Report Number : ICR00004209

1. Project Data

Project ID	Project Name	
P125288	GY - UG Science and Technology Support	
Country	**Practice Area(Lead)**	**Additional Financing**
Guyana	Education	P156746
L/C/TF Number(s)	**Closing Date (Original)**	**Total Project Cost (USD)**
IDA-49690,IDA-57530	30-Jun-2017	11,400,000.00
Bank Approval Date	**Closing Date (Actual)**	
23-Jun-2011	30-Sep-2017	

	IBRD/IDA (USD)	Grants (USD)
Original Commitment	10,000,000.00	0.00
Revised Commitment	13,664,000.00	0.00
Actual	12,558,906.44	0.00

Prepared by	Reviewed by	ICR Review Coordinator	Group
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2. Project Objectives and Components

a. Objectives

According to the Financing Agreement (p. 5), the objective of the project was to strengthen the four science and technology faculties at the University of Guyana (UG) through infrastructure, research and curricular improvements while building the basis for improved facilities management and future growth.

Outcome targets were changed at a restructuring in November 2014; however, a split rating will not be performed because both original and revised outcome targets were met.

b. Were the project objectives/key associated outcome targets revised during implementation?
Yes

Did the Board approve the revised objectives/key associated outcome targets?
Yes

Date of Board Approval
04-Nov-2014

c. Will a split evaluation be undertaken?
No

d. Components
The project had three components.

Component 1: Education Quality Improvement Program (estimated total cost: US$1.9 million, of which International Development Association (IDA) funds of US$1.5 million / actual total cost: US$1.1 million, of which IDA funds of US$1.1 million)

Sub-component 1a: Curriculum Reform
This sub-component was to carry out a science curriculum reform process by updating existing curricula and/or reorienting the existing curricula of UG aimed to support the country's low carbon development strategy (LCDS) through, inter alia: (i) the provision of technical assistance on curriculum reform, instructional design and science content; and (ii) the provision of honoraria to selected UG lecturers participating in such curriculum reform processes.

Sub-component 1b: Research Grants
This sub-component was to carry out selected research relevant to the LCDS through the provision of research grants to selected UG lecturers.

Component 2: Infrastructure Rehabilitation (estimated total cost: US$6.2 million, of which IDA funds of US$5.5 million / actual total cost: US$11.7 million, of which IDA funds of US$10.3 million)

Sub-component 2a: Building and Laboratory Rehabilitation
This sub-component was to rehabilitate and/or improve existing science laboratory buildings of four faculties located within the UG campus to provide basic teaching, including the improvement of UG campus-wide drainage.

Sub-component 2b: Laboratory Equipment
This sub component was to provide scientific and multimedia equipment to the existing science laboratory buildings to deliver practical science teaching and research.

Sub-component 2c: Information and Communication Technology (ICT)

This sub-component was to establish a campus wide internet network within UG to connect its faculties and libraries to the internet and to prepare UG to connect to international links including, inter alia, the development of software applications, e-learning tools and digital content repositories to support the curriculum reform process described in component 1.

Component 3: Institutional Capacity Building (estimated total cost: US$1.8 million, of which IDA funds of US$1.5 million / actual total cost: US$1.4 million, of which IDA funds of US$1.3 million)

This component was to support the building of institutional capacity within UG through the provision of: (a) technical assistance on (i) managerial and administrative capacities, including, inter alia, curricular supervision, ICT, environmental and social management, monitoring, evaluation and facilities management (the elaboration of a facilities management plan, a project website, and an environmental management framework), and (ii) strategic business planning matters, including, inter alia, the preparation of studies related to the creation of a biodiversity institute, the set up of a research and innovation fund, the establishment of a business development unit, and an assessment of existing human resources; and (b) honoraria to selected UG staff for carrying out project tasks.

e. Comments on Project Cost, Financing, Borrower Contribution, and Dates

Project Cost:

The total project cost at appraisal was US$9.9 million. Actual costs for component 1 and 3 were lower than estimated, at US$1.1 million and US$1.4 million respectively; on the other hand, that of component 2 was higher than estimated at US$11.7 million due to inflation and design modifications of buildings and laboratories (which the ICR indicated were necessary because of unforeseen problems, e.g. asbestos in perimeter cladding had to be removed and several adjoining structures required repairs to correct electrical power and sewage issues). The financing gap was covered by Additional Financing (AF) approved on December 8, 2015 and reallocation of funds from components 1 and 2.

