

Malaysia

FY2018 Ex-Post Evaluation of Japanese ODA Loan Project

“Higher Education Loan Fund Project (III)”

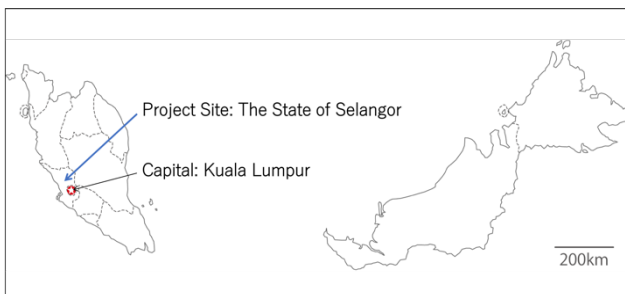
External Evaluator: Takako Haraguchi, Global Group 21 Japan, Inc.

0. Summary

This project attempted to facilitate the development of engineers with advanced skills and strong work ethic by implementing a program that combines in-country education with undergraduate study abroad in Japan and programs for postgraduate study abroad in Japan for Malaysian students in science and technology. The relevance of the project is high because these objectives are consistent with Malaysia’s development plan, Malaysia’s development needs, and Japan’s aid policy. The evaluation confirms that thanks to these programs, which were refined based on the experience in preceding phases, the graduation rate among Malaysian students who studied in Japan is high. Many graduates are active in the science and technology fields and development/research/design work, contributing to the economic development in Malaysia and the facilitation of a friendly relationship between the two countries. Therefore, the effectiveness and impact are high. The efficiency is high because neither the project cost nor the project period exceeded the plan. The sustainability is high, reflecting the follow-up efforts by the executing agency facilitating the success of the graduates and the continuing implementation of a domestic project in Malaysia that was modeled after this project.

In light of the above, this project is evaluated to be highly satisfactory.

1. Project Description



Project location



Graduates who serve as in-country education instructors in the subsequent domestic project in Malaysia (Fingers indicating his or her own phase)

1.1 Background

Against the backdrop of the rise of new production centers in neighboring countries with cheap labor, Malaysia was experiencing a decline in its comparative advantage as a conventional labor-intensive production center in the manufacturing sector, which had driven

the country's economic development. For this reason, Malaysia, through its development policies including "The National Development Initiative (Vision 2020)" (announced in 1991), aimed for a social development based on a knowledge/technology-intensive economy to strengthen Malaysia's competitiveness through improved value-added and productivity in the industry. Malaysia thus needed to develop talents who would enable these goals, particularly those individuals who have advanced skills and strong work ethic. Under such a circumstance, in addition to promoting the expansion of the quality and quantity of domestic higher education institutions, the Malaysian government promoted studying abroad in academic fields for which domestic capacity was insufficient such as the science and technology fields.

At the same time, Malaysia has promoted the "Look East Policy" since 1982. This policy, advocated by then Prime Minister Mahathir, pursued Malaysia's own nation building by modifying the conventional Western-oriented approach and actively learning from Far Eastern countries such as Japan and South Korea. In line with this policy, Japan started to provide assistance in 1983 including the dispatching of instructors for pre-study abroad preparatory instructions in Malaysia, and has since then continuously accepted Malaysian students to support the "Look East Policy Study Abroad Program" of the Public Service Department of Malaysia. Additionally, since 1993, Japan assisted the in-country education and study abroad for Malaysian students in science and technology through ODA loan projects "Higher Education Loan Fund Project" (hereafter, "HELP1"¹) and "Higher Education Loan Fund Project (II)" (hereafter, "HELP2") in which the MARA Education Foundation (Yayasan Pelajaran MARA: YPM) acted as the executing agency. Since studying abroad in Japan would cost more than studying abroad in Western countries, HELP2 introduced a "twinning" system in which students would complete part of the undergraduate education in Malaysia and transfer mid-degree to a Japanese university. Furthermore, HELP2 particularly emphasized the development of talents who would engage in development and research and initiated a master's level study abroad program. The "Higher Education Loan Fund Project (III)" (hereafter, "HELP3" or "this project") as its succeeding phase assisted the continuation and development of the study abroad program from preceding HELPs by further improving the twinning system and adding a doctoral-level study abroad program.

1.2 Project Outline

The objective of this project is to facilitate the development of engineers with advanced skills and strong work ethic needed for the area of development and research by implementing in Malaysia and Japan a twinning program consisting of in-country education and undergraduate study abroad in Japan and postgraduate study abroad programs in Japan for Malaysian students

¹ Hereafter, "HELP," without a number, will be used to refer to the series of "Higher Education Loan Fund Projects" from HELP1 through HELP3. To collectively refer to HELP1 and HELP2, "preceding HELPs" will be used.

in science and technology, thereby contributing to the strengthening of industrial competitiveness needed for Malaysia’s economic development and the facilitation of a friendly relationship between the two countries.

Loan Approved Amount/ Disbursed Amount	7,644 million yen / 7,140 million yen
Exchange of Notes Date/ Loan Agreement Signing Date	March 2006 / March 2006
Terms and Conditions	Interest Rate 1.2% Repayment Period 25 years (Grace Period 7 years) Conditions for Procurement General Untied
Borrower / Executing Agency	Malaysia / Yayasan Pelajaran MARA (MARA Education Foundation) (YPM)
Project Completion	March 2015
Target Area	The State of Selangor and Japan
Main Contractor(s) (Over 1 billion yen)	None
Main Consultant(s) (Over 100 million yen)	Japanese University Consortium for Transnational-education (JUCTe)
Related Studies (Feasibility Studies, etc.)	Special Assistance for Project Implementation (SAPI) study for “Higher Education Loan Fund Project” (1998) SAPI study for “Higher Education Loan Fund Project (II)” (2001)
Related Projects	<u>ODA Loan</u> Higher Education Loan Fund Project (HELP1) (1992) Higher Education Loan Fund Project (II) (HELP2) (1999) Look East Policy (1999) <u>Malaysian domestic projects</u> Look East Policy Study Abroad Program (1983–) Malaysia Japan Higher Education Program (MJHEP) (2011–2023 (expected))

The twinning for the undergraduate study abroad program has evolved in the following way. HELP1 adopted a “2+4” system in which students would first receive two years of in-country preparatory instructions in Malaysia and then spend four years at a Japanese university where they would enroll as first-year students after taking an entrance examination. HELP2 introduced twinning as mentioned above, adopting a “2+3” system in which students would first receive two years of in-country education (one year of preparatory instructions and the first-year undergraduate education) and then spend three years at a Japanese university where they

matriculate as second-year transfer students after taking a transfer examination. Finally, this project (HELP3) adopted a “3+2” system in which students would receive three years of in-country education (one year of preparatory instructions and the first- and second-year undergraduate education) and then spend two years at a Japanese university where they matriculate as third-year transfer students after taking a transfer examination.

After the completion of this project, the executing agency implemented a domestic project that was modeled after the “3+2” twinning system of this project, the “Malaysia Japan Higher Education Program” (hereafter, “MJHEP”). Table 1 outlines each HELP phase and MJHEP through the time of ex-post evaluation.

Table 1. Outlines of HELPs and MJHEP

	HELP1	HELP2	HELP3 (this project)	MJHEP
Type of implementation (Loan agreement)	ODA loan project (May 1992)	ODA loan project (April 1999)	ODA loan project (March 2006)	Malaysian domestic project
Executing agency	MARA Education Foundation	MARA Education Foundation	MARA Education Foundation	MARA Education Foundation
Period ^a	1993–2004	1999–2009	2005–2015	2011–2023
Program	<u>Bachelor’s</u> “2+4” <ul style="list-style-type: none"> • 2 years of in-country education • 4 years of studying abroad in Japan (as 1st-year undergraduate students) 	<u>Bachelor’s</u> “2+3” Twinning <ul style="list-style-type: none"> • 2 years of in-country education • 3 years of studying abroad in Japan (as 2nd-year undergraduate transfer students) <u>Master’s</u> <ul style="list-style-type: none"> • 2 years of studying abroad in Japan 	<u>Bachelor’s</u> “3+2” Twinning <ul style="list-style-type: none"> • 3 years of in-country education 2 years of studying abroad in Japan (as 3rd-year undergraduate transfer students) <u>Master’s</u> <ul style="list-style-type: none"> • 2 years of studying abroad in Japan <u>Doctor’s</u> <ul style="list-style-type: none"> • 3 years of studying abroad in Japan 	Same as HELP3
Number of participated students and graduates (Cumulative total)	<u>Bachelor’s</u> : 291	<u>Bachelor’s</u> : 270 <u>Master’s</u> : 79	<u>Bachelor’s</u> : 465 <u>Master’s</u> : 68 <u>Doctor’s</u> : 13	<u>Bachelor’s</u> : 359 <u>Master’s</u> : 145 <u>Doctor’s</u> : 23 (Number of graduates through March 2019)

Source: Prepared from documents provided by the Japan International Cooperation Agency (JICA) and the executing agency.

