring would be easier. Even in cases in which a project does not meet its goals, we could still suggest easy and appropriate countermeasures.

In conclusion, cost effectiveness analysis can be applied to evaluation of human resource development projects other than the vocational training field addressed by this study. Cost effectiveness analysis is an extremely effective method for understanding an overall system and determining the success or failure of a project, but it cannot clarify the content problems of the system. When a project does not produce the expected results, it is necessary to examine the problems in the system as a model.

Introduction: Outline of the Study

1. Background and Purpose

Technical cooperation is the transfer of a developed nation's technology or expertise to counterparts in a developing country. Designed to conform to the target country's technical environment, technology transfer is achieved through such means as dispatching experts, accepting trainees or donating resources and equipment. Its purpose is to cultivate human resources who will further the social and economical development of the recipient country. In most technical cooperation projects, it is assumed that counterparts will pass technology on to co-workers or students.

To ensure the maximum impact of a technology transfer, the receivers of the transfer must actually engage in production activities that utilize the new technology. The type of technology, cooperation and organization or system involved will determine how quickly a project's effects are felt, and for how long those effects endure. Therefore it is difficult to measure the impact of Japanese cooperation while the project is actually being carried out. There is a lag in the development of methods and frameworks for monitoring projects and for evaluating the impact of technical transfers after the project. JICA's evaluation activities also focus on final evaluations conducted immediately before cooperation ends, with virtually no quantitative measurement of a project's impact even in follow-up evaluations.

It is therefore necessary to comprehensively address the development of methods for quantitative measurement and analysis of the impact of technical cooperation projects relative to their cost and content.

In this context, in FY1994 as an impact study of technical cooperation, JICA's Institute for International Cooperation attempted to measure and analyze the impact of two training centers for vocational instructors, one in Malaysia (Center for Instructor and Advanced Skill Training, or CIAST) and the other in Indonesia (Center for Vocational and Extension Service Training, or CEVEST). The study[*1] was conducted under the supervision of Professor Hiromitsu Muta, Faculty of Engineering, Tokyo Institute of Technology.

Based on lessons learned from the above mentioned study, this study, as the second phase of the previous study, was conducted with the aim of improving the objectivity and accuracy of impact analysis methods.

[*1] *ASEAN hitozukuri purojekuto ni kakaru inpakuto chosa-mareishia (CIAST), indoneshia (CEVEST) ni okeru jirei kenkyu hokokusho*. Japan International Cooperation Agency, March 1995. (Available only in Japanese)

2. Subject and Scope of Study

The subject of analysis in this report is Thailand's Ubon Institute for Skill Development (UBISD). Based on suggestions from the analysis conducted in Malaysia and Indonesia, these were some of the reasons for selecting UBISD: (1) it is a vocational training center, as was the subject of the previous analysis; (2) not much time had elapsed since the completion of the project, therefore not hampering information gathering; (3) it addresses private-sector personnel, making it likely that improvements in the productivity of trainees will be smoothly reflected in wages; and (4) it is not located in a country where high inflation makes it difficult to assess the program's impact on income.

Specific subjects of the study were UBISD graduates, instructors and administrators, and supervisors in companies employing UBISD graduates.

The main focus of the study was measuring the project's impact on employment, promotion and wage increases due to improvements in graduates' skill level. UBISD's curriculum, training methods and processes were included as a secondary study areas.

3. Implementation Framework

JICA's Institute for International Cooperation collaborated with Educational Planning, Faculty of Engineering, Tokyo Institute of Technology to form a study team.

In order to provide additional support to the study team and promote the reflection of the team's findings in JICA, an advisory group was formed. The group members were from related Divisions of the Social Development Cooperation Department, Evaluation and the Post-Project Monitoring Division of the Planning Department and Development Specialists.

The Research and Development Division was designated as the project's secretariat, and put in charge of maintaining communication between the study team and the advisory group as well as compiling this report. The following is the list of study members and related officials of the Thai government.

(1) The Study Team

- Research and Development Division, Institute for International Cooperation, JICA (also secretariat for the project)
- Educational Planning, Faculty of Engineering, Tokyo Institute of Technology

(2) Thai Government Officials
- Kirasak Chancharaswat, Deputy Director General, Department of Skill Development, Thai Ministry of Labor and Social Welfare
- Sakda Bunyoprakarn, Inspector-General, Department of Skill Development, Thai Ministry of Labor and Social Welfare
- Somchart Lekhalawan, Director, NISD
- Kasam Vises, Director, UBISD

(3) Advisory Group
- Planning Division and First Technical Cooperation Division, Social Development Cooperation Department, JICA
- Evaluation and Post Project Monitoring Division, Planning Department, JICA
- Yoichi Suzuki, Development Specialist, JICA

(4) Resource Staff
- Yorio Kanemaru, Employment Promotion Corporation (former expert dispatched for UBISD project)

4. Structure of This Report

Chapter I analyzes the content, history and current status of the project relating to the overall structure of vocational training in Thailand by using existing documents and on-site research. The chapter also identifies specific areas of cooperation which Japan has provided and post-project activities of UBISD.

Chapter II explains the logic behind the impact measurement and the analysis methods which are the core of this study.

Chapter III gives an overview of questionnaires and on-site interviews and measures the impact of the project based on the data, using the analysis methods described in Chapter II.

Chapter IV presents evaluations and suggestions based on the results detailed in Chapter III. It also lists issues related to the framework for analysis and information gathering methods used in this study.

The Appendices include information about the current status of UBISD training and its educational processes.

Chapter I Background and Outline of the Project

This chapter provides background on UBISD, the subject of this study, and Japan's cooperation with the Institute. Also included is a description of UBISD's activities from the time of the project's completion until the writing of this report.

1. Human Resource Development in Thailand's Overall Development Strategy

In the last 30 years, Thailand has achieved stunning growth thanks to several national economic and social development plans. The Sixth National Economic and Social Development Plan, 1987-1991, in particular achieved an average annual growth rate of 10.5%-a record high, far exceeding the target rate. During this time, Thailand achieved remarkable industrialization and internationalization due to direct investment from overseas in export-oriented production.

Two factors underpinning this outstanding economic expansion were an abundance of natural resources and low-cost labor. The rapid economic growth, however, also caused natural resource problems, a widening income gap between urban and rural areas, and a shortage of the kind of labor needed for a sophisticated industrialized society.

As industry began to seek skilled and educated workers, the gap in wages between unskilled (less educated) workers-who tended to be in oversupply-and skilled (educated)-who were in short supply-increasingly widened. After 1990, this imbalance in the supply-demand structure of the industrial labor market resulted in a sharp, sustained climb in wages, not accompanied by increases in productivity.*1 While capital-intensive industries have been forced to hire experienced workers at high wages, labor-intensive industries either moved their production bases to other countries with lower labor costs or faced the pressure to modernize production processes.

Due to these trends, economic expansion based on abundant cheap labor has already reached the limit, and less-educated unskilled workers have serious employment problems.

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*1 Recent increases in minimum wages in the greater Bangkok area

Fiscal Year	1985	87	89	90	91	92	93	94	95
Baht	70	73	78	90	100	115	125	135	145

Source: Kaigai rodo josei geppo, May 1995

One reason for this situation is that previous national economic and social development plans emphasized industrialization, but the government did not accordingly reform education and vocational training systems to correct the income gap. In other words, it did not take adequate steps to promote education and training of inexperienced workers, or to cultivate human resources for an advanced level of economic activity.

To address this problem, the Seventh National Economic and Social Development Plan (1992-1996) aimed for sustained economic growth, with special emphasis on correcting gaps in income and development levels between urban and rural areas, promoting the development of human resources, raising living standards, and protecting the environment and natural resources.

In 1993, the Ministry of Labor and Social Welfare (MLSW) was established primarily to develop human resources, and industrial labor in particular. In 1994, the ministry's Department of Skill Development (DSD) submitted the nation's First Skill Development Plan 1995-2001, which was approved by the Cabinet.

The plan describes various human resource development issues that Thailand currently faces, and indicates specific goals to be reached between 1995 and 2001. In order to accomplish these goals, the plan names groups that should be the target of skill development, and designates particular target industries based on labor demand in each region. It specifies necessary projects and programs, and designates organizations with responsibility for implementation, management and evaluation.

The plan may require further evaluation and adjustment, but it confirms human resource development as a crucial aspect of the nation's development strategy. In the future, the MLSW, and the DSD in particular, will be expected to play an even more important role in plan's implementation, management and evaluation.

2. Vocational and Technical Training Systems in Thailand's Public Sector

2.1 Outline

Thailand's educational system, including the vocational field, is divided into "formal education" (schools) and "non-formal education" (outside of schools). Except for national and private universities that offer degrees, which are under the jurisdiction of the Ministry of University Affairs, schools are overseen by the Ministry of Education.

At present, compulsory education in Thailand consists of nine years: six years of primary school and three years of middle school. After completing the compulsory course, students can choose to go on to a regular or vocational course

of study. Students who complete a vocational course of secondary ("upper middle school") study receive a certificate. When they complete another two or three years of technical (vocational) high school, they receive a diploma. Students who complete a regular course of study can also transfer to a diploma- or degree-level vocational course. Today, most public and private schools offer vocational education according to curricula drawn up by the Ministry of Education.

Vocational courses at the secondary school ("upper middle school") level include hands-on vocational education aimed at cultivating a pool of semi-skilled industrial workers who will be ready to work.*2 In fact these courses tend to be viewed as a step towards the diploma or degree level rather than a form of technical training aimed at meeting the needs of local industry, and most students choose to continue their schooling rather than seek employment*3.

Meanwhile, some quite serious problems have occurred when young graduates of secondary vocational courses enter the labor market, due to gaps between their new skills and industrial needs, and between actual productivity and the employers' expectations based on the graduates' educational level.

Since 1994, the government has positioned these problems as top-priority development issues related to the reform of its vocational training and educational systems, and is now considering specific measures to deal with them.

For example, since 1995, authorities have run an experimental program in which students can get on-the-job training (with pay) by working half a day or three days per week while they stay in school and earn their graduation certificate or diploma. This was achieved through partnerships forged between private companies and vocational secondary schools or vocational instructor junior colleges.*4 This is an example of a policy measure that encourages private businesses, the direct users of human resources, to become actively involved in the cultivation of workers with

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*2 Training fields can generally be divided into the following four categories:
1. Industrial technology: manufacturing, electrical/electronics, machinery, etc.
2. Commerce: accounting, clerical work, sales technology, etc.
3. Agriculture: marine products, livestock, agricultural machinery, etc.
4. Home economics/crafts: food, textiles (manufacturing), crafts, etc.

*3 The Ministry of Education's Department of Vocational Education conducts regular follow-up studies of graduates of formal vocational schools. According to its 1989-1993 data, an average of 54% of graduates chose to continue their education rather than seek work right away (ADB 1995), Government of Thailand, Ministry of Education (1993). Data was not available by level (certificate or diploma).

*4 A company visited in the Ubon region accepted on-the-job trainees with the following conditions of employment:
1. vocational schools: 3 days per week (800 baht per month), three years
2. teacher training college: 200 hours total, with maximum of 8 hrs. per month of in-house training
3. vocational schools: half-day school, half-day in-house training program (2,000 baht per month + 1 meal per day)

the skills that the labor market requires. It can also be considered a concrete example of government and business working together.*5

Like formal vocational education, non-formal vocational training had been overseen and managed by the Ministry of Education's Department of Vocational Education. But after the Ministry of Interior established the Department of Labor in 1965, the Department of Labor also took responsibility for cultivating industrial workers and began offering vocational training primarily for unemployed or inexperienced workers.

In 1969 in order to expand employment services for workers and establish a vocational training system especially for inexperienced and unemployed workers, the Department of Labor set up the National Institute for Skill Development (NISD) with the cooperation of international organizations (the United Nations Development Programme and the International Labor Organization). After NISD's vocational training operations had become successful, the Thai government, in cooperation with international organizations and individual countries, took the next step of setting up regional institutes for skill development (ISDs) across the country. Under the NISD's leadership, the government has been promoting vocational training in regional areas.

NISD was Thailand's first vocational training center. In addition to serving its original function of providing training in the Bangkok area, it also took on the role of guiding the regional institutes that had sprung up all over the country. It became the central agency for training vocational training instructors, and developing and supplying a wide range of training materials.

However, in the reorganization that accompanied the establishment of the MLSW in 1993, responsibility for instructor training was transferred to the Institute for Training Personnel Development within the new ministry's DSD. At present, NISD has lost its central leadership and serves only as the Bangkok area's regional ISD.

Currently in Thailand there are 47 training facilities: NISD, 12 regional ISDs, and 34 provisional regional centers for skill development (PCSDs). The government is working on expanding the network of training facilities, with emphasis on adding provincial facilities; by the end of 1996 there is to be either an ISD or a PCSD in every province, for a total of 76 facilities.

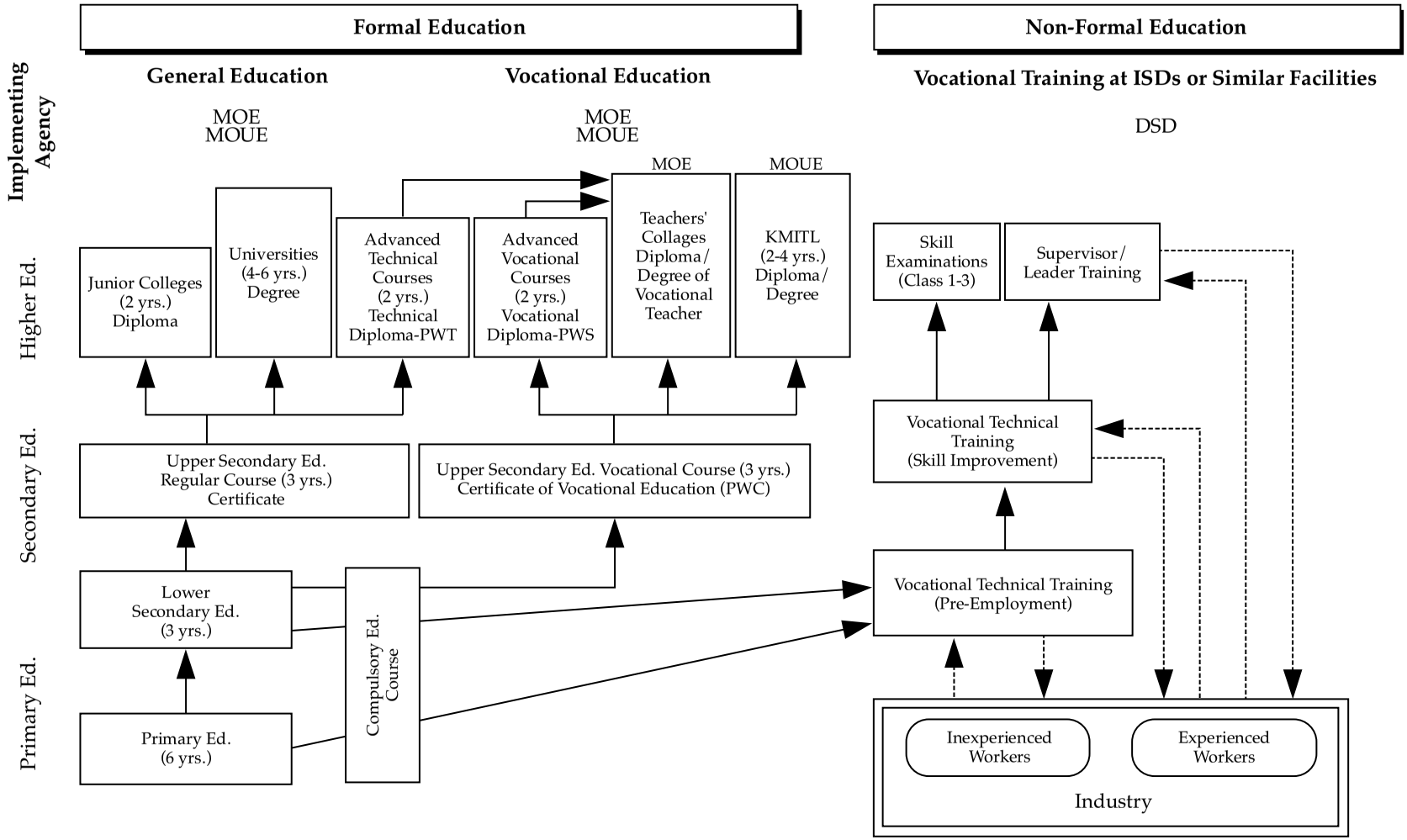
In the same way that the MLSW's DSD oversees formal education, non-formal education is overseen by the Non-Formal Education Department of the Ministry of

*5 To provide an example of private-sector vocational training, information about Don Bosco Technical School is included in Appendix S4.

Education. Non-formal vocational education also provides basic and advanced training aimed at improving employment opportunities and increasing income.

Diagram I-1 shows relationships between the formal education system and non-formal vocational education supervised by the MLSW, which is the object of this study. Table I-1 shows major government agencies in charge of administration of formal education, and Table I-2 shows ministries, departments (implementing organizations) and categories of training.

Diagram I-1 Thailand's Educational System and Vocational Training Offered By the Ministry of Labor and Social Welfare



Source: Shinzawa, Masayoshi (1988, 1995)

Table I-1 Main Government Entities Involved in School Administration

Entity	Authority
Office of the National Education Commission	Under the prime minister's office; main roles are to formulate national educational plans, study and gather data on education, and promote and expand the availability of education.
Ministry of University Affairs	Administers national and private universities.
Ministry of Education	Administers pre-school, primary and secondary education. Also administers advanced education (specialized advanced vocational schools and teacher training education) other than national or private universities supervised by MOUA, or special schools such as those training military, police, or railroad personnel.

Source: Shinzawa, Masayoshi (1995)

Table I-2 Types of Vocational Training and Main Entities Involved

	Entity	Relevant departments (or area)	Related training schools/ Area of training
Formal education	Ministry of Education	Dept. of Vocational Education	Advanced schools specializing in technology, agriculture and other vocations (about 162 schools)
		Institute of Technical and Vocational Education	Advanced schools specializing in technology, agriculture, commerce, or home economics (about 29 schools)
		Office of Private Education Commission	Private vocational or technical schools supervised by MOE and following its curricula (about 400 schools); attended by roughly half of all vocational education graduates who earned certificates or diplomas
	Ministry of University Affairs	King Mongkut's Institute of Technology and affiliated advanced technical specialty schools	
		Private technical colleges (Sripatum College, South East Asia College, Siam Technical College, etc.)	
	Ministry of Defense	Military vocational schools	
	Ministry of Communication	Railway Engineering School	
Non-formal education	Ministry of Education	Dept. of Non-Formal Education	Various forms of basic and advanced training for income generation (vocational training centers, mobile training units, remedial adult education, correspondence courses, etc.)
		Dept. of Vocational Education	Industrial arts schools, regional vocational centers
		Office of Private Education	Non-formal, private training such as adult education, religious education, typing, accounting, English language education, or industrial training
	Ministry of Labor and Social Welfare	Dept. of Skill Development	National Institute for Skill Development (NISD) Regional Institute for Skill Development (RISD) Pre-employment training, skill improvement, mobile training, skills testing
	Ministry of Industry	DIP runs ISI; offers consulting service, provides technical data and guidance, and holds technical training courses for light industry	
	Other ministries: Ministry of Defense, Ministry of Public Health, Ministry of Agriculture and Cooperatives, Ministry of Interior	Establishment of schools providing training in required skills	
	Public and private enterprises, NGOs	Training programs implemented as needed to train workers in job-related tasks, using their own or outside trainers (in-service training)	

Source: Shinzawa, Masayoshi (1995), and others
Note: DIP = Department of Industrial Promotion; ISI = Industrial Services Institutes

2.2 Ministry of Labor and Social Welfare

The Ministry of Labor and Social Welfare (MLSW) was basically formed by combining four government departments/offices: the Department Welfare and Labor Protection and the Department of Skill Development, both former sub-units of the Ministry of Interior handling labor-related problems; a part of the Department of Public Welfare handling welfare administration in general; and the Office of Social Security, in charge of public health insurance, etc. With the founding of MLSW, departments in charge of vocational-training-related operations and employment-related operations were separated and placed under the DSD and the Department of Employment respectively. Before the MLSW was established, the Ministry of Interior's Department of Labor was responsible for labor administration; but as it focused on wage issues, it did not gather sufficient information about the quality of the labor force. By elevating this function from the departmental to ministerial level, the government can be expected to allot a larger budget to the resolution of labor-related problems, and will be able to take action on a broader scale.

The MLSW's DSD has been responsible for managing UBISD since 1993.*[6] Since it is in charge of vocational skill development, the DSD is expected to formulate training plans aimed at promoting employment and raising worker productivity, and to make preparations for the implementation of those plans. Its highest priority measures are, in fact, gradually becoming ready for implementation.

The MLSW's principal aims are to contribute to further economic development by supplying human resources that meet the needs of industry and to reduce poverty by encouraging employment opportunities and improving the job market. Therefore DSD's main job is to provide elementary and intermediate-level vocational technical training, in a variety of formats, for unemployed young people who cannot otherwise receive formal education because of poverty or other extenuating circumstances. These facilities, namely NISD, the ISDs and the PCSDs, provide training to various target groups in accordance with their needs in order to promote better employment conditions and raise workers' standard of living by improving their skills.

*[6] Information about NISD, etc., as of November 1995 can be found in Appendix S2.

3. Ubon Institute for Skill Development (UBISD)

3.1 Background and Goal of Cooperation

In its Fifth and Sixth National Economic Social Development Plans, the Thai government began focusing on human resource development through vocational training that would give unemployed young people in farming areas a chance to find a job or run a business, thus relieving poverty in outlying areas through provincial development. In this regard, Thailand asked Japan for grant assistance and project-type technical cooperation.

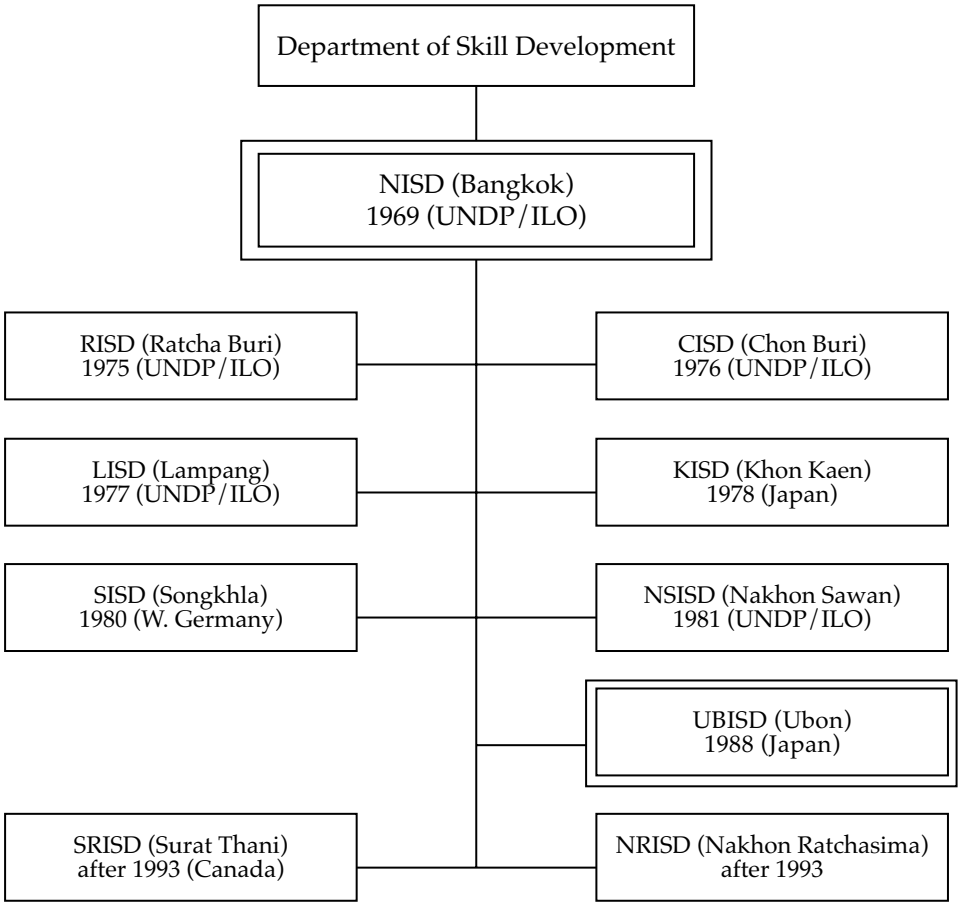
In response to this request, Japan built UBISD with grant assistance and implemented the UBISD project through JICA for five years beginning on October 1, 1988.

UBISD is a training facility that offers vocational training in a number of fields for young people in seven provinces in the southern part of northeastern Thailand.*[7] JICA also sent experts to NISD, which at the time was charged with guiding regional vocational training centers in Thailand. JICA implemented technical cooperation to review training curricula and methods and to develop and disseminate training materials in order to improve the overall level of vocational training instructors. In order to efficiently promote technical cooperation with UBISD, JICA aimed to achieve an organic cooperation between UBISD and NISD by simultaneously helping NISD, which was guiding instructors at all regional ISDs.

Diagram I-2 shows the relationship between NISD and regional ISDs at the time that JICA was implementing project-type technical cooperation.

*[7] UBISD is located in northeastern Thailand and operates in seven of the 18 provinces in the region: Nakhon Phanom, Mukdahan, Yasothon, RoiEt, Si Sa Ket, Amnat Charoen, and Ubon Ratchathani. Eight of the other 11 provinces are served by KISD in Khon Kaen, with the remaining three provinces served by NEISD in Nakhon Ratchasima.

Diagram I-2 Relationships between NISD and Regional ISDs



as of June 1, 1993

Source: JICA

CISD: Chon Buri Institute for Skill Development
KISD: Khon Kaen Institute for Skill Development
LISD: Lampang Institute for Skill Development
NRISD: Nakhon Ratchasima Institute for Skill Development
NSISD: Nakhon Sawan Institute for Skill Development
RISD: Ratcha Buri Institute for Skill Development
SISD: Songkhla Institute for Skill Development
SRISD: Surat Thani Institute for Skill Development

3.2 Japanese Cooperation

Thanks to grant assistance from Japan, construction of the UBISD training facility and donations of equipment were completed by March 1989. For a period of five years beginning in June 1989, Japan implemented project-type technical cooperation by dispatching experts, accepting trainees and donating equipment. The institute started training courses with an emphasis on pre-employment training.

Cooperation with NISD, the central training center for instructors, was provided as part of Japan's assistance to UBISD. After the Thai government built an instructor training center (completed in February 1990), Japan established instructor training courses and provided technical guidance.

