Indonesia

Development Project of Institute of Technology in Bandung (1)

Report Date: March 2001
Field Survey: August 2000

1. Project Profile and Japan's ODA Loan

Location Map of Project Area

School Building Newly Constructed by this Project (No.5 Building)

(1) Background

The Institute of Technology in Bandung (ITB), which was founded in 1920, is Indonesia's oldest university. It is a first-rate academic university in technical fields and serves as Indonesia's center for technical education, providing personnel for the government and the private sector. It also provides ongoing education for the teaching staff of domestic universities, and advises the government on matters of technology policy and development. The Fifth Five-Year Plan set the education of personnel to support the country's economic development as the main target for the education sector (higher education). Particular emphasis was placed on raising the quality and quantity of technical students, raising the quality of bureaucrats, and enhancing the efficiency of university operations. To meet the demands of the country's development policies and make rapid and effective progress in technical education and development, the ITB, which had taken a leading role in previous education and development, was targeted for expansion and improvement.

The comprehensive plan for the expansion and improvement of the ITB was scheduled for a period of ten years. Phase I (the first five years) aimed to improve the internal efficiency of education by improving tutorial staff and experimental research equipment and materials, and by alleviating the in the cramped conditions of the facilities. To that end, Phase I raised the level of tutors (through study abroad), provided equipment and materials, and redeveloped the main campus. It also opened two of the planned new academic departments -- marine engineering and materials engineering -- because preparations for those departments were already relatively advanced. Phase II aimed to further improve the internal efficiency of education, focusing on post-graduate education, new courses and strengthening research. The western campus of ITB was targeted for development under Phase II.

(2) Objectives

Phase I aimed to improve the university's buildings, materials and equipment, with emphasis on the Faculty of Science and Faculty of Engineering, and whereby improve the internal efficiency of education and research (graduation rate: [No. of graduating students / No. of registered students] x 100) and establish new strategically important departments for Indonesia's industrialization and technical development (Department of Marine Engineering and Department of Materials Engineering). Phase I was to include the following projects:

[1] Engineering services (E/S) for Phase I projects.
[2] Construction of two education and research buildings necessary for the first step in redeveloping the main campus.
[3] Provision of equipment and materials for the above two education and research buildings.

(3) Project Scope

1) Construction works

[1] No.5 education and research building (8,000m^2): Computer center, Faculty of Information Science, Department of Marine Engineering, shared university buildings.
[2] No.6 education and research building (8,000m^2): Faculty of Applied Physics and shared university buildings.

2) Educational equipment and materials

[1] Provision of educational equipment and materials for the departments to be housed in the No.5 and No.6 education and research buildings.
[2] Faculty of Information Science: Computers etc.
[3] Department of Marine Engineering: Marine environmental research equipment (equipment for the collection of samples)
[4] Faculty of Applied Physics: Plant control equipment.

3) Consulting services

[1] Review of the M/P.
[2] Basic and detailed designs for the buildings scheduled to be built in Phase I (review of detailed designs for the No.5 and No.6 education and research buildings). Eight buildings for education and research and other functions.
[3] Selection of educational equipment and materials (Equipment and materials for the Faculty of Information Science, Faculty of Applied Physics and Department of Marine Engineering, which were to be housed in the No.5 and No.6 education and research buildings for construction in Phase I).
[4] Preparation of bidding documents.
[5] Management of the construction works for No.5 and No.6 education and research buildings.
[6] Management of the delivery and installation of equipment and materials.
[7] Assistance for coordination between the various components of the project, and between related agencies.

4) Technical assistance (T/A)

[1] Preparation of Japanese-language training programs for dispatch of students to Japan.

[2] Assistance for a review of the plan for dispatch of students to Japan, and for preparations for dispatch of students.

(4) Borrower/Executing Agency

Republic of Indonesia / Directorate General of Higher Education, Ministry of Education and Culture

(5) Outline of Loan Agreement

Loan Amount/Loan Disbursed Amount	¥1,609 million / ¥1,580 million
Exchange of Notes/Loan Agreement	September 1992 / October 1992
Terms and Conditions	Interest rate: 2.6%, Repayment period: 30 years (10 years for grace period), General Untied (Partially untied for consulting services)
Final Disbursement Date	November 1997

2. Results and Evaluation

(1) Relevance

Indonesia's development policy continues to emphasize the education of instructors in fields such as education, science and technology who will build human resources for the country's development. Therefore, the objectives of this project remain relevant at the time of evaluation.