Note: a. “Period” refers to the period in which in-country education or the study abroad program was provided to students.

2. Outline of the Evaluation Study

2.1 External Evaluator

Takako Haraguchi, Global Group 21 Japan, Inc.²

² Participated as reinforcement from i2i Communication, Ltd.

2.2 Duration of Evaluation Study

This ex-post evaluation study was conducted with the following schedule.

Duration of the Study: September 2018 – August 2019

Duration of the Field Study: November 25 – December 7, 2018

February 10 – February 14, 2019

2.3 Constraints during the Evaluation Study

In this ex-post evaluation, a tracer survey of the graduates using an online structured survey was conducted. Although a complete enumeration was originally planned, we could only send the request for participation to 240 individuals out of a total of 505 graduates³ (of these, 180 responded). These were the only individuals for whom we could identify the valid contact information through referrals from former consultants and interviewed graduates and solicitations on social networking services (SNS) through the alumni association, since the information about the graduates is not being updated at the executing agency. There are potential biases, such as more professionally successful graduates may be easier to contact or more motivated to answer. However, it is difficult to generalize their impact on the study results because it is also conceivable that busy graduates may be less involved in the alumni association and may not respond to the survey. With this being said, we should note that the respondents do not statistically represent the entire graduates.

3. Results of the Evaluation (Overall Rating: A⁴)

3.1 Relevance (Rating: ③⁵)

3.1.1 Consistency with the Development Plan of Malaysia

As explained below, the consistency between this project and Malaysia's development policy is high both at the time of appraisal and ex-post evaluation.

The aforementioned "Vision 2020" and "Look East Policy" have continued through the time of ex-post evaluation. The development of talents with advanced knowledge and skills for economic development is emphasized in each of the long-term plans, the "Third Outline Perspective Plan" (2001–2010) and the "Government Transformation Programme" (2011–2020), and mid-term plans, the "Eighth Malaysia Plan" (2001–2005) and the "Eleventh Malaysia Plan" (2016–2020).

The education policy, the "Malaysia Education Blueprint" (2013–2025), promotes the specialization and diversification of higher education institutions, internationalization of the

³ The number of unique individuals, with no double counting of the same recipient who received multiple scholarships in this project, such as for the undergraduate and graduate programs or for the master's and doctor's programs.

⁴ A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

⁵ ③: High, ②: Fair, ①: Low

higher education system, and collaboration between the government, higher education institutions, researchers, industry, and the community for building a higher education system that can contribute to the strengthening of Malaysia's international competitiveness. The industrial policy, the "Third Industrial Master Plan" (2016-2020) promotes the development of talents in the science and engineering fields for research and development (R&D) as one of the key strategies with emphasis on the production of high value-added products and the application of technologies.

3.1.2 Consistency with the Development Needs of Malaysia

Based on the circumstances described in "Background," the consistency between this project and the development needs was high at the time of appraisal. It is also high at the time of ex-post evaluation based on the following points.

Although the development of engineers and R&D professionals are in an upward trend as shown in Table 2, the need for talents in the science and technology fields persists. The policies mentioned above commonly point out that there still is a shortage of talents needed to promote high value-added industries. In addition, the proportion of students in the science and technology fields is still around 40 percent, which has not changed despite the upward trend in the number of students in higher education. The demand for the graduates of Japanese universities is also high in the industry and educational fields. The Japanese Chamber of Trade & Industry, Malaysia, points out that the demand for individuals who studied in Japan and acquired Japanese work ethic and Japanese language skills is uniformly high among Japanese-owned companies. Due to the adoption of a policy for curbing foreign workers (such as a moratorium on accepting new workers) in 2016 by the Malaysian government, qualified Malaysian workers are in even higher demand.

The number of Malaysian students studying in Japan has steadily increased and the aforementioned Look East Policy Study Abroad Program is continuing (Table 2). On the other hand, according to the Japanese universities that accepted HELP/MJHEP students (hereafter, "Partner Universities"), the need for securing and expanding outstanding international students is also increasing among Japanese universities. Although the following do not constitute studying abroad, the opening of the Malaysia-Japan International Institute of Technology (hereafter, "MJIT") in 2011, which provides Japanese-style engineering education in Malaysia, and the plans for creating satellite campuses of Japanese universities in Malaysia are also part of the responses to the need for Japanese university education. Furthermore, because students who seek positions in the science and technology fields are more likely to advance to graduate school, the need for postgraduate study abroad is also high among the HELP/MJHEP students. According to the placement survey by the executing agency, 217 out of 454 respondents who studied at Japanese undergraduate programs through this project directly advanced to Japanese

graduate schools after graduating their undergraduate programs.

Table 2. Indicators concerning the supply of human resources
in science/technology and higher education

	2005	2010	2015	2017
Number of newly registered engineers (person) ^a	3,253 (2006)	5,235	7,966	5,506 (2016)
Number of R&D professionals (person) ^b	19,021 (2006) (Female: 38%)	67,412 (Female: 49%)	89,861	Unknown
Number of R&D professionals per 10,000 workers (person) ^b	18 (2006)	55	62	Unknown
Number of students in higher education (thousand persons) ^c	672	1,134 (Female: 55%)	1,236 (Female: 55%)	1,326 (Female: 53%)
Of these, proportion of students in science and technology (%) ^c	39%	39%	41%	37%
Number of students studying at overseas higher education institutions (person) ^d	47,491	59,442	64,767	64,187
Number of students studying at Japanese higher education institutions (person) ^e	2,114	2,548	2,594	2,945
Of these, Look East Policy Study Abroad Program (person) ^f	483	409	314	395
HELP/MJHEP (person) ^f	56	79	90	117

Source: a. The Board of Engineers Malaysia; b. The Malaysian Science and Technology Information Centre of Ministry of Science, Technology and Innovation; c. The Ministry of Education Malaysia; d. The United Nations Educational, Scientific and Cultural Organization, the Institute of Statistics; e. The Japan Student Services Organization; f. The Embassy of Japan in Malaysia.

Note: The proportion of females is mentioned only where data are available. b. Not including technicians and support staff.

3.1.3 Consistency with Japan's ODA Policy

As explained below, the consistency with Japan's ODA policy at the time of appraisal was high. The "Country Assistance Program for Malaysia" (November 2004) identifies the development of highly knowledgeable and skilled individuals that would play key roles in Malaysia's future as a priority area for support. In addition, the "Medium-Term Strategy for Overseas Economic Cooperation Operations" (September 2005) promotes the assistance on human resource development as a priority area. Furthermore, the "Country Assistance Strategy for Malaysia" (September 2005) also states that Japan would assist human resource development through higher education in the science and technology fields including development and research to contribute to the strengthening of international competitiveness by transforming the Malaysian economy into a knowledge-intensive economy.

In light of the above, this project has been highly relevant to Malaysia's development plan and development needs, as well as Japan's ODA policy. Therefore its relevance is high.

3.2 Efficiency (Rating: ③)

3.2.1 Project Outputs

The components of this project included the development and operation of—and the

procurement of educational equipment required for—an in-country education program in Malaysia for Malaysian students transferring to Japanese universities, short- and long-term dispatching of staff including instructors from Japan, and the granting of scholarships (no financial obligations to students) to the students including the expenses for studying abroad (undergraduate and postgraduate). The outputs of this project covered by the ex-post evaluation are organized, as in the plan at appraisal, into five categories: 1) the provision of scholarships, 2) education services (the operation of an in-country education program), 3) the procurement of educational equipment, 4) the development of lecturers for in-country education and the improvement/studies on the program, and 5) consulting services. Each area of actual outputs will be discussed below. Among these outputs, the granting of scholarships (the number of study abroad students) grew, but others were generally in line with the plan. “Comparison of the Original and Actual Scope of the Project” at the end of this report should also be reviewed.