Financing and Borrower Contribution:

The project was to be financed by an IDA Credit (IDA-49690) of US$10 million and AF (IDA-57530) of US$3.7 million approved on December 8, 2015. The actual disbursed amount was US$12.6 million. The borrower's contribution was estimated at US$1.4 million, and the actual disbursed amount was US$0.6 million.

Dates:

The project was appraised on May 23, 2011 and approved on June 23, 2011. It became effective on December 13, 2012. The mid-term review (MTR) was conducted in May 2015. The project was

restructured three times during its implementation. The first was on November 4, 2014 to update the results framework. The second was on September 18, 2015 to again update the results framework. The third was on February 7, 2017 to allow reallocation of the funds between disbursement categories and to extend the closing date for three months from June 30, 2017 to September 30, 2017, to complete civil works and deliver and install laboratory equipment under component 2.

3. Relevance of Objectives

Rationale

The PDOs of the project are highly relevant to the Country Engagement Note for Guyana FY16-18, which has three objectives: (a) enhancing resilience of selected infrastructure and building disaster risk management capacities, (b) setting up the foundations for high quality education, and (c) laying the ground for private sector development. The PDOs of the project directly aligned with the second country engagement objective. The project addressed the problem of the low quality of tertiary education graduates in science and technology, which is one of the key binding constraints for sustainable growth of the country, by supporting UG, the only university in the country, to improve the quality of its education and research. The project also contributed to the first objective by teaching and training professionals who would contribute to execution of the country's LCDS, which addresses climate change and disaster risk issues.

Rating

High

4. Achievement of Objectives (Efficacy)

Objective 1

Objective

Strengthen the four science and technology faculties at UG through curricular improvements.

Rationale

The project was envisioned to improve the quality of educational programs offered by the four science and technology faculties to meet international standards and labor market needs. Based on identified needs by the consultations with external stakeholders, the project was expected to review and revise existing curriculum.

Outputs:

- Curricular reform was carried out by Curriculum Reform Technical Committee, comprised of twelve UG Department Heads from the four science and technology faculties, and a group of consultants specializing in instructional design and content development.

- The courses in need of improvement were identified by the Committee.
- Consultations were carried out with key external stakeholders including government, private sector employers, non-governmental organizations, and community leaders to identify the knowledge and skill sets that UG graduates in the science and technology fields would need to master.
- The curricula of 15 bachelor's degree programs were revised: five in the Faculty of Technology, two in the Faculty of Agriculture and Forestry, two in the Faculty of Earth and Environmental Sciences, and six in the Faculty of Natural Sciences. The revised curricula of these 15 programs were approved by the UG Academic Board.
- The 15 revised bachelor's degree programs were posted on UG's website for online registration, meeting the target.

Outcomes:

- UG is now equipped with a standardized process for curriculum reform that can be followed in the science and technology faculties to review and revise curricular elements on a regular basis.
- The ICR reported that a June 2017 beneficiary survey indicated positive feedback in curriculum reform, particularly with respect to the relevance of the revised curricula (content reflects what should be taught at UG, content is more streamlined and practice-based) and faculty ownership and participation in the curriculum reform process (staff input was incorporated in new course outlines, staff feel committed to implementing new curricula). When interpreting the results of this beneficiary survey it is important to note that, although the ICR reported that 252 students and faculty members (of which 79 percent were students and 21 percent were faculty members) responded to the survey, neither the ICR nor the beneficiary survey report offered information on the response rate or indicated how the survey population was selected. The PAD provides some information on the size of the student body, saying that "UG graduated 1,261 students in 2009, of which approximately 25 percent studied in the science faculties" (PAD, p. 2), and estimating the number of direct beneficiaries to be 6,000 students and 300 faculty members.
- The ICR reported that degree programs now align with both labor market needs and international standards, and that graduates acquire practical training that prepares them to assume employment in LCDS-related sectors; however, the ICR offered little evidence to support this claim.
- The International Labour Organization report "Skills for Green Jobs Study - Guyana" (2017) stated the expectation that employment opportunities for future graduates of UG will expand beyond the public sector thanks to the curriculum reform. The project team shared anecdotal evidence that some graduates have been hired by an international oil company, which recently started its business following oil discovery in the country.
- The faculties of Social Sciences and Education and Humanities at UG, which were not direct beneficiaries, have followed project-established procedures to review and update their curricula.