The implementation of the project was extended by the addition of equipment, materials and technical assistance related to the construction of building No. 10. The extension of project scope contributed to the realization of the project's objectives, and, as will be described below, had no effect on the total cost or implementation schedule of the project. Therefore, the made to the scope of the project are considered relevant.

(2) Efficiency

Effective implementation of international competitive bidding, and other factors, succeeded in cutting the implementation schedule for education and research buildings No.5 and No.6 by five months, and in reducing the cost. In addition, the construction of education and research building No. 10 (Faculty of Chemical Engineering, Department of Materials Engineering) and related consulting services were carried out within the planned total cost and according to the implementation schedule. Inflation and other factors caused a cost overrun of around 50% above the nominal cost in local currency, but there was no major problem because the total project cost and the ODA loan portion both remained within the planned range.

(3) Effectiveness

1) Quantitative effects

Figure 1 shows the increasing trend in the numbers of students in each of the two new departments. Student numbers in both the Department of Marine Engineering and the Department of Materials Engineering have been growing steadily since the two departments opened in 1994, probably because the courses offered reflect social needs. By 1999, the two departments had 174 and 169 students, respectively. The number of students enrolled in each of the new departments is rising, indicating that the school are providing needed access to advanced academic fields.

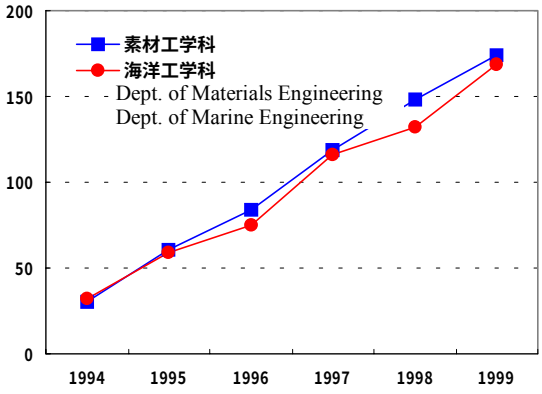


Figure 2 Internal Efficiency of Education in Each Department and Faculty

Figure 2 shows the internal efficiency ([No. of graduating students / No. of registered students] x 100) of the departments and faculties housed in buildings No.5, No.6 and No.10, which were built under this project. The university-wide target was to increase internal efficiency from 13% in 1990 to 20% in 2002. Internal efficiency at the three established faculties, which was in the 10~15% range in 1991, rose to the 13~22% range by 1999. Figures for the two new departments are included for reference, but their internal efficiency figures for 1999 are reduced because they opened in 1994, meaning that they were just producing their first graduates and because their student entry numbers are increasing every year. Their figures are expected to rise to the level of the other faculties from 2000 on.

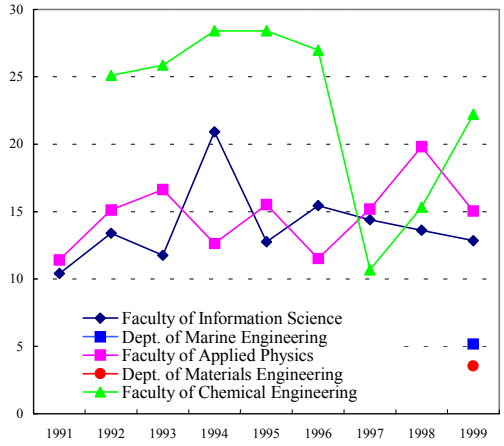
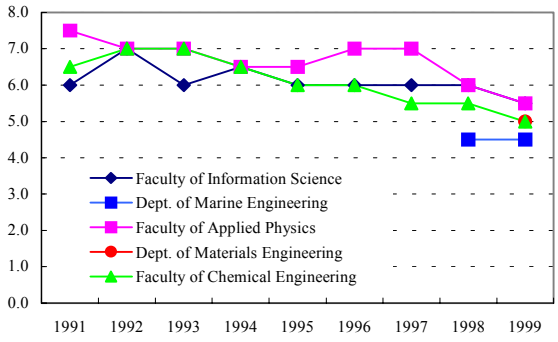


Figure 3 Average Years to Graduation in

Figure 3 shows the average years to graduation in each department and faculty. The three previously established faculties do not reach the regulation course duration of 4.5 years, but the actual number of years required is declining in each. As mentioned above, the two new departments have figures of 4.5~5.0 years because only those who made steady progress would have graduated by this stage.