1) Granting of scholarships (the number of study abroad students)

As shown in Table 3, the plan at appraisal designated a combined total of 491 undergraduate and graduate scholarships, but the actual number of scholarships provided to Malaysian students who studied in Japan was 550,⁶ and a cumulative total of 546 students among them graduated from or completed Japanese universities or graduate schools. The increase in the number of recipients, which was the result of expanding the available slots for undergraduate and graduate programs by using additional funding from the Ministry of Finance of Malaysia (unused funds in the Malaysia-side budgets in preceding HELPs) and the unused portion of both the loan and Malaysian funds within the project budget of this project, is considered appropriate as it is in line with the needs. On the other hand, the actual number for the doctor’s program was lower than the plan. The executing agency and graduates explained the situation as follows. Many graduates in this project who completed their undergraduate programs desired to continue to master’s programs in Japan. However, since the number of available slots for master’s programs in this project was limited, many graduates advanced to Japanese graduate schools by receiving combined master’s/doctor’s scholarships provided by Malaysian universities and other entities (with a condition that they would become the faculty members of these universities after receiving degrees).⁷ This might have been a reason why the number of applications for the doctoral-only scholarships was lower than the number of available slots.

⁶ The total number of scholarship recipients including the 44 students who quit the pre-study abroad in-country preparatory instructions was 594.

⁷ As discussed in “Consistency with the Developing Needs of Malaysia,” about 48 percent (217 of the 454 people who responded) of the students in this program who graduated universities directly advanced to Japanese graduate schools, but the capacity for master’s program in this project was 15 percent of that for the undergraduate program.

Table 3. Actual results of study abroad in HELP3 (as of March 2015)

Program	Planned number of students in appraisal	Available slots after adjustment	In-country education in Malaysia (3 years)		Study abroad in Japan (2 years for undergraduate/master's, 3 years for doctor's)		
			Entered (Actual)	Completed (Actual)	Study abroad students (Actual)	Graduated (Actual)	
						Total	Graduated within designated time limit
Bachelor's	5 batches of 80 students: 400	Added 70 students for Batch 6: 470	6 batches in total: 511 ^a	6 batches in total: 467 ^b	6 batches in total: 467	6 batches in total: 465 ^c	459
Master's	6 batches of 11 students: 66	Added 3 students for Batch 7: 69			7 batches in total: 69	7 batches in total: 68 ^d	67
Doctor's	4 batches of 5-7 students: 25	Same as the plan			4 batches in total: 14	4 batches in total: 13 ^d	8 ^e
Total	491	564			550	546	534

Source: Documents provided by JICA; documents provided by the executing agency

Note: The numbers are cumulative numbers. a. The number of students who entered the in-country education program was greater than the available slots because 441 students were selected with an assumption that there would be a 10-percent dropout rate in Batches 1–5. b. Poor academic performance was the main reason for the non-completion of the in-country education program (44 students). c. The breakdown of the difference (two students) between the undergraduate study abroad students and the number of graduates was as follows: one student was dismissed for poor academic performance; and one student was held back for one year but graduated by extending the study abroad period through self-funding. d. Master's and doctor's students who withdrew without completion (one student each) due to poor academic performance. e. One of the five students who exceeded the designated time limit for doctor's programs (three years) was studying in a four-year medical program, which was processed as a repeated year in the scholarship granted to this student; this should be considered completion within the designated time limit.

2) Education services (operation of the in-country education program)

As part (a prior step of studying abroad in Japan) of twinning, an in-country education program (Japanese Associate Degree (JAD) Program) was provided in Malaysia using a curriculum created in collaboration with the Partner Universities from Japan. Its components were the same as the ones in the plan at appraisal; a diploma (an associate degree) program (in electrical and electronic engineering and mechanical engineering) equivalent to the first and second years at a Japanese university was developed in collaboration with the University of Selangor and was administered at this university's campus. Japanese Partner Universities (a total of 17 universities comprised of 12 private universities and five national universities⁸) formed a consortium called "HELP3 Japanese University Group (JUG)" (hereafter, Japanese

⁸ Tokai University, Takushoku University, the Shibaura Institute of Technology, Ritsumeikan University, Meiji University, Kindai University, Tokyo University of Science, Okayama University of Science, Nagaoka University of Technology, Tokyo Denki University, Keio University, Saitama University, Tokyo University of Technology, Waseda University, Yamaguchi University, Kyushu Institute of Technology, Muroran Institute of Technology. Of these, the two national universities newly participated in the additional intake for the undergraduate program—Batch 6.

University Group), and its principal institutions, the Shibaura Institute of Technology (science and technology fields) and Takushoku University (Japanese language education) led activities such as the creation of a curriculum and the selection and dispatching of instructors. With respect to the curriculum, the Shibaura Institute of Technology approached and made detailed arrangements with each Partner University to ensure that as many credits as possible earned in Malaysia can be transferred to each Partner University. With respect to the dispatching of Japanese instructors, preceding HELPs mostly dispatched high school teachers. However, in this project, the in-country education had to cover foundation university courses and specialized courses up to the second year. Thus, the Shibaura Institute of Technology made a significant amount of effort in selecting faculty members who would be available for long-term dispatching and in handling mid-appoint instructor changes. With respect to Japanese language education, the Japanese language instructor group including faculty members of Takushoku University creatively developed instructional materials and provided directions to ensure that Malaysian students with non-kanji backgrounds can complete the coursework equivalent to the first two years of undergraduate education in three years of in-country education using Japanese.

The number of dispatched or hired instructors was as follows: 2-10 Japanese instructors per year with a long-term appointment (mostly open recruitment) in science and technology; 6-16 instructors per year in the Japanese language department: 4-11 Japanese instructors with a short-term appointment (mostly the instructors at the Partner Universities); 4-10 Japanese teaching assistants (hereafter, "TAs") per year for short intensive courses; 4-12 Japanese TAs per year for regular terms; and 24 Malaysian instructors or lab technicians. Although comparisons between actual numbers and the numbers in the plan at appraisal are not straightforward as these numbers were decided each year after the start of the project, interviews with the executing agency, instructors, graduates, and former consultants appear to confirm that the supervision was thorough and a sufficient number of instructors were deployed.

3) Procurement of educational equipment

The project procured electrical/electronic engineering and mechanical engineering educational equipment required for the in-country education program (equipment for exercises and experiments), language education lab equipment, and IT hardware. As the details concerning items and quantity were decided after the start of the project, comparisons between the plan at appraisal and the actual results are not straightforward. Former instructors nevertheless stated in interviews that equipment required for executing the tasks specified in the syllabus, including the equipment procured in HELP2, had been mostly deployed.

4) Development of instructors for in-country education and the improvement/studies on the program

The project contained plans for training, meetings, and studies to improve the effectiveness and sustainability of the in-country education program and study abroad in Japan. Some of them were not extensive, but all planned activities were generally carried out. First, to localize HELP (i.e., to facilitate the deployment of Malaysian instructors), on-site training and training in Japan for the in-country education program instructors were planned and administered to several individuals, but this part of the project was substituted by the graduates of preceding HELPs who returned to Malaysia and became instructors for the program. Next, to align the in-country education's curriculum with the needs of the industry, the project formed the "Industry Advisory Panel" with Japanese-owned companies and the Board of Engineers Malaysia and held several meetings. However, due to these partners' mediocre interests toward the in-country education curriculum, its activities did not become very active. A former consultant assesses that this was due to the fact that the curriculum was not directly relevant to the employment at these companies because students would study abroad in Japan after completing the in-country education.⁹ In addition to these, as part of the executing agency's tasks, the project implemented a placement survey, assistance for the alumni association, and a human resource development needs survey.

5) Consulting services

The Japanese Partner Universities (the members of the Japanese University Group) mentioned above formed a nonprofit corporation, JUCTe, and provided consulting services for this project. In line with the plan at appraisal, responsibilities included assistance for implementing twinning, assistance for dispatching instructors, and monitoring of students. In general, the Japanese University Group was in charge of academic aspects, and JUCTe was in charge of operations. Although this was the first time for university-related organizations to provide the consulting services of any HELP, they engaged in the project operation using their experience as the Partner Universities in preceding HELPs. Continuity of the operation was enhanced by placing consultants who were involved in the consulting services in preceding HELPs in the consultant team in JUCTe. The amount of work increased due to additional dispatching of study abroad students.