Although the project fully achieved its output targets for this objective, the ICR did not offer sufficient evidence on achievement of the project's expected outcomes about improved quality of the programs offered -- e.g. external validation of the curriculum quality and fit with international standards and labor market needs

-- to merit a rating of Substantial.

Rating
Modest

Objective 2

Objective
Strengthen the four science and technology faculties at UG through research improvements

Rationale
In addition to improving the quality of educational programs, the project's theory of change included measures to develop a research and knowledge-generation culture at the four science and technology faculties. The project was expected to provide research grants for faculty members to conduct research in LCDS-relevant areas.

Outputs:

- UG's first research grant program was developed by the Research Technical Committee, comprised of seven UG faculty members and representatives from external stakeholders.
- The most promising topics for a research agenda were identified by the Committee based on feedback from a stakeholder workshop.
- A template for research grant proposals and criteria to assess proposals in terms of relevance to the LCDS, potential for funding, and safeguards compliance, was developed by the Committee.
- Two proposal calls were conducted, and proposals were evaluated by the Committee.
- 16 scientific research grants were awarded, not reaching the original target of 40, but meeting the revised target of 16.

Outcomes:

- 11 out of 16 research papers produced as a result of the grants met minimum standards of research quality and relevance to Guyana's LCDS, exceeding the target of 10. According to the TTL, research paper evaluations were done by external experts and a research paper meeting the minimum standards needed to demonstrate robust structure, methodology, data collection, sampling, laboratory experiment results, analysis and conclusions. The topics of the papers included cancer cell lines, the potential for carbon storage in mangrove forests, and mining impacts on fish diversity in coastal and inland rivers. This indicator (on research papers produced) was added to the results framework in 2015.
- The research findings were presented at UG's inaugural Undergraduate Research Conference in April 2017, and abstracts of the research papers were published in a commemorative booklet.
- The beneficiary survey results indicated positive feedback, particularly with respect to enhancing

knowledge about low carbon development (research grants generated relevant knowledge), capacity building (research skills honed through research grants will positively impact academic careers), and establishment of a research culture (plans to continue engaging in research in the future).

Rating
Substantial

Objective 3
Objective
Strengthen the four science and technology faculties at UG through infrastructure improvements

Rationale
The project's theory of change also included measures to improve the physical teaching and research environment in the four science and technology faculties. The project was envisioned to rehabilitate buildings and laboratories, provide scientific and multimedia equipment, and establish ICT connections.

Outputs:

Infrastructure Rehabilitation, Equipment, and ICT Technical Committees led the process of building and laboratory rehabilitation, procurement and installation of laboratory equipment, and installation of a campus-wide ICT network.

Building and Laboratory Rehabilitation

- Eight classroom buildings and five laboratories in the science and technology faculties were rehabilitated.
- The campus drainage system was renovated.

Laboratory Equipment

- A priority equipment list was finalized, and technical specifications for equipment were formulated by the Equipment Technical Committee.
- Scientific equipment was procured to furnish the rehabilitated laboratory spaces. The ICR did not provide information about kinds, quantity, or price of procured equipment.

ICT

- The ICT Technical Committee investigated equipment and software options, made procurement recommendations, and worked with the Curriculum Reform Technical Committee to integrate new classroom equipment and software into curricula that had been redesigned under the project.
- A campus-wide fiber optic network and wireless access points were installed to connect all UG faculties and libraries to the Internet.
- ICT equipment such as laptops, projectors, interactive whiteboards, and instructional software such as computer programs were provided to facilitate web-based learning.

Outcomes:

The beneficiary survey results suggested positive feedback, particularly with respect to the improved learning environment for students provided by the rehabilitated buildings and labs, a more appealing campus due to rehabilitated buildings and better drainage, and enhanced efficiency resulting from new IT infrastructure.