(1) Grant assistance

The total cost of the project was 2.535 billion yen, of which Japan provided 2.386 billion yen and the Thai government paid 149 million yen (or 23.39 million baht). Table I-3 provides details on Japanese cooperation and Thailand's contribution.

(2) Project-type technical cooperation

Tables I-4 and I-5 provide details on Japan's cooperation with UBISD and NISD, with an emphasis on the topic of this study. Table I-6 shows Thailand's contributions during the cooperation period.

Table I-3 Grant Assistance from Japan and Thai Contributions

Japanese Contributions	Thai Contributions
Construction of facility, including: Main building (office, classrooms, training facilities, cafeteria) 1 bldg. 3,088 sq. meters Workshops 8 bldgs. 9,968 sq. meters Dormitory 1 bldg. 1,895 sq. meters Storehouse 1 bldg. 354 sq. meters Garage, for mobile training vehicles 1 bldg. 200 sq. meters Guardhouses (front and back gates) 2 bldgs. 69 sq. meters Covered passageway 670 sq. meters Total: 16,244 sq. meters	Preparation of construction sites Provision of land used during construction (temporary office, storage site for building materials, working area, etc.) Supply of electric power and water used during construction Installation or hook-up of supplementary equipment (electric power supply for facilities, telephone lines, water supply, drainage pipes), etc.
Materials for: Machinery Electrical Sheet metal, welding Construction Ceramic production Painting Auto repair Agricultural machinery/repair Mobile training Special training Audiovisual Other	

Source: JICA

Table I-4 Cooperation Provided to UBISD*1

Type of Cooperation	Long-term experts	Short-term experts	Accepted trainees	Donated materials	Technical cooperation
Heavy Machinery	2	2	2	Various types of lathes, milling machines, grinders, and drilling machines	Provision of guidance on setting up training programs, creating training materials and running courses in machinery, welding and sheet metal working; provision of guidance on how to operate and maintain welding-related equipment
Electrical	3	2	2	Television picture receivers, oscilloscopes, computers, videotape recorders, electronic circuit testing equipment, pulse testing equipment, signal transmitters, frequency counters, refrigerators, air conditioners, vacuum pumps, etc.	Provision of guidance on setting up training programs, creating training materials and running courses in electrical machinery, refrigeration/air conditioning, and radio/television repair; provision of guidance on operating and maintaining donated equipment
Automotive	2	8	5	Various types of testers, cylinder boring machines, surface grinders, oil changers, tire changers, body frame repair sets, etc.	Provision of guidance on setting up training programs, developing and producing training materials for three types of courses: auto mechanics, agricultural machinery and body repair; provision of guidance on operating and maintaining tools and equipment; introduction and training of latest automotive technology
Construction	2	3	5	Pipe laying practice models, welders, gas exhaust equipment, cutters, benders, drills, hydraulic punchers, water pressure test pumps, toning machines, standard light sources, surface roughness gauges, surface hardness gauges, drafting and design equipment, slide projector, industrial dust collectors, electric drills, electric planes, wood carving tools, copy machines, drafters, etc.	Installation and testing of equipment, curriculum development and review, and study of on-site needs and graduate employment situation; guidance on forming, muffle painting and baking technology; in addition, technical training in pipe laying, furniture making and painting

*1 Does not include experts who helped with development of audiovisual materials, or trainees accepted for short periods of about one month.

Source: JICA

Table I-5 Cooperation With NISD

Type of cooperation	Long-term experts	Short-term experts	Accepted trainees	Donated materials	Technical cooperation
Development of educational materials	2			Videotape recorders, video cameras, editing machines, color monitors, slide projectors, computers, production mixers, etc.	During the first half of the cooperation period, developed educational materials and gave technical guidance related to donated production machinery in order to round out educational materials used in instructor training. During the second half of the period, focused on reviewing and updating printed and audiovisual educational materials distributed by NISD to the regional ISDs and provided technical guidance on new developments.
Teaching methods	2		2	CNC lathes, CNC milling machines, tape-making machines, universal tool grinders, universal projectors, etc.	Established a foundation for the instructor training system by working with educational materials development experts. Transferred specialized technology and teaching techniques for electrical equipment and repair. Transferred computer and mechatronics technology. Reviewed and expanded training of new teachers.
Machinery	2	1			Transferred beginning and intermediate technology related to CNC milling machines, CNC lathes and CNC wire cutters; developed and improved teacher training courses.

Source: JICA

Table I-6 Thai Contributions During Project Implementation

Contribution	UBISD	NISD
Operating budget allocations	Salaries of staff and instructors; educational materials, utilities, etc., some training facility expenses	
Allocation of staff and counterparts (June 1993)	Administrative employees (public employees) -- 49 Full-time contract employees (instructors, drivers, operators) -- 29 Temporary contract employees (secretaries, drivers) -- 3	Administrative employees (public employees) -- 10 Full-time contract employees (instructors) -- 3, counting only related employees within DSD and NISD
Construction of facilities	Employee dormitories -- 74 units	Instructor training center (floor space: 541 sq. meters X 3 stories = 1,623 sq. meters)

Source: JICA

4. Training at UBISD

All training at regional ISDs consists of 80% practical training and 20% theory. The format, duration and object of training, etc., are supposed to be basically the same at all ISDs, but in fact there are some significant differences.*[8]

Table I - 7 shows the training programs conducted at UBISD. Tables I-8 (a and b) show the total numbers of students in the various training programs. Below is a description of the current status of various types of training, based on information from an on-site survey.

(1) Pre-employment training

Pre-employment training, aimed at unemployed young people, is DSD's top priority. Statistics on DSD training show that in 1994 roughly 80% of training hours were allotted to pre-employment training.*[9]

Pre-employment training helps promote and improve employment opportunities for unemployed young people by giving them the opportunity to receive vocational technical training. Once trainees finish their training, most are hired by the same companies that took them on as on-the-job trainees. The names of companies accepting on-the-job trainees are announced publicly at UBISD, and trainees can specify the companies for which they would like to work. Companies that offer good conditions (training allowances, meal allowances, lodging, etc.) attract the most applicants. When the number of applicants exceeds the number of positions available, UBISD decides where to send each trainee based on testing, level of skill, attitude toward study, etc.

(2) Skill improvement

UBISD provides specific skill improvement training free of charge, in principle for people who are already employed. Company-wide training is possible, but most trainees are individual workers who hope to advance their position by acquiring new or better skills. There are also some cases of secondary school students taking courses before they find a job, or of whole schools taking advantage of the course.

UBISD has almost no track record in skill improvement training commissioned to address the individual needs of companies, and it appears that this UBISD service itself is not well known. Almost all the present training is therefore based on the present UBISD curriculum.

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*[8] According to ADB (1995), there are significant regional differences in the operational structure, course curricula, course duration and subjects offered. It is noted that these differences are not caused by differences in the needs of regional industries.

*[9] ADB (1995).

Table I-7 Outline of UBISD Training Courses

Type of training	Description	Courses	Trainees	Duration
Pre-employment	Vocational training for young people, aimed at cultivating skilled or semi-skilled workers; courses currently offered in 17 vocational fields; each course includes two or three months of on-the-job training	Automotive, machinery, electrical/ electronics, construction	Unemployed graduates of primary and lower secondary school, aged 16 to 25	10 months at UBISD + 2 months on-the-job, or 6 months at UBISD + 3 months on-the-job
Skill improvement	Designed to help employed workers keep up with technological innovation	Automotive, machinery, electrical/ electronics, construction	In principle, employed workers over the age of 16 who have experience in the area for which they are applying	Day or night (60 hrs. total); can be adjusted to fit situation
Mobile training	Educational materials are loaded onto a bus, trailer, etc. , and taken to an area where there is a need for training. Depending on the village, subjects includes small engine maintenance, motorcycle repair and household appliance repair. People who are interested are introduced to UBISD's various courses.	Automotive, welding, construction, electrical machinery	People of working age who live in remote areas (students receive an allowance of 50 baht per day)	From 1996, each course is 60 days long (total of 360 hrs)
(Below are programs to which Japan does not contribute)				
Special skill improvement	Vocational training for non-technical positions (house maid, receptionist, tailor, guard, waiter, tour guide, self-run business, etc.)		Mainly unemployed young people	30-60 hours
Managerial or supervisory training	To improve the efficiency of on-the job training, teaches managerial skills and teaching methods. Currently merged with special skill improvement training.		Mostly managers	60 hrs.
National skill assessment test (standard testing)	Testing for qualifications (1st Class: skilled, 2nd Class: semi-skilled, 3rd class: regular worker). Tests are offered for 31 vocational fields (as of Dec. 1991) and include practical and theoretical sections. Also technical qualification testing of applicants for overseas employment, which is administered by the Ministry of Labor and Social Welfare. Offers training courses (60-70 hours) aimed at passing qualifying exams.			Pre-employment training students (twice yearly) Outside applicants (once every 3 months)
Contests of skill	Held at UBISD since 1991			

Source: JICA (1993a), (1993b), and interviews conducted locally.

Table I-8 (a) Number of UBISD Trainees in Pre-Employment Courses

Year	1989	1990	1991	1992	1993	1994	1995	1996
Subject/Term	1st term	2nd term	3rd term	4th term	5th term	6th term*1	7th + 8th terms*2	
Automotive	74 - 62 (79.0%)	74 - 66 (57.6%)	77 - 67 (58.2%)	87 - 70 (74.3%)	91 - 64 (73.4%)	104 - 84 (-)	569 - 48 (91.7%)	
Machinery	102 - 78 (74.4%)	105 - 90 (85.6%)	103 - 90 (87.8%)	104 - 85 (100.0%)	107 - 84 (88.1%)	130 - 89 (-)	306 - 29 (100.0%)	
Electrical	60 - 49 (55.1%)	62 - 52 (73.1%)	59 - 49 (75.5%)	73 - 47 (89.4%)	65 - 38 (97.4%)	80 - 57 (-)	332 - 20 (85.0%)	
Construction	97 - 75 (78.7%)	103 - 80 (82.5%)	96 - 68 (83.8%)	112 - 84 (97.6%)	123 - 82 (93.9%)	139 - 74 (-)	381 - 16 (100.0%)	
Total	333 - 264 (73.1%)	344 - 288 (76.0%)	335 - 274 (77.4%)	376 - 286 (91.2%)	386 - 268 (87.7%)	453 - 304 (-)	1588 - 113 (93.8%)	

Number of entrants - number who complete on-the-job training

Figure in parentheses is the employment rate.

*1 Employment rate for the 6th term is unavailable.

*2 The number of on-the-job training graduates and employment rates shown under 7th + 8th terms (June course) is only from 7th term.

Table I-8 (b) Number of UBISD Trainees in Courses Other Than Pre-Employment Courses

Course	1989	1990	1991	1992	1993	1994	1995
Skill improvement	145	247	457	336	410	456	1,656
Mobile training	80	824	1,127	1,634	1,056	599	1,075
(includes training done from regular budget)	80	535	240	176	342	599	1,075
Special skill improvement	156	502	1,817	400	545	898	2,056
(includes training done from regular budget)	156	502	477	166	308	307	1,450
National Skill Assessment Tests	-	48	82	128	376	402	1,500
Contests of skill	-	-	123	-	-	121	-
Special projects	-	-	-	-	-	7,330	5,908

(No. of trainees)

(3) Mobile training

In the northeast part of Thailand, there is quite strong demand for mobile training. Mobile training is primarily aimed at agricultural workers who wish to acquire skills that will allow them to find work in manufacturing, or who want to use their slack season to work away from the farm. In FY1995 (November 1994 - October 1995), an average of about 17 courses was conducted in each province. When UBISD first started offering these courses, each one was about 10 days long (60 hours), but they became longer year by year, growing to 30 days (180 hours) FY1995 and 60 days (360 hours) in FY1996.

UBISD budgets 121,200 baht per mobile course, which includes an allowance of 280 baht per day for a UBISD instructor, or daily wages of 450 baht per day for a contracted instructor (all expenses included), and daily wages of 50 baht per student.

Each province has a labor office operated by the MLSW, where public officials sent by the ministry monitor regional needs for mobile training. Mobile training plans follow procedures as specified below; the same method is used by all regional ISDs.

(1) Annually, before the start of the budget year (October - September), each regional ISD receives requests for mobile training from its offices in each province.
(2) Each ISD then evaluates its capacity for providing mobile training in light of the requests for training in various fields, coordinates the requests for training and prepares a feasible training plan proposal.
(3) Early in the fiscal year (around November), staff assigned to the provincial offices are assembled at each regional ISD along with instructors. They develop training plans for the year based on a proposed preliminary plan from each region. During this process, consideration is given to the location and type of course, demand from trainees (whether the minimum of 25 trainees is met), and whether the local community will provide support. Final plans are approved by each regional ISD's director.

Chapter II Analysis Methods

1. The Logic behind Impact Measurement

As shown in Diagram II-1, the impact of education and training were divided primarily along two axes: "economic" vs. "non-economic" and "personal" vs. "societal." The former refers to whether or not a particular impact can be quantified in economic terms, while the latter refers to the beneficiary. A time axis could also be added to discriminate between "short-term" impacts that appear immediately after the education or training is completed, and "long-term" impacts that are sustained long after training has ended.

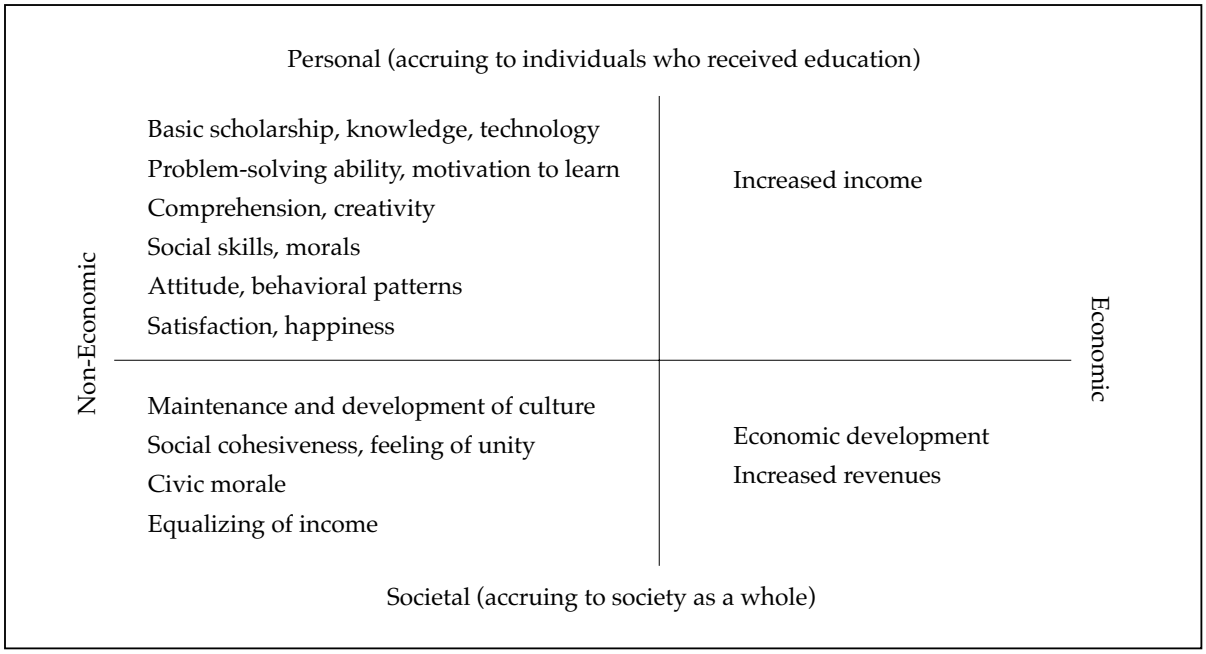
The various results definitely do not fall neatly into categories. For example, increased income is a economic impact, but it can also be seen as a consequence of non-economic impacts such as the acquisition of knowledge or technology, or improved attitude. Likewise, the accumulation of knowledge or technology is likely to lead ultimately to economic development-an economic result. Thus, a variety of cause-effect relationships exist among these factors, making it impossible to explain them all at once. Therefore, in our survey and analysis, we needed to clarify which results to measure and how to define results.

As stated in Chapter I, UBISD was built in 1987 with grant assistance from Japan, and a technical cooperation project was implemented for five years beginning in 1988.

The Ubon Vocational Training Center Evaluations Team evaluated the overall accomplishment of the project's aims of establishing the vocational training center and its operational methods, the transferal of appropriate technology to counterparts, the utilization of equipment, and the project's ability to attract adequate numbers of trainees and conduct vocational training.*1 The team found that the project had generally fulfilled its goals. The team mainly used as reference points direct outputs such as project operating conditions, number of training courses and number of trainees to determine whether or not project goals had been achieved.

*1 The evaluation conducted upon completion of the UBISD project in July 1993 focused on numerical results achieved while the project was running (number of graduates, number of courses offered, etc.). It confirmed that the project operated almost exactly as planned, and had achieved its goals (JICA 1993a).

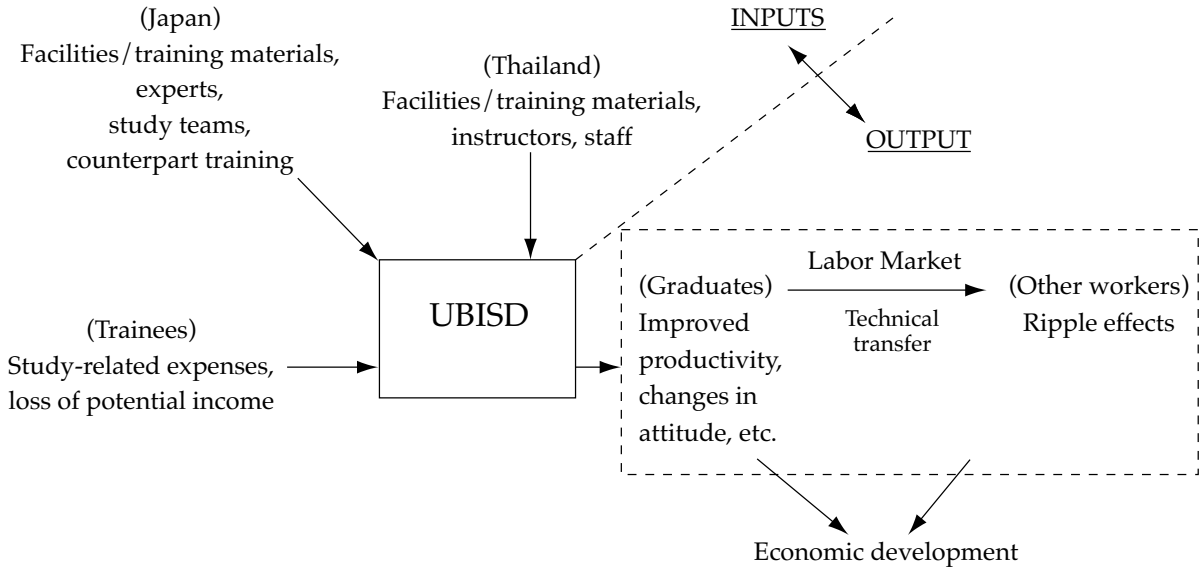
Diagram II-1 Impact of Education, by Category



If UBISD's goal is to improve the productivity of society by cultivating skilled workers, then its direct output is skilled workers and its indirect output is the ripple effects generated by graduates through their activities. Therefore, in order to evaluate UBISD, it is necessary to examine the relationship between UBISD and the labor market by evaluating how many graduates it sends into the labor market and their role in it, and whether those graduates actually possess qualities of skilled workers in the labor market (Diagram II-2).

The most important impacts of an educational or training project are not the short-term ones that become immediately evident, but rather the long-term ones that remain over time. Indirect or ripple effects spread by the direct recipients of training are also important. Thus, it is not sufficient to measure the impact of an educational or training project based only on whether its initial objectives were achieved. It is necessary to measure impact from a long-term point of view, giving consideration to external conditions.

Diagram II-2 System Inputs and Outputs



2. System Inputs (Investments) and Outputs (Impacts)

The easiest way to evaluate human resource development in an educational/training project is to look at all of the project's activities as a single system, measure that system's inputs (investments) and outputs (results) and compare the two. Likewise, this study focuses on UBISD's training activities as a system.

In this report, we define investments as "all inputs that were invested in the system," including equipment, buildings, training materials, instructors, trainees, etc. These investments were then converted into economic terms; equipment and buildings, etc. , are quantified based on their costs, and the labor of instructors and staff is quantified based on the cost of their labor. Trainees shoulder a portion of the cost in the sense that they forgo other paid positions during their training period, thereby temporarily giving up income in the hopes of increasing their income in the future. In the analysis that follows, investments are expressed as "costs."

The system's impacts are defined as "all direct and indirect outputs of the system."

However, as shown in Diagram II-1, the impacts of education and training are varied, with both long-term and short-term effects. Also extremely important are indirect ripple effects passed on by those who actually received the education or training. Therefore, the range of impacts depends on the scope of the system being analyzed, as well as the capacity for analysis.

The previous study focused on long-term effects, or knowledge and skills gained by graduates, and ripple effects resulting from their transmission to others.

In order to take account of both the economic and non-economic gains that together represent the main aims of human resource development projects, the current study measured increases in graduates' income and as well as other benefits listed by graduates in their subjective evaluations. By comparing inputs and outputs and using cost-effectiveness analysis, we evaluated the vocational training center in terms of a single system with inputs and outputs.

3. Impact of UBISD

3.1 Economic Impact

3.1.1 Indicators for expressing economic impact

The main objective of UBISD vocational training is the cultivation of skilled workers, but the number of such workers produced, or the "quantity," is not the only indicator available for expressing UBISD's impact. There must also be an indicator that expresses "quality," or the skill level of those workers produced.

For this purpose, we define "human resources" as "people with a high degree of productivity." Then in order to quantify impact, we simply measure the extent to which productivity was increased through vocational training. The trainees' combined "productivity increase" becomes the impact of the vocational training center. This allows one indicator to measure both "quantity" and "quality."

But productivity is not in itself a tangible concept. There are three main methods for making tangible, quantitative measurements of productivity:

(1) using income to represent productivity, based on the assumption that highly productive people earn higher wages;

(2) asking supervisors and co-workers to evaluate trainees'/graduates' productivity;

(3) measuring the productivity of the organization, based on the idea that an organization's success is determined by the productivity of individuals.

In this study, we used method (1) to quantitatively measure improvements in productivity through increases in income. We chose this method because it enables us to easily compare income increases with expenses, and because we felt that wages, i.e., the price of labor, represent the most appropriate indicator of productivity. We supplemented our findings from method (1) by using method (2): conducting interviews with supervisors at companies where graduates work.

3.1.2 Cautionary points about using wages as an indicator

According to neoclassical economic theory, earnings are a coefficient of education and training; assuming the labor market is fully competitive, income levels will be equal to the value of labor's marginal productivity (Shultz, 1961; Becker, 1975). In other words, by acquiring skills through education or training, workers improve their productivity and ultimately earn higher wages. But there is a limit to the usefulness of wages as an indicator of productivity. Most problematic is the assumption that the labor market is fully competitive.

When the labor market is not fully competitive, it is possible that wages may be determined by sociological factors (Piore, 1973), and wages, which should express each worker's personal value, may be distorted. The previous study focused on public employees (instructors at vocational training centers), so there was a problem in that the project's effects on wages were obscured by a previously determined pay structure. Since most of the graduates in this study were working at private companies, we did not encounter that same problem, but we should still consider the effects of Thailand's minimum wage system.*2

The minimum wage system poses a problem to the concept that wages correspond to a worker's productivity. That is, all workers are assured the minimum wage, even if their productivity levels are lower than those presupposed by the minimum wage. So it is not advisable for business managers to employ workers with productivity that is lower than that corresponding to the minimum wage level. We believe that this fact may be behind the policy of some Ubon-area companies to hire "only workers who have been trained." We learned of this employment policy through interviews with managers. Since UBISD graduates have been hired by companies with this policy, we can assume that the graduates' productivity is at least equal to minimum wage level and that the minimum wage system is probably not affecting graduates' wages. If there is an influence, we can infer that their wages are being somewhat depressed because the profits they generate are being offset by workers with productivity levels below those corresponding to the minimum wage.

Differences in minimum wages and income levels between the Bangkok area and other areas can be attributed to differences in the work environment and levels of capital investment by businesses. Since the samples used in this study include workers both in the Bangkok area and outside of it, we need to consider those gaps when analyzing our findings.

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*2 Thailand's minimum wage varies according to region and is raised once or twice a year. Due to a minimum wage hike in April 1995, the minimum wage at the time of the study (Nov. 1995) was 145 baht per day in the Bangkok area and 118 baht per day in the Ubon Ratchathani area.

Even apart from such factors, when we look at the results of our analysis, we must consider the minimum wage system's effects on the labor market, and the limitations of using wages as an indicator of productivity. Nevertheless, despite individual differences, overall there is no doubt that training helps people to acquire skills and increase their productivity and wages. Also, to account for error, we supplement our study with sensitivity analysis.

3.1.3 Measuring economic impact

There are two primary methods for using wages as a measure of the impact of education. One is the before-and-after approach, which measures the increase in each individual's income before and after the education. The other is the with-or-without approach, which measures the difference in wages between people who have been educated and those who have not.

Because this study focused primarily on pre-employment training and most of the subjects had never previously worked, we were obliged to use the latter method. We used questionnaires to ask graduates about their current income, and in order to supplement their answers, we interviewed managers and supervisors at companies employing them. We used statistical references to access information about the incomes of people who did not receive training.

In item F-1 on the questionnaire for graduates, we asked about current monthly income. When compiling these answers, we needed to consider the wage gap between the Bangkok area and the Ubon area. We viewed the gap in minimum wages between the two areas as the cause of the wage gap. Statistical data showed that most workers put in about 26 days per month. We multiplied the gap between the two minimum wage rates by 26 to get 702 baht as the monthly income gap between the two areas. We subtracted 702 baht from each sample in the Bangkok area to offset the geographical gap, and compiled all the samples.

Then we created experience-income profiles, linking the number of years of experience in the current job with the amount of income. But because the number of people in our sample was small, we needed some way to smooth out the curves. In our previous study, we used a regression line to estimate incomes, but since the maximum length of experience in the sample was only a little over five years (64 months), estimated income for later years could be seriously distorted. So this time we used the moving average method.