3.2.2 Project Inputs

3.2.2.1 Project Cost

The total project cost was within the plan (93 percent against the plan), with the actual cost of 11,883 million yen (7,140 million yen of which was ODA loan) compared to the planned cost 12,782 million yen (7,644 million yen of which was ODA loan). The reduction in cost for the

⁹ The executing agency explained that the MJHEP at the time of ex-post evaluation was utilizing the panel to facilitate the implementation of the internship program introduced into the in-country education program.

in-country education (mainly the instructor dispatching cost) due to a strong yen and the stability of the living expenses and tuitions in Japan resulted in some remaining balance.¹⁰

3.2.2.2 Project Period

The period between the signing of the loan agreement and the project completion in this project (as defined as the graduation of the undergraduate and postgraduate study abroad students in the final batch) was 108 months between March 2006 and March 2015 and was within the plan. It should be noted that in both the plan at appraisal and the actual results, the project start (the start of the in-country education for Batch 1 students) was April 2005, one year ahead of the signing of the loan agreement.¹¹ Because the students in the final batch of HELP2 completed the in-country education in March of that year, matriculating HELP3's Batch 1 students for the in-country education in April was a necessary measure from the perspectives of securing the consistency of education and the continuity of projects, continuously hiring instructors and staff, and maintaining coordination with Japanese universities. The implementation of the activities in the period before the provision of the ODA loan was funded by stopgap funding from the Malaysian government and fronted by the Shibaura Institute of Technology and Takushoku University. Both universities reported that it took a significant amount of effort to make arrangements within the university to use university funds.

3.2.3 Results of Calculations for Internal Rates of Return (Reference only)

The internal rate of return was not calculated at the time of appraisal. The calculation was also not performed at the time of ex-post evaluation because the nature of the sector made it difficult to convert benefits into monetary values.

In light of the above, both the project cost and project period were within the plan. Therefore, the efficiency of the project is high.

3.3 Effectiveness and Impacts¹² (Rating: ③)

3.3.1 Effectiveness

3.3.1.1 Quantitative Effects (Operation and Effect Indicators)

The objective of this project was to develop engineers with advanced skills and strong work ethic needed for development and research, and this was to be measured through indicators

¹⁰ The cost for studying abroad was estimated on the high side based on the experience from HELP2 (the project had to reduce the number of accepted students because the required cost for studying abroad per person became greater than the estimate).

¹¹ According to the documents provided by JICA, the discussion with the HELP2 Japanese University Group in 2004 was seeking to have the loan agreement signed in March 2005. Subsequently, based on the argument by the Japanese government that "because ODA was currently being reviewed, HELP3 must be examined based on the evaluations of HELP1 and HELP2," the start time for the loan was postponed by one year.

¹² Sub-rating for Effectiveness is to be put with consideration of Impacts.

(Operation and Effect Indicators) including the graduation rates, the proportion of graduates who are employed at companies or institutions in the science and technology fields, and the proportion employed in the research/design/development fields. As shown below, each Operation and Effect Indicator mostly achieved 80 percent or more of the target. Therefore, the target achievement rate in this project is evaluated to be high.

1) Graduation rates (Operation Indicators)

As shown in Table 4, the graduation rates (Operation Indicators 1 through 3) were higher than 90 percent, achieving above 90 percent of the target. Examination of supplemental information including the withdrawal rate, repeat rate, and credit completion rate indicated that all of these rates performed well when compared to preceding HELPs.

By generalizing the results of the interviews with the executing agency, graduates, the Partner Universities,¹³ and former consultants, the factors that facilitated the achievement of the target can be identified as follows. 1. Having selected outstanding students¹⁴ and adopted a curriculum in the in-country education that conformed to the undergraduate education in Japan, students were able to acquire a sufficient level of Japanese language proficiency and specific knowledge before they left for Japan to study. 2. Thanks to the adoption of the “3+2” twinning, students transferred to Japanese universities after they earned credits in Malaysia for foundation courses, which many students often fail. 3. By guiding students during the in-country education to pick a university that would be compatible with the aptitude and preferences of each student, there were not many cases of mismatches during their overseas study. 4. Appropriate monitoring and support were provided by the executing agency, the Japanese University Group, and consultants. For example, multiple graduates stated that “the in-country education was very hard, so as long as you can complete it, you would not have issues with the courses in Japan.” Many Partner Universities also pointed out that the students from Malaysia already had sufficient ability to take required courses in Japanese when these students transferred to their universities.

¹³ This ex-post evaluation used the following qualitative data collection methods in addition to the tracer survey of the graduates (a quantitative data collection method). 1. Interviews with the graduates of each phase of HELPs and the managers at the place of their employment. A total of 32 graduates (six from HELP1, six from HELP2, and 20 from HELP3 (8 for individual interviews and 12 for group interviews)) were selected in such a way that there would not be a bias in terms of the type of job at the time of ex-post evaluation. A total of four colleagues/managers at the place of their employment were also selected. 2. A written survey with Japanese Partner Universities (15 out of 17 universities responded) and interviews with three universities.

¹⁴ The admission qualification included that they had to take and pass an 8- to 10-week intensive preparatory course for the in-country education (the course was not implemented in Batches 1 and 6 due to scheduling constraints) and be among the top scorers in the Malaysian Certificate of Education (completion exam for the secondary education qualification).

Table 4. Graduation status (Operation Indicators)

	Target	Actual	Actual
	2015	2015	2018
	Year Project Completed	Year Project Completed	3 Years After Project Completion
Operation Indicator 1: Graduation rate (Bachelor's)	95% or higher	91.0% ^a	Same as 2015 ^b
Of these, diploma acquisition rate among students who entered the in-country education program	95% or higher	91.4%	Same as 2015
Rate of earning a Bachelor's Degree among students who studied in Japan	95% or higher	99.6%	Same as 2015 ^b
Operation Indicator 2: Graduation rate (Master's)	95% or higher	98.6%	Same as 2015
Operation Indicator 3: Graduation rate (Doctor's)	85% or higher	92.9%	Same as 2015
Supplemental Information 1: Withdrawal rate	(For reference, 6.1% and 2.9% in HELP1 and HELP2 for undergraduate programs, respectively) ^c	In-country education 8.6% Bachelor's 0.2% Master's 1.4% Doctor's 7.1%	Same as 2015
Supplemental Information 2: Repeat rate in Bachelor's programs	(For reference, 12.3% and 15.7% in HELP1 and HELP2, respectively) ^d	In-country education 0.2% Undergraduate 1.3%	Same as 2015
Supplemental Information 3: Credit completion rate (Earned credits divided by credits required for graduation)	-	Bachelor's 106% Master's 111% Doctor's 132%	Same as 2015

Source: Documents provided by JICA; documents provided by the executing agency

Note: a. The rate of earning a Bachelor's degree among the students who entered the in-country education program. b. Although not included in the actual, one student who self-funded for a repeated year graduated in March 2016. c. As another reference value, the annual average withdrawal rate in Japanese universities was 2.65% in Academic Year 2012 (The Ministry of Education, Culture, Sports, Science and Technology (September 25, 2014), "*Gakusei no chutotaigaku ya kyugaku nadono jokyoni tsuite*" (The status of withdrawal and leave of absence among students)). d. As another reference value, the average repeat rate in Japanese universities was 3.4% in Academic Year 2015 (The Ministry of Education, Culture, Sports, Science and Technology, "FY2015 School Basic Survey").

2) Employment in the science and technology fields (Effect Indicators)

As shown in Table 5, 87 percent of the graduates who found jobs did so at companies and institutions in the science and technology fields, accomplishing more than 90 percent of the target—95 percent. In addition, at least 23 percent of the graduates who found jobs engaged in work in the research/design/development fields. Although this missed 80 percent of the 30 percent target by a very small margin, it was the lowest possible value discernable from the study results at that time, with a possibility that the actual proportion might have been greater (see the note in the table). Therefore, it was determined that the project mostly reached the target.

The employment status at the time of ex-post evaluation was investigated using a survey (a tracer survey) of the graduates. The survey revealed that although the proportion of employment at companies and organizations in the science and technology fields had somewhat declined, more than half of the graduates who responded were working in the research / design /

development fields. However, the number of graduates who engage in R&D at corporations and research institutions was not high (such employment opportunities are particularly limited in Malaysia), and many of these respondents are presumed to be engineers in a design division or university faculty members.