Building and Laboratory Rehabilitation

- The renovated drainage system has lessened flooding in the campus.
- Laboratory works now take place under safer conditions thanks to ventilation improvements and disposal of bio-hazardous waste.

Laboratory Equipment

- Laboratory equipment is now stored in a temperature-controlled environment, ensuring its maintenance and longevity.
- According to the ICR, it took some time for instructors to integrate new laboratory equipment with new and improved course content.

ICT

- High-speed Internet connectivity now enables staff to access and develop digital content and e-learning tools that support the new curricula, while students benefit from e-learning opportunities associated with the new classroom equipment and software.

Rating
Substantial

Objective 4

Objective

Build the basis for improved facilities management at UG

Rationale

As part of institutional capacity building, the project's theory of change included measures to enhance the university's capacity for facility management. As the project was expected to rehabilitate buildings and laboratories, provide various equipment, and establish ICT connection under objective 3, this objective was envisioned to ensure that the facilities rehabilitated and provided would be maintained well through developing and applying a Facilities Management Plan.

Outputs:

- An initial inventory was conducted by a consulting firm in 2013 to assess the level of building and laboratory maintenance at UG, using a standardized protocol to assign a maintenance score ranging from 0 to 100 percent to each building, piece of laboratory equipment, and ICT network asset.
- A Facilities Management Plan that incorporated the maintenance protocol was developed by another consulting firm and the Infrastructure Rehabilitation, Equipment, and ICT Technical Committee.
- Facilities maintenance was carried out according to the Facilities Management Plan.

Outcomes:

- UG is now equipped with a systematic process for facilities management to maintain assets in the science and technology faculties.
- Maintenance scores for building, equipment, and ICT assets at project closure were 79 percent, 80 percent, and 100 percent respectively against targets of 70 percent, 33 percent, and 100 percent. The baseline values in December 2013 were 54 percent, 28 percent, and 0 percent.

Rating

Substantial

Objective 5

Objective

Build the basis for future growth at UG

Rationale

As part of institutional capacity building, the project's theory of change also included measures to enhance the university's capacity for business planning. The project was expected to provide essential technical assistance and capacity building for making strategic institutional decisions designed to increase the university's relevance and impact related to the LCDS, and to enhance its financial sustainability.

Outputs:

- Terms of Reference for four studies were developed by the Capacity Development Technical Committee: 1) Human Resources (HR) Management Study, 2) Feasibility Study for a Business Development Unit, 3) Feasibility Study for a Research and Innovation Fund and 4) Feasibility Study for a Center of Excellence for the Study of Biodiversity.
- The four studies were carried out by consultants, with a supervision by the Committee.

Outcomes:

- Recommendations made by the four studies were incorporated into the UG strategy, meeting the target of four studies.
- The recommendations provided by the HR Management Study were incorporated into UG's Annual Plan. Those recommendations include establishing a dedicated HR Department, acquiring software to support HR data management, and implementing a performance management system to track productivity. UG was working on these recommendations at project closure.
- Establishment of a Center for Research, Innovation and Business Development (CRIB) was recommended by the two feasibility studies on a Business Development Unit and Research and Innovation Fund. At project closure, UG had hired a manager to oversee establishment of the CRIB.
- A feasibility study on a Center of Excellence for the Study of Biodiversity recommended establishing it in the Department of the Environment within the Ministry of the Presidency. The Center has been incorporated into the framework of the Green State Development Strategy of the country.

Rating

Substantial

Rationale

For the first objective (to strengthen the four science and technology faculties at UG through curricular improvements), although output targets were almost fully achieved, outcome indicators were not constructed well, and the ICR did not offer enough evidence to support substantial achievement of outcomes. For the second

objective, to strengthen the UG faculties through research improvements, the ICR did not provide sufficient information on the quality review process for completed research projects, but the task team provided detail indicating substantial achievement. For the third objective, to strengthen the four science and technology faculties at UG through infrastructure improvements, relevant outcome indicators were missing; however, the ICR reported beneficiary survey data that suggested substantial achievement of the objective. For the fourth and fifth objectives, outcome targets were achieved. In sum, one out of five objectives was rated Modest, and four were rated Substantial. Taken together, an overall efficacy rating of Substantial is supported.