First we set up classification blocks by number of months, so that each block would contain at least five respondents in order of experience (working years). We sought the average length of experience and average income for each block. After

we drew straight lines between the average point of each block, we found moving averages for all blocks for each six-month section, except those on either end, and inferred a smooth curve.*3 Since we had used after-tax income, we determined the income tax rate to be 2% based on interviews and other sources, and added an allowance for taxes onto the estimated income. This figure was regarded as the indicator of graduates' productivity.

Diagram II-3 shows an experience-income profile. As it is unrealistic to assume that the impact of training will last forever, we assumed that it would last for ten years after completion of the training.

Next, in order to measure economic impact, we estimated the income of people not trained at UBISD. In response to a question about what they guessed their average monthly income would be if they had not received training at UBISD, most respondents gave figures close to the minimum wage in the Bangkok or Ubon area. Interviews with business managers and data from the Japanese chamber of commerce also suggested that starting pay for elementary, middle school or high school graduates was at or near minimum wage level. Therefore we assumed that people with no training were working for the minimum wage. In fact, wage statistics clearly show that many people work for wages lower than the minimum wage. To calculate the monthly income of people with no training, we multiplied the minimum daily wage by 26, the average number of working days per month, and added 2% for income tax.

We then multiplied the employment rate by this monthly income. We calculated the employment rate by looking at labor statistics for men in northeastern Thailand and combining the employment rates for graduates of elementary school, middle school, high school and vocational high school. Thai employment rates, especially in northeastern Thailand, fluctuate greatly depending on the season. A large number of people in farming villages are employed during the agricultural busy seasons, but are idle at other times. Since labor surveys are conducted three times a year in Thailand,*4 we used labor statistics from three consecutive surveys (May 1992, August 1992 and February 1993) assuming there is a national average of four seasons per year: a busy farming season, a slack farming season and two other seasons. We sought the average of those values. We came up with 82.38% as the estimated annual average employment rate for workers in northeastern Thailand

*3 There are some irregularities in these profiles, but there is no reason to believe that they do not express actual conditions. Rather it would be natural to believe that irregularities were evident because of the small size of the samples. The moving average method allows a reasonable degree of smoothness when seeking the essential shape of a profile (Hanoch, 1967).

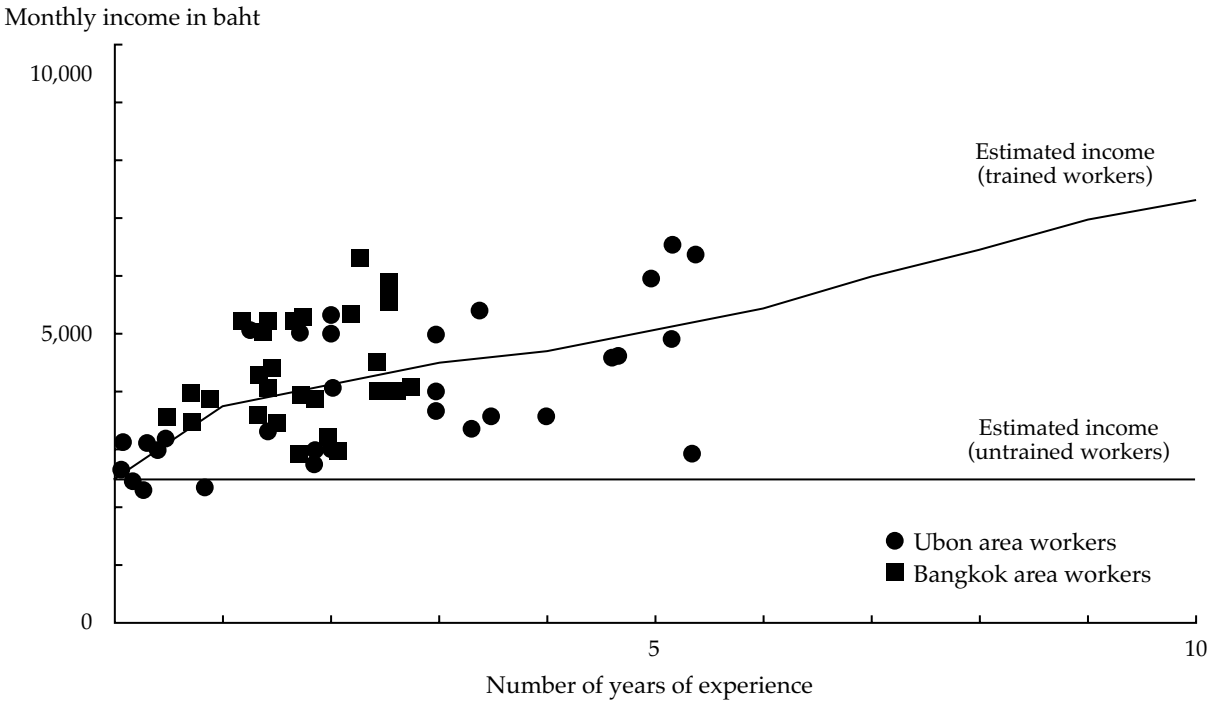
*4 Agricultural slack season (Round 1: February), Other, (Round 2: May), Agricultural busy season, (Round 3: August); reference indices are included at the end of Appendix S1.

who had not taken training at UBISD.

As explained above, we estimated the monthly income of workers not trained at UBISD as 118 baht X 26 days X 1.02 (pre-income tax) X 82.38% = 2,578 baht. This level of income is represented by the straight line in Diagram II-3 (estimated income for untrained workers).

The difference between the income of trained workers and untrained workers, as estimated above, represents the economic impact. This is shown in Diagram II-3 as the difference between the two representations of estimated incomes. Ten years after completing the training, each trainee is expected to have received a total estimated economic impact of 331,340 baht based on FY1995 real prices.

Diagram II-3 Experience-Income Profile*5

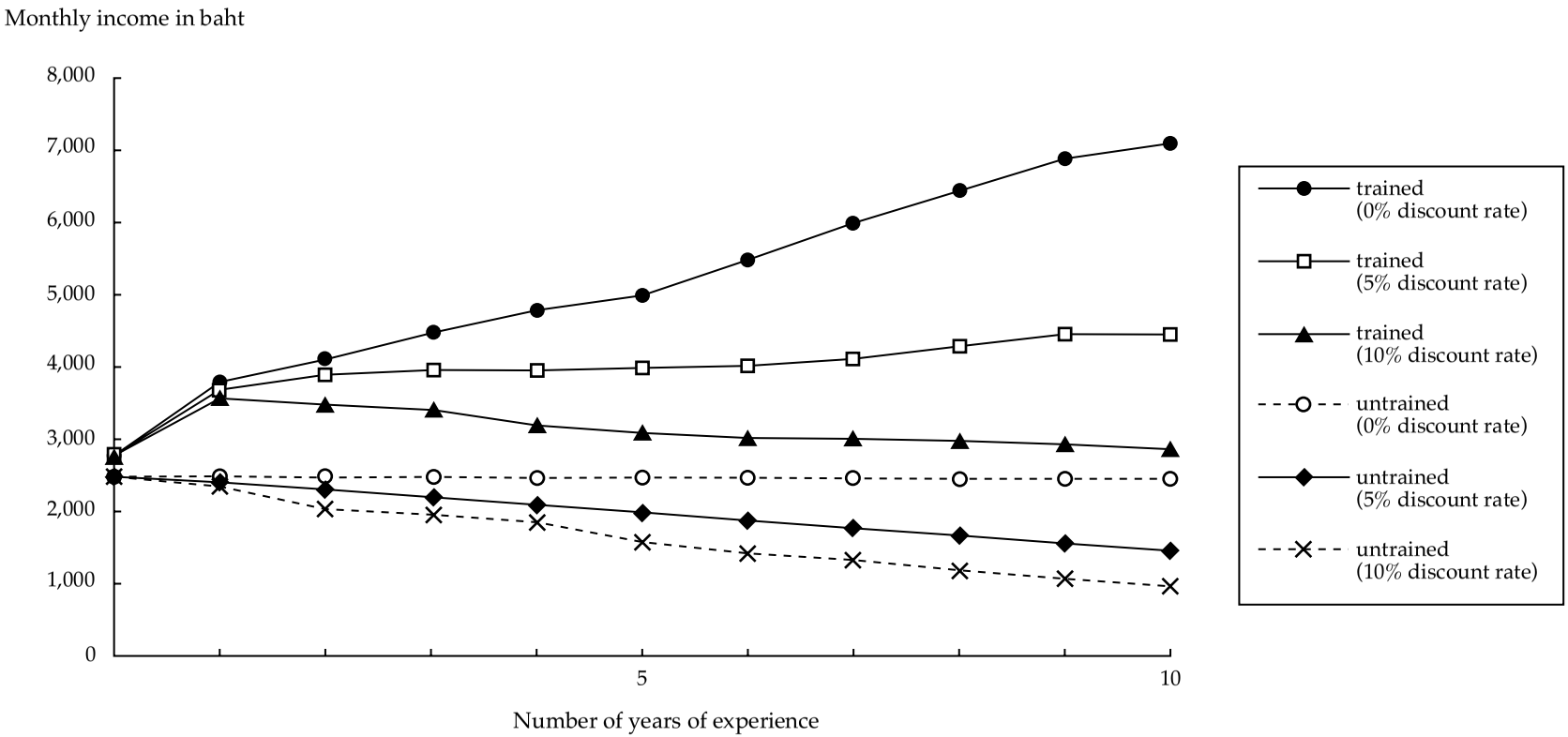


Currently there are no graduates with more than 64 months of work experience, so the experience-income profile beyond that point is based on projections. In these projections, income climbs continuously after 64 months, but this should not pose a major problem later when we discuss cost effectiveness. Diagram II-4 shows changes in the experience-income profile depending on the discount rate used. According to our calculations, the impact of training should be discounted over time. Therefore it is critical to analyze impact immediately after the completion of training. The

*5 Adjusted to 1995 real prices

margin of error in the section on future earnings projections should not have a significant effect on the results. The impact of margins of error on results will be discussed in detail in Chapter III, in the section on sensitivity analysis.

Diagram II-4 Changes in Experience-Income Profile Adjusting for Discount Rate*6



*6 Adjusted to 1995 real prices

3.2 Indicators for Expressing Non-Economic Impact and Their Measurement

Non-economic effects that might not be reflected in wages were also measured and analyzed using the questionnaires to graduates. Non-economic impact is usually assessed through interviews. However in some cases, as in this study in which survey results from urban and rural areas were compared, objective criteria for determining such differences are required. Also, in order to compare the significance of various non-economic effects, expressing data as numerical values is probably more appropriate. For these reasons, we prepared questions about possible non-economic effects that might be experienced, and asked the graduates to answer on the questionnaires. Questionnaire responses were structured based on a five-point scale, with the total number of points being the indicator.

Of the non-economic impacts, the ones that this study emphasized were those pertaining to the workplace, such as "knowledge and skills necessary for work," "more positive attitude toward work," and "observing workplace rules and regulations," etc. To these we added items related to relationships with other workers, such as "I was able to teach skills to co-workers or subordinates," and also items about advantages perceived by the worker upon entering the job market, such as "I was able to get a good job."

4. Costs

4.1 Number of Trainees Expressed as Pre-Employment Course Trainees

As stated in Chapter I, UBISD offers a variety of training courses. Because the number of training hours varies depending on the course, the trainee receives different "services" depending on which course the student takes. Therefore in our analysis we could not treat trainees in the various courses as if they were the same. We needed to apply some kind of mechanism to convert all trainees to pre-employment course trainees.

To do this, we multiplied the number of trainees by the number of hours in each course*[7] for each fiscal year and divided the result by 1,400, the number of hours in a 10-month pre-employment course. This gave us the number of trainees expressed as pre-employment trainees. To adjust for trainees who withdrew from

*[7] We calculated each (10-month) pre-employment course at 1,400 hours, (6-month) pre-employment course at 840 hours, skill improvement, special skill improvement and mobile training courses at 60 hours, skill testing at 15 hours, contests at 8 hours, and training courses given as special projects (under special budget) at a uniform 60 hours.

a course before completing it, we averaged the number of enrollees and the number of graduates. Because the pre-employment course spans two UBISD fiscal years, we allocated the "number of trainees X number of training hours" to both periods.

Table II-1 shows the number of trainees, expressed as pre-employment course trainees, by type of budget (normal or other) and training facility (UBISD or other). The figures were taken from activity reports submitted by UBISD each fiscal year.

Table II-1 Number of Trainees (Expressed as Pre-Employment Course Trainees), by Type of Budget and Training Location

Fiscal Year	1989	1990	1991	1992	1993	1994	1995
Regular budget	144.8	367.5	368.5	350.3	385.2	426.9	1033.4
Other budget	0.0	12.4	92.4	70.0	38.8	339.6	278.8
UBISD	139.7	334.0	342.0	339.3	370.0	403.1	961.7
Other location	5.1	45.9	118.9	81.0	54.0	363.4	350.5
Total	144.8	379.9	460.9	420.3	424.0	766.5	1312.2

4.2 Categories of Costs

As indicated in Table II-2, educational costs were classified as direct or indirect costs. We defined direct costs as those needed directly for education, and indirect costs as those incurred as an indirect consequence of receiving education.

Table II-2 Categories of Costs

Direct Costs (expenses directly relating to education)	Consumption-type outlays	Labor costs, administration expenses, etc., outlays for items to be used within the same year
	Capital outlays	Cost of facilities, equipment, etc., outlays for items that will provide long-term service
Indirect Expenses (costs incurred indirectly because of attending training)	Study-related expenses, loss of productivity due to foregoing work (loss of potential income), etc.	

4.2.1 Direct costs

Direct costs are divided into consumption-type outlays and capital outlays. Consumption-type outlays apply to the cost of items that are used within the year in which they are purchased; capital outlays are for items expected to provide service over a longer period of time.

When figuring annual expenses for year-by-year analysis, consumption-type outlays for each year can be used as is; capital outlay figures must be adjusted to take into account the fact that purchases of facilities or equipment will provide service for decades. We calculated essential yearly capital outlays as follows: we considered each fiscal year's budget for capital outlays to be the initial assessed value of capital assets purchased in that year, adjusted for the cost of losing access to the funds invested in those assets (opportunity cost), and distributed this amount evenly over the assets' life span (depreciation period).*8

Most other studies use a discount rate of 5% or 10%. In this analysis, we set the discount rate at 5% in light of interest rates offered recently by financial institutions in Japan and Thailand, and due to the fact that we have already adjusted for inflation by using consumer price index. We used 40 years as the life span of buildings based on the type of construction used, and 10 years as the life span of all machinery and other equipment, based on accounting standards used by Japanese educational institutions.*9 In reality, however, we expect that most of the equipment can be used for more than 10 years, so the estimates of annual capital outlays may be slightly high.

4.2.2 Indirect costs

In addition to direct costs, we must consider indirect costs that accompany the opportunity to receive an education. Indirect costs consist of school-related expenses borne by trainees, such as the cost of work clothes and transportation

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*8 Multiplying the initial assessed value of capital goods by a capital recovery coefficient gave us the capital outlay for each fiscal year. In other words, if initial assessed value is A, each fiscal year's capital outlays C(r, n) can be expressed as

$$C(r, n) = A\{r(1+r)^n / [(1+r)^n - 1]\}$$

r represents the discount rate and n is the number of years in the life span (Levin 1983, 67-73).

*9 According to accounting rules for Japanese educational institutions, the life span of a piece of equipment is 10 years. Both vocational training centers have a wide variety of machinery, from things like lathes and milling machines that can be expected to last more than 20 years, to items with relatively short life spans, like computers or cutting tools. Because it would be difficult to classify them and determine their specific costs, we used a uniform 10-year life span for machinery in our analysis.

expenses, and the loss of potential income (opportunity cost) incurred when trainees give up the opportunity to work while receiving training.

4.3 Calculation of Costs

As a rule, it is necessary to use figures from year-end accounts when analyzing cost effectiveness. But due to restrictions on the data available to the study team, we mainly used budget figures in the belief that they reflect actual expenses. We used year-end account figures only for items for which they were available. Because budgets often overestimate actual expenses, we may suppose that the figures below lean to the high side. In order to factor out the influence of inflation, all expenses were adjusted to FY1995 real prices according to Thailand's nationwide comprehensive consumer price index.

4.3.1 Calculating direct costs

(1) Japanese investments

Japanese investment figures were mainly taken from reports of several studies conducted by JICA, or from operating data released by JICA each fiscal year. In our previous study, we did not include expenses for dispatching on-site experts, study teams or counterpart training when calculating technical cooperation costs. Since those expenses are part of the Japanese investment, we have included them in this analysis.

The largest portion of the costs paid by Japan consisted of a grant of 2.337 billion yen allocated as the initial investment in the project. This amount includes costs and expenses related to constructing buildings and purchasing materials. The details of how this money was spent are unknown, so we made an assumption that 75% was allotted for construction of facilities and 25% was allotted for purchase of equipment. All of these expenses fall under the category of capital outlays. As explained above, we calculated the discounted annual cost and distributed it among the number of years in the life span. We handled the cost of donated equipment and materials in the same way.

We decided that it would be appropriate to also treat expenses associated with the dispatch of experts, study teams and counterpart training as capital outlays, since those activities could be expected to provide long-term service. We distributed these costs to each year over a depreciation period of 10 years.

To convert yen to baht, we used an average exchange rate for each fiscal year, which was calculated by averaging the 12 monthly average exchange rates for each year.

(2) Thai investments

Labor costs represented slightly over 50% of consumption-type outlays paid from Thailand's regular budget. The budget also included purchase of consumables and administrative costs such as public utility expenses, as well as materials costs. Capital outlays listed as facilities/ equipment costs were high until FY 1991 due to construction of staff housing, but after that, Thailand's only capital outlays were for purchasing equipment and amounted to only 2 - 10% of the consumption-type outlays.

We do not have information about expenses related to training conducted by Thailand outside of the regular budget. This poses no problem when calculating consumption-type outlays if we simply exclude trainees of these courses from our analysis. But because those trainees also used UBISD facilities and equipment, we need to subtract the amount that they used from our estimate of capital outlays. To do this, we calculated the percentage of trainees in courses covered by special budgets within "trainees X training hours," and subtracted a corresponding proportion from the overall capital outlays.

4.3.2 Calculating indirect costs

In order to determine them, we asked graduates about study-related expenses on the questionnaires. By adding reported expenses for meals, work clothes and transportation during training, we found that expenses averaged 12,804 baht per student.

To estimate the cost of lost potential income, we used the same method described in section 3.1.3 of this chapter for estimating the income of non-UBISD workers: we multiplied the minimum daily wage for northeastern Thailand by the average number of days worked per month and adjusted for income tax and the yearly average employment rate. We found that each student gave up an estimated average gross income of 25,780 baht during the training period, or net income of 25,274 baht.*[10]

By the above method, we found that indirect costs totaled 38,584 baht per student, 38,078 baht of which was covered individually by each student.

*[10] The amount of gross potential income that was lost represents the loss of labor productivity incurred by society as a whole; the amount of after-tax potential income that was lost represents personal income given up by individual students.

4.4 Cost per Trainee

Now that we have detailed calculations of the various costs associated with UBISD training courses, we can calculate total costs for each fiscal year. Table II-3 shows UBISD's annual direct costs, calculated by the methods described above. It also shows direct costs per trainee, determined by dividing annual costs by the number of trainees (expressed as a number of pre-employment course trainees). Diagram II-5 is a bar graph showing total annual costs per trainee broken down into various categories. Since we noted that purchased capital can provide "service" for several decades, and figured effective capital outlays to be equivalent to the service provided by capital goods each year, capital outlays increased as the years passed.

First, we see from Table II-3 that Thailand consistently provided funds for consumption-related expenses. Education and training projects in developing countries often suffer from delays in allocating an operating budget, but in Thailand, funding for UBISD tended to increase. The number of trainees increased and direct costs per trainee declined markedly in 1994 and 1995. In other words, the buildings and equipment invested at the project's inception were being well-utilized. As was pointed out in the previous study, if the country receiving assistance fails to conduct training, it will not incur related variable expenses like materials costs required for training activities, but fixed expenses like basic salaries for instructors, maintenance and management expenses and the cost of the initial capital investment are incurred regardless of whether or not training is conducted. In this regard, UBISD is in doing well.

Next, we see in Diagram II-5 that Japanese investment played an important role. Taking FY1990 as an example, Japanese investment in building and equipment accounted for about 70% of direct costs. In the CIAST and CEVEST case studies*[11] evaluated in the previous study, that proportion was a little over 50%. Even if we adjust for the fact that the project fund included assistance to NISD, resulting in somewhat overestimated expenses, and for the fact that, unlike the previous study, this one counts the cost of some technical cooperation conducted in Japan, generally speaking the proportion of Japanese investment could still be called somewhat high. But that problem is resolved by the increase in the number of students. In FY1995 the proportion declined to 53%, so based on what we have seen from vocational training centers in general, we can determine that the initial investment was being put to more than adequate use, even from a cost standpoint.

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*[11] JICA's Institute for International Cooperation (1995a).

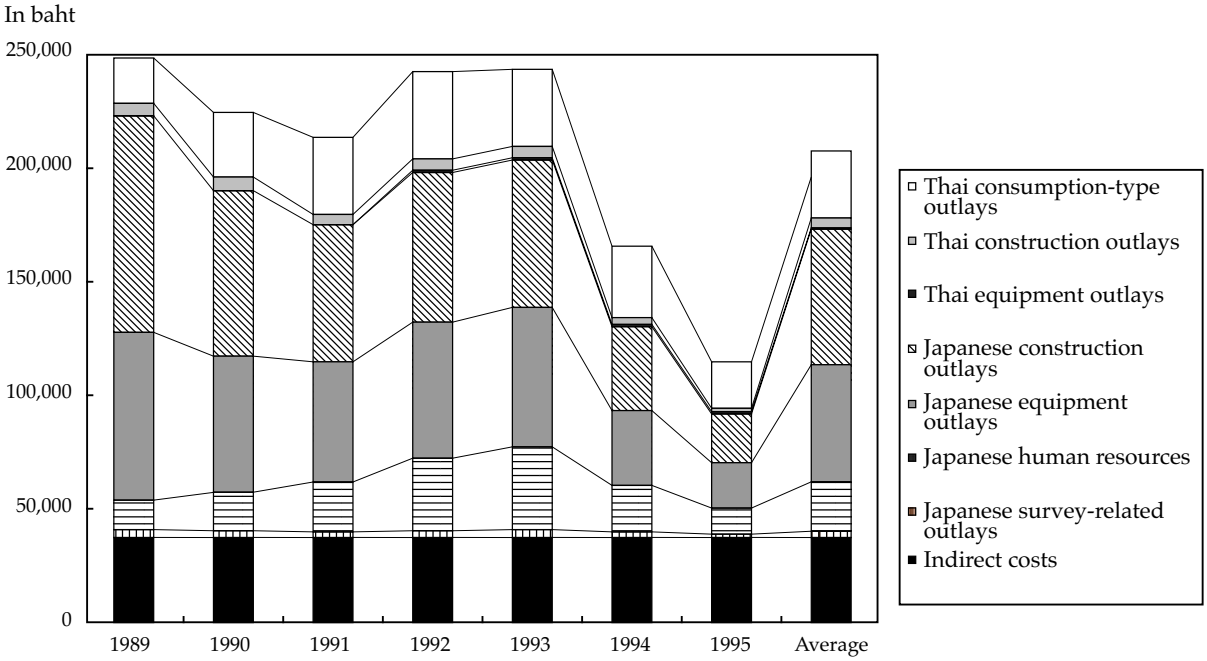
Table II-3 Total Direct Expenses and Per-Trainee Direct Expenses at UBISD

Fiscal Year	1989*1	1990	1991	1992	1993	1994	1995	Total during training period
Thai investments								
Consumption-type outlays	3,048,340	10,398,083	12,481,072	13,507,041	13,196,721	13,255,586	21,824,134	87,710,977
Capital outlays-Sub-total*2	643,757	1,703,327	1,530,714	1,707,608	1,962,009	1,250,781	1,811,058	10,609,252
(breakdown) Construction costs	643,757	1,703,327	1,407,667	1,467,370	1,599,666	980,625	1,386,649	9,189,061
Equipment costs	0	0	123,047	240,238	362,343	270,156	424,409	1,420,192
Subtotal of Thai investments	3,692,097	12,101,409	14,011,786	15,214,649	15,158,730	14,506,367	23,635,191	98,320,229
Japanese investments								
Capital outlays-Sub-total*2	26,843,307	56,208,471	50,340,789	56,077,209	63,813,936	39,239,230	55,486,053	348,008,994
(breakdown) Construction costs	13,734,178	26,572,855	21,960,398	22,891,791	24,955,685	15,298,303	21,632,495	147,045,705
Equipment costs	10,799,479	21,952,348	19,191,101	20,692,392	23,204,433	14,320,049	20,249,201	130,409,002
Human resources	1,675,657	6,336,261	7,993,905	11,097,615	14,056,065	8,641,425	12,219,367	62,020,296
Survey expenses	633,992	1,347,008	1,195,385	1,395,411	1,597,753	979,452	1,384,990	8,533,991
Total	30,535,404	68,309,881	64,352,575	71,291,857	78,972,666	53,745,597	79,121,244	446,329,224
Number of students expressed as pre-employment course trainees (in regular budget courses only)	145	368	368	350	385	427	1,033	3,077
Direct costs per trainee								
Thai investment only	25,493	32,926	38,027	43,436	39,351	33,981	22,871	31,957
All direct costs	210,840	185,862	174,648	203,528	205,008	125,898	76,563	145,071

(In baht, adjusted to FY 1995 real prices)

*1 In 1989 training did not begin at the start of the fiscal year; the figures were converted to reflect expenses from the period during which students were accepted.
*2 Capital outlays have been reduced to reflect use of UBISD facilities and equipment by trainees in courses covered by special budgets.
*3 Due to rounding off, the subtotal and total figures do not necessarily match the exact total of the individual items.

Diagram II-5 Costs Per Trainee



Chapter III Data Collection and Analysis

1. Data Collection

Through local surveys we confirmed the status of the project's operation and used the following methods to gather information from the involved parties. Please refer to the questionnaires in Appendix S3.

1.1 Questionnaires for UBISD Graduates

(1) Survey method

We simultaneously used the following two methods to gather data from UBISD graduates scattered in various parts of the country.