Table 5. Status of employment in science and technology fields (Effect Indicators)

	Target	Actual ^a	Actual ^a
	2015	2015	2018
	Year Project Completed	Year Project Completed	3 Years After Project Completion
Effect Indicator 1: Proportion of the graduates employed at corporations and educational/research institutions in the science and technology fields	95% or higher	87%	83% ^b (Female 74%, Male 88%)
Effect Indicator 2: Proportion of the graduates working in the research/design/development fields	30% or higher	23% ^c	50% (Female 41%, Male 55%)

Source: Documents provided by JICA; documents provided by the executing agency (for the actual as of 2015; 396 valid responses out of 505 students); a survey of the graduates (for the actual as of 2018; 180 valid responses out of 505 students)

Note: a. For either year, the tabulation excluded the students who were enrolled in graduate schools at the time of the survey. Effect Indicators 1 and 2 both include university faculty members. b. The proportion of the graduates whose professional responsibility, not the organization to which they belonged, was in the science and technology fields was 79% (66% for female and 87% for male). c. Due to the lack of data that matched the indicator title, the figure reflects only those graduates whose job title contained “design” for engineers who worked for corporations. The actual proportion of this type of employment is presumed to be higher than reported here since there probably were additional engineers engaging in design in practice.

Concerning Effect Indicator 1, graduates cited the following when they were asked about the reasons for not being employed at corporations or institutions in the science and technology fields: 1. The notion that the study abroad students in HELP were expected to contribute in the science and technology fields and development/research was not widely shared among the students (even though this expectation was addressed in various presentations by the executing agency and the Japanese University Group). 2. Employment guidance or support that was aligned with such goal of HELP was limited, and job matching with and information sharing from the Japanese Chamber of Trade & Industry, Malaysia, and its member companies were not available. 3. In Malaysia, engineers’ salaries have been lower than in the financial and service sectors.

Table 6 shows the occupations of the graduates of this project who responded to the tracer survey at the time of ex-post evaluation. The most common occupation was engineers, with a share of 38 percent among the respondents. However, this proportion has decreased from 51 percent in 2015, suggesting the diversification of occupations when compared to the time immediately after graduation. This is also consistent with the result of Effect Indicator 1 mentioned above.

Table 6. Occupations of HELP3 graduates at the time of ex-post evaluation

Occupation at the time of ex-post evaluation	Female (person)	Male (person)	Total	
			Person	%
Engineer	18	51	69	38.3
Lecturer	14	21	35	19.4
Manager ^a	4	8	12	6.7
Researcher	2	1	3	1.7
Self-employed	0	2	2	1.1
Seeking job	1	0	1	0.6
Homemaker	2	0	2	1.1
Other ^b	17	24	41	22.8
Student	7	8	15	8.3
Total	65	115	180	100.0

Source: Tracer survey of the graduates

Note: a. Of the 12 “Managers,” 10 work for corporations or educational/research institutions in the science and technology fields and seven engage in work in the research/design/development fields. b. “Other” includes IT analysts, financial analysts, interpreters, customer service specialists, sales, etc.

3.3.1.2 Qualitative Effects (Other Effects)

1) Improvement of skills and capabilities of study abroad students¹⁵

In the tracer survey at the time of ex-post evaluation, the most frequently cited takeaways from studying abroad in Japan were “Japanese language skills” (166 out of 180 respondents), followed by “Japanese work ethic” (156 respondents), “advanced knowledge and skills in science and technology” (147 respondents), and “human resource development methods in Japan” (121 respondents). These results exhibit similar tendencies as in the tracer survey by the executing agency (2018) and the ex-post evaluation for HELP2. Among these, the graduates reported that they are currently helped by “Japanese work ethic” (159 respondents), “Japanese language skills” (122 respondents), “human resource development methods in Japan” (116 respondents), and “advanced knowledge and skills in science and technology” (92 respondents). By considering the fact that at the time of the survey, 36 respondents lived in Japan,¹⁶ and 61 worked for Japanese-owned companies (regardless of the location), the results show that Japanese language skills and Japanese work ethic are helping them whether their workplace is related to Japan or not.

In the interviews with the graduates, most frequently cited assets they acquired from this project were Japanese language skills and Japanese work ethic (including punctuality, a sense of responsibility, hard work, compassion, etc.). On the other hand, all of the graduates who were

¹⁵ The qualitative effects that were assumed at the time of appraisal were: 1. The improvement of skills and capability of study abroad students; 2. Contribution to the economic development in Malaysia and the strengthening of the Japan-Malaysia bilateral relationship through the success of the graduates in the industry and other fields; 3. Benefits to Japanese-owned corporations in Malaysia; and 4. Contribution to the expansion of the domestic higher education in Malaysia through the expansion of the in-country education program. This ex-post evaluation treats Effect 1 as Effectiveness-level effects and Effects 2 through 4 as Impact-level effects.

¹⁶ The comparison between the survey conducted by the executing agency at the time of project completion (2015) and this tracer survey (2018) reveals that the proportion of the graduates who live in Malaysia has increased from 56 percent to 79 percent. There also were multiple interviewees who reported that they lived in Japan after graduation but returned home. Main reasons included “family circumstances,” “I have experienced Japan enough,” “I’d like to give back to Malaysia,” “I want to spread Japanese culture in Malaysia,” etc.

interviewed expressed that if students return home immediately after graduating an undergraduate program through the “3+2” twinning, it would be difficult to master Japanese ways of thinking (including work ethic) in two years, which was shorter than in previous HELPs. In addition, although there are individual differences and the impact on the effects of studying abroad is not clear, many graduates reported that they tended to stick with other study abroad students because Japanese students already had established networks of friends by the time Malaysian students transferred to the third year, making it difficult to make Japanese friends.

2) Utilization of procured equipment

According to the executing agency and the in-country education instructors, the equipment procured in this project was adequately utilized. All graduates who were interviewed responded that, while studying abroad, they did not run into issues in classes or experiments that were attributable to an inadequacy of equipment in the in-country education program.

3.3.2 Impacts

3.3.2.1 Intended Impacts

1) Growth and expansion of engineers and manufacturing in Malaysia (Quantitative Effects)

At the time of ex-post evaluation, it is estimated that there are about 70,000 engineers in Malaysia.¹⁷ Against this figure, the tracer survey with the graduates indicated that 28 percent (51 individuals) of the graduates of this project who responded are employed as engineers in Malaysia. In addition, the number of private companies in the manufacturing sector in Malaysia increased from 39,669 in 2010 to 49,101 in 2015.¹⁸ Against this, 32 percent (57 individuals) of the graduates of this project who responded to the tracer survey have technical positions in the manufacturing sector in Malaysia.¹⁹ Thus, although the graduates of this project make up a tiny fraction of the whole country and the majority of them are not employed as engineers or in manufacturing due to their diverse employment patterns, this project has contributed to the growth of engineers and manufacturing in Malaysia.

2) Contribution to the strengthening of industrial competitiveness needed for economic development and the facilitation of a friendly relationship between the two countries through the success of the graduates (Qualitative Effects)

The professional activities of the graduates who were directly interviewed will be featured

¹⁷ Malaysia needs 500,000 scientists and engineers by 2020. (2018, August 13). *New Straight Times*.

¹⁸ The Ministry of International Trade and Industry, Malaysia (data from the “Economic Census 2016”)

¹⁹ As of December 2015, there were 1,456 Japanese-owned companies in Malaysia and 771 of them were in manufacturing (The Japanese Chamber of Trade & Industry, Malaysia, “Malaysia Handbook,” 2017 edition). Among the respondents of the tracer survey, 32 individuals worked at Japanese-owned corporations in Malaysia and 21 of them were in the manufacturing sector.

in the appendix at the end of this report. In addition to these, many other examples were shared by the executing agency, former consultants, and the interviewed graduates. These accounts are generalized and summarized below.

1. Contribution to the strengthening of industrial competitiveness: The graduates who work for Malaysian companies or Malaysian subsidiaries of Japanese or Western companies engage in development, production, quality management, etc. and contribute to productivity improvement through their work ethic, Japanese language skills, and technical skills. In addition, the graduates who became university faculty members nurture the next generation of talents. With respect to the promotion of Japanese-style education, more than 10 graduates serve as instructors for MJHEP's in-country education program and about five graduates serve as MJIT instructors. There also are graduates who have adopted Japanese practices, such as supervision provided in seminars and by more senior students, at Malaysian universities.

2. Contribution to the facilitation of a friendly relationship between the two countries: In addition to the benefits to Japanese-owned companies and the internationalization of Japanese universities as will be described below, the graduates—by engaging in the exchanges between Japan and Malaysia as an international relations coordinator for a local government in Japan and marketing and promoting halal food using Japan's domestically produced ingredients—are contributing to the facilitation of Japanese people's understanding of Malaysia and the understanding of Japan among the Muslims in Japan.