※Source：Institute of Technology in Bandung

The number of students per faculty member, which can be regarded as an indicator of the quality of education, was 10~13 in the three older faculties (in 1999), and it is considered unlikely that they will reach their target of 8.4 by 2002. The number of graduate students in those faculties has been growing steadily, and the number of teaching staff should be increased to fill the gap.

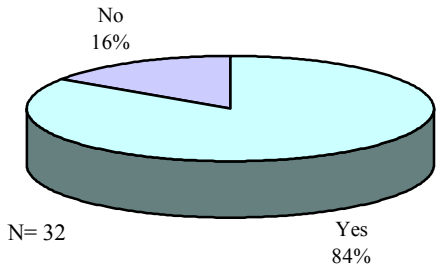
2) Evaluation by university-related persons

For this report, a questionnaire survey was distributed, with the assistance of the Bandung Institute of Technology, to teaching staff and students associated with the Department of Marine Engineering and Department of Materials Engineering. The results, obtained from 32 respondents, are summarized below.

<Contribution to improving educational efficiency>

Over 80% of respondents stated that the project had improved educational efficiency (Figure 4). The reasons given for the improvement were: "The expansion of university equipment and facilities has an indirect impact in improving educational efficiency," and "The research environment is more comfortable and efficient, enabling researchers to concentrate better on their research work".

Figure 4 Do you think this project helped to improve educational efficiency at this university (Yes/No)

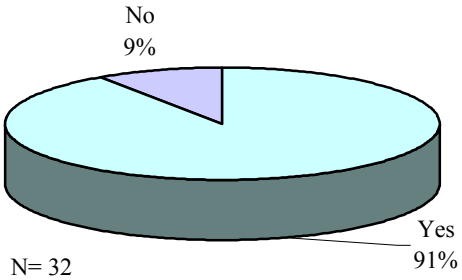


Reasons given by respondents who answered that the project did not improve educational efficiency (less than 20% overall), included the fact that "the expanded facilities and equipment basically have no direct connection with educational efficiency," and that "the facilities and equipment were excellent when they were newly completed, but their deterioration is becoming apparent after more than five years".

<Contribution to raising academic levels>

Over 90% of respondents felt that the project had helped to raise the academic level of the Bandung Institute of Technology (Figure 5). The university's traditional admission standards preclude all but Indonesia's finest students form entering, and that policy has compounded with the improved standards of facilities and equipment to raise academic levels.

Figure 5 Do you think this project helped to improve the academic level of this university? (Yes/No)

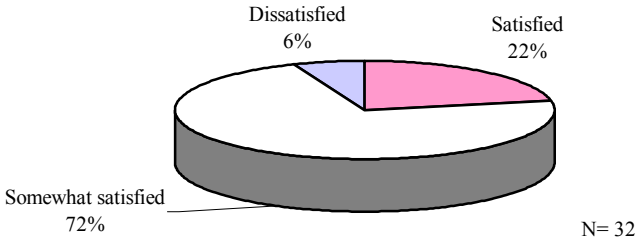


Respondents who answered in the negative (less than 10% overall), took the same view as in the preceding question, that "the expanded facilities and equipment basically have no direct connection with educational efficiency".

<Overall satisfaction>

As Figure 6 shows, over 90% of respondents were either "satisfied" or "somewhat satisfied" with the project overall. There was a very limited level of dissatisfaction among the teaching staff and students.

Figure 6 Satisfaction with This Project (selection from three levels)



(4)Impact

1) Social impact

Three years after the completion of the project, it is difficult to assess its contribution to the higher goal of contributing to Indonesia's industrialization and technological development. It takes a long time for human resource development through education to make a contribution to national progress; therefore, it is still too soon to gauge how well that objective has been attained.

2) Environmental impact

This project consisted of improvements to facilities within the university's buildings, and therefore its implementation had no notable negative impact on the environment.