A. We sent questionnaires to individuals chosen through random sampling, and asked them to fill out the questionnaire and return it by mail. Response rate to the mail method: 176 questionnaires sent, 8 returned.
B. We selected companies that accept many UBISD trainees from among the companies that UBISD commissions to do in-plant training, and sent out questionnaires in advance and had local survey teams collect them personally. Response rate to the accumulation method: 91 questionnaires collected*1

(2) Survey contents

The questionnaires mainly focused on graduates' subjective evaluation of the project's impact. The composition of the questionnaires was as follows:

Section A : Training received at UBISD (format, subject, cost, commuting method, etc.)
Section B : Reasons for taking training
Section C : Evaluation of UBISD training (instruction methods, length of course, level of course contents, etc.)
Section D : Transfer of technology acquired at UBISD, information sources for knowledge or skills that students have acquired
Section E : Impact of UBISD training
Section F : Economic impact of completing UBISD training
Section G : Comments on UBISD's strengths and weaknesses (open/free response)

*1 Initially we planned to send questionnaires to companies based on lists of UBISD graduates and collect them when we visited, but many of the addresses changed after the students graduated. For that and other reasons, we switched to the method described here.

(3) Cautionary points

In this survey, we gave priority to securing large enough samples to allow analysis. Therefore, we had to analyze the data keeping in mind that the samples might have been skewed.

First of all, of the companies that we visited in the Ubon area, those that were employing the most UBISD graduates were automotive-related companies. Therefore, the survey respondents included a large proportion of graduates from automotive training programs. In the Bangkok area, there were 38 respondents, 12 of whom work in a company that sells, installs, or deals in glass. This company gives priority to hiring graduates of regional ISDs, regardless of the subjects they studied. It is worth noting that their replies are also likely to be somewhat skewed.

1.2 Interviews and Questionnaires Aimed at Supervisors in Companies where Graduates Work

(1) Survey methods

At the 27 companies (15 in the Ubon region, 12 around Bangkok) where we collected questionnaires as described in Section 1.1 above, we conducted interviews and/or received questionnaires from direct supervisors of graduates or from managers. Of the 27 companies surveyed, we received responses from 24 companies (15 in Ubon, 9 in the Bangkok area).

(2) Survey contents

Interviews were mainly concerned with companies' placement of UBISD graduates and managers' assessment of the impact of UBISD training. Survey items were as follows:

A. Company outline
B. Whether or not in-plant training is conducted; if so, its format
C. Placement of UBISD graduates within the company
D. UBISD graduates' wages; wage scales
E. UBISD graduates' strengths and weaknesses
F. Suggestions for UBISD

The content of the managers' questionnaire corresponds to Section E of the questionnaire for graduates, which is the section on non-economic impact. In other words, its purpose is to gauge the impact of UBISD training on graduates from the business managers' point of view.

2. Cost Effectiveness Analysis

We gauged cost effectiveness by comparing UBISD's inputs and outputs; in other words, we compared the economic impact calculated in the previous chapter against the project's costs. We used the rate of return method because it allows for easy comparison with other investment opportunities. In addition, to give a graphic illustration of the extent of actual merit, we used the present value method as a reference. The rate of return method*2 uses a discount rate to determine how much profit was gained from an investment. If UBISD's rate of return is higher than the interest paid by a financial institution, we can determine that the project is producing a satisfactory profit. The present value method*3 involves converting funds into their present value by discounting by a fixed rate and expressing the value of the investment in terms of present value.

Because the level of activity varied greatly from year to year, we analyzed the cost effectiveness of all activities from the establishment of UBISD through FY1995 using average yearly figures for enrollment and costs. This means considering the average cost and impact per student for all activities until that point. In order to simplify things from this point on, we shall use per-student values as we proceed with the analysis.

2.1 Cost Effectiveness as Viewed from the Standpoint of Overall Society

Table III-1 indicates the costs and economic impact of the project for an average trainee, as seen from the standpoint of society in general. The rate of return is shown as 9.60%. We also calculated for reference the rate of return for the project activities in FY1995, the year that had the highest enrollment in regular-budget courses and could therefore be expected to be most cost efficient. The result was 18.8%. Since all values were converted into real 1995 prices, this rate of return is not affected by inflation. Present value, or impact minus costs, was 56,593 baht for the five-year period, and 125,101 baht for FY1995.

By comparison, in the previous case studies of CIAST and CEVEST, the corresponding rates of return were 2.2% and -2.7%. In a somewhat older study, Cohen (1983) calculated rates of return for apprenticeship programs at four

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*2 If Ci is the flow of funds during period i and r is the discount rate, a value for r that fulfills the following would be called the earnings rate or internal earnings rate:

$$S [Ci / (1 + r)i] = 0 \quad .....(1).$$

*3 The present value method use the formula given in footnote 2 above, and is the left-hand value when r is a randomly established value. Factors like interest rates are taken into account when determining r.

companies in Malaysia and found the societal rate of return to be 14% to 35%. Levine (1979) calculated the societal rate of return of industrial schools in Israel at 2% to 14%. Due to differences in various conditions affecting these analyses, these are not very meaningful comparisons. However, we might say that the cost effectiveness in the UBISD analysis was restrained by the large size of the investments in facilities and equipment and in human resources such as on-site experts and counterpart training. If we look at the UBISD vocational training center as an investment and compare it to other investment opportunities, we can see that it was a meaningful project.

As another point of reference, let's look at the economic effect of UBISD on the economic development of the seven southern provinces in northeastern Thailand that are served by UBISD. First, we combine the gross products from each of the seven provinces to find gross regional product (GRP) for each year from 1989 to 1993. Furthermore, we assume that the region's productivity increased in a linear fashion. If we apply linear regression analysis, we find that GRP increased an average of about 8.26 billion baht per year. *4

If we assume at this point that half of UBISD graduates are working within the region, there would be 1,538 pre-employment course graduates working as skilled laborers with one to seven years of experience in FY1996, and the workers' increase in productivity as a result of UBISD training would be reflected in growth in GRP. We estimated that production had increased by a value of about 10.75 million baht resulting, or 0.13% growth in GRP from FY1995 to FY1996.

This growth resulted from UBISD activities prior to FY1995. The number of UBISD graduates was relatively low at first, and since UBISD will continue to produce graduates, we can expect the number to grow even more in the future. Since GRP includes capital spending in addition to laborers' income, and since we are not counting ripple effects on people other than graduates, we estimate that the actual value is even higher than what we have calculated here.

*4 Converted to 1995 real prices. For reference, GRP in the region was about 64.9 billion baht in 1989 and 96.5 billion in 1993.

Table III-1 Cost Effectiveness from a Societal Perspective (Average per Trainee, in Baht)

All activities through Fiscal 1995		Activities in Fiscal 1995 Only	
Total costs	183,654	Total costs	115,147
Direct costs	145,071	Direct costs	76,563
Thai investments	31,957	Thai investments	22,871
Consumption-type outlays	28,509	Consumption-type outlays	21,119
Capital outlays	3,448	Capital outlays	1,753
Japanese investments	113,114	Japanese investments	53,692
Capital outlays	113,114	Capital outlays	53,692
Breakdown of above:		Breakdown of above:	
Facilities/equipment	90,181	Facilities/equipment	40,528
Human resources *1	20,158	Human resources *1	11,824
Study team expenses	2,774	Study team expenses	1,340
Indirect costs	38,584	Indirect costs	38,584
Impact (present value) *2	240,248	Impact (present value) *2	240,248
Impact minus costs (present value) *3	56,593	Impact minus costs (present value) *3	125,101
Rate of return	9.60%	Rate of return	18.77%

*1 Human resources expenses are the sum of on-site expert costs plus counterpart training costs.
*2 5% was used as the discount rate (r) for the present value calculation.
*3 The subtotals may not equal the totals due to rounding.

2.2 Cost Effectiveness of Thai Investments Alone

When we evaluate an educational system by comparing inputs and outputs, the result will be different depending on the extent to which it is viewed as a single system. Since Japanese assistance was not granted in the expectation of reaping profits, we think it is useful to examine the project's results from the perspective of Thai investments alone.

Table III-2 Cost Effectiveness of Thai Investments Alone (Average per Trainee, in Baht)

All activities through Fiscal 1995		Activities in Fiscal 1995 Only	
Total costs	70,541	Total costs	61,455
Direct costs	31,957	Direct costs	22,871
Consumption-type outlays	28,509	Consumption-type outlays	21,119
Capital outlays	3,448	Capital outlays	1,753
Indirect costs	38,584	Indirect costs	38,584
Impact (present value) *1	240,248	Impact (present value) *1	240,248
Impact minus costs (present value) *2	169,707	Impact minus costs (present value) *2	178,793
Rate of return	30.59%	Rate of return	34.46%

*1 5% was used as the discount rate (r) for the present value calculation.
*2 The subtotals may not equal the totals due to rounding.

The results of that analysis are shown in Table III-2. The rate of return for all activities through FY1995 was 30.6%, while the rate for FY1995 alone was 34.5%. Present value through 1995 was 169,707 baht; in 1995 it was 178,793 baht.

These are extremely favorable figures. In simple terms UBISD is a good investment that earns the nation an annual return of over 30% and training one citizen yields about 170,000 baht in present value in the future.

In light of the fact that Japan paid more than 50% of direct costs, it is clear that it would have been difficult for Thailand alone to have set up and run UBISD. In that sense, we can say that this project was extremely meaningful.

2.3 Cost Effectiveness of Trainees' Investment (Personal Rate of Return)

The analyses above are related to societal cost effectiveness. But for individual trainees, a more critical issue is how much benefit they will receive personally after

graduation from UBISD. If we consider factors like motivation of trainees, it makes sense to analyze personal cost effectiveness. When doing so, we look only at indirect expenses such as study-related expenses and net potential income that was foregone in order to pursue training.

The personal rate of return and present value are shown in Table III-3. Indirect costs were relatively high at 38,078 baht, but trainees could expect an even bigger return: the (personal) rate of return was 49.7% and the personal present value was 197,459 baht. These figures make it clear that if trainees can bear the indirect costs, they can definitely expect to gain more than they invest.

Table III-3 Personal Rate of Return

(in baht)

Indirect costs borne by trainees	38,078
Breakdown of above:	
Study-related expenses	12,804
Loss of potential income	25,274
Impact (present value) *1	235,537
Impact minus costs (present value) *1	197,459
Rate of return	49.73%

*1 5% was used as the discount rate (r) for the present value calculation.

3. Sensitivity Analysis of Rates of Return

Economic impact was calculated on the basis of experience-income profiles, which in turn were estimated from UBISD graduates' responses to survey questions. Therefore we can expect that there was some degree of error in the results. Also, expenses were probably estimated on the high side, since most figures were taken from budgets. If the cost and benefit figures used for the analysis differed from the actual values, it goes without saying that the rates of return and present values used to express cost effectiveness would also differ. Furthermore, expenses are already a fixed factor, but impact includes elements that are based on future projections. If outside factors such as labor market conditions were to change in the future, we should expect impact to change correspondingly.

Because of this, we calculated rates of return that would result from changes of +/-10% in expenses and impact, and checked the suitability of the rates of return calculated in the previous section. The range of +/-10% was chosen on the assumption that neither the margin of error in the analyses nor variations in future

conditions are likely to exceed this range.

Table III-4 shows the results of sensitivity analysis of costs vs. benefits for all activities societal, including all Japanese and Thai investments from a societal viewpoint.

The +/-0% block for both costs and benefits contains the cost effectiveness figures calculated as described above. If impacts were 10% larger and costs were 10% smaller, the result would be a rate of return of 13.34% (a present value of 98,983 baht) which we consider the maximum impact. On the other hand, if costs were 10% higher and impacts 10% less, which we consider the minimum value, the rate of return would be 6.12% (a present value 14,203 baht). But because we believe that cost estimates up to this point have been on the high side, we can say that UBISD's current rate of return, including a margin of error, is between 7.74 and 13.34%.

Table III-4 Sensitivity Analysis
(with a Variation of ± 10% in Costs and Impact)

(in baht)

Impact / Costs	-10%	-5%	± 0%	+5%	+10%
-10%	50,934 9.60%	62,946 10.58%	74,959 11.53%	86,971 12.45%	98,983 13.34%
-5%	41,751 8.64%	53,764 9.60%	65,776 10.53%	77,788 11.43%	89,801 12.30%
± 0%	32,568 7.74%	44,581 8.69%	56,593 9.60%	68,606 10.48%	80,618 11.34%
+5%	23,386 6.91%	35,398 7.84%	47,410 8.73%	59,423 9.60%	71,435 10.44%
+10%	14,203 6.12%	26,215 7.04%	38,228 7.92%	50,240 8.77%	62,253 9.60%

Another method of analyzing sensitivity involves exploring how much one element would have to change, while other elements remained unchanged, to bring the rate of return down to the same level as the opportunity cost of investing the funds (or to bring the present value to 0). The percentage of change in that element is called the break-even point, and one could say that break-even points define the outer limits of the tolerance range within which the project can be deemed to be successful. Break-even points are also excellent indicators for managing risk in a project. We could say that elements with a small absolute value as the break-even

point (or elements to which the project results are very sensitive) should be controlled particularly carefully, while those that have a large absolute value as the break-even point (or those to which project results are not so sensitive) are less important to control.

Table III-5 shows the break-even point calculated by changing the major elements in this analysis. The overall break-even point for costs was +30.8% while that for benefits was -23.6%. Absolute break-even points on the "inputs" side of the table are bigger because each expense item is a breakdown of the total expenses break-even point. On the other hand, because graduates' income minus non-graduates' income is equal to economic impact, it is only natural that each break-even point works out to be small. To put it another way, changes in the income profiles will tend to have a bigger influence on cost effectiveness than changes in costs.

Table III-5 Sensitivity Analysis (Break-Even Points)

Inputs		Outputs	
Total costs	+ 30.8%	Overall impact	- 23.6%
Direct costs	+ 39.0%	Overall shift in income profile of graduates (changes in estimated income, employment rates, etc., due to changes in labor market)	- 11.8%
Thai investments	+ 177.1%		
Consumption-type outlays	+ 198.5%		
Capital outlays	+ 1641.2%		
Japanese investments	+ 50.0%	Time period during which economic impact continues	+ 16.7%
Buildings/ equipment	+ 62.8%		
Human resources	+ 280.7%	Estimated expected income of non-graduates (changes in estimated income, employment rates etc., due to changes in labor market)	+ 23.7%
Study team expenses	+ 2040.3%		
Indirect costs	+ 146.7%		
Number of trainees (expressed as number of pre-employment course trainees) -28.1%			

On the input side, if we were discussing the project during its planning phase, we would have to think about the size of Japan's investment. But at this point, Japan's investment has already largely been decided. Therefore, practically speaking, it is the Thai side that should be considered. The break-even point for Thai investments is 177.1%; i.e., Thailand could invest roughly 2.7 times as much as does now without losing money. In reality, it is very hard to imagine that Thailand would increase its investment to that extent, so there is not much to worry about on the

input side.

What does merit close attention is the output side. Changes in the labor market or a decline in UBISD graduates' income or employment rate due to a decline in their quality, for example, could have a serious impact on cost-effectiveness. In other words, we should be able to conclude that in order to improve cost-effectiveness, it would be more effective to work on expanding benefits rather than cutting costs.

Meanwhile, the number of students is an example of an element that influences both inputs and outputs. If we assume that the graduation rate remains unchanged, an increase in enrollment will mean a proportional increase in the number of graduates, resulting in an increase in system outputs. Of course if enrollment increases, costs will also increase. A vocational training center's costs include fixed and variable costs[*5] , but only the variable costs increase as enrollment grows. So the increase in inputs would be proportionally smaller than the increase in enrollment. Therefore if enrollment were to increase, the cost-effectiveness of the entire system should be raised to some extent.

However, we cannot necessarily say that an increase in enrollment will always bring about a corresponding increase in cost-effectiveness. Enrollment increases, if not accompanied by increases in instructors and training equipment, could lead to a decline in the quality of graduates by depriving students of valuable training time with instructors and equipment. This, in turn, would probably lessen the institute's impact. Moreover, increasing enrollment might lead to a decline in the graduation rate. Thus, enrollment is an element that should be handled with the utmost care.

Enrollment shot up dramatically in FY1994 and 1995, but average enrollment so far (expressed as pre-employment trainees) was about 490. If we apply the break-even point to this figure, it appears that the overall project will produce benefits as long as there are about 352 students per year. According to the Record of Discussion (R/D), however, the plan was to have around 372 (in pre-employment terms),[*6] not including students in mobile training or managerial training. As a result, we can say that the R/D training plans were appropriate.

[*5] Variable costs and fixed costs: We can divide costs into variable costs that fluctuate along with the number of students enrolled, and fixed costs that are required regardless of the number of students. Variable costs include things like instructional materials and salaries for temporarily-hired instructors; fixed costs cover things like construction costs and salaries for the buildings' management staff.

[*6] Yearly figures for mobile and managerial training are not clear in the R/D.

4. Non-Economic Impact of UBISD

4.1 Results and Overall Interpretation

Non-economic impact is discussed in the following analysis, drawing on Section E of the questionnaire for graduates.

The questions were divided into "personal impact," "societal impact," and "third-party evaluations" although strictly speaking the latter is not a kind of impact but relates to how graduates perceive they are evaluated by people around them. Table III-6 lists the items by category, from highest to lowest score (largest to smallest impact).

In the personal impact category, "acquired knowledge necessary for job," "acquired skills necessary for job," and "was able to find a job quickly" were among the most-cited benefits of training. This shows that UBISD fulfills its main objective of providing vocational training opportunities to help unemployed young people in northeastern Thailand to find work as skilled laborers. In addition, the results show that UBISD also has a large impact on other qualities necessary for work including "more positive approach to work" and "observe rules and regulations," as well as secondary effects like "made more friends."

The items that did not reflect a large impact were those related to "status" and "wages." But in fact, especially with regard to small companies, some companies paid UBISD graduates a higher starting salary than other workers, and some even gave them special consideration for promotions. The directors of UBISD and KISD both said in their responses that graduating from an ISD would affect a student's income.

On average, graduates who found work in the Bangkok area disagreed that their UBISD training had helped them gain higher status or higher wages. But in fact their income was higher than that of graduates who stayed in the Ubon area. It may be that they responded the way they did because they felt dissatisfied when they compared their income to that of other workers around them. Indeed, it is quite possible that their ability to find employment in the Bangkok area was an effect of their training at UBISD.

Thai society attaches great importance to a person's academic background. Even after completing training at UBISD, a worker would not be able to advance to a position much higher than site manager. Also, because the minimum wage is high, there typically are not large differences in wages. The relatively low scores for "status" and "wages" questions could be interpreted to mean that graduates said impact was small because it was less than they had expected.

In the societal impact category, the questionnaire responses indicated that there was impact, but somewhat less than in the personal category. Similar responses emerged from the interviews with workplace supervisors. It is possible that UBISD graduates do not have much impact on other workers because even when they find work, they do not immediately have a conspicuous edge over other workers.

The last category, third-party evaluations, also rated as a less significant area of impact. We believe this is because, relative to other workers, UBISD graduates have not acquired an outstanding level of skill. This belief may also explain the weak responses to "the threat of losing my job has declined," in the personal impact category.

Table III-6 Non-Economic Impact, by Labor Market (Average Values)*1

Survey Item	Overall	Ubon	Bangkok
Personal Impact			
Made more friends	4.20	4.33	4.03
Acquired knowledge needed for job*2	4.17	4.49	3.76
Acquired skills needed for job*2	4.12	4.41	3.73
Was able to find a job quickly	4.10	4.25	3.89
Could adapt to new machinery	4.08	4.25	3.86
Began to observe rules and regulations*2	3.96	4.25	3.59
Was able to get a good job*2	3.96	4.27	3.56
Developed a more positive approach to work*3	3.91	4.08	3.68
Was given important work to do	3.90	3.90	3.89
Felt less threat of losing job	3.49	3.49	3.49
Have a better chance of reaching a high position*2	3.09	3.41	2.68
Was able to earn high wages*3	3.07	3.35	2.70
Societal Impact			
Saw efficiency in my work place improve*3	3.98	4.22	3.65
Raised morale among co-workers or subordinates*2	3.94	4.17	3.65
Was able to teach my skills to co-workers or subordinates*2	3.60	3.92	3.19
Contributed to the growth of my company*3	3.52	3.78	3.19
Third-Party Evaluation			
Received high marks from my supervisors	3.50	3.53	3.46
Was evaluated highly by co-workers or subordinates	3.44	3.63	3.19

*1 The numbers in the table represent average evaluation responses based on a five-point scale. Respondents were asked to choose one of the following levels of agreement/disagreement to the statement "Because of my UBISD training, I ...."

1. completely disagree
2. disagree somewhat
3. can't say one way or the other
4. agree somewhat
5. strongly agree

*2 The gap between the average values in the Ubon and Bangkok areas was a statistically significant 1%.

*3 The gap between the average values in the Ubon and Bangkok areas was a statistically significant 5%.

4.2 Comparison between Urban and Provincial Areas

When we compare the non-economic impact experienced by workers in Ubon, a provincial area, with that experienced by workers in the Bangkok area, a large urban area, we get some interesting results.

First of all, compared to workers in the Ubon area, workers in the Bangkok area gave the impacts of their UBISD training lower scores for every survey item. This is probably explained by the fact that although graduates in Ubon and Bangkok shared similar skills, those in Bangkok faced a more competitive job market.

If we look at Table III-6 -- Personal Impact -- item by item, differences in the responses given by workers in the Ubon and Bangkok areas to "knowledge needed for job," "skills needed for job," "rules and regulations," "good job" and "high position" were a statistically significant 1%. Responses to the former two items may reflect the higher expectations demanded by employers in the Bangkok area, and the other items may be due to differences in the labor environments surrounding the two groups of UBISD graduates. In the societal impact section, the gap in the responses given by workers in the Ubon and Bangkok areas to "I raised morale among my co-workers or subordinates" was a statistically significant 1%. This gap was due to the differences of UBISD graduates' competitiveness in the labor market and positioning in the company caused by the graduates' level of competitiveness.

4.3 Evaluation by Supervisors at Companies Employing Graduates

The above analysis on non-economic impact used graduates' responses to questionnaires, and was based on graduates' subjective evaluations. Therefore, we tried to get objective evaluation from managers at companies where graduates are employed. We asked them to answer whether UBISD graduates "are superior compared with other workers." Comparing graduates with other workers provided a yardstick for the impact of training. It is worth noting, however, that this is a relative evaluation, and would likely be affected to some extent by the quality of other workers.

On the whole, the managers' responses to all 26 survey items averaged above the neutral level of "3." From this standpoint, at least, UBISD's goal of cultivating skilled laborers was achieved.

Table III-7 shows the seven items, among the total of 26, for which UBISD graduates were rated most highly in comparison with other workers. Employers ranked "obedience" as UBISD graduates' strongest asset; those in the Ubon area received an extremely high rating on this point, and even in Bangkok-area

companies, many managers said "the strength of ISD graduates is that they are obedient." The next highest ratings were for items like "following the work schedule," "cooperation" and "observing rules and regulations." Except for "having acquired basic technical skills," UBISD graduates were not found to be particularly superior in terms of technology or skills.

However, the graduates were praised for having their good temperament as workers. In other words, managers evaluating the non-economic impact of training found the impact of UBISD training to be less significant in terms of knowledge or skills than in terms of acquiring a good disposition as a worker. Especially for young people from farming villages, who had previously worked mainly in agriculture, training provided an introduction to various restrictions such as working schedules and rules that would prepare them to go to work in a company. In that sense, having acquired a good disposition for working should have been extremely useful for them.

Table III-7 Managers' Evaluations of Graduates*[1]

Survey Item	Overall	Provinces (Ubon)	City (Bangkok)
Obedient	4.17	4.40	3.78
Follows work schedule	3.88	4.07	3.56
Cooperative*[2]	3.88	4.13	3.44
Observes workplace rules and regulations	3.83	3.93	3.67
Can complete important work	3.75	4.00	3.33
Understands assignments quickly	3.75	3.73	3.78
Contributes to growth of company	3.75	3.80	3.67

*[1] The numbers in the table represent average responses based on a five-point scale. Respondents were asked to choose one of the following answers to the question "In your opinion, are UBISD graduates superior in this respect?"

1. no, not at all
2. no, not much
3. can't say one way or the other
4. yes, somewhat
5. yes, very much

*[2] The gap between the average values in the Ubon and Bangkok areas was a statistically significant 5%.

4.4 Differences between Graduates' and Managers' Evaluations of Non-Economic Impact

We compared results for items relating to non-economic impact that were evaluated by both graduates and managers. Table III-8 shows our findings.

Table III-8 Differences between Graduates' and Managers' Evaluations of Non-Economic Impact*1

Subjective Evaluation by Graduates		Evaluation by Managers	
Has knowledge needed for job	4.17	Has basic knowledge	3.46
Has skills needed for job	4.12	Has advanced knowledge	3.29
Can adapt to new machinery	4.08	Has basic skills	3.67
Improved productivity of workplace	3.98	Has advanced skills	3.29
Began to observe rules and regulations	3.96	Can keep up with technological advances	3.50
Raised co-workers' morale	3.94	Raises productivity level of workplace	3.63
Developed a more positive approach to work	3.91	Observes rules and regulations of workplace	3.83
Was given important assignments	3.90	Raises level of morale and discipline among co-workers	3.50
Was able to teach skills to co-workers	3.60	Has positive attitude toward work	3.58
Contributed to the growth of company	3.52	Can complete important assignments	3.75
		Teaches skills to co-workers often	3.46
		Contributes to growth of company	3.75

*1 Numbers in table represent average responses based on five-point scales. Survey items and response choices were the same as in Tables III-6 and III -7.

Regarding items related to temperament as workers, there are no large differences between the two groups' responses. However, the managers gave lower marks to knowledge and skill than did the graduates, probably because graduates are comparing these items against their own abilities before they received training, while the managers were comparing the graduates to workers who did not receive UBISD training. The graduates did gain knowledge and skills as non-economic benefits of the training, but the managers saw these as the normal knowledge and skills that they would expect a worker to have.

Chapter IV Evaluation and Suggestions

1. Project Evaluation and Suggestions, Based on Analysis Results

Because UBISD's goal is the cultivation of skilled laborers, this study has made the assumption that the institute's main impact is also the cultivation of skilled laborers. We measured that impact in both economic and non-economic terms and evaluated the UBISD system as a vocational training institute.

In order to measure the economic impact of human resource cultivation both qualitatively and quantitatively, we treated improvement in productivity as a economic benefit and used wage increases as an indicator in our measurement. We then analyzed cost-effectiveness by comparing these benefits against costs invested in vocational training and evaluated the profitability of UBISD.

As a result, we found that UBISD's societal rate of return, taking all costs into account, was 9.60%, an ample rate of return on investment. This rate of return would be analogous to a scenario in which 100 yen held today increased to 109 yen in one year, assuming no inflation.

If we look only at FY1995, when enrollment was at its highest, we find that the increased enrollment boosted the societal rate of return to 18.77%, allowing us to say that UBISD is currently operating extremely well from a cost-effectiveness standpoint.