3. Benefits to Japanese-owned companies in Malaysia: The graduates who work at Japanese-owned companies engage in development, production, quality management, customer support, support for Japanese companies entering the Malaysian market, internal training, etc. According to the Japanese Chamber of Trade & Industry, Malaysia, Malaysian graduates who studied in Japan including HELP graduates are contributing to these companies because they understand Japanese working style, have high motivation for work, and possess both Japanese language skills and technical skills.

3) Contribution to the expansion of Malaysia's domestic higher education through the expansion in-country education program

By implementing the "3+2" twinning system that has evolved based on the experiences from preceding HELPs, the duration of the in-country education became three years and the diploma certificate (mentioned above) certified by the Malaysian government can now be granted. The curriculum for the in-country education program was created by Japanese

universities and it meets both Japanese universities' standards and Malaysian standards. The required number of credits—126 credits—is as many as an undergraduate program.²⁰

4) Contribution to Japanese universities

In the survey and interviews with the Partner Universities, all 15 universities that responded reported that the expectations from their universities for this project had been met. Some of the specific responses included:

- We were able to recruit outstanding students.²¹
- Our lab received positive influence from earnest and enthusiastic study abroad students.
- By studying with study abroad students, Japanese students were able to learn global diversity and enlarge their perspectives.
- They led the journal club and presentations in English, helping Japanese students feel much more comfortable with presentations in English. Japanese students became aware of the importance of English.

In the interviews with three universities, they expressed that their participation in this project, along with other international exchange programs, contributed to the internationalization of their university. In addition, as was the case at Nagaoka University of Technology, there have been cases where universities started twinning with universities in other countries using their experience in HELPs.

3.3.2.2 Other Positive and Negative Impacts

1) Impacts on the Natural Environment

This project took place in a sector (human resource development) in which we do not anticipate any particular environmental impacts. According to the executing agency, the processing of lab waste from the in-country education program was outsourced to professional services in compliance with government rules. The executing agency reported that other aspects of this project also did not have any negative impacts on the environment.

2) Consideration for gender

At the time of appraisal of this project, it was presented that the project would contribute to

²⁰ For example, the required number of credits to receive a diploma in electronics engineering from Universiti Tenaga Nasional (Tenaga National University) is 91. The required number of credits to graduate at the University of Malaya, Department of Electronic Engineering is 133. The numbers are from each university's website.

²¹ Several individuals expressed that although study abroad students with inadequate academic performance sometimes created issues in preceding HELPs, the situation was improved in this project.

improve access to higher education in Malaysia and consider the equality of opportunity between men and women in the student selection process. According to the executing agency, although the admission selection for the in-country education program was based on academic performance and did not particularly give consideration to the male-female ratio, the proportion of women among the admitted students was 38 percent. According to the calculations of the data from Malaysia's Ministry of Education, the proportions of women among the admitted students for diploma and undergraduate programs in science and technology at private universities in Malaysia in 2010 were 21 percent and 31 percent, respectively. Although it is difficult to directly compare these data to this project, which was premised on studying abroad in Japan, it does not appear that women's opportunity was particularly hindered in the admission selection in this project.

3) Long-term effects of all HELP phases

To analyze the long-term effects of all HELP phases, this ex-post evaluation conducted interviews also with HELP1 and HELP2 graduates. According to the graduates and former consultants who were interviewed, the original graduates of HELP1 are already in their mid-40s and many of them play leading roles at corporations and educational institutions. There were cases in which the graduates of undergraduate programs in a preceding HELP who continued their study in Japanese graduate programs by receiving scholarships from a subsequent HELP acquired more advanced knowledge and skills and put them into practice at corporations and educational/research institutions. Furthermore, these graduates became the in-country education instructors in subsequent HELPs/MJHEP (in fact, the head of the instructor group at the time of ex-post evaluation is a HELP1 graduate), facilitating the materialization of the effects in subsequent generations.

It is particularly notable that the study abroad program has been improved based on the experiences of multiple phases (as already discussed, reductions of the cost through twinning, a shortening of the duration of study, an improved graduation rate, expansions of the postgraduate study abroad programs, the development of in-country instructors, a greater involvement of Japanese Partner Universities) and it was perfected in this project. As a result, the Malaysian side was able to implement a succeeding project, MJHEP, on its own using an almost same configuration as HELP3.²²

This project has achieved its objectives. Therefore, the effectiveness and impacts of the project are high.

²² Due to the reduced cost of studying abroad, some students in the Look East Policy Study Abroad Program by Malaysia's Public Service Department started to enter MJHEP's "3+2" twinning program since 2016. At the time of ex-post evaluation, MJHEP admits about 30 students per year from the Program in addition to admitting about 60 students per year as MJHEP.

3.4 Sustainability (Rating: ③)²³

3.4.1 Institutional / Organizational Aspect of Operation and Maintenance

The organizational arrangement of the executing agency—the MARA Education Foundation (a subordinate organization of the People’s Trust Council (Majlis Amanah Rakyat; hereafter, “MARA”), a government agency under the Ministry of Rural Development)—has not changed since the time of appraisal.

At the time of the ex-post evaluation, the Student Affairs division, which is the project implementation unit (the former project implementation unit of this project) of MJHEP within the executing agency, is in charge of the follow-up activities related to the graduates (the operation of the alumni association website, tracer surveys with the graduates, networking events between the graduates and current MJHEP students, etc.). The actual body that plans and carries out follow-up activities is the HELP alumni association, which was formed as a voluntary organization in 2006 and became a nonprofit corporation in October 2018. The graduates volunteer to serve as the officers for the alumni association. Interviews and their SNS posts indicate that the officers are actively involved even though they are busy with their profession. Although the information about the graduates is not being adequately updated at the executing agency as mentioned in “Constraints during the Evaluation Study,” the alumni association explained that there are SNS-based networks that connect the graduates to other graduates and the officers of the alumni association. The alumni association reported that news about events could be notified to many graduates by spreading them through SNS.

As discussed already, the continuation of the study abroad program has been achieved in a form of MJHEP. The executing agency has further created a plan for its succeeding MJHEP2 (this is a provisional name; it is planned to be run for 10 years following the completion of MJHEP) and submitted its proposal to the Malaysian government. MJHEP’s executing system has not significantly changed since the time this project was implemented;²⁴ the program is participated by the Shibaura Institute of Technology and Takushoku University through individual contracts for education services and by JUCTe through a contract with the Shibaura

²³ The evaluation of the sustainability will be conducted from the following vantage points, which are the same as those used in the ex-post evaluation for preceding HELPs: 1. Whether the sustainability of the effects generated by the graduates of this project can be ensured (the existence of a follow-up system provided by the executing agency to facilitate the success of the graduates; the sustainability of the project effects themselves); 2. Whether the executing agency will continue the study abroad program (the sustainability of the study abroad program). The second point is supplemental because it is not directly related to the effects of this project (i.e., the effects generated by the graduates). See, JICA. (September 2003). “*JICA kanren ryugakusei jigyo no hyoka ni kakaru chosa kenkyu* (A study on the evaluations of JICA projects related to studying abroad).”

²⁴ However, due to an increase in the number of students, the site for the in-country education was changed from the University of Selangor to a dedicated school building built at the MARA Japan Industrial Institute (a vocational school operated by MARA) when MJHEP started. In addition, the diploma for MJHEP is granted by the University of Kuala Lumpur, not the University of Selangor.

Institute of Technology. As a result of some reshuffling of the members of the Japanese University Group since the time of this project, the number of universities, 24, is greater at the time of ex-post evaluation and more national universities now participate. Malaysian instructors in the in-country education program have further been added. Since around 2016, Malaysian instructors have outnumbered Japanese instructors. Japanese instructors who are dispatched on a long-term basis are working for the project by individually signing an employment contract with the executing agency.

Since many of the staff positions in the executing agency (28 employees at the time of ex-post evaluation) are based on an annual contract, they have been replaced except for some employees. Although this has not caused significant problems overall and the operation of MJHEP has been continuing, some Japanese instructors pointed out that administrative processes became more challenging compared to during the implementation period of this project because the handoff process of tasks to new staff members is inadequate.

The administration unit of MJHEP is performing the operation and maintenance of the educational equipment including the items procured in this project.

Thus, although there are some challenges, the system of operation and maintenance has been secured.

3.4.2 Technical Aspect of Operation and Maintenance

The follow-up operation concerning the graduates of this project do not have any issues as no special technologies (such as a database) are required to manage the contact information of the graduates and operate the alumni association.

Regarding the sustainability of the study abroad program, the executing agency has the capability to smoothly implement MJHEP based on twinning. Most of the Malaysian instructors in the in-country education program have a master's or doctor's degree from Japan.