(5) Sustainability

1) Operation and Maintenance

The maintenance of the facilities is the responsibility of the Department of General Affairs, which has a staff of 304. Maintenance teams are formed under the vice chancellor, and the faculties and departments that occupy each building (No.5 building houses the Faculty of Information Science, No.6 houses the Faculty of Applied Physics and the Department of Marine Engineering, and No.10 houses the Faculty of Chemical Engineering and Department of Materials Engineering) operate a system in which they cooperate mutually with to distribute funding and personnel. The maintenance activities of common areas (elevators, toilets, corridors and other passages, and equipment) are controlled and supervised by facility managers, who are members of the maintenance team funded from the university's maintenance budget and payment from the tenants.

2) Operation and Maintenance Status

<Operation and maintenance budget>

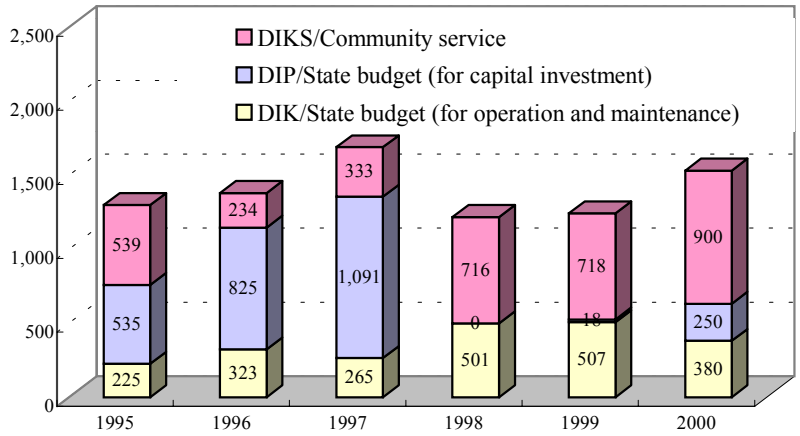
Costs for maintenance of all the university's facilities are covered from three financial sources: DIKS (community service), DIP and DIK. DIKS is a fund made up of donations to the university. DIP is a fund

allocated from the annual state budget for capital investment (including maintenance and repairs); DIK is also from the annual state budget, but is allocated to operating funds.

Figure 7 shows how budget allocations from each funding source changed between 1995 and 2000. There was a shift in the balance of funding sources for operation and maintenance around the time of Indonesia's currency crisis in 1997. Up to 1997, the majority of funding came from the state budget (DIP and DIK), but from 1998 onward, the share from those sources dropped and DIKS came to provide a larger share. For the two years of state fiscal crisis due to the currency crisis, 1998 and 1999, DIP largely ceased, and the university's independent DIKS was used to cover the budget shortfall. DIP finally recovered in 2000, but the state budget is still less than half of the total.

Figure 7 Movements in Operation and Maintenance Budgets (millions of Rupiah)

* Based on data from the Bandung Institute of Technology



The total budget value was 1,530 million Rupiah in 2000. As the total area of the facilities is 450,000m^2, the unit maintenance budget was around 3,400 Rupiah/ m^2. This is not adequate funding. The teaching staff generally spend 25% of their working time on teaching and other activities within the university. The remaining 75% is spent on joint research and contracted research for companies, to earn funding from external sources. Their work covers a portion of the budget shortfall (such earnings are not accounted as general university budget, and are therefore not presented in the graph above)[1]. Around one million Rupiah/ year are allotted to the Faculty of Information Science and the Faculty of Chemical Engineering from the procured funds for maintenance, repair and fixture costs.

<State of the facilities>

The evaluation mission visited Bandung Institute of Technology in August 2000 to inspect the condition of buildings No.5, No.6 and No.10. Some facilities were in poor condition, but the structures themselves were sound and there were no notable problems.

3) Sustainability

All those involved in the ITB go about their duties with pride in its academic record, even though the institution suffers from inadequate operation and maintenance budgets. Only the top 3% of 450,000

[1] Under government regulations, teaching staff must spend at least six months of each year in educational work within their universities, but the reality is moving away from the regulations.

applicants nationwide are able to enter the ITB, and their high performance after admission helps to maintain its high academic level. The university's ability to continue attracting the best applicants is directly linked to its ability to maintaining high academic efficiency. Therefore, the teaching staff are united in striving to preserve the scholastic spirit and idealism that are the university's pride.