This analysis does not cover ripple effects that occur when graduates transfer technology to other workers or when a counterpart who has acquired technical know-how from an expert moves to another vocational training center and passes on that knowledge to other instructors or students. Therefore, we think that actual cost-effectiveness is greater than the values given above.

For reference, we also calculated the cost-effectiveness of the Thai investment alone, exclusive of Japan's investment, and the cost-effectiveness of trainees' investment, but taking into account only the indirect costs that they bore. The societal rate of return of 30.59% that we found for the Thai investment alone suggests that continuing UBISD's vocational training activities would be a highly beneficial investment for the Thai government in the sense of raising productivity in the northeast part of the nation, especially since Japanese assistance has already provided the majority of the required facilities and equipment. As a donor, Japan should be able to positively evaluate the project for having created this investment opportunity for Thailand. We should also be able to say that for UBISD trainees, if they can just manage to bear an average of 38,078 baht in indirect costs, the training will bring an rate of return of 49.73%, making it an extremely meaningful investment

opportunity.

Next, in sensitivity analysis, we investigated how much impact there would be on the rates of return if the estimated figures used in analysis varied within a +/- 10% range, and evaluated the suitability of our findings. As a result we found that, even if we accounted for error, the societal earnings ratio for all investments in UBISD was between 7.74% and 13.34%, allowing us to conclude that in any event UBISD is a highly profitable investment as a vocational training system.

Furthermore, we calculated break-even points and revealed that impact is more important than costs in determining the success or failure of UBISD. In order to increase the rate of return of the UBISD investment in the future, and to further improve productivity in northeastern Thailand, from UBISD's point of view it would be important to improve the quality of the institute's graduates.

Finally, in the analysis of non-economic impact, we confirmed that training formed the foundation for UBISD graduates to work as skilled laborers. In the Ubon region, UBISD graduates received positive evaluations and demand for them is strong. Instilling knowledge and technical skills should clearly be among UBISD's primary goals, and in fact, it appears that UBISD graduates do possess basic skills. But their strength, according to their employers, is their disposition as laborers and not any particular superiority in knowledge or skills. This holds particularly true in urban and industrially developed areas surrounding Bangkok.

As it stands, we can say that UBISD is achieving its goal of cultivating skilled workers, but we believe that for the future, UBISD must gradually improve its course offerings to provide more advanced vocational training.

As a result of having analyzed UBISD's economic and non-economic impact, we can say that the impact is consistent with the institute's purpose and constitutes a sufficient return on investment in the institute. We can conclude that it was a worthwhile cooperation for both the assistance donor, Japan, and the assistance recipient, Thailand. Since it is generally known that education and training have large ripple effects, the actual impact of UBISD will probably not be limited to the impact on graduates. If we could include an analysis of those ripple effects, the rate of return that we indicated as the project's cost-effectiveness would probably be even higher.

In the past, evaluation of educational/training projects and measurements of their impact have been hampered by a lack of appropriate methods, largely because impact was difficult to quantify or make tangible. However this study showed that it is possible to measure that impact and presented one method of evaluation. It also showed that, given the right conditions, an educational/training project aimed at human resource development can be extremely worthwhile, and that such

assistance can contribute to the economic development of the recipient country.

At the same time, the UBISD case calls attention to the fact that even workers hired as skilled workers in the Ubon area may be hired in the Bangkok area under conditions not much different from those of unskilled workers. In 1993, per capita gross regional product was US$8,670 in the Bangkok area and US$670 in northeastern Thailand.*1 If the Bangkok area is considered industrially mature, and the Ubon area industrially immature, then vocational training for people with a low level of education is already losing its value in the industrialized area where corporate in-house education has proliferated. If Thailand's economy continues to develop smoothly in the future and other business sectors become industrialized, then it will probably become necessary for UBISD to change its role from developing skilled laborers to developing technicians or engineers.

On a broader level, this lesson indicates that economic development is best served when low-income countries begin with vocational training designed for a low educational level, and gradually shift to higher-level vocational training as incomes rise.

2. Lessons Learned about Study and Analysis Methods; Suggestions

This study systematically and quantitatively measures long-term, intangible effects of education and training. This study's aims were to evaluate the project mainly by analyzing its cost-effectiveness, while also developing and suggesting useful methods for evaluating future cooperation projects. This study was planned with ample consideration of the shortcomings of the previous study. Although we did improve to a certain extent, in practice we encountered some of the same problems as in the earlier study and also some new ones. Below we offer some lessons that we learned and suggestions regarding four areas: (1) survey methods, (2) accuracy of analysis, (3) questionnaires and (4) the application of cost-effectiveness analysis to project evaluation. We hope these will be of use in future studies.

(1) Survey methods

A Use of questionnaires

In this study, we used questionnaires as our main survey method, and supplemented them with interviews and statistical data. We clearly saw that if a

*1 Alpha Research Co., Ltd. and Manager Information Services Co., Ltd. (1995), Bank of Thailand (1995), IMF (1990), (1996)

suitable questionnaire is made, the accumulation method of distributing questionnaires and collecting them can be effective even in developing countries where questionnaires are not commonly used. However, the collection rate for questionnaires that were mailed was less than 5%. Collections by mail were obstructed by flooding that occurred during the survey period, but basically there was no sufficient incentive to encourage cooperation from graduates who received questionnaires by mail, resulting in further evidence that it remains difficult to conduct a survey by mail. Another factor was that the questionnaire may have been too long for a by-mail survey.

B Gathering of local information during survey planning

Unlike surveys aimed at gathering information about local conditions, a study like this one which is aimed at measuring impact must start to look into the target project's output after first studying information on local conditions. Understanding local conditions beforehand is especially vital when studying the output of an educational or training project because those outputs are generated at the points of contact between the project and external systems, or within external systems. We conducted preliminary information gathering by interviewing JICA experts who had previously worked on this project. We were still unable to gather accurate information, however, because major changes had taken place in the organization and training courses since the end of the cooperation period.

With interview surveys, it is possible to respond flexibly to such developments, but with the questionnaires, change was difficult because the questions had been determined in advance. In this study we were surprised at UBISD graduates' lack of superiority in the workplace, and at how little significance there was in measuring ripple effects via technical transfers in the workplace. In other words, our lack of local information resulted in the inclusion of inaccurate items on the questionnaires, and increased the burden on respondents. We should be able to improve on this in the future.

Circumstances will differ depending on study conditions, but if local conditions are ascertained before conducting a study and the study is designed appropriately, the remaining work should be routine. By making more efficient use of local human resources, it should be possible to achieve results with a smaller investment in actual study activities.

(2) Accuracy of analysis

A Characteristics of study subjects

Naturally, the bigger the sample used, the more accurate the results. While it may depend on the right balance between various circumstances, random sampling is desirable. In this local study, there were many errors in the addresses and telephone numbers in the roster of graduates, making random sampling impossible. For this reason, we asked for the cooperation of companies that employ a relatively high number of graduates and included only currently employed graduates in our sample, although we believe there are actually many graduates who are currently unemployed or engaged in agricultural work. It is necessary to take their situation into account in order to perform more accurate analysis, which should be addressed in the future. Furthermore, the most accurate indicator for gauging graduates' productivity in terms of economic value would probably be the income of those graduates who change jobs. Studying them should enable even more accurate analysis.

Information about where graduates are employed cannot be tracked without continuous monitoring. UBISD does a fine job of compiling and storing annual data about costs and numbers of students; but if the project is to be evaluated later, it is necessary to clearly define the details of monitoring (who should do it, items to be covered, methods to be used, storage methods, etc.) during the project design phase and prepare the necessary structures.

B Establishing control groups when measuring economic impact*2

Based on the sensitivity analysis described in Chapter III Section 2, we see the need for accurately measuring impact when analyzing cost-effectiveness. Considering that UBISD is located in the northeast of Thailand, the poorest part of the country, its purpose is to promote employment opportunities for unemployed youths. When evaluating UBISD's economic impact, i.e., the extent to which it raised the productivity of its subjects, one issue that will need to be addressed in future analyses is how to establish control groups and define these young people's productivity and chances of finding a job before receiving training.

C Need for process analysis

Cost-effectiveness analysis is aimed at evaluating an educational or training system based on understanding the relationships between the system's inputs and

*2 Alpha Research Co., Ltd. and Manager Information Services Co.,

outputs. Cost-effectiveness analysis is an extremely effective method for simplifying and grasping a system as a whole and provides indicators that help determine whether a project has been a success or failure. This methodology, when used alone, is not perfect, however, because it does not clearly examine the internal process between the input and output sides. In the case of UBISD, vocational training is that process.

In this study, we looked at the "vocational training" activities within the UBISD system in terms of ease of comprehension, effectiveness, length and course content level. Also, in analyzing the open comments from the questionnaires, we made a model of vocational training as a process consisting mainly of "instructors," "facilities and equipment," and "trainees." Using this model, we compiled strong and weak points in Appendix S3, Diagram S3 - 3, and attempted to evaluate the findings.

Because UBISD was an excellent project, no major problems were revealed. But in projects that fail to produce expected results, we believe it would be effective to construct a model of the system and explore which parts of the internal system are obstructing the process.

(3) Questionnaires

A Shortcomings of the questionnaires

The questionnaires used in this study were greatly improved over those used in the previous study. However, because the questionnaires were created on the basis of Japanese-language references, some inconsistencies between actual Thai terms and the Thai language used in the questionnaires were introduced in the process of translating from Thai (original references) to Japanese to English to Thai, particularly in the section concerning the respondents' background. It should have been possible to avoid these linguistic problems in future studies.

B Improving questions about wages

Questions about wages were the backbone of this study, and it was important to formulate the questionnaires with adequate consideration for workers' perception of their own wages. In this study, we were aware of the existence of minimum wages and that some workers are paid a daily rate while others are paid a monthly rate, but the questionnaire did not adequately consider benefits such as overtime pay, meal expenses, or the use of dormitories. It is necessary to simplify the questionnaires, but with regard to wages, increasing the number of questions may actually make responding easier.

C Model questionnaire

Both last year's study and this year's used questionnaires to survey graduates about vocational training centers in developing countries. Although this year's questionnaires were an improvement over the previous ones, they were still too long, and need to be simplified even further. Simplifying the questionnaires would improve collection rates and require less work to gather information. We have created a model questionnaire that is included at the end of this chapter, as a reference for creating an improved questionnaire.

This model questionnaire is brief, yet also facilitates acquisition of the minimum information needed for analysis. The most important things to consider when conducting a survey using questionnaires are (1) the ability to gather accurate preliminary information and (2) securing a sample large enough to support quantitative analysis. The questionnaire items that were eliminated can be substituted by information from interviews or statistical data. This model is nothing more than an example; it goes without saying that the question content and format must be modified or added to in accordance with the subject of study, local conditions and cultural factors, etc.

(4) Application of cost-effectiveness analysis to project evaluation

A Application of cost-effectiveness analysis to other human resource development projects

This study focused on the vocational training field. But the usefulness of cost-effectiveness analysis in education is definitely not limited to evaluating vocational training; it can also be applied to other types of human resource development projects, such as:

- promulgation of basic education through instructor development, construction of elementary and middle school buildings, etc.;
- support of advanced education through subsidies to universities or affiliated research institutes, etc.;
- promotion of local residents' health through cultivation of doctors and nurses.

Japan does not have sufficient experience in providing assistance in such fields as educational administration or educational planning, but cost-effectiveness analysis should also be an effective tool for macro-type policies and can be expected to be applicable to such projects.

Carrying out cost-effectiveness analysis and the logic behind it, are not difficult. In the future, it is necessary to keep accumulating results from this type of analysis

B Designing projects with post-project evaluation in mind

A project is essentially of a cycle consisting of planning stage --> investigation stage --> implementation stage --> evaluation stage --> and recycling of findings into the project itself or other projects. This study is part of the evaluation stage of the project cycle. As was pointed out in the previous study, in order to ensure effective project monitoring or evaluation, it is necessary to clarify a logical framework in the planning stage.

During the planning stage of the UBISD project, preliminary studies were conducted. At that time, overall goal and project goal were established, but other critical factors were not qualitatively and quantitatively defined, including resources to be invested (inputs), expected results (outputs), target levels defining project success, criteria for measuring achievement of those targets and external factors affecting the project. If such a logical framework had been established during planning, monitoring would have been extremely easy. In the event that the targets were not achieved or the project rendered meaningless due to external or internal factors, such a logical framework could offer simple and appropriate countermeasures.

This does not apply only to the donor nation. If both the donor and recipient nations participate in the planning stage, it should be possible for the recipient nation alone to evaluate the project, and the donor nation might simply give advice to supplement the recipient's efforts.

Because it is necessary to take a broad view of the entire system in order to evaluate a project using cost-effectiveness analysis, this study does not presume to mention the type of international assistance provided. Japan provides many examples of grant assistance and project-type technical cooperation, in addition to UBISD; but these two formats are often separated in the project evaluation stage. But for Thailand, as the recipient of assistance, UBISD is a single project; the form in which funds were received is not an issue; rather it is necessary to consider entire projects when evaluating assistance.

Impact Analysis of Technical Cooperation *Sample Questionnaire*

Subject of survey: Vocational training school graduates

A. About the type of vocational training you received

1. Which training course did you take? Please check the box after each applicable item.
   Training course A [ ] Training course B [ ]
   - If you checked only course A ... → please answer about *course A*.
   - If you checked both courses
   - If you checked only course B ... → please answer about *the course B that you took most recently*.

2. Which subject did you take? Please choose one applicable item and check it.

   <Choices: training subjects> (be absolutely sure to check in advance on terminology used locally)

3. Please estimate the total amount spent by you or your family to take the training (for example, expenses for purchasing textbooks, transportation, dormitory lodging, meals, etc.) during the time you were in school. *Please answer in terms of the costs at that time.*
   <Make examples as appropriate as possible based on preliminary information>
   _____ baht

B. About the training at the vocational training school

1. What do you think of the training at the vocational training school? Please choose one answer that you think is most appropriate for each item, and circle the number of that answer.
   1) was far too short 2) was somewhat too short 3) was suitable
   4) was somewhat too long 5) was far too long

   (1) The duration of classroom study at the vocational training school 1 - 2 - 3 - 4 - 5
   (2) The duration of training using machinery at the vocational training school 1 - 2 - 3 - 4 - 5
   (3) The duration of hands-on training at a company 1 - 2 - 3 - 4 - 5

   1) completely disagree 2) disagree somewhat 3) can't say either way
   4) agree somewhat 5) strongly agree

   (4) Classroom study at the vocational training school was easy to understand. 1 - 2 - 3 - 4 - 5
   (5) Training using machinery at the vocational training school was easy to understand. 1 - 2 - 3 - 4 - 5
   (6) The instructors' teaching style was easy to understand. 1 - 2 - 3 - 4 - 5
   (7) Textbooks, manuals and other instructional materials were easy to understand. 1 - 2 - 3 - 4 - 5
   (8) The vocational training school had adequate machinery and equipment. 1 - 2 - 3 - 4 - 5
   (9) The things I learned in classroom study at the vocational training school are useful to me now. 1 - 2 - 3 - 4 - 5
   (10) The things I learned from training with machinery at the vocational training school are useful to me now. 1 - 2 - 3 - 4 - 5
   (11) The things I learned from on-the-job training at the company are useful to me now. 1 - 2 - 3 - 4 - 5
   (12) I would recommend this vocational training school to others. 1 - 2 - 3 - 4 - 5

2. Is the technology that you learned at vocational training school *more or less advanced* than the technology you use in your job?

   less advanced [ ] , somewhat less advanced [ ], about the same [ ],
   somewhat more advanced [ ], more advanced [ ]

3. Is your level of technical skill higher or lower than that of other workers have who do the same job as you at the same workplace?

lower [ ] , somewhat lower [ ], about the same [ ], somewhat higher [ ], higher [ ]

C. About transferring the technology that you acquired at vocational training school

1. How much of the classroom and training instruction taught at the vocational training school were you able to master?

- almost all (81 - 100%) ..... [ ]
- most (61 - 80%) ..... [ ]
- about half (41 - 60%) ..... [ ]
- not very much (21 - 40%) ..... [ ]
- almost none (0 - 20%) ..... [ ]

2. Of the specialized knowledge and skills that you use in your work, about what portion do you think you learned from classroom study and training at the vocational training school?

- almost all (81 - 100%) ..... [ ]
- most (61 - 80%) ..... [ ]
- about half (41 - 60%) ..... [ ]
- not very much (21 - 40%) ..... [ ]
- almost none (0 - 20%) ..... [ ]

3. How did you acquire specialized knowledge and skills besides through the vocational training center? Please write your answers below (multiple answers accepted).

4. To what extent have you taught things like specialized knowledge or skills to subordinates or co-workers?

- I frequently teach ..... [ ]
- I do some teaching ..... [ ]
- can't say either way ..... [ ]
- don't teach very frequently ..... [ ]
- don't teach at all ..... [ ]

D. The following questions are about the impact of training at the vocational training school.

Did you experience the following as a result of training at the vocational training school?

1) not at all 2) not much 3) can't say either way 4) somewhat 5) very much

(1)	I was able to earn a good salary.	1 - 2 - 3 - 4 - 5
(2)	I have a better chance of being promoted to a high position.	1 - 2 - 3 - 4 - 5
(3)	There is less danger of losing my job.	1 - 2 - 3 - 4 - 5
(4)	I received a positive evaluation from my boss.	1 - 2 - 3 - 4 - 5
(5)	I received a positive evaluation from my co-workers/ subordinates.	1 - 2 - 3 - 4 - 5
(6)	I gained knowledge necessary for my job.	1 - 2 - 3 - 4 - 5
(7)	I gained skills necessary for my job.	1 - 2 - 3 - 4 - 5
(8)	I was able to adapt to new machinery.	1 - 2 - 3 - 4 - 5
(9)	I was given important assignments.	1 - 2 - 3 - 4 - 5
(10)	I developed a positive attitude toward my job.	1 - 2 - 3 - 4 - 5
(11)	I began to observe rules and regulations.	1 - 2 - 3 - 4 - 5
(12)	I raised morale among my co-workers or subordinates.	1 - 2 - 3 - 4 - 5
(13)	I was able to pass on my skills to co-workers or subordinates.	1 - 2 - 3 - 4 - 5
(14)	I was able to get a good job.	1 - 2 - 3 - 4 - 5
(15)	I was able to get a job quickly.	1 - 2 - 3 - 4 - 5

F. Please answer the following questions about your current work situation.

1. What is your average income from your main employer?
(including allowances such as bonuses and overtime pay)

monthly income _____ baht
daily income _____ baht

[Note: find out how the pay system works through preliminary study and phrase the question to match the actual conditions]

2. *If you hadn't taken training at the vocational training school*, what do you think you would be doing right now?

- I would have a better job than I do now ..... [ ]
- I would have the same job that I do now ..... [ ]
- I would have a worse job than I do now ..... [ ]
- I wouldn't have a steady job ..... [ ]

3. *If you hadn't taken training at the vocational training school*, what do you think your average income would be now?
(including allowances such as bonuses and overtime pay)

monthly income _____ baht
daily income _____ baht

H. Please answer the following questions about yourself.
[questions about the personal background of respondent]

Depending on the circumstances, questions might include:
•gender •age •highest educational level completed •type of business
•number of years of work experience

I. Please tell us your opinion. Write as much as you like.

1. What do you think are the positive aspects of attending vocational training school?

2. What aspects of vocational training school do you think could use improvement?
What do you think could be done to improve the school?

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S1 Evaluation of UBISD and Its Graduates by Employers

Because this study's goal is to establish methods for measuring the impact of technical cooperation, we took care to choose as our case study a project unlikely to be affected by special conditions that could skew the results of analysis. For similar reasons, in the local surveys we checked the contents of some of the UBISD training processes, although these were not subject to analysis in Chapters II or III, and did a study to confirm that there were no special factors that needed to be considered when doing our analysis.

In the local surveys, we listened to opinions from managers at 29 companies that employ UBISD graduates, and from staff connected with UBISD, KISD and NISD. In this section, we analyze and evaluate training processes, mainly at UBISD, based on information gleaned from interviews, from portions of the questionnaires not directly linked to measuring impact, and from observations made in the course of conducting local surveys.

S1.1 UBISD's Present Situation

S1.1.1 Types of training

(1) Pre-employment training

True to its original purpose of providing free vocational training opportunities to young people who were unable to continue their schooling due to poverty or other reasons, it was evident that pre-employment training definitely contributes to promoting employment opportunities for unemployed young people. Also, training courses were newly established or reorganized in light of the industrial structure of Ubon Ratchathani and the number of applicants.

But with the surge in enrollment after FY1994, the increased burden on instructors became a serious problem, especially in popular fields like automotive technology. This obviously shortened the time that each student could spend using the training equipment, and it became necessary to either keep enrollment down to manageable levels or increase the number of instructors and machines.

At the same time, enrollment has dropped in some courses such as furniture making. The institute needs to do some publicity or take other measures to boost enrollment, or think about scaling down these courses.

(2) Improvement/special improvement training

Both improvement courses and special improvement courses have achieved

more than was originally planned. Improvement courses offer employed workers an excellent opportunity to upgrade knowledge and skills.*1 Special improvement courses vary in terms the budgeting source and the training style. For example some were funded from provincial budgets, some were conducted for inmates in prisons in each province, some were conducted at Ubon Ratchatari College or Ubon Ratchatari Technological School, while others were held in cooperation with private businesses.

Courses funded through special budgets also turn out thousands of graduates. These include vocational training programs aimed at assisting flood victims, reducing the flight of rural workers to urban areas, and promoting vocational training among women and children. Japanese cooperation did not cover these programs, but we can say that training programs tailored to these diverse needs are meaningful for the regional development of northeastern Thailand.

(3) Mobile training

UBISD training is provided free of charge, but trainees need about 1,000 baht per month to pay for meals and work clothes, and also need to pay for their own transportation to and from the institute. Because it is difficult for people in farming villages to get information about UBISD, mobile training is an extremely good way to provide opportunities for training to unemployed young people in farming villages.

At one mobile training site visited as part of our local survey, training graduates were managing a service garage. They operated a business handling car, motorcycle and agricultural machinery maintenance and repairs. Specifically, they did relatively simple work like fixing flat tires, tuning engines, and welding shift levers, but it is clear that increasing the number of self-employed people in a farming village helps create employment opportunities for the slack agricultural seasons.

Some instructors at UBISD and KISD said that the mobile training courses are too short and that the students' educational level is often low; consequently, their level of technical proficiency after training is lower than the level demanded by employers. This problem could probably be remedied by offering training on an ongoing basis at one site.

*1 Among the managers we interviewed, one owner of an auto repair business said that he took improvement courses three times and a manager in a construction company said that the courses were extremely worthwhile.

S1.1.2 Staff

The number of employees allocated to UBISD by the Department of Skill Development (DSD) has not changed since UBISD was founded in 1989. Lately, however, there has been a shortage of instructors due to the greater number of trainees and courses, and outside instructors have been hired on a temporary or contract basis in addition to the permanent instructors. The Thai government is currently giving priority to cultivating human resources through vocational training, so increasing the quality and number of instructors will continue to be a major issue in the future.*2

Like other ISDs, UBISD has two categories of staff: employees of DSD and instructors employed by the center.

Table S1-1 UBISD Staff (number of people)

		Ministry employees				Permanent instructors employed by center				Total
Highest educational level		High school (regular)	High school (vocational)	Diploma	Degree	High school (regular)	High school (vocational)	Diploma	Degree	
Administrators		1+6 (6 double as instructors)				-				1
Office workers		24				-				24
Instructors	Electricity/ electronics	0	0	1	3	2	3	1	0	10
	Machinery	0	0	1	3	2	2	2	0	10
	Automotive	0	0	0	4	2	0	3	0	9
	Construction	0	0	2	1	2	0	0	2	7
Total										61

Source: UBISD data

(1) Ministry employees

Employees in this category are public employees of the MLSW who have passed a state examination. They receive their pay according to a graded salary system with 11 wage levels, and must have a certificate of completion from high school as a minimum qualification. Normally they rotate between the ministry and

*2 There were several people at UBISD and KISD who were hired as instructors after fairly extensive experience (about 10 years) working in the private sector. According to them, as public employees, instructors have better job security and benefits than private sector workers, so it is rare for a public servant in the technical/ engineering field to take a job in the private sector.

training facilities (NISD, ISDs, PCSDs) in cycles of about three to five years, and teach the theoretical portion of training courses.

Table S1-2 Qualifications and Promotion System for Public Employees

Level	Qualifications/ Promotion System
1	Automatically promoted every two years until Level 3; must pass a test to move from Level 3 to Level 4
2	Entry level for people with diplomas
3	Entry level for university graduates; automatic promotion until Level 5; must pass a test to move from Level 5 to Level 6
4	Promotions above Level 6 depend on evaluation by superior; in Levels 3-5, transfers to other departments within the ministry are likely but above Level 6 there are generally no transfers
5	
6	Coordinator
7	Technician
8	Chief of section
9	Individual ISD director level
10	Inspector
11	Director general, permanent secretary

Source: interviews with KISD and UBISD employees

(2) Permanent instructors

Permanent instructors are government employees, but they work on a different grading system than MLSW employees. They are generally hired locally in the vicinity of each regional ISD or PCSD and do not transfer from one regional ISD or PCSD to another unless there is a particular request for them to do so. Lately, however, because the government's policy has changed, employees hired in this category will also be subject to transfers in the future. The minimum required educational level is elementary school; greater emphasis is placed on private sector experience. Therefore, they teach the hands-on portion of training courses.

There used to be four levels of instructors*3 , Levels 1-4, but due to a change

*3 These levels are different from the public employee grades. Hiring standards for the instructor levels are as follows:

Level 3:
1) more than 8 yrs. work experience + Class 3 skill license
2) completion of ISD pre-employment training + more than 7 yrs. work experience + Class 3 skill license
3) vocational high school certificate + more than 3 yrs. work experience + Class 3 skill license
4) diploma + Class 3 skill license

Level 4:
1) more than 10 yrs. work experience + Class 2 skill license
2) more than 9 yrs. work experience + completion of ISD pre-employment training + Class 2 skill license
3) vocational high school certificate + more than 5 yrs. work experience + Class 2 skill license
4) diploma + more than 2 yrs. work experience + Class 2 skill license
5) degree + Class 2 skill license

in government policy aimed at ensuring the quality of instructors, currently only Level 3 and 4 positions are being filled.

(3) Temporary instructors

Lately the government has started actively hiring temporary instructors because of the shortage of teachers. This is especially true in mobile training, where about 40% of instructors are temporary employees. Temporary instructors sometimes become permanent instructors; most of them would like to be lifetime employees. Most of the temporary instructors are graduates of pre-employment training and were recruited by their own instructors.