Overall Efficacy Rating
Substantial

5. Efficiency

The Internal Economic Rate of Return (IERR) was estimated to be 6.0 percent at appraisal, based on the following assumptions: 3,300 students benefitted for 12 years at a cost per student of US$1,927 and graduates' yearly salary increase of US$120. If the premium were set at US$180, the IERR would rise to about 10 percent. The IERR at project closure was estimated to be 9.6 percent, using a different calculation than at appraisal to estimate returns for Guyana comparing with neighboring countries. Building on a recent study on returns to higher education in Latin America and the Caribbean, the ICR calculated Guyana's returns of tertiary education by taking the average of the returns between a high-return country (Chile) and a low-return country (Peru). The ICR used the following assumptions to estimate IERR: discount rate at 5 percent, and 2,485 students benefitted for 25 years at a cost per student of US$973 per year and a secondary graduate average wage of US$3,196. According to the sensitivity analysis conducted in the ICR, the project would have yielded a 4.6 percent IERR with a 10 percent discount rate, and a 7.7 percent IERR under a low-return scenario comparable to Peru, both of which are still favorable. The IERR calculations both at appraisal and at closure assumed that the project was completely responsible for increased enrollment in the four science and technology faculties; however, this assumption may be questionable because higher education enrollment would be affected by many other external factors including economic situation.

The Project required US$4.3 million of additional resources, of which US$3.7 million came from IDA Additional Financing; this increase was considerable when compared to the original commitment amount of $10 million, particularly given that at the time there was no corresponding change in project activities. However, reallocation of funds between components (approved in February 2017) helped to finance additional rehabilitation work and equipment purchases beyond the project's original scope. Although the main factors in the increased cost were outside the Project’s control (such as SDR depreciation and increased costs for civil works caused by inflation and unforeseen design modifications), the increased cost overall may raise questions about project efficiency.

Despite the issues mentioned above, Efficiency is rated Substantial mainly due to favorable IERR.

Efficiency Rating
Substantial

a. If available, enter the Economic Rate of Return (ERR) and/or Financial Rate of Return (FRR) at appraisal and the re-estimated value at evaluation:

	Rate Available?	Point value (%)	*Coverage/Scope (%)
Appraisal	✓	6.00	100.00 ☐Not Applicable
ICR Estimate	✓	9.62	90.00 ☐Not Applicable

* Refers to percent of total project cost for which ERR/FRR was calculated.

6. Outcome

Relevance of Objectives is rated High, as the objectives were fully aligned with Bank and country strategy at project closure. Efficacy is rated Substantial, as four out of five objectives were rated Substantial, and one objective was rated Modest mainly due to lack of outcome evidence. Efficiency is rated Substantial mainly due to favorable IERR. Taken together, these ratings are indicative of minor shortcomings in the project's preparation and implementation, and therefore Outcome is rated Satisfactory.

a. Outcome Rating

Satisfactory

7. Risk to Development Outcome

Financial risks

Lack of funds at UG is the main risk to the sustainability of the project's achievements. Enough budget needs to be allocated to sustain and expand curriculum reform, a research program, and maintenance of assets. At project closure, the University's management had stated its intention to broaden its funding base beyond government budget and student tuition to include planned giving, merchandising, public-private partnerships, grants, and contracts. The ICR reported one positive example of UG securing additional financial resources. In October 2017, the Ministry of Natural Resources signed an Memorandum of Understanding with UG for a US$485,000 grant for academic year 2017-18. The funds will primarily provide the Faculty of Technology with additional equipment for its geology labs, and will also support ongoing curriculum development, training, and field research, all linked to Guyana's emerging oil and gas sector. The first tranche of funds (US$218,000) has been disbursed to UG.

Further, the Ministry of Education's planning unit has strengthened its capacity for project coordination, monitoring and evaluation of data, and overseeing procurement and fiduciary process after implementing the project.