With respect to the educational equipment, since all items are basic items that are used during the first two years of university education, Malaysian instructors who graduated from Japanese graduate school do not have any problem operating or using them. These instructors have created booklets to organize their own experience in using the apparatus for exercise and experiment procured in this project. At the time of ex-post evaluation, instructors still use these booklets as references. Precision equipment is maintained properly as this work is outsourced to the manufacturer or distributor.

Thus, the technical aspects of operation and maintenance have been secured.

3.4.3 Financial Aspect of Operation and Maintenance

With respect to the budget required for the follow-up activities related to the graduates (the expenses for the alumni association website, surveys, events, etc.), a required amount is paid on

as need basis from the special account within the executing agency's MJHEP fund (entirely funded by the government). The MJHEP fund is comprised of 799 million ringgit (24,760 million yen) approved by the Malaysian government at the time of project completion and the Malaysian side's remaining fund in HELPs. Table 7 shows that the expenditure exceeded the income (quarterly payments from MARA), but the shortfall is paid from the remaining fund in HELPs. In addition, the Malaysian government has approved the use of 800,000 ringgit of the Malaysian side's remaining fund in HELP3 as a provision budget that the executing agency would need in the preparation efforts for MJHEP2 (studies, meetings, etc.).

The executing agency pointed out that one of the major challenges was that the amount of payment from MARA to the executing agency had started to fall under the budget since 2012 when the Ministry of Finance began paying the budget to MARA instead of paying it directly to the executing agency (the accounts receivable for MJHEP). As a result, since MJHEP did not have enough funding for scholarships, the recruitment for postgraduate programs had to be cancelled after the academic year 2019 in order to continue the undergraduate program, which had a higher priority. However, planned MJHEP2 proposes a system in which the budget is paid again directly to the executing agency and incorporates programs for master's and doctor's programs.

Thus, although there are some challenges, the financial aspects of operation and maintenance have been mostly secured from the perspective of the continuation of the project effects of this project.

Table 7. Income and expenditure of MJHEP

(Unit: ringgit)

	Income	Expenditure
2015	82,834,478	57,263,864
2016	47,821,770	68,856,331
2017	39,000,000	76,350,386

Source: The executing agency's response to the questionnaire

3.4.4 Status of Operation and Maintenance

To continue the study abroad program, the equipment procured in this project was all moved to the school building of MJHEP and put into use there. At the time of ex-post evaluation, many of the items are no longer in use as their service life has elapsed, but there are some items, such as the large-scale experimental apparatus in the mechanical engineering lab, that are still being used. The status of operation and maintenance related to educational equipment in MJHEP is sound. Equipment including decommissioned equipment is being managed using a detailed asset list.

Thus, no issues were found regarding the status of operation and maintenance.



A class in MJHEP's "Electronic Circuit 1," taught in Japanese. The students are in the second year of the in-country education (the equivalent of university freshman) and the instructor is a HELP2 graduate.



The machining center (machining equipment) procured in this project. Currently used in MJHEP's mechanical engineering lab.

In light of above, no major problems have been observed in the operation and maintenance of this project in terms of its institutional/organizational, technical, and financial aspects and its current status. Therefore, the sustainability of the project effects is high.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

This project attempted to facilitate the development of engineers with advanced skills and strong work ethic by implementing a program that combines in-country education with undergraduate study abroad in Japan and programs for postgraduate study abroad in Japan for Malaysian students in science and technology. The relevance of the project is high because these objectives are consistent with Malaysia's development plan, Malaysia's development needs, and Japan's aid policy. The evaluation confirms that thanks to these programs, which were refined based on the experience in preceding phases, the graduation rate among Malaysian students who studied in Japan is high. Many graduates are active in the science and technology fields and development/research/design work, contributing to the economic development in Malaysia and the facilitation of a friendly relationship between the two countries. Therefore, the effectiveness and impact are high. The efficiency is high because neither the project cost nor the project period exceeded the plan. The sustainability is high, reflecting the follow-up efforts by the executing agency facilitating the success of the graduates and the continuing implementation of a domestic project in Malaysia that was modeled after this project.

In light of the above, this project is evaluated to be highly satisfactory.

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

To grasp the effects generated by the graduates of this project and leverage this knowledge to improve the sustainability, it is recommended that the MARA Education Foundation revamp the collection of information concerning the graduates with missing contact information by coordinating with the alumni association and using SNS. In addition, in times when the board members of the association are busy, it is recommended that necessary staff be deployed from the MARA Education Foundation to adequately focus on the follow-up activities concerning the graduates.

4.2.2 Recommendations to JICA

It is recommended that JICA, by staying connected with the MARA Education Foundation and the graduates, identify individuals in higher education with a high level of knowledge about Japan who were nurtured in this project as resource persons for future cooperation projects with Malaysia and keep information about them updated.

4.3 Lessons Learned

1) Strengths and weaknesses of the “3+2” twinning program

The “3+2” twinning system appears to be an appropriate twinning model because the reduced cost of studying abroad (due to a shorter stay in Japan) and lower withdrawal rates (because students complete foundation courses in Malaysia) in this system are significant advantages. However, it is necessary to have students mentally prepared by telling them during the in-country education the fact that they will transfer to the third year, by when students already have established networks of friends; and monitor students during their overseas study by paying attention to this aspect. In addition, it would be beneficial to make it part of the program to find employment or advance to graduate school in Japan after earning the bachelor’s degree so that students will sufficiently absorb Japanese culture and ideas.

Because the “3+2” twinning requires that the in-country education also cover specialized courses, this system needs to expand the instructors and facilities of the in-country education to a greater extent than in the “2+3” system. When it is difficult to secure human resources (such as the candidates for Japanese instructors who are available for long-term dispatching) or facilities for exercises and experiments for many fields, it would be necessary to narrow down (select and concentrate on) the departments to a certain extent, as did this project.

2) Facilitation of the achievement of project objectives through employment support after graduation

In this project, the proportion of the graduates who were employed at corporations and

institutions in science and technology fields was slightly lower than expected. This was caused in part by the inadequate amount of guidance or support concerning employment that is consistent with the objective of the project and the lack of job matching or information sharing with the Japanese Chamber of Trade & Industry, Malaysia, or its member companies. In a study abroad project, it would be beneficial if the executing agency coordinates with the employers in those sectors in which the graduates are anticipated to find employment after studying abroad (such as Japanese-owned companies, the Japanese Chamber of Trade & Industry), understand the human resource needs in such sectors, share information about the students who are graduating, and create job matching opportunities.

3) Ensuring the sustainability of the support for multi-phased study abroad and in-country education programs

In this project, because the ODA loan's adopted year was one year later than originally expected, the executing agency and the Partner Universities in Japan had to bear the project cost in order to start this project immediately after the completion of the preceding project without any gap. In a multi-phased project involving study abroad programs, the plans for subsequent phases should be made using a sufficient amount of time to ensure the continuous employment of instructors and staff members and the continuation of education.

Comparison of the Original and Actual Scope of the Project

Item	Plan	Actual
1. Project Outputs		
1) Provision of scholarships	Total: 491 students - Bachelor's: 400 - Master's: 66 - Doctor's: 25	Total: 550 students - Bachelor's: 467 - Master's: 69 - Doctor's: 14
2) Administration of in-country education program	A diploma program equivalent to the first and second years in a Japanese university	Mostly as planned
3) Procurement of educational equipment	Educational equipment for electrical and electronic engineering, mechanical engineering; language lab equipment, and IT hardware	Total: 193 items; 1,163 pieces The scope was as planned
4) Development of instructors for in-country education and the improvement/studies on the program	On-site training, training in Japan, coordination with the industry/tracer surveys/support for the alumni association/human resource development needs survey	Mostly as planned
5) Consulting services	Total: 434.6 man-months Support for the in-country education, support for the implementation of the twinning program, support for dispatching of instructors, monitoring of students, etc.	Total: 545 man-months The scope of the services was as planned
2. Project Period	April 2005 – March 2015 (120 months)	April 2005 – March 2015 (120 months)
3. Project Cost		
Amount Paid in Foreign Currency	7,644 million yen	7,140 million yen
Amount Paid in Local Currency	5,138 million yen (176 million ringgit)	4,743 million yen (160 million ringgit)
Total	12,782 million yen	11,883 million yen
ODA Loan Portion Exchange Rate	7,644 million yen 1 ringgit = 29.23 yen (As of October 2005)	7,140 million yen 1 ringgit = 29.64 yen (Average between 2005 and 2015)
4. Final Disbursement	July 2016	

Appendix: Examples of successful career paths of HELP1 through HELP3 graduates

The following are the cases of the graduates we were able to interview in Malaysia or Japan who were recommended as “being successful” in the interviews with people related to this project (As of February 2019).