(4) Training of instructors (including officers)

DSD's Institute for Training Personnel Development offers a variety of improvement courses for training permanent instructors. UBISD sends an average of one employee per month to the institute for training. In FY1996 (1995-1996), the institute plans to offer 144 courses, of 52 types. Many courses teach English, administration, budgeting, management or computer operation. There are also courses for newly hired instructors and executive officers.

Besides the DSD training, each regional ISD's director looks into training activities offered by outside organizations and sends staff out for training when deemed appropriate. However, outside training courses tend to be costly, especially those run by private businesses, so only one or two employees per year are sent to them. Money for such training comes from the training budget that each facility receives at the beginning of each year.

S1.1.3 UBISD graduates

(1) Jobs for UBISD graduates

Companies that accept trainees from ISDs or vocational schools for on-the-job training tend to keep them as employees once their training is finished. Machinery and automotive-related companies in the Ubon area only hire experienced workers. There were also several other companies that did not hire people unless they had taken training at a vocational high school, technical vocational school, ISD or another vocational training program. From the start, such companies demand a certain level of productivity from their workers, so the fact that formerly unemployed young people were able to get work there after graduating from UBISD can be attributed to UBISD vocational training.

However, one of the primary goals of developing human resources through

UBISD vocational training is to contribute to the economic development of the southern part of northeast Thailand. According to the project report, "Poverty and unemployment have become major problems in the northeast of Thailand, which is the most underdeveloped part of the country. An unending flow of unskilled laborers moving to the city looking for work has been one reason for the deterioration in employment conditions in the Bangkok area. There is an urgent need to devise measures to counter this trend." However, although there are companies in the Ubon area that view UBISD graduates as valuable human resources and offer them working conditions equivalent to those found in Bangkok (when the difference in living costs and other costs is factored in), it seems that many graduates move to Bangkok and other urban areas anyway.

(2) Recruitment methods used by companies

In both Ubon and Bangkok, the majority of unskilled and semi-skilled laborers hired for minimum wages are recruited through employee introductions or by advertisements placed in front of the factory, which often do not provide information about the type of work or pay offered. Because of the lack of communication infrastructure, employment-related information does not reach rural farming villages, and thus finding jobs in companies is difficult in those areas. A similar lack of information flow between other regions and Bangkok, which is currently experiencing a labor shortage, is also a reason for the flow of laborers into Bangkok.

(3) Employment and advancement systems

In our interviews, we found that UBISD graduates were working under the kind of employment and promotion systems shown in Table S1-3.

Few companies had clearly outlined wage or promotion systems, but we noted that among the companies employing UBISD graduates, smaller companies were less likely to attach importance to academic background and tended to offer greater opportunities for career advancement based on technical skills acquired through years of experience. In contrast, larger companies tended to have seniority-based pay scales tied to the highest level of completed education. In such companies, opportunities for career advancement for UBISD graduates are limited, because UBISD vocational training is not counted as academic background and they enter the promotion system according to the last educational level completed. Especially around Bangkok, the overall educational level of workers is higher than in Ubon, which often seems to make it difficult for UBISD graduates to advance. For workers with a low educational level, like the majority of UBISD graduates, the best strategy seems to be to work at one company for a long time and improve one's skills until

one can advance.

There are also some cases of capable graduates who went into business for themselves once their skills had matured. In companies with potential for growth, UBISD graduates whose abilities are recognized may be promoted to supervisory status along with graduates of vocational training schools.

Table S1-3 Employment and Advancement Systems Affecting UBISD Graduates

Type of employment	Wages/ benefits/ advancement
On-the-job training (2-3 months)	Normally, an allowance of less than minimum wage is paid. In some cases, an allowance for meals, transportation or lodging may be provided.
Probation period (1-6 months)	(used by some companies in Bangkok, especially large firms) Employment on a daily basis, at minimum wage, is standard. Some companies view this as part of on-the-job training.
Employment exam	(used by some companies in Bangkok, especially large firms) Exam is held before or after probation period. People with a high level of basic education may be hired as technicians, but in fact they work as general laborers.
On-site laborers	Employment on monthly basis is standard (daily basis at some companies) Case (1): hired at minimum wage. ISD graduates are placed as general laborers; pay increases only when minimum wage is raised. Case (2): hired at minimum wage or extremely close to minimum wage. Promoted according to experience. In both of the above cases, various benefits mentioned above apply, as does overtime pay. Some companies pay bonuses or ability pay to provide incentives.
Promotion	At all companies, workers could advance to the level of group leader/job chief, and then to site manager, based on such qualities as attitude, diligence, competency and cooperation. There is an unwritten rule that workers must raise their educational level in order to advance in the company.
Pay raises (Case 2 of 'On-site laborers' above)	Ubon area: monthly salary 2,000 - 5,000 baht. Raises of up to 500 baht per year. Maximum of about 7,500 baht (someone answered 8,570 baht) Bangkok area: monthly salary 3,500 - 7,000 baht. Raises of up to 900 baht per year. Maximum of about 10,000 baht (someone answered 7,000 baht)

(4) Methods of acquiring skills after becoming employed

The smaller a company is, the less likely it is to offer technical training to employees. Employees gain the skills needed for their jobs through on-the-job training. Especially in the Ubon region, there are almost no companies -- besides automotive companies with nationwide networks -- that have systematic in-house training programs. Therefore, the gap becomes obvious between people who have taken UBISD training and those who have not.

During our interviews, many managers said that because UBISD graduates have basic knowledge and skills, it was extremely easy to teach them about their jobs, since there was no need to start from scratch. But other workers tend to catch on within a few months, so although the managers recognized a gap in technical level between graduates and non-graduates in the first 6-12 months of employment, most said that after that period, job advancement depended on the worker's level of diligence, motivation and effort. We believe the fact that UBISD graduates were able to get jobs at companies that offer good conditions and demand a high level of productivity is a result of UBISD training. There is no doubt of the positive impact of the training. We also believe that the above opinion of the managers is natural, because each company can teach its workers with material suited to its particular needs. UBISD should consider its responsiveness to market needs.

(5) Employers' opinions about UBISD graduates

• In general

Managers in both the Bangkok and Ubon regions found that UBISD graduates are generally easy to train when first hired because of their basic knowledge of machinery and mathematics, although opinions on the extent of UBISD impact differed from company to company. In the long term, however, if graduates do not work on upgrading their own basic educational level, non-graduates can catch up to their level of technical skill within 6-12 months of on-the-job experience.

Also, because UBISD's training methods in general do not emphasize adaptability, several managers pointed out that graduates lack the ability to adapt their acquired skills to a range of tasks. In addressing how to solve this problem, some people said graduates need more experience, while others said they need more fundamental, comprehensive knowledge. Others also suggested that businesses would appreciate UBISD even more if the institute would further its current offerings by gearing its education and training more closely to the occupational skills demanded by industry.

Managers appreciated that UBISD graduates were generally less likely to leave

the company than graduates of vocational high schools or technical junior colleges (equivalent to Japanese advanced skill schools). The higher his educational level, the more opportunities an employee has to find a better job elsewhere; therefore, workers tend to move to where their skills are rewarded with better pay. Regarding employees' contribution to their company, some managers said that because UBISD graduates have a foundation in machinery and technology, in the short term they may be more productive than employees with a higher educational level (who lack hands-on training), but that in the long term, employees with a higher level of theoretical knowledge are easier to utilize as workers.

• The Ubon region

According to most of the companies we visited in the Ubon region, UBISD graduates are a valuable pool of talent in an area where good-quality human resources are in short supply. It is clear that there is great demand for their labor. Partly because there are few vocational schools in the region, UBISD is making a basic contribution toward supplying needed human resources. Many companies that do not currently accept on-the-job trainees expressed a desire to do so. On the other hand, managers in companies that do accept trainees worried about whether graduates would remain with the company after completing their training, as many tend to go to Bangkok after completing on-the-job training. However, there is a shortage of good-quality labor throughout Thailand, and many companies said they would be happy to hire graduates who had gone to Bangkok and returned.

• The Bangkok region

Many companies in the Bangkok area said that knowledge and skills, while necessary, could be gained through in-house training, whereas the primary strength of UBISD graduates is that they are obedient. It is believed that UBISD's good discipline has much to do with this.

Some companies complained that UBISD graduates became homesick after they were hired and ended up returning home or leaving the company to work elsewhere with friends from their hometown. This type of complaint came mostly from companies that offered relatively poor conditions; there were few such problems among companies that offered better conditions, including things like lodging or full benefits. Most companies employing many UBISD graduates found their turnover rate was relatively low.

(6) How people learned of UBISD

Based on their questionnaire responses, most companies in both Ubon and

Bangkok learned of UBISD through a letter of introduction they received at the time of UBISD's establishment. Many others in the Ubon area heard of UBISD through word of mouth informally through personal acquaintances of instructors, from UBISD graduates who happened to be hired by a company, or from friends of managers in companies conducting on-the-job training. Some managers wanted to know more about on-the-job training or skill improvement training, and said they would like to actively make use of those functions if they appear useful. Even in the Ubon region, many companies did not know that UBISD offers skill improvement training.

When we asked UBISD graduates how they learned about the training, many said they had heard about it through a friend who had already taken training, from a notice posted in front of a school, or from the radio.

S1.2 Subjective Evaluation by UBISD Graduates

S1.2.1 Evaluation of training methods

In the questionnaires, we asked graduates to evaluate the three aspects of UBISD training courses: classroom work (theory), using machinery (practice), and on-the-job training. They were to base their evaluations on three criteria: appropriateness of course duration, ease of comprehension and usefulness in their present job. Table S1-1 is a compilation of their answers. These questions were in Section C of the questionnaire; responses to each item can be found in S1 in the Appendix.

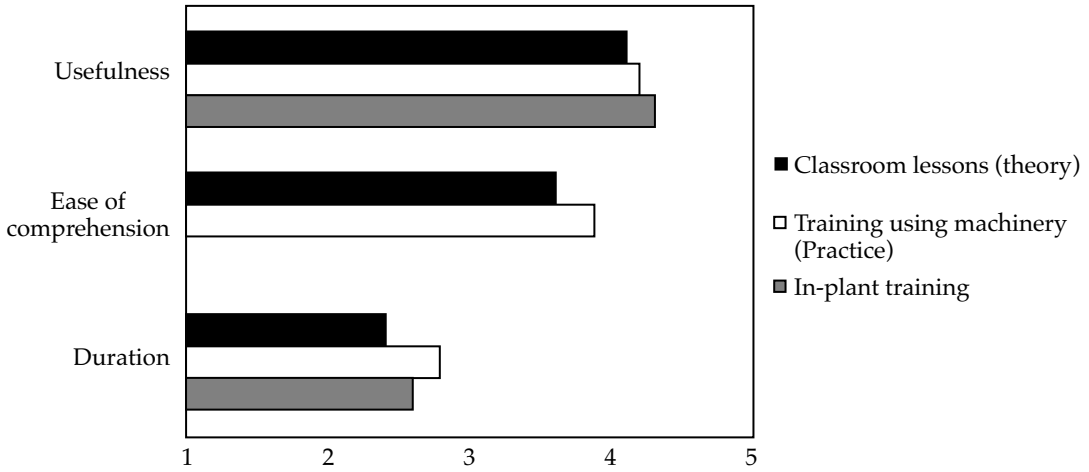
Table S1-1 shows that graduates felt that all aspects of their training were a bit too short. This feeling was especially pronounced regarding the classroom work. This is probably because 80% of training time was devoted to practice, while only 20% was given to theory. It seems that the machinery, technology, etc., used at UBISD facilities are different from those actually used at companies. Especially in the Bangkok area, managers pointed out that UBISD graduates may have basic skills, but lack depth to their knowledge -- for example, some cannot read diagrams. It appears that in some areas, UBISD graduates need more theoretical background to enable them to adapt to more sophisticated environments.

All three aspects of training were generally rated favorably in terms of usefulness and ease of comprehension, so it seems there is no problem in these areas. Practical training, both at UBISD and at companies implementing on-the-job training, received high scores.

Questions about instructors' teaching methods, teaching materials and

equipment all drew favorable responses of about 4 on a 5-point scale. As will be noted later in the section providing analysis of the comments, we can conclude that overall, the quality of UBISD training is being satisfactorily maintained.

Diagram S1-1 Evaluation of Training



Usefulness and ease of comprehension were evaluated on a 5-point scale, with 5 being best.
Duration was evaluated as 1 --- much too short
3 --- just right
5 --- much too long

S1.2.2 Evaluation of the technical level of UBISD training

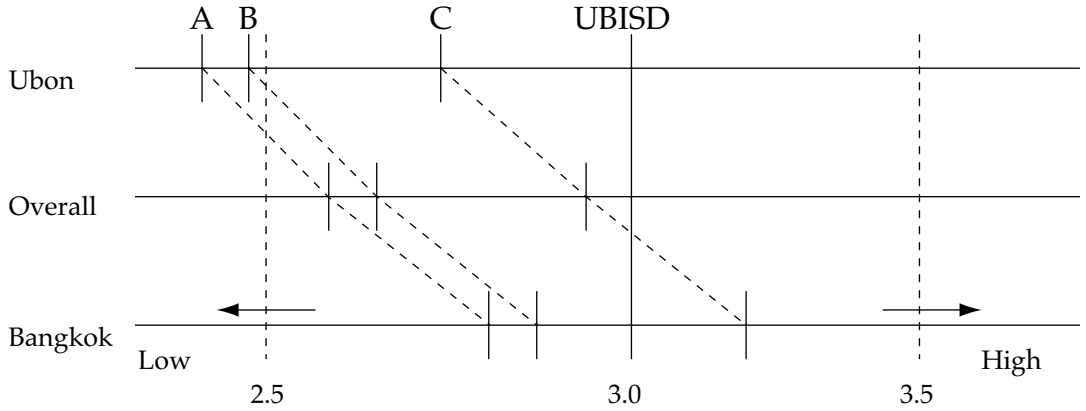
In order to assess UBISD's training methods, we asked respondents about the current usefulness of course content, but in this section we look specifically at the technical level of UBISD course content. This is a continuation of the analysis of Section C of the questionnaire. In order to simplify the questionnaire and out of consideration for the fact that many respondents only have a primary or middle school education, we omitted a question from the previous study, "tendency of technology to become outdated over time."

As each question in the questionnaire set up separate scales based on the technical level of each subject of comparison, the scale of each question is different.*4 We converted the average values of the answers to each question so that UBISD's technical level would be the standard, and showed these on straight lines in Diagram S1-2. The diagram clearly shows the appropriateness of the technical level offered

*4 The question was "Is the level of content in UBISD training higher or lower than... (A-C in Table S3 - 2). The choice of answers was 1. lower 2. somewhat lower 3. about the same 4. somewhat higher 5. higher

by UBISD with the order of technical levels and the gap between city and country.

Diagram S1-2 Evaluation of the Technical Level of UBISD Course Contents



A. Technical level of other laborers at workplace

B. Technical level expected to be gained through training

C. Technical level used on the job

In Diagram S1-2, with UBISD's technical level at 3, the other technical levels fall within about plus or minus 0.5 points of it. Since 2 is "somewhat low" and 4 is "somewhat high," we can judge that UBISD's course content meets the required technical level and is not excessively high; in other words it is appropriate.

If we look at the order of the technical levels, UBISD's level is the highest, followed by (in order) the 'on-the-job' level, the 'expected' level, and the level of other workers. The most important point here is UBISD's position, and it is clear that in this sense, UBISD's technology is sufficiently advanced. If graduates can acquire all of the technological knowledge taught at UBISD, they should have no problem working for the companies at which they now work.

One other point to note is the gap between urban and rural. Graduates working in the Bangkok area clearly positioned UBISD at a relatively lower level than those working in the Ubon area. Of course, one reason for the gap may be that many graduates in the urban area work for major companies, where they use new, sophisticated machinery and equipment.

As the primary goal of the project is to foster human resources that can contribute to the economic development of the Ubon region, it might not be in keeping with UBISD's goal to take into consideration the fact that some graduates will be working in the Bangkok area. However, it is a reality that a large number of UBISD graduates leave Ubon to in and around Bangkok. But in light of Thailand's

economic development, businesses are likely to start operating around Ubon too, and the technology used by UBISD graduates is likely to progress rapidly. In the future, the training curriculum must evolve to accommodate demographic changes, as well as technical advances in industry.

S1.2.3 Transfer of technology from UBISD graduates to other workers

UBISD graduates retain the knowledge and skills that they have acquired as their personal assets, and the impact will last for some time. In addition, from a societal perspective, the impact of training can even multiply when graduates pass on knowledge to third parties. In our previous study, by incorporating analysis of the impact of technical transfers, we indicated that the ripple effects of educational or training projects are very significant.

In this study, we focused on ripple effects of technical transfers occurring at the graduates' workplaces (private companies). We used the same methods to calculate the percentage of technical transfer and the magnitude of the ensuing ripple effects. In order to clearly show the percentage of transferred technology deriving from UBISD, we added a question about the sources of graduates' knowledge and skills.

Regarding the degree to which they learned the material, more than half of the students responded that they mastered "most" of the training content. Less than 10% replied that they mastered "not very much" or "almost none." These evaluations reflect the students' own subjective opinions, but it leads us to believe that they understood most of the course content before graduating.

The next question concerns the sources of specialized knowledge and skills; the responses suggest that the graduates gained a large proportion of these from UBISD. In comparison with values for each information source for graduates working in the Ubon area and Bangkok, the reason why the latter were closer is that many of them found work in a field other than the one they studied at UBISD. If such workers are eliminated from the sample, there is almost no gap between the two groups.

Finally, we asked, "How much of your skills have you taught to your co-workers or subordinates?" Most graduates responded "a large amount" or "about half." There are many reports of the difficulty of transferring technology within Thai work places, but in our company visits during this survey we observed graduates working as general laborers; we did not see the kind of circumstances described in such reports. In response to this question, there were six comments written outside the answer space, such as "exchanged knowledge" or "sought advice."

These comments suggest that this situation was not a one-way technical transfer from graduates to other workers, but rather a collegial situation in which workers helped each other with points about which they were unclear. Thus, we can surmise that technical transfer did take place through UBISD graduates and generated ripple effects.

We believed it would be difficult in this study to quantitatively measure the impact of technical transfer by the same methods that were used in the previous study, which relied, namely, on the percentage of technical transfer. We did not try to do so because that method presumed that UBISD graduates would enter the labor market as skilled workers, even though we could see from surveys of graduates, interviews with their employers and observation of graduates' actual working environments that, in fact, the graduates were not conspicuously more skilled in their companies than other workers who had had on-the-job training. We therefore determined that it would not be appropriate to include questions based on the assumption that there were one-way technical transfers. Another reason for this decision was that, unlike the subjects of the earlier study who were instructors whose main mission was the transfer of knowledge and technology, the subjects of this study probably had no systematic grasp of their own knowledge and skills and little awareness of the concept of technical transfer.

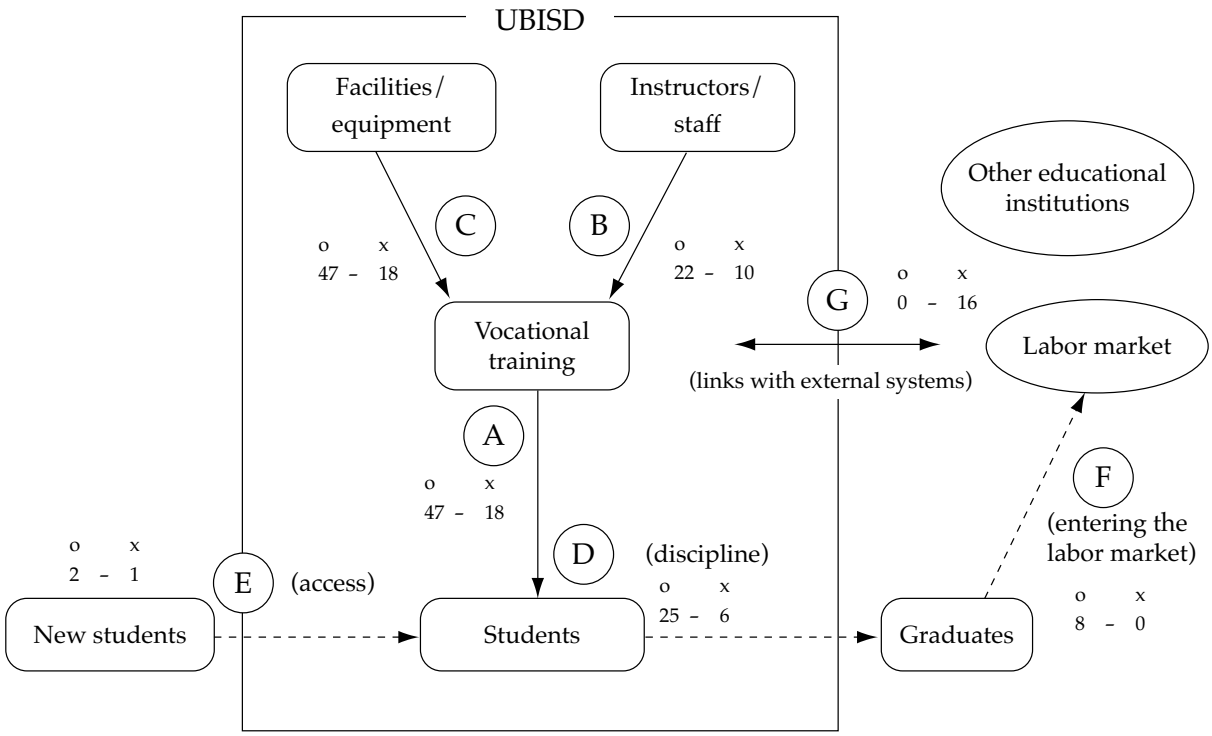
S1.2.4 Analysis of comments from the questionnaires

On the questionnaires, graduates were asked to write in an open/free form section their own comments about UBISD's strengths and weaknesses. Below is a summary of those comments. The students had many different opinions, and many of them commented on more than one issue. We compiled all the opinions and divided them into seven categories according to the Kawakita classification system, or the KJ Method. The categories are:

A. Comments about the training
B. Comments about instructors or staff
C. Comments about facilities or equipment
D. Comments about discipline
E. Comments about access to training
F. Comments about entering the labor market
G. Comments about links with external systems

In Diagram S1-3, these categories are shown within a model of the training process. The circles in the diagram indicate positive responses while the Xs indicate negative ones; the numbers below the circles and Xs indicate the number of responses.

Diagram S1-3 Number of Comments by Category



Looking at UBISD's strong points first, the category that drew the largest number of favorable comments was C, "facilities/equipment." Many students wrote that facilities, equipment and practice materials were good, new, modern, etc. Since Japanese assistance played a large role in this category, we can say that the assistance was meaningful. Among suggestions for improvement, many graduates said there were not enough practice materials, or that their use was limited because of their expense. In fact, the Ministry of Labor and Social Welfare plans to increase the total number of students at ISDs as of FY1994, and it seems that almost all applicants will be admitted to UBISD. Because of this, it seems that students have fewer chances to use practice materials, especially in the automotive courses.

The category that drew the next largest number of favorable comments was A, "training." Graduates said they were able to acquire knowledge and skills, and that the training is useful to them now. Overall, the graduates had positive views on training activities. This is connected with their response to F, "entering the labor market", but on the whole we believe that graduates are satisfied with the process of receiving training at UBISD, acquiring knowledge and skills and getting a good job.

Most of the comments about how UBISD might improve had to do with the duration of training, and course content and structure. First of all, many respondents said the training period should be longer. This indicates that many students, when

they actually started working in a company, wanted to continue their training; in other words, the knowledge and skills they had gained at UBISD were insufficient and undeveloped. There were also complaints pertaining to category G, that unlike schooling administered by the Ministry of Education, UBISD training does not allow graduates to pursue a career path.

Regarding course content, many graduates wrote that hands-on training should be made more efficient and systematic, a point which is closely related to points for improvement that were allocated to category B. In that category, many students said the instructors were good, allowing us to conclude that instructors themselves are of sufficiently high quality. Graduates pointed out, however, that there was a need for improvement regarding instructors' responsibility, rates of absence or shortages of instructors during hands-on practice sessions. This indicates that situations occurred in which there were not enough instructors to teach all of the students at the practice sessions.

In this study, we were surprised to receive 28 positive comments about D, "discipline." This category even received three positive comments given as responses to the question "What needs to be improved?" As mentioned above in Chapter III Section 4.3 about managers' evaluations, the development of a good, basic attitude toward working was an important non-economic impact. This serves as a major positive factor especially when graduates find work in the Ubon area, where the value of UBISD from a societal standpoint is an issue.

From the above comments, we can see that while there may be some problems with maintaining the correct amount or balance of the three types of input to training (facilities/equipment, instructors/staff and students), in general the inputs are functioning well. Regarding links between the UBISD system and external systems, however, there were many suggestions for improvement along with some comments that the training was helpful for getting work. Especially regarding on-the-job training, graduates made an important recommendation that "students should be sent to a company whose work is related to the student's field of study." If students are sent to receive on-the-job training at companies in a different industry, they will be unable to use almost anything they have learned up to that point. To improve this situation, it is necessary for administrators to prepare detailed preliminary studies. It is also essential for UBISD to have a firm grasp of market demands in order to cultivate the kind of talent sought by the labor market. Publicity is also essential, both for finding good jobs for graduates, and for recruiting trainees. UBISD and the MLSW need to concentrate on points like these in order to build close links to external systems.

Table S1-4 (a) Comments: Strong Points of UBISD

A. Classes/training (41)*1	
Acquisition of knowledge/skills (12)	• can gain knowledge/skills that are immediately useful for work • can learn skills before starting a job • can learn to meet all the requirements of one's job, etc.
Classes/training (16)	• practical training is useful in current work • can test own skills • learn sense of responsibility and seriousness about work
Curriculum (9)	• curriculum/course plan is good • training system is good
Ease of comprehension (4)	• easy to understand (course content)
B. Instructors/staff (22)	
Instructors (18)	• instructors are good • instructors are of a high quality • instructors have high level of knowledge and skill • instructors are good at teaching
Staff (4)	• all staff are good • Japanese experts gave good guidance
C. Facilities/equipment (47)	
Facilities/equipment for training (39)	• training facilities (machinery) are good • training facilities (machinery) are modern • equipped with all the materials needed for training
Other facilities (8)	• buildings are attractive; good infrastructure • dormitories are attractive
D. Discipline (25)	
Discipline (23)	• rules and regulations (related to training and daily life) are good • experiencing UBISD rules prepares students for working in any company • rules and regulations about clothing, hairstyles, forming lines and daily life give students more discipline and make them better workers
Atmosphere (2)	• good atmosphere • sense of unity
E. Access to training (2)	
Easy access (2)	• tuition is free; low expenses • provides training for people who would not otherwise have an opportunity to get vocational training
F. Entering job market (8)	
Helpful for finding work (8)	• can get a good job • helps people without opportunities and who could not find work • could not have found a good job if not for UBISD • can prepare for work before finding a job, etc.