A successor project is now being implemented, and the university's facilities are expanding further. The university authorities are satisfied with the expansion of the facilities, but some are concerned about whether it will be possible to operate and maintain the facilities effectively and efficiently. The facilities must be expanded in order to produce as many superior personnel as possible, but if the maintenance scheme (finance and personnel) is not reinforced at the same time, it will be difficult to ensure sustainability and independent development potential. The questionnaire of university-related people indicated that these issues are potential problems, and appropriate measures will have to be taken before the situation becomes severe.

The level of funding that can be secured from the central government (DIP, DIK) and from independent funds (DIKS) is limited, and the teaching staff must spend a majority of its working time on commissioned studies and other tasks. Some are of the opinion that this situation leads to neglect of academic work. According to the university authorities, the proportion of Indonesia's education sector budget that is covered by the central government is expected to rise from the current 6% to 25% in the near future. However, it is thought that government expenditures will be allocated mainly to elementary and secondary education; there is little prospect of increased funding for higher education. While an adequate budget allocation from the central government would be desirable, further consideration must be given to ways in which institutions of higher education can secure their own financial independence in ways that do not impede their educational work, for instance by taking in external funds through commissioned studies and through links with the private sector.

Comparison of Original and Actual Scope

Item	Plan	Actual
① Project Scope		
(1) Construction Works		
・No.5 education and research building	- Total floor area: 8,000㎡	- Total floor area: 8,740㎡
・No.6 education and research building	- Total floor area: 8,000㎡	- Total floor area: 8,740㎡
・No.10 education and research building	-	- Total floor area: 8,118㎡
(2) Materials and equipment for education		
・Faculty of Information Science / Computer Center ・Faculty of Applied Physics ・Faculty of Marine Engineering	- Details were to be coordinated and decided by engineering services	- Package I (Information and Computer System) - Package II (Measurement & Electro/Mechanical System) - Int'l Shopping (Procurement of Wave Simulator System Equipment) - Procurement of Additional Equipment
(3) Technical assistance	- Introduction of Japanese language training program - Introduction of dispatching student system	- No changes - No changes
(4) Consulting service	- Review of master plan - Review of detailed design - Engineering service - Construction supervision - Project management	- Review of master plan - Preparation and review of detailed design - Engineering service - Construction supervision - Project management
② Implementation Schedule		
(1) Consulting service		
・Contract	- May 1993	- E/S: Oct. 1993, P/M: Aug. 1993
・Detailed design	- Jul. 1993 ~ Fe. 1994	- Oct. 1993 ~ Mar. 1994
・Construction supervision	- Jun. 1994 ~ Aug. 1995	- Mar. 1994 ~ Mar. 1995
(2) Construction works		
・Bidding	- Sep. 1993	- No.5 and No.6 buildings: Oct. 1993
・Construction	- Sep. 1994 ~ Aug. 1995	- Mar. 1994 ~ Mar. 1995
(3) Procurement of materials and equipment		
・Bidding	- Jan. 1994	- Mar. 1994 for each Package
・Delivery / installation	- Feb. 1995 ~ Mar. 1996 (To be completed)	- Package I, II: Nov. 1994 ~ Jun. 1995 - Int'l Shopping: Feb. 1995 ~ Jan. 1996
(4) Technical assistance		- Fellowship Services Bidding: Aug. 1993 Period: Nov. 1993 ~ Sep. 1994 - Language Services Bidding: Aug. 1993 Period: Dec. 1993 ~ Sep. 1994 ☆Completed in December 1995☆ Additional items below.

Item	Plan	Actual
		1) Consulting service 2) Construction works (No.10 building) ・ Bidding: Aug. 1994 ・ Period: Jan. 1994 ~ Dec. 1995 3) Procurement of materials and equipment (international procurement) ・ Bidding: Aug. 1995 ・ Delivery/installation: Nov. 1995 ~ Mar. 1996 4) Technical assistance (language training) ・ Bidding: Nov. 1994 ・ Period: Jan. 1995 ~ Mar. 1995 ☆Completed in March 1996☆
③Project Cost Foreign currency Local currency Total ODA loan portion Exchange rate	 ¥537 million 21,243 million Rp. ¥1,894 million ¥1,609 million 1Rp. ＝¥0.064	 ¥555 million 32,373 million Rp. ¥1,830 million ¥1,570 million 1Rp. ＝¥0.052