Commitment risks

UG has demonstrated its commitment to sustain and build on the project's achievements. For educational quality improvement, the university is establishing a Center of Excellence for Teaching and Learning to continue and expand the curriculum review and revision process. For research, the university is creating an Internal Ethics Review Board so that future research at UG can be disseminated internationally. For facilities management, the university has hired an electrical engineer to manage the Facilities Management Department and an on-site mechanic to maintain equipment according to the new maintenance protocol.

8. Assessment of Bank Performance

a. Quality-at-Entry

The ICR reported that project preparation was participatory, with the Bank working closely with key stakeholders in Guyana including the private sector, non-governmental organizations, indigenous groups, student groups, and community leaders. This participatory approach enabled the project to address the need to improve tertiary education in science and technology disciplines. The PAD identified 10 topics relevant to the needs of the country based on stakeholder consultations. The project's design was guided by lessons learned from the Bank's previous engagements in science, technology and innovation, as reported in the PAD, including orienting teaching and learning toward addressing local challenges, using an interdisciplinary approach, and empowering beneficiaries through capacity building. The PAD identified key risks including political risks, which actually caused an 18-month delay in project effectiveness following a change in government. The implementation arrangement proved to be adequate, taking advantage of existing capacities and comparative advantages of the Ministry of Education and the University. There were moderate shortcomings in M&E design for some objectives (Section 9a), in particular, expected outcomes were not well measured by the indicators selected.

Quality-at-Entry Rating

Moderately Satisfactory

b. Quality of supervision

After an 18-month delay in project effectiveness, the Bank team supported the Project Coordination Unit (PCU) to accelerate implementation to compensate for lost time. Thanks to this effort, the project ended up with only a three-month extension of its closing date. The MTR in 2015 was thorough, providing a comprehensive overview of project progress, achievements, and key issues to be addressed. The Bank team provided support to strengthen the results framework, trying to ensure that each indicator was well defined and reflected what the project intended to achieve. During this process, the Bank team suggested dropping one PDO indicator and add two new PDO indicators. There were moderate shortcomings in this process: first, the restructuring to revise PDOs was carried out in September 2015, when nearly half of project funds had already disbursed; and second, one of the added PDO indicators was output-oriented (see Section 9b). To address a financing gap mainly caused by SDR depreciation and increased costs for civil works, the Bank team facilitated AF of US$3.7 million in 2015. The Bank team also

facilitated reallocation of funds in 2017 to make use of savings of US$1.7 million in components 1 and 3 to finance additional rehabilitation work and equipment purchases under component 2.

The Bank team supported environmental and social safeguards implementation through a local Environmental Specialist and a Social Development Specialist to ensure that mitigation measures would match local contexts (Section 10a).

Quality of Supervision Rating
Moderately Satisfactory

Overall Bank Performance Rating
Moderately Satisfactory

9. M&E Design, Implementation, & Utilization

a. M&E Design
M&E design had significant shortcomings. Institutional arrangements and responsibilities were clear, relying on the PCU in the Ministry of Education to liaise with established entities within the University for data collection and analysis. The results framework contained intermediate results indicators that were well aligned with project-supported activities and that measured implementation progress. However, the PDO-level indicators, especially for objectives 1 and 3, were either missing or not sufficiently relevant to capture outcomes. For indicators lacking a baseline, a survey was planned to collect baseline data in the first year.

b. M&E Implementation
M&E implementation was generally effective, with some moderate shortcomings. A survey was carried out to collect baseline data in the first year, as planned. The beneficiary survey showed that satisfaction would likely be influenced by factors outside the project's scope, e.g. salary levels for faculty. Therefore, PDO 1 (Increase in student, faculty, and private sector satisfaction with the strength of the four science faculties at UG) was dropped, and two other PDO indicators were added: 1) number of reformed/strengthened programs offered and 2) number of research grants with at least one paper evaluated as successful. The first indicator, added to assess education quality, is output-oriented compared to the original PDO indicator to measure beneficiary satisfaction. Nevertheless, the project carried out a beneficiary survey in June 2017 at project closure to measure satisfaction by students and faculty members. Satisfaction on the part of the private sector was not covered in the beneficiary survey. The survey results were reported in ICR, though not formally incorporated into the project's results framework.

c. M&E Utilization

M&E data enabled the project to track implementation progress towards achieving the PDOs. M&E data was also used to adjust project implementation. For example, the MTR conducted in May 2015 identified the need to adjust a PDO indicator and financing gap, which informed the restructuring in September 2015 and the AF in December 2015. The team's decision to reallocate funds between components in February 2017 was also informed by M&E information.