*1 The number in parentheses indicates the number of people who provided responses for the given topic.

Table S1-4 (b) Comments: Points for Improvement of UBISD

A. Classes/training (47)	
Offer more subjects (4)	• should offer a wider variety of subjects (2) • should offer classes in computer operation (1) • should teach more English (1)
About particular subjects (6)	• automotive courses needs improvement (2) • all courses in electronics field should be brought up to date (1) • should improve electronics course (2) • should improve furniture making and ceramics courses (1)
Course content (20)	• should stress on-the-job training (1) • should have more hands-on training (2) • should improve hands-on training (4) • should make hands-on training more efficient (2) • should attach importance to time for theoretical work (5) • hands-on training should be based on theory (2) • too many theoretical classes (1) • should improve training systems (1) • should introduce more modern methods of instruction (1) • would like UBISD to provide manuals (1)
Length of training (17)	• training courses should be made longer than they are now (16) • length of some courses should be changed (1)
B. Instructors/staff (10)	
Instructors/ staff (7)	• instructors should get more experience in a particular field (1) • instructors should take responsibility for providing guidance during training (3) • instructors should be present during training (1) • guards should improve their attitude (1)
Number of instructors (3)	• too few instructors (not enough for practical training) (3)
C. Facilities/equipment (18)	
Facilities/equipment (18)	• would like to be able to use equipment and practice materials more (2) • use of practice materials is limited due to their high cost, so students cannot learn how to use them; this should be improved (2) • should supply more machines and practice materials, as there are not enough (students must take turns to use them) (5) • should use new equipment (5) • would like to invite outside teachers to give instruction in using new machinery (1) • should use equipment and materials appropriate for market (1) • would like to have broken machines repaired (1) • improve dormitories (1)
D. Discipline (6)	
Discipline (6)	• should improve on unnecessary rules, etc. (3) • should try harder to get trainees to follow rules (3)
E. Access to training (1)	
New students (1)	• should allow more trainees to enter UBISD (1)

(continued from page 92)

G. Links with external systems (16)	
On-the-job training (8)	• trainees should be sent to a job in their area of study (7) (Explanation: most students find work with the company where they do on-the-job training, so if they are sent to a different type of company, they cannot use what they have learned and experience difficulty on the job.) • should send trainees only to companies where they have a chance of being hired (1)
Assessing demand (2)	• should study demand for labor and offer courses that meet the market's needs (1) • should send instructors and students out to companies and other places in order to obtain more sophisticated knowledge (1)
Publicity (2)	• should create more publicity to make companies and the general public aware of UBISD (2)
Links with other educational institutions (4)	• should make course longer and give graduates certificate equivalent to completion of vocational high school (as this would be valued by companies) (3) • should arrange for trainees to be able to continue education at higher level institution (1) • should remember the fact that people who graduate from regular high school and UBISD earn less than people who graduate vocational high school (1)

S1.3 Challenges Related to Training

(1) Development of UBISD instructors

Currently the Thai government plans to expand its vocational training facilities. Because of this, increasing the number and quality of instructors working in vocational training will be a major challenge in the future. The central government (DSD) is apparently planning to build a system whereby people in private industry who have the knowledge and skills required for vocational teaching will be hired on a temporary contractual basis, and in exchange, private companies will be provided with training using ISD facilities. DSD is aware that good equipment is essential if ISD training is to replace private sector training. It is still uncertain how beneficial this plan will be for private business, but it does look promising as a way to secure competent instructors.

UBISD already employs outside instructors on temporary contracts in addition to its permanent instructors. The first place UBISD looks for such outside instructors is among its own graduates of pre-employment training; therefore, we can view cultivation of future instructors as an important effect of training.

In interviews with UBISD instructors, we spoke with several people who had

worked for about 10 years in the private sector before being hired as instructors. In their opinion, they are better off working as instructors than as employees of a private company, because as government employees they have better long-term job security and benefits other than wages. They also said they have good social status, and that it is rare for a government technical employee to move to the private sector.

Permanent instructors said during interviews that their chances to upgrade their technical skills, in other words their chances of being sent for advanced training, are limited. Although their workload has been lightened with the hiring of instructors on a contractual basis, it seems they have little time to take on anything beyond their responsibilities, which include evening skill improvement and special improvement courses in addition to daytime pre-employment courses and daily training activities. Instructors in charge of hands-on training are especially busy and seemed to be concerned about their level of technical skills.

Evaluations by local instructors from the central government's instructor training center (formerly NISD) are generally very good. UBISD is ranked high in quality at this stage because it has good equipment, high-quality instructors and it offers advanced training, etc. Other people have pointed out weaknesses, such as UBISD does not reflect the needs of business (or the local community), its equipment is outdated compared to that used in private industry, and some students have no chance to use what they have learned because UBISD does not have the necessary equipment. Many instructors from the instructor training center said that training courses are too short, and often end before all the material can be covered. It is necessary to examine how much technology should be taught, and about the length and efficiency of courses.

On the whole, instructors would like to undertake more improvement training than they do now, and do so on a continual basis. But they have almost no opportunities to be sent to the instructor training center, overseas study programs or corporate training. It would be difficult to assert that the central government was taking the initiative in raising the quality of instructors. In order to deal with this issue, each regional ISD tries to upgrade its instructors' skills by holding seminars for them on various subjects.

Because capacity is limited at the instructor training center, and because the center has a greater need to expand the number of instructors than to improve their quality, the current situation suggests that in the future there will be more pressure to provide new teacher training. It is one of the future challenges to find a way to continually improve the quality of the instructors.

(2) Technical transfers from Japanese experts to counterparts

Japanese experts are generally highly-regarded, as can be seen from the number of people who say they would like further opportunities to learn about technology from Japanese experts. Their knowledge and skills are valued extremely highly. Counterparts left their jobs in some cases, but they generally moved to other regional ISDs or were promoted, and almost never moved to the private sector. When they do change jobs, they are said to make a smooth transition to their new workplaces. They can be expected to generate even more ripple effects through technical transfers at their new jobs.

In previous study, problems with counterparts' English ability was noted, but in this study, in contrast, we heard more positive opinions about the English ability of the Japanese experts. Language problems can often be overcome when dealing with technology or machinery, but language can be a major obstacle when it comes to transmitting knowledge. In the future, it will be necessary for both sides to make a greater effort in this area.

(3) Adequacy of equipment; usage of donated materials

Based on our observations at UBISD and NISD, it appears that the most important materials are in ample supply and are being used effectively. We also saw new materials and parts being purchased out of the Thai budget, so we believe there is generally no problem. However, we also heard that some machines were broken, and that spare parts were not available, and there was no money budgeted for repairs. In the opinion of experts now working at NISD, maintenance of machines is the most serious problem. Donated machinery could be used more effectively if counterparts are taught not just how to operate it, but how to maintain and care for it. At KISD, some machines show signs of wearing out.

Instructors said that they could not read the operating/maintenance manuals of the machinery because they were written in Japanese. Although the instructors may not encounter problems in their daily work because they have received verbal instructions on how to operate the machines, apparently they feel irritated that they cannot read manuals or technical documents left by Japanese experts because they are in Japanese.

(4) Relationships between companies and UBISD

Many managers at companies in the Ubon area said that they would like more information about UBISD, and think that UBISD should be more heavily publicized. They said that their only interaction with UBISD is when it sends them students for on-the-job training. The companies we visited were relatively large ones in the

Ubon region, and most of them are accepting on-the-job trainees. Hearing such opinions from these companies indicates that there is not enough contact between the companies and UBISD.

Many instructors also suggested, as an area for improvement, that UBISD should have closer relations with businesses. Because the majority of the training curriculum is determined by the central government, some of it appears to be unsuited to the actual market. It should be noted that instructors at both UBISD and KISD said that enrollment in construction-related courses is falling and that the ISDs should do some PR to attract students.

Some managers pointed out that there is no monitoring or follow-up of on-the-job training, and that this could be considered irresponsible. If UBISD's goal is the cultivation of skilled workers, then we believe it must pay most careful attention to understanding the needs of companies that take on trainees and build close ties between companies and the institute.

S1-4 Points to Consider for UBISD's Development

Based on the analyses of cost-effectiveness and non-economic impact explained in Chapter III, UBISD was evaluated to be working in a sufficiently effective manner toward its goal of providing unemployed young people in northeastern Thailand with opportunities to receive vocational training in order to promote employment. At the same time, we learned of points that should be improved, based on comments from graduates and interviews with graduates' employers and UBISD instructors.

The following are points that should be considered in order to promote the further growth and development of UBISD:

(1) Proper balance between levels of enrollment, instructors and equipment

In the beginning, all of UBISD's training courses were 10 months long, and we applaud the fact that some courses, depending on their content, were shortened to six months with the dramatic expansion of UBISD that began in FY1995. But in order to turn out as many graduates as possible, it seems that since FY1994 the institute has been accepting almost every applicant. If only enrollment increases, without corresponding increases in instructors, equipment and materials, it is only natural that problems will arise, such as an inability to provide high-quality instruction to all trainees, and reduced opportunities for trainees to have hands-on practice with machinery. There should be an appropriate balance between the number of trainees, number of instructors and amount of practice materials and equipment. If that balance breaks down, it could lead to a decline in the quality of

graduates.

In fact, many graduates wrote that practical training should be made more efficient and that the training period is too short. One possibility is to reduce the number of trainees, but fortunately, profitability and sensitivity analyses show that the institute can remain profitable even if the investment in instructors and equipment is increased. UBISD should probably strive to maintain a proper balance between the number of instructors, number of students and size/amount of facilities and equipment.

(2) Reorganization of course offerings

The number of applicants for furniture making and ceramics courses has declined because students who complete these courses have trouble finding work, and even when they do, the wages are low. Ceramics is a traditional industry in the Ubon region, so we cannot necessarily say without reservation that eliminating the course would be the best policy. But because idle equipment still incurs opportunity costs, we think some measures need to be taken, such as reducing the scale of the courses, using its resources for other training programs, or working on publicity to attract more trainees.

In the Ubon area, there has been little development of industry in the electronics field. So we suppose that most graduates in this field either move to Bangkok or remain unable to use what they have learned. Computer-related work is on the increase, however, so the curriculum should probably be adjusted to meet that need.

As an aid donor, Japan should have clarified problems with potential demand during the project's design phase. Because the original design is expected to provide service for several decades, it should have been researched more carefully.

(3) Making practical training more like actual work

Employers expressed the opinion that in addition to general knowledge and skills, training should include practice that is more like actual work. One might say that in this respect, the Don Bosco Technical School in Bangkok, an independently funded institution, would be a good model for study (see S2). Of course, since UBISD provides training to people who have previously had no vocational training whatsoever, it would be difficult to perfectly copy the Don Bosco model. Nevertheless, it should run efficient training programs that prepare trainees as much as possible for working at real jobs.

(4) Selection of companies for on-the-job training

Some Bangkok companies complained that even though they hired graduates

who had completed on-the-job training, the workers did not stay there for long. The main reason is homesickness. Another reason may be that workers, who in Ubon would be considered to have competitive ability, are essentially treated as unskilled workers in the Bangkok area. The minimum wage in the Bangkok area is quite a bit higher than in Ubon, but if living conditions are taken into consideration, workers are usually better off in Ubon. Therefore, UBISD should set stricter standards for employment conditions and other criteria for companies that take on on-the-job trainees, and must take responsibility for thoroughly investigating companies before sending students to them. For example, UBISD could decide not to send trainees unless lodging is provided.

Another problem is that in Bangkok, many trainees were working in fields unrelated to the subject they had studied during training. This is not because they found such jobs on their own, but because they were sent to those companies for on-the-job training. About half of the survey subjects who were working outside of their field expressed dissatisfaction. We believe that UBISD should avoid as much as possible sending students for their on-the-job training to companies whose work is unrelated to the trainees' area of training/study.

UBISD sends trainees as far away as metropolitan Bangkok for on-the-job training, but this policy, which encourages the outflow of workers, seems to contradict the institute's primary goal of developing the economy of northeastern Thailand. One might argue that on-the-job training positions cannot be found for all trainees within the area covered by UBISD, but by limiting on-the-job training sites to northern Thailand as much as possible, UBISD can be expected to make an even greater contribution to the local community.

(5) Duration of on-the-job training/establishment of monitoring and follow-up systems

In order for UBISD's course content to reflect the needs of the companies that supply jobs to its graduates, it is important for the institute to have opportunities for firsthand observation of training at factories and other businesses, and a forum for employers' opinions.

To promote ties with companies, especially in the Ubon area, we think UBISD needs to establish a regular system of monitoring trainees during their on-the-job training period and following up after they are employed. The results of this exchange should be reflected in course content. UBISD should also work actively to recruit new companies that can provide on-the-job training.

(6) Expanding the pool of potential students

Indirect expenses may well be an obstacle to receiving training. For people who would like to receive training, these expenses may be a more significant factor in deciding to pursue training than the amount of future income they can expect.

Average monthly income for a household in northeast Thailand is 4,644 baht*[5]. UBISD does not charge tuition for pre-employment training, but trainees must still spend approximately 1,000 baht per month for meals and uniforms in order to take a course. We believe this limits, to some extent, the number of people who can afford to pursue training. Because UBISD is mainly aimed at providing training opportunities for unemployed young people, who (especially those in farming villages) generally have very little income, providing scholarships, grants or other forms of financial aid should probably be considered.

Also, because it is difficult for people in farming villages to access information about UBISD, there is still latent demand for training. In the future, if vocational training facilities are expanded, there will be a need to look for ways to uncover this kind of latent demand.

(7) Improvement of social standing

Because UBISD is under the authority of the MLSW and is not generally regarded as an educational institution on academic records, graduates cannot embark on a career path after being hired by a company, and thus their opportunities for advancement within the company are limited. Currently the Ministry of Labor and Social Welfare conducts skill licensing examinations corresponding to qualifications authorized by the Ministry of Education. The MLSW hopes that in the future these exams will gain greater social standing and be widely recognized.

ISDs should also conduct active public relations campaigns and strive to improve their social standing by conducting training activities in close cooperation with industry.

(8) Improving the quality and number of instructors

Increasing both the number and quality of vocational training instructors is an urgent issue. UBISD has begun actively using temporary instructors from the private sector, but it is still unlikely that there are enough instructors relative to the number of students. In FY1994, each permanent instructor was generally responsible for a large number of students: in automotive courses the number averaged 26.1, in construction 33.9, in electronics 16.1 and in machinery 32.7. Trainee-instructor ratios

*[5] Office of the Prime Minister, National Statistical Office (1992a)

are even higher at the provincially operated PCSDs.

Based on interviews with permanent instructors, it seemed that opportunities were limited for instructors to update their skill levels by being sent out for training. Many seemed to be concerned about their own level of technical skill.

Instructor training is an area where we can expect to see cooperation with the private sector in the future. In order to make this a reality, it is absolutely essential that UBISD acquire a better grasp of conditions affecting supply and demand of instructors and determine how many instructors are needed in each technical field, what instructor skill levels are needed, where such instructors can be found and how their skills can be improved. It is also important to start considering what kind of incentives should be adopted in order to recruit high-quality instructors.

(9) A long-term perspective on technical education

UBISD is trying to produce skilled laborers who meet the needs of today's market. Although the program is meeting this need in the short term, if one thinks in terms of decades, UBISD graduates are likely to work for at least 30 more years, and there is virtually no doubt that their working environment will change during that time. The institute will probably need to prepare, by developing appropriate forms of technical education, for the day when the technical labor conditions found today in the Bangkok area extend to the Ubon area. For example, instead of simply teaching students to operate machines, training at UBISD should broaden their basic knowledge and increase their ability to adapt to new technology.

Also, instead of only providing technical training, the institute needs to give guidance in a variety of areas to encourage young people to consider the kind of lifestyle they want to lead in the future, and to stay in Ubon-area companies as an important industrial pool of talent for the future of northeastern Thailand. From a long-term perspective, it would be advantageous to actively incorporate basic educational training into the curriculum.

(10) Promoting South-South cooperation

UBISD was established to cultivate human resources for the industrial development of northeastern Thailand, but because of its geographical location, possibilities for cooperation with vocational technical training in neighboring countries such as Cambodia, Laos and Myanmar are now being explored. There are plans to establish a vocational training center soon in Phnom Penh and UBISD has been asked to help train instructors. Thus, South-South cooperation is becoming a reality.

This contribution to South-South cooperation is a ripple effect that no one

imagined in the project's planning stages. We think it is also important for Japan to explore how to provide effective lateral support when the Thai government takes the lead in the future and enables UBISD to contribute to human resource development in neighboring countries through vocational training.

S2 Circumstances Affecting Vocational Training in Thailand Today

The Chuan Leekpai administration that governs Thailand today treats raising employment and upgrading the labor force as important policy matters, and is working on reforming educational and vocational training. At present, the various ministries and agencies have formulated concrete policies and are now moving into the implementation phase. Several of these are explained below for reference.
As part of our local surveys, we had an opportunity to visit the Don Bosco Technical School, and we have also included a description of the school in this section.

(1) The Ministry of Labor and Social Welfare's Department of Skill Development and the new NISD

The Thai government's seventh National Economic and Social Development Plan calls for establishing a new NISD aimed at promoting and providing opportunities for laborers to receive high-tech training. For now, the DSD is planning and implementing this new NISD project. In the FY1996 (October 1995- September 1996) budget, 1 billion baht was allocated for the new NISD, 80% of which is to be used for construction of facilities and 20% for other administrative expenses.

With the opening of the new NISD, DSD plans to clearly divide the curriculum of technical training conducted at the existing NISD, regional ISDs and PCSDs into the levels shown in Table S2-1, in order to consolidate Thailand's vocational training outside of the educational system.

Table S2-1 DSD's Graded Vocational Training System

Level 1: National Institute for Skill Development (new NISD)	The goal of the program is to supply high-quality general laborers who can keep up with increasingly sophisticated technology and skills, especially in high-tech and other industries, in order to meet industry's need for human resources in line with rapid economic development. It expands improvement training for employed laborers while providing more advanced technical training than normal ISDs (such as CNC operation, etc.)
Level 2: Regional Institutes for Skill Development (regional ISDs)	There are currently 12 ISDs throughout the country which conduct basic technical training adapted to the needs of each region's industries. Facilities are bigger and better equipped than smaller-scale Level 3 training facilities. Level 2 institutes also have dormitories for trainees.
Level 3: Provincial Centers for Skill Development (PCSDs)	These are small training centers at the provincial level. They aim to provide opportunities for technical training to residents of rural villages where there is limited access to regional ISDs, by conducting small-scale training that better reflects the needs of local villages.

Source: JICA

(2) The National Committee for Skill Development

The committee was established with the goal of improving human resources by coordinating and unifying private and government institutions involved in vocational skill training to improve the quality of service provided by public vocational training schools and centers, in recognition of the need to cultivate relatively educated workers in order to raise the international competitiveness of Thailand's labor force. However, it has not fulfilled its role and function in a satisfactory manner. Because of this, in December 1995 the prime minister himself took over chairmanship of the committee from the labor minister. The committee plans to strengthen its function by raising its status to the cabinet level and promoting the passage of concrete legal measures, etc.

The committee has 31 members from private-sector groups related to chambers of commerce, finance and manufacturing, and from government ministries and

agencies with jurisdiction over skills training. The committee is expected to confirm requirements for vocational technical training, and establish and coordinate the allocation of responsibilities, etc., among the various related organizations. There are also subcommittees operating under the committee in each province. These are chaired by each province's governor and are aimed at coordinating regional training and promoting assessment of demand.

(3) Training Promotion Act (expected to take effect from 1996)

Recognizing the importance of improving the quality of the work force in order to maintain international competitiveness and the need for active encouragement of investment in human resource development, the Thai government is considering a vocational skills training promotion law , which would include tax incentives to encourage the private sector to participate actively in vocational skills training. Specific measures under consideration include tax deductions for machines and equipment purchased for in-house training, and allowing companies to pay less than minimum wage during the training period.

(4) Skill Development Fund

Revolving funds have been allocated for this fund in the FY1996 budget. The fund's establishment was planned with the goal of supporting worker re-education by loaning funds to workers who want to improve their skills or acquire new ones, and to companies or other entities that promote re-training. An MLSW working group (headed by the deputy director of DSD) was set up to study establishment of such a fund and submitted its report in 1995. The National Committee for Skill Development is now considering specific details of how the fund should operate, based on the working group's report.

(5) Special Investment Promotion Zones

The concentration of economic development around metropolitan Bangkok has led to extreme imbalances in incomes between Bangkok and outlying provinces, and to urban decay and environmental pollution due to the rapid rise in population in and around the capital. Since the late 1980s as part of Thailand's overall regional development strategy, the government has been encouraging investment in rural areas in order to disperse the industrial belt that has been built up around Bangkok.

Excluding Bangkok, Samut Prakan, Samut Sakhon, Pathum Thani, Nonthaburi, Nakhon Pathom, Samut Songkhram, Ratchaburi, Kanchanaburi, Suphan Buri, Ang Thong, Ayutthaya, Saraburi, Nakhon Nayok, Chachoengsao and Chon Buri, the nation's 60 other provinces, including Laem Chabang Industrial Estate, were all

designated as Special Investment Promotion Zones in which investors receive tax breaks and other privileges to encourage business to move away from Bangkok and into outlying regions.

(6) Don Bosco Technical School

A Roman Catholic religious group from Italy founded the school 50 years ago and continues to operate and manage it. Similar to UBISD, Don Bosco offers two years of free technical training to low-income young people with excellent academic records. The school also offers formal education programs: high school (M6-level) and diploma-level vocational education, night-time diploma courses and two-year technical training pre-employment courses. The training is quite demanding, but workers who qualified here as vocational high school graduates are highly praised by companies.

Most instructors were trained at Don Bosco. The school supports graduates' efforts to continue their education (by giving a 20% discount on diploma course tuition, for example) while hiring them as temporary instructors or teaching assistants. This system allows the school to get competent instructors.

By hiring students as instructors while supporting their acquisition of a higher degree, the school not only provides a great benefit to instructors but also contributes to improving the content of its own training.

Furthermore, the school effectively utilizes and benefits from practical training done by its more advanced trainees, in that it takes in about 62% of its operating costs from profits on auto repairs, parts production and other work performed by trainees. It is precisely because they have experienced this type of practical training that graduates are valued so highly by businesses and are hired as skilled laborers or supervisors from the start. In addition to technical subjects, the school teaches general knowledge, civics and other subjects necessary for managerial positions, and there are extremely strong spiritual bonds between instructors and trainees.

S3 Questionnaires

Questionnaire Survey The Impact Analysis of Technical Assistance - Phase II -
(The Ubonratchathani Institute for Skill Development Project)

A Request for Your Cooperation:

1. Objective

The Ubonratchathani Institute for Skill Development was established in 1988, by the government of Thailand with financial assistance from Japan. A technical cooperation project was implemented between Thailand and Japan, which was designed to enhance the Thai government's effort to develop skilled manpower in the lower north-eastern region of Thailand by improving and strengthening the regional vocational training system including skill training for the unemployed youths and thus improving employment opportunities.

This questionnaire survey aims to asses the impact of the Ubonratchathani Institute for Skill Development Project on human resource development in Thailand and on the basis of such information, to contribute to the improvement of the quality of future assistance of Japan in the area of human resource development.

2. Survey respondents

Questionnaire 1 : Ex-participants of UBISD's pre-employment training programmes in the areas of auto-mobil, machinery and electric/electronic

Questionnaire 2 : Instructor of ISDs (KISD and UBISD)

3. Processing of the survey results and confidentiality

The survey is to be carried out on an anonymous basis. There is no way in which data can be traced to a particular individual. While the final results will, in line with the objective stated above, publicize information concerning the type of course work, year of graduation and other specified data provided by respondents, it will appear in compiled form only and not as it appears on the completed questionnaire forms.

4. Filling in the questionnaires

1) Unless otherwise stated, you are asked to choose one answer from the responses provided.
   * Please check (√) your answer in the box (☐) if such a box is provided.
   * Please circle (○) an appropriate number if several numbers are provided in line for your answer.
2) When you have to answer with a specific figure , please round up or down the figure to the nearest whole number. When it is difficult to ascertain the exact figure, use approximations or estimates.
3) Please do not skip any of the questions and answer them all if you could.

5. Deadline

Please return the completed questionnaire no later than ____, _____.

6. Inquiries

Please contact the following person should you have any questions or opinions about this survey.

QUESTIONNAIRE

Question respondents: ex-trainees of the UBISD training

A. Regarding the training course of UBISD which you have taken

Q 1. Which training course of UBISD have you ever participated in?
Please check (√) in the box after the appropriate answer.

Pre-employment training course ☐ Up-grading training course ☐

If you checked "Pre-employment training course"
→ Please answer the following questions about the pre-employment training course.
If you checked both training course
→ Please answer the following questions about the pre-employment training course.
If you checked "Up-grading training course"
→ Please answer the following questions about the up-grading training course you participated most recently

Q 2. When did you take the course, and how long was it ? Please specify.

From 19_____(25_____), _____ for _____ months
(year) (month) _____ days

Q 3. Which subject was the training course about? Please check (√) your answer appropriately.

Pre-employment training course

machine ☐, welding ☐
Auto-mechanic ☐, Agro-mechanics ☐
Auto-body Repair ☐
Electric ☐, Electronics ☐, Air-conditioning ☐
Cabinet making ☐, Painting ☐, Plumbing ☐
Ceramics ☐, Assistant to Workshop Supervisor ☐

Up-grading training course

Machine-related ☐
Automobile-related ☐
Electricity & Electronics-related ☐
Construction / Ceramics-related ☐

Q.4 What was the total amount of money you or your family spent to participate in the training of UBISD such as purchasing books, paying for transportation, dormitory , food etc.
Please indicate the amount spent at that time, and do not convert to current rates.

_____ bahts

Q.5 Where did you stay while attending of the training of UBISD?
Please check (√) your answer appropriately

Home ☐, Dormitory ☐, House of Relatives or Friends ☐

B. Reason for participating in the training course of UBISD

Please indicate to what extent you were motivated by the following factors to participate in the training course of UBISD? In answering questions, please read 1 through 5 below firstly, then circle an appropriate number next to each item/ factor.