HELP1 Graduates

<Case 1: Faculty member> Male. He received a master’s degree through HELP2 after working for a Malaysian subsidiary of a Japanese-owned electronics manufacturer as a production engineer. He was then hired by the MARA Education Foundation as a physics instructor for HELP2’s in-country education. Later, he has served as a mechanical engineering instructor for HELP3 and MJHEP. At the time of ex-post evaluation, he leads the in-country education as the head of the instructor group. “MARA Education Foundation took care of me. I wanted to give back.” (In the front row of the picture on p.1 of this report.)

<Case: 2: Manager for a Japanese-owned company> Male. After receiving a bachelor’s degree, he worked for a Malaysian company and a Malaysian government agency before becoming a senior manager in the project development division of a Malaysian subsidiary of a Japanese-owned energy company. He is also active as the president of the alumni association. (The person on the left in the picture.)



<Case 3: Engineer for a Japanese-owned company> Female. After receiving a bachelor’s

degree, she has been working as a production engineer for a Malaysian subsidiary of a Japanese optics manufacturer for 19 years. “I work for the same company for a long time because this company has a great environment and I like the manufacturing division.”

<Case 4: R&D researcher for a Japanese-owned company> Male. He used a scholarship from a national university in Malaysia to earn his doctorate in Japan and was hired by the same university as a faculty member. He is currently dispatched to the IT research division of a general trading company in Japan and engages in R&D for 5G.



<Case 5: Postdoctoral fellow in Japan> Male. He earned his bachelor’s degree through HELP1, master’s degree through HELP2, and doctor’s degree through HELP3. After working for a Malaysian subsidiary of a Japanese-owned chemical manufacturer and working as a HELP/MJHEP in-country education instructor, he is currently a postdoctoral fellow at a Japanese university’s medical school. His research on hematopoietic stem cells was selected for the front page of a top American hematology journal. “I encourage students to look at Japanese people’s serious attitude to their work.”



<Case 6: Manager for a food company> Male. He majored in bioengineering, but worked for the general affairs/human resources division of a Malaysian subsidiary of a Japanese-owned electronics manufacturer after receiving a bachelor's degree because he could not find jobs in bioengineering. He was later appointed as an international relations coordinator for Hioki-shi in Kagoshima Prefecture. Since completing the term of his appointment, he has been working for a food company in southern Kyusyu as a halal manager and provide/promote halal food using domestically produced ingredients to Muslims across Japan (residents and tourists). He stays in touch with and assists students who are currently in the study abroad program to provide support.

HELP2 Graduates

<Case 7: Faculty member> Female. After receiving her bachelor's degree, she earned her master's and doctor's degrees through scholarships from a Malaysian national university and was hired by the same university as a faculty member. She was the very first Muslim woman at the Japanese university where she studied, and her university created a prayer room for female Muslims, which other female Muslim students used later. (Second from the right in the picture. All other people in the picture are also HELP graduates who became faculty members.)



<Case 8: Faculty member> Male. After receiving his bachelor's degree and working for a Malaysian subsidiary of a Japanese electronics manufacturer, he earned his master's and doctor's degrees through HELP3. He is currently the vice director of the nanotechnology research institute at a Malaysian national university. He conducts joint research projects with Malaysian corporations. He leads student exchanges with his Japanese alma mater (this in turn facilitates joint research projects and his students' employment in Japan), joint seminars, and joint research, as well as interactions between Japanese people who live in Malaysia, the creation of an alumni network for Malaysian students from his Japanese alma mater, and other activities for interaction.



<Case 9: Engineer for a Western company> Female. After engaging in design work at a Malaysian subsidiary of a Japanese electronics manufacturer, she has worked for an Australian construction equipment manufacturer. She is scheduled to leave her current employer soon to join the launching of business in Malaysia by a Japanese automobile/aircraft parts manufacturer. "Even though I will make less money, I want to become a pioneer." (The person on the right in

the picture.)



<Case 10: R&D researcher for a Malaysian company> Male. After earning his bachelor's degree by participating in HELP2 program through a scholarship from a Malaysian power company, he has been engaging in R&D for the same company as the chief researcher. He has also taught seminars and provided consulting services many times in Japan.



<Case 11: Owner of an engineering company> Male. After engaging in design work at a Malaysian subsidiary of a Japanese-owned electronics manufacturer, he started his own soundproofing engineering company. Some of his customers are Japanese. He also serves as a board member of the HELP alumni association. (The person in the middle in the Case 2 picture.)

<Case 12: Owner of a trading company> Male. After engaging in design work for terrestrial digital television tuners at a Japanese electronics manufacturer, he started his own trading company in Malaysia. His experience in the previous job is helping him make technical proposals for different antenna systems for different countries. "I came back because I

wanted to promote Japanese culture in Malaysia." His wife is also a HELP graduate and works for MJHEP's in-country education as an instructor.



HELP3 Graduates

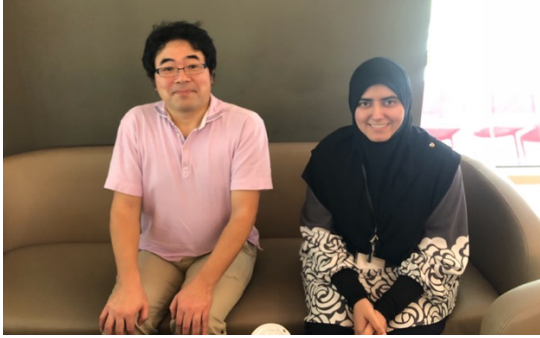
<Case 13: Faculty member> Male. He earned his master's and doctor's degrees through scholarships from a Malaysian national university and currently works for the same university as a faculty member. "Many of my colleagues who graduated through HELP conduct Japanese-style seminars and teach Japanese manners." (The person in far left in the Case 7 picture.)

<Case 14: Entrepreneur> Male. He started a trading company with an upper-grade student in HELP2 and engages in multiple projects. He serves as a board member of the HELP alumni association and is actively involved in activities for more recent students. (The person in far right in the Case 2 picture.)

<Case 15: Engineer for a Japanese-owned company> Male. After working for a Japanese-owned electronics manufacturer and a Japanese-owned information system company, he currently produces steam turbines at a Malaysian subsidiary of a Japanese-owned energy corporation.

<Case 16: Engineer for a Western company> Female. After working for a Japanese-owned electronics manufacturer in Malaysia, she currently engages in the offshore development targeting Japan at a Malaysian subsidiary of an American-owned multinational IT corporation.

Her Japanese colleague said, “When I came to Malaysia, I was surprised by her high level of Japanese. The way she works makes a nice balance between Japanese-style code of conduct and international standards.” (The right person in the picture. The person on the left is this Japanese colleague.)



<Case 17: Engineer for a Western company> Male. He engages in the design and installation of oil pipes at a Malaysian subsidiary of a France-U.S. energy joint venture. His manager said, “I don’t know if this is because he graduated from a Japanese university, but he is very independent and has high problem-solving and communication skills.” (The person on the left in the picture. The person on the right is his manager.)



<Case 18: Engineer for a Western company> Male. After working for an electronics manufacturer in Japan and a Malaysian subsidiary of a European-owned company, he currently works for an Australian construction equipment manufacturer. He engages in the design and production of cranes as a structural engineer. (The person on the left in the Case 9 picture.)

<Case 19: R&D researcher for a Japanese-owned company> Male. After earning his bachelor’s and master’s degrees through HELP3, he earned his doctorate through a scholarship from the Ministry of Education, Culture, Sports, Science and Technology. He currently engages in R&D (sensor development) at a Japanese automobile parts manufacturer. “I want to be a faculty member at a Malaysian university in the future.”

<Case 20: International relations coordinator for a Japanese local government> Female. After engaging in research work at a Malaysian subsidiary of a Japanese-owned automobile sensor manufacturer and customer service work at a German global logistics company, she became the first female international relations coordinator of Hioki-shi in Kagoshima prefecture. Currently, she is the only Malaysian national among the 472 international relations coordinators in Japan. Although her predecessor was also a HELP graduate, she undertakes activities from women’s perspective and facilitates a broad range of Japan-Malaysia exchanges. Her manager said, “She is popular among the residents. She is very compassionate.” (The person on the right. The person on the left is her manager.)