M&E Quality Rating

Modest

10. Other Issues

a. Safeguards

The project triggered the following safeguard policies: Environment Assessment (OP/BP 4.01), Natural Habitats (OP/BP 4.04), Forests (OP/BP 4.36), Pest Management (OP/BP 4.09), and Indigenous Peoples (OP/BP 4.10).

The ICR (page 21) reported that, generally, there was compliance with the Bank's safeguard policies triggered by the project. The PCU developed an Environmental Management Plan that was consistent with Bank procedures. The plan covered safeguards related to natural habitats, forests, and pest management. A local Environmental Specialist was hired by the PCU and worked on-site during implementation of the infrastructure rehabilitation component of the project to ensure full compliance with environmental mitigation measures. A World Bank Social Development Specialist worked with the Technical Committees for Research and Curriculum Reform to ensure that both of these project sub-components addressed the concerns of Amerindian communities. As a result, the concerns of indigenous people were taken into consideration in the curriculum reform and research grant award processes.

b. Fiduciary Compliance

According to the Bank's Financial Management Specialist, financial management performance was satisfactory during the life of the Project. The PCU submitted quarterly Interim Financial Reports to the Bank in a timely manner. The Audit Office of Guyana submitted prompt audited financial reports that were issued clean opinions and deemed free of internal control weaknesses. A final project audit report for the period January 1 – November 30, 2017 was sent to the Bank in March 2018. The audit report confirmed that the presented financial statements were in accordance with International Public Sector Accounting Standards. The ICR did not provide information about the extent to which Bank procurement guidelines were followed.

c. Unintended impacts (Positive or Negative)

None reported.

d. Other

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11. Ratings

Ratings	ICR	IEG	Reason for Disagreements/Comment
Outcome	Satisfactory	Satisfactory	---
Bank Performance	Satisfactory	Moderately Satisfactory	Moderate shortcomings in quality at entry and quality of supervision were observed.
Quality of M&E	Substantial	Modest	Significant shortcomings in M&E design were observed.
Quality of ICR		Substantial	---

12. Lessons

The following lessons are adapted from the ICR:

Beneficiary involvement leads to capacity development and sustainability of project outcomes. In this project, faculty members of the university gained knowledge and built skills through activities of the six Technical Committees that were established to collaborate on and advance the project's sub-components. As a result, these faculty members now possess the knowledge and skills to continue working on curriculum reform, research, and facilities management

Lack of a communications strategy makes it difficult to manage beneficiaries' expectations. In this project, it took some time for instructors to integrate new laboratory equipment with new and improved course content. Both administrators and students expressed some dissatisfaction with resulting delays in the full use of UG's upgraded laboratory facilities. A formal communications strategy, preferably developed at project start to guide messaging during the course of implementation, could have helped to set expectations about the use of new equipment.

Lack of capacity in impact assessment makes it difficult to measure longer-term project outcomes. The first cohort of students to benefit fully from the project's interventions will graduate with bachelor's degrees in mid-2019. The project timeline could not encompass assessments of the project's impact on labor market outcomes for UG graduates (employment rate, earnings, employer perceptions of graduates' technical knowledge, etc.). However, it would likely have been feasible to incorporate a capacity building element into the

project to prepare UG to undertake this important follow-up work after the project closed.

13. Assessment Recommended?

No

14. Comments on Quality of ICR

The ICR provided a detailed overview of the project. It was concise and succinct. To supplement the incomplete results framework, the ICR provided additional data and evidence including beneficiary survey results to demonstrate achievement of outcomes, although in some cases there was still not sufficient evidence to support substantial achievement. The ICR would have benefitted from having more quantitative information on procured equipment and explanations on procurement issues. The ICR's lessons were clear, useful, and based on evidence outlined in the ICR.

a. Quality of ICR Rating
Substantial