No motivated at all	------ 1
Not so motivated	------ 2
Can't say one way or the other	------ 3
Rather motivated	------ 4
Very strongly motivated	------ 5

(1) To get a good job 1 --- 2 --- 3 --- 4 --- 5

(2) To obtain a high salary 1 --- 2 --- 3 --- 4 --- 5

(3) To obtain a high post 1 --- 2 --- 3 --- 4 --- 5

(4) To improve social standings 1 --- 2 --- 3 --- 4 --- 5

(5) To obtain knowledge necessary for job 1 --- 2 --- 3 --- 4 --- 5

(6) To obtain technical skills necessary for job 1 --- 2 --- 3 --- 4 --- 5

(7) Because I had no job at that time 1 --- 2 --- 3 --- 4 --- 5

(8) Because family / relatives encouraged me to go to UBISD 1 --- 2 --- 3 --- 4 --- 5

(9) Because school teacher encouraged me to go to UBISD 1 --- 2 --- 3 --- 4 --- 5

(10) Because supervisors / managers of company encouraged me to go to UBISD 1 --- 2 --- 3 --- 4 --- 5

C. Training of UBISD

Q.1 How would you rate the training methods of UBISD in terms of the following factors? In answering questions, please read 1 through 5 below firstly, then circle (○) an appropriate number next to each item/ factor.

Very short	----- 1
Rather short	----- 2
Can't say one way or the other	----- 3
Rather long	----- 4
Very long	----- 5

(1) Time devoted to lecture in classroom 1 --- 2 --- 3 --- 4 --- 5

(2) Time devoted to practical training at UBISD 1 --- 2 --- 3 --- 4 --- 5

(3) Duration of the in-plant training at private companies 1 --- 2 --- 3 --- 4 --- 5

For (4) through (12), in answering questions, please read 1 through 5 below firstly, then circle (○) an appropriate number next to each item / factor.

Strongly disagree	----- 1
Disagree	----- 2
Can't say one way or the other	----- 3
Agree	----- 4
Strongly agree	----- 5

(4) The lecture in classroom was easy to follow 1 --- 2 --- 3 --- 4 --- 5

(5) The practical training was easy to follow 1 --- 2 --- 3 --- 4 --- 5

(6) The teaching methods of instructors were good 1 --- 2 --- 3 --- 4 --- 5

(7) The teaching material / textbooks were understandable 1 --- 2 --- 3 --- 4 --- 5

(8) UBISD was adequately furnished with equipment 1 --- 2 --- 3 --- 4 --- 5

(9) The lecture at UBISD is useful for present job 1 --- 2 --- 3 --- 4 --- 5

(10) The practical training at UBISD is useful for present job 1 --- 2 --- 3 --- 4 --- 5

(11) The in-plant training at private companies is useful for present job 1 --- 2 --- 3 --- 4 --- 5

(12) You would recommend this programme to others. 1 --- 2 --- 3 --- 4 --- 5

Questions about the level of training received at UBISD

In answering questions, please read 1 through 5 below firstly, then circle (○) an appropriate number next to each item/ factor.

Low	----- 1
Rather low	----- 2
About the same	----- 3
Rather high	----- 4
High	----- 5

Q.2 The level of training was higher / lower than <u>your expectation before the training</u>.

1 --- 2 --- 3 --- 4 --- 5

Q.3 The level of training was higher / lower than <u>the technical skills required by your current job</u>.

1 --- 2 --- 3 --- 4 --- 5

Q.4 The level of training was higher / lower than <u>the technical skills of your colleagues who are in the same line of duty</u> 1 --- 2 --- 3 --- 4 --- 5

D. Transfer of technology you acquired at the training programme of UBISD

Q.1 Please indicate to what extent you could learn the training contents offered by UBISD? Please check (√) in the box after the appropriate answer.

Could learn almost all contents	(81 ~ 100%)	☐
Could learn much of the contents	(61 ~ 80%)	☐
Could learn half of the contents	(41 ~ 60%)	☐
Could not learn much	(21 ~ 40%)	☐
Could not learn anything	(0 ~ 20%	☐

Q.2 Presently, you have skills and knowledge that you acquired either through the training provided by UBISD or by other means. Please indicate what proportion of your skills / knowledge came from the following sources. In answering questions, please read 1 through 5 below firstly, then circle (◯) an appropriate number next to each item/ factor.

Almost all of my skills / knowledge	(81 ~ 100%)	----- 1
Much of my skills / knowledge	(61 ~ 80%)	----- 2
About the half of my skills / knowledge	(41 ~ 60%)	----- 3
Not so much of my skills / knowledge	(21 ~ 40%)	----- 4
Virtually none of my skills / knowledge	(0 ~ 20%)	----- 5

(1) Self-teaching with books 1 --- 2 --- 3 --- 4 --- 5

(2) Training provided by UBISD 1 --- 2 --- 3 --- 4 --- 5

(3) Training / Education by other schools or institutions 1 --- 2 --- 3 --- 4 --- 5

(4) In-house training of your company
(except for in-plant training during UBISD's training) 1 --- 2 --- 3 --- 4 --- 5

(5) Guidance from your superior worker / colleague of your working place
1 --- 2 --- 3 --- 4 --- 5

Q.3 Of all the skills you have, how much do you think you transferred to your colleagues / subordinates? Please check (√) in the box after the appropriate answer.

You transferred almost all of your skills.	(UBISD 81 ~ 100%)	☐
very much	(UBISD 61 ~ 80%)	☐
about half	(UBISD 41 ~ 60%)	☐
not so much	(UBISD 21 ~ 40%)	☐
virtually none	(UBISD 0 ~ 20%)	☐

Q.4. How much of the skills you teach to your colleagues / subordinates come from the training by UBISD? Please check (√) in the box after the appropriate answer.

Almost all skills	(UBISD 81 ~ 100%)	☐
Much skills	(UBISD 61 ~ 80%)	☐
About half	(UBISD 41 ~ 60%)	☐
Not so much	(UBISD 21 ~ 40%)	☐
Almost none	(UBISD 0 ~ 20%)	☐

Q.5 Please indicate to what extent your colleagues / subordinates could learn the skills taught by you. Please check (√) in the box after the appropriate answer.

They learned almost all the skills.	(81 ~ 100%)	☐
They learned much skills.	(61 ~ 80%)	☐
They learned half of the skills.	(41 ~ 60%)	☐
They didn't learn so much.	(21 ~ 40%)	☐
They didn't learn anything.	(0 ~ 20%)	☐

Q.6 How many colleagues are doing the same job as you are in your working place? _____

Q.7 How many of the above colleagues did you teach your skills to? _____

E. The impact of UBISD training on you

1.Looking back on your personal experience, to what degree was the UBISD training useful for you in terms of the following factors (1) ~ (18) ? In answering questions, please read 1 through 5 below firstly, then circle (○) an appropriate number next to each item/ factor.

Not useful at all ----- 1
Not useful so much ----- 2
Can't say one way or the other ----- 3
Rather useful ----- 4
Very useful ----- 5

(1) higher salary 1 --- 2 --- 3 --- 4 --- 5

(2) future promotion 1 --- 2 --- 3 --- 4 --- 5

(3) less risk of losing job 1 --- 2 --- 3 --- 4 --- 5

(4) higher evaluation from supervisors 1 --- 2 --- 3 --- 4 --- 5

(5) higher evaluation from colleagues / subordinates 1 --- 2 --- 3 --- 4 --- 5

(6) knowledge necessary for job 1 --- 2 --- 3 --- 4 --- 5

(7) skills necessary for job 1 --- 2 --- 3 --- 4 --- 5

(8) ability to use new machines / equipments 1 --- 2 --- 3 --- 4 --- 5

(9) more responsible work 1 --- 2 --- 3 --- 4 --- 5

(10) more positive approach to work of you 1 --- 2 --- 3 --- 4 --- 5

(11) observing rules of working place (discipline) 1 --- 2 --- 3 --- 4 --- 5

(12) has raised positive approach to work of colleagues / subordinates
1 --- 2 --- 3 --- 4 --- 5

(13) enabled you to teach colleagues / subordinates your skills
1 --- 2 --- 3 --- 4 --- 5

(14) increased productivity at your working place 1 --- 2 --- 3 --- 4 --- 5

(15) your company's growth 1 --- 2 --- 3 --- 4 --- 5

(16) has helped you expand your circle of friends 1 --- 2 --- 3 --- 4 --- 5

(17) and (18) are for ex-participants of "Pre-employment training course"

(17) has enabled you to get a good job 1 --- 2 --- 3 --- 4 --- 5

(18) has enabled you to get a job quickly 1 --- 2 --- 3 --- 4 --- 5

F. Your personal status

Q.1 What is your average monthly salary before tax?
(an annual income including tax, bonus and allowances divided by 12)
_____ bahts

Q.2 What will be your average monthly salary after five years from now ?
(an annual income including tax, bonus and allowances divided by 12)
_____ bahts

Please answer the following questions assuming that you have not taken UBISD's training.

Q.3 What kind of job you would be doing if you had not taken the training provided by UBISD?
Please check (√) in the box after the appropriate answer.

Better job compared to present job ☐
The same job as present job ☐
worse job compared to present job ☐
No job ☐

Q.4 Then, what would be your average monthly salary if you had not taken the training of UBISD?
(an annual income including tax, bonus and allowances divided by 12)
_____ bahts

H. Personal information

1. Sex 1. Male ☐ 2. Female ☐

2. Age _____ years old

3. The school from which you last graduated
Please check (√) in the box after the appropriate answer.

College or University ☐, Upper Secondary School (Vocational) ☐
Upper Secondary School (General) ☐, Lower Secondary School ☐
Elementary school ☐, Leaving Elementary School in Midcourse ☐

4. In which province did you live before you took the UBISD training?
Please check (√) in the box after the appropriate answer.

Ubonrachathani	☐,	Surin	☐,	Srisaket	☐
Mukdahan	☐,	Yasothon	☐,	Buriram	☐
Korat	☐,	Roi-et	☐,	Others	☐

5. Type of company
Please check (√) in the box after the appropriate answer.

Manufacturing	☐,	Repair / Maintenance	☐,	Sales	☐
Installation of facilities	☐,	Construction	☐,	Other Service	☐

Others ☐ (concretely)

6. Type of job
Please check (√) in the box after the appropriate answer.

Motor vehicles, parts and accessories ☐, Electrical machinery and equipments ☐
Electricity, gas and water ☐, Metalwork and Steel work ☐, Woodwork ☐
Ceramics ☐, Painting ☐, Transport, storage and communication ☐

7. In which province is your company ?
Please check (√) in the box after the appropriate answer.

Ubonrachathani	☐,	Surin	☐,	Srisaket	☐
Mukdahan	☐,	Yasothon	☐,	Buriram	☐
Korat	☐,	Roi-et	☐,	Others	☐

8. Number of workers
Please check (√) in the box after the appropriate answer.

1 ~ 5 ☐,	6 ~ 10 ☐,	11 ~ 50 ☐,	51 ~ 100 ☐,
101 ~ 500 ☐,	501 ~ 1000 ☐,	more than 1000 ☐	

9. Your title or position in your company / organization
Please check (√) in the box after the appropriate answer.

Regular Worker	☐,	Skilled Worker	☐,	Engineer / Technician	☐
Supervisor	☐,	Head of Division	☐,	High-ranked manager	☐

Manager of Your Own Company ☐, Others ☐
(concretely)

10. Your employment status?
Please check (√) in the box after the appropriate answer.

Permanent ☐, Temporary ☐

11. Number of years of experience at your current position (your principle job)

_____ years_____ months

12. (This question is only for ex-participants of pre-employment training course.)
Have you been doing the some kind of work as you have been trained for?
Please check (√) in the box after the appropriate answer.

Yes ☐, No ☐

I Finally, please state your own opinions about the following:

Q.1. What are the strong points of UBISD?

Q.2. What areas of UBISD need to be improved, and how can they be improved?

Thank you very much for your cooperation.

INTERVIEW SHEET

Interview respondents: Manager of companies where ex-participants of UBISD are currently employed (pre-employment training course)

Q.1. Please provide a brief overview of this company. In doing so, please answer the questions/items listed in **Table 1**. (If you have any written reference materials containing the related information, please give us a copy of them instead of answering questions. Regarding Table 2 through 4, we would like to ask you in likewise.)

Q.2. Let us ask about the in-house training.

(1) Does your company/organization have a specific in-house training system or method? If so, please fill in **Table 2**.

(2) What is the ratio of training expenses to the overall labor expenses of your company?

(3) How does the technology transfer occur among employees? (to hold in-company training sessions, to produce written manuals, through on the job training, etc.)

(4) Does your company have quality control activities(such as QC circles or a proposing system)?

Q.3. What is the composition of your employees in terms of their educational backgrounds? Please fill in **Table 3** for the answer.

Q.4. How are the ex-participants of UBISD being utilized in their respective posts? What rank of the hierarchy do they stand among the overall employees?

* as a regular worker
* as a skilled worker
* as a technician
* as a useful resource for the future
* as a useful resource for the present need of the company
* as a foreman

Q.5. How do you rate a potential of the ex-participants of UBISD in term of moving up the corporate ladder?

Q.6. Please provide us with the information regarding a wage scale of your company according to age, job-type, and educational background of employees.

Q.7. If you compare the ex-participants of UBISD to the other workers who have joined the company without skills training, how long would it take for the latter workers to reach the same level of skills and knowledge?

Q.8. To what extent do you think that the UBISD training has improved the productivity of your company?

Q.9. How much is the average monthly salary of the ex-participants of UBISD?

Q.10. What do you think the average monthly salary of such employees would be if they did not undertake the training?

Q.11. In what areas and how do you think that the ex-participants of UBISD excel or fall behind other workers? Please fill in **Table 4**.

Q.12. If you have any comments or requests regarding the future training programmes to be provided by UBISD, please state your views.

Table 2. In-house training

If your company / organization have a specific in-house training system or method, please fill in the following matrix.

Type of Training	Contents	Duration	Number of participants of Last Year

Total of participants of last year	

Table 1. Overview of This Company / Organization

1. The Name of The Company / Organization _____

2. Main Products / Activities _____

3. Size of The company / Organization

   (1) Capital _____ Bahts

   (2) Proportion of Capital Domestic _____%, Chinese _____%, Japanese _____%
   European and Americans _____%, Government _____%

   (3) Number of Employees Total _____
   Number of Permanent Employees _____
   Number of Temporary Employees _____

Table 4. The participants of UBISD comparing with other workers

In answering questions, please read 1 through 5 below firstly, then circle (○) an appropriate number next to each item/ factor.

ISD graduates / participants are much superior to other workers ----- 1
ISD graduates / participants are rather superior to other workers ----- 2
cannot say one way or other ----- 3
ISD graduates / participants are rather inferior to other workers ----- 4
ISD graduates / participants are much inferior to other workers ----- 5

(1) basic knowledge	1	2	3	4	5
(2) advanced knowledge	1	2	3	4	5
(3) basic technical skills	1	2	3	4	5
(4) advanced technical skills	1	2	3	4	5
(5) ability to catch up with recent technical advancement	1	2	3	4	5
(6) ability to complete responsible work	1	2	3	4	5
(7) ability to quickly master the required work	1	2	3	4	5
(8) level of overall understanding towards their working assignment	1	2	3	4	5
(9) positive approach toward work (morale)	1	2	3	4	5
(10) observing rules of working place (discipline)	1	2	3	4	5
(11) ability to observe work schedule	1	2	3	4	5
(12) strong sense of responsibility	1	2	3	4	5
(13) ability to concentrate on work	1	2	3	4	5
(14) hard-working	1	2	3	4	5
(15) spirit of cooperation	1	2	3	4	5
(16) obedience to an order	1	2	3	4	5
(17) quickness of decision making	1	2	3	4	5
(18) tactfulness or quick wit	1	2	3	4	5
(19) diligency such as no absenteeism, late coming to office	1	2	3	4	5
(20) leadership	1	2	3	4	5
(21) ability of self control and management	1	2	3	4	5
(22) ability of managing and supervising others	1	2	3	4	5
(23) ability to raise the morale (positive approach toward work) of colleagues and subordinates	1	2	3	4	5
(24) instruction and guidance of skills to colleagues and subordinates	1	2	3	4	5
(25) ability to raise the productivity of working place	1	2	3	4	5
(26) contribution to growth of the company	1	2	3	4	5

Table 3. Constitution of your employees in terms of educational backgrounds

Title	Education	Number or Proportion
Management Staff	college or university	(%)
	upper secondary school (vocational)	(%)
	upper secondary school (general)	(%)
	lower secondary school	(%)
	elementary school	(%)
	leaving elementary school in midcourse	(%)
Supervisor	college or university	(%)
	upper secondary school (vocational)	(%)
	upper secondary school (general)	(%)
	lower secondary school	(%)
	elementary school	(%)
	leaving elementary school in midcourse	(%)
Engineer / Technician	college or university	(%)
	upper secondary school (vocational)	(%)
	upper secondary school (general)	(%)
	lower secondary school	(%)
	elementary school	(%)
	leaving elementary school in midcourse	(%)
Skilled Worker	college or university	(%)
	upper secondary school (vocational)	(%)
	upper secondary school (general)	(%)
	lower secondary school	(%)
	elementary school	(%)
	leaving elementary school in midcourse	(%)
Regular Worker	college or university	(%)
	upper secondary school (vocational)	(%)
	upper secondary school (general)	(%)
	lower secondary school	(%)
	elementary school	(%)
	leaving elementary school in midcourse	(%)
Total	college or university	(%)
	upper secondary school (vocational)	(%)
	upper secondary school (general)	(%)
	lower secondary school	(%)
	elementary school	(%)
	leaving elementary school in midcourse	(%)

QUESTIONNAIRE

Respondents: Instructors of ISDs (UBISD and KISD)

Q.1. Have you ever participated in any training course of NISD? Please check (√) in the box after the appropriate answer. If you have participated more than once, please indicate how many times.

YES ☐ (times) NO ☐

Q.2. From what sources (or how) did you obtain the technical skills and knowledge you are applying to your work? What proportion does each factor listed below account for the skills and knowledge you currently use? In Answering, please read 1 through 7 below firstly, then circle an appropriate number next to each item/ factor.

All came from this. (100%)	----- 1
Most came from this.	----- 2
Much came from this.	----- 3
About half came from this. (50%)	----- 4
Not so much came from this.	----- 5
Very little came from this.	----- 6
None came from this. (0%)	----- 7

(1) Studying with the text books and training manuals provided by NISD

1 -- 2 -- 3 -- 4 -- 5 -- 6 -- 7

(2) Studying with books other than (1) 1 -- 2 -- 3 -- 4 -- 5 -- 6 -- 7

(3) School education before being hired by your ISD 1 -- 2 -- 3 -- 4 -- 5 -- 6 -- 7

(4) Training provided by NISD 1 -- 2 -- 3 -- 4 -- 5 -- 6 -- 7

(5) Training provided by other institutes than NISD in Thailand

1 -- 2 -- 3 -- 4 -- 5 -- 6 -- 7

(6) Overseas training 1 -- 2 -- 3 -- 4 -- 5 -- 6 -- 7

(7) From colleagues 1 -- 2 -- 3 -- 4 -- 5 -- 6 -- 7

(8) From the company previously employed 1 -- 2 -- 3 -- 4 -- 5 -- 6 -- 7

(9) Other than the above (concretely _____)

1 -- 2 -- 3 -- 4 -- 5 -- 6 -- 7

Q.3. From what sources (or how) did you obtain the teaching skills(methods) you are applying to your work? What proportion does each item/factor listed below account for the teaching skills you currently use? Please circle the figure. In Answering, please read 1 through 7 below firstly, then circle an appropriate number next to each item/ factor.

All came from this. (100%)	----- 1
Most came from this.	----- 2
Much came from this.	----- 3
About half came from this. (50%)	----- 4
Not so much came from this.	----- 5
Very little came from this.	----- 6
None came from this. (0%)	----- 7

(1) Studying with the text books and training manuals provided by NISD

1 -- 2 -- 3 -- 4 -- 5 -- 6 -- 7

(2) Studying with books other than (1) 1 -- 2 -- 3 -- 4 -- 5 -- 6 -- 7

(3) School education before being hired by your ISD 1 -- 2 -- 3 -- 4 -- 5 -- 6 -- 7

(4) Training provided by NISD 1 -- 2 -- 3 -- 4 -- 5 -- 6 -- 7

(5) Training provided by other institutes than NISD in Thailand

1 -- 2 -- 3 -- 4 -- 5 -- 6 -- 7

(6) Overseas training 1 -- 2 -- 3 -- 4 -- 5 -- 6 -- 7

(7) From colleagues 1 -- 2 -- 3 -- 4 -- 5 -- 6 -- 7

(8) From the company previously employed 1 -- 2 -- 3 -- 4 -- 5 -- 6 -- 7

(9) Other than the above (concretely _____)

1 -- 2 -- 3 -- 4 -- 5 -- 6 -- 7

Q.4. (This question is for the people who have participated in the training provided by NISD. If you have never participated in the training provided by NISD, please proceed to the next question.)
To what extent has the training provided by NISD been useful to your teaching?
Please check (√) in the box after the appropriate answer.

Very useful	☐
Rather useful	☐
Can't say one way or the other	☐
Not very useful	☐
Not useful at all	☐

Q.5. Of the skills and knowledge you teach, how much do you think that your students comprehend? Please check (√) in the box after the appropriate answer.

Almost all (81%~ 100 %) ☐
Almost (61% ~80 %) ☐
About the half(41% ~ 60%) ☐
Not so much (21% ~ 40%) ☐
Virtually none (0% ~ 20%) ☐

Q.6. Of the skills and knowledge you possess, how much do you transfer to your colleagues? Please check (√) in the box after the appropriate answer.

Almost all (81%~ 100%) ☐
Almost (61% ~80 %) ☐
About the half (41% ~ 60%) ☐
Not so much (21% ~ 40%) ☐
Virtually none (0% ~ 20%) ☐

Q.7. Personal Information

(1) Sex Male ☐ Female ☐

(2) Age _____years old

(3) The school from which you last graduated
Please check (√) in the box after the appropriate answer.

College or University ☐, Upper Secondary School (Vocational) ☐
Upper Secondary School (General)☐,Lower Secondary School ☐
Elementary school ☐, Leaving Elementary School in Midcourse☐

(4) Teaching Subject
Please check (√) in the box after the appropriate answer.

Auto-motive ☐, Machinery ☐, Electrical ☐,
Building Construction ☐, Others ☐ (concretely _____)

(5) What is your employment status?Please check (√) in the box after the appropriate answer.

Government Employees ☐ ISD Employees ☐

Q.8. Finally, please state your own opinions about the following:

(1) What are the strong points of NISD?

(2) What areas of NISD need to be improved, and how can they be improved?

(3) What are the strong points of the ISD where you are working?

(4) What areas of the ISD need to be improved, and how can they be improved?

Thank you for your cooperation.

INTERVIEW SHEET

Interview respondents: Instructors of NISD

Q.1. How do you appraise the instructors of ISDs who have participated in the training course at NISD?. Please fill in **Table** for the answer

For example: with regard to basic technical knowledge
with regard to advanced technical knowledge
with regard to basic technical skills
with regard to advanced technical skills
with regard to ability to catch up with the recent technological advancement
with regard to good understanding towards their own work

Q.2. What are the objectives of the instructor training of NISD? Please fill in **Table** for the answer.

For example: to help participants acquire advanced technical skills
to help participants understand overall technical knowledge
to help participants catch up with the recent technological advancement
to help participants upgrade their teaching skills
to help participants upgrade their management skills

Q.3. In your opinion, what are the possible bottlenecks for the smooth technology transfer from NISD to ISDs?

For example: differences in machinery and equipments available at NISD and ISDs
differences in curriculum
differences in skill levels among trainees within the same class
differences in training needs
skills of instructors of NISD etc.

Q.4. How much do you think that the ISDs' instructors who participate in your training courses can comprehend?

Q.5. Do you think that the instructors of NISD, who directly worked with the Japanese experts assigned to NISD, make the best of the technology transferred from such experts?

Q.6. Further, do you think that the skills and knowledge transferred from the Japanese experts have been smoothly transferred from the said instructors to other instructors of NISD?

Q.7. What do you think are NISD's strong points and weak points?

For example: - Curriculum
- Learning process
- Training materials
- Competence of instructors of UBISD
- Availability of equipments
- Duration of the training
- Trainees etc.

8. If you have any comments or requests regarding the Japanese technical cooperation programme for human resource development in Thailand, please state your views.

Table. The instructors of NISD

In your opinion, what are the characteristics of the instructors of ISDs who participate in the training provided by NISD? Firstly, please read 1 through 5 below, then circle (○) an appropriate number next to each item/ factor.

Totally disagree	--- 1
Rather disagree	--- 2
Cannot say one way or the other	--- 3
Rather agree	--- 4
Strongly agree	--- 5

(1) equipped with basic knowledge	1 -- 2 -- 3 -- 4 -- 5
(2) equipped with advanced knowledge	1 -- 2 -- 3 -- 4 -- 5
(3) equipped with basic technical skills	1 -- 2 -- 3 -- 4 -- 5
(4) equipped with advanced technical skills	1 -- 2 -- 3 -- 4 -- 5
(5) equipped with the ability to catch up with recent technical advancement	1 -- 2 -- 3 -- 4 -- 5
(6) equipped with the ability to understand their working assignment thoroughly	1 -- 2 -- 3 -- 4 -- 5
(7) positive approach toward work (morale)	1 -- 2 -- 3 -- 4 -- 5

What about <u>the instructor training provided by NISD</u> with respect to the following items?

(8) helpful in acquiring basic knowledge	1 -- 2 -- 3 -- 4 -- 5
(9) helpful in acquiring advanced knowledge	1 -- 2 -- 3 -- 4 -- 5
(10) helpful in acquiring basic technical skills	1 -- 2 -- 3 -- 4 -- 5
(11) helpful in acquiring advanced technical skills	1 -- 2 -- 3 -- 4 -- 5
(12) helpful in catching up with recent technical advancement	1 -- 2 -- 3 -- 4 -- 5
(13) increase the participants' understanding towards their working assignment thoroughly	1 -- 2 -- 3 -- 4 -- 5
(14) helpful in acquiring teaching skills	1 -- 2 -- 3 -- 4 -- 5
(15) helpful in teaching the skills and knowledge acquired during the training to their students in each ISDs	1 -- 2 -- 3 -- 4 -- 5
(16) helpful in teaching the skills and knowledge acquired during the training to colleagues and subordinates	1 -- 2 -- 3 -- 4 -- 5