

UNIVERSIDAD PARA LA COOPERACION INTERNACIONAL
(UCI)

FINAL GRADUATION PROJECT NAME:
ENHANCING PROCUREMENT PROCESSES THROUGH THE APPLICATION OF AGILE,
SCRUMBAN, AND CMP METHODOLOGIES FOR GOVERNMENT-FUNDED
EDUCATION PROJECTS

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DEDICATION

This thesis is dedicated to my husband Daniel and my two children Siyah and Judah. Their love and support have allowed me to work hard and persevere throughout this process. Their encouragement was the foundation of this journey. I am grateful for the sacrifices made that allowed me to fulfil my dream.

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Abstract

The Final Graduation Project develops structured project management methodologies to improve the procurement processes within the Project Execution Unit (PEU) under the Ministry of Education, Culture, Science and Technology (MOECST) in Belize. The PEU executes multimillion-dollar education projects funded by both the Inter-American Development Bank (IDB) and the Caribbean Development Bank (CDB), which are international funding institutions (IFI) that provide funding for countries like Belize. However, procurement inefficiencies, such as process delays, lack of performance tracking, limited use of digital tools, and weak vendor evaluation systems negatively affect project timelines, cost efficiency, and service delivery. These inefficiencies hinder the Ministry's ability to deliver the products on time, in keeping with its goals. They, therefore, compromise the quality of the educational products and put the government at risk for future funding. The project identifies these issues through primary data collection such as interviews, review of internal documents, and direct observation. It also incorporates secondary sources, such as global project management standards, to design a solution that is appropriate for the government sector and the Belizean context. The proposal integrates Agile, Scrumban, and Critical Path Method (CPM) methodologies to support standardized workflows, promote flexibility, and improve monitoring and accountability. It includes a procurement performance tracking system, vendor evaluation mechanisms, and stakeholder engagement strategies to align procurement practices with strategic goals. Ultimately, this project contributes to more efficient project execution, supports compliance with IFI requirements, and strengthens the PEU's capacity to deliver sustainable and impactful educational services.

Key Words: Project Management, Efficiency, Procurement, Framework, Improvement

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ABBREVIATIONS AND ACRONYMS

Agile – An iterative project management methodology focused on flexibility and customer collaboration

BMIS – Belize Management Information System

BOQ – Bill of Quantities

CDB – Caribbean Development Bank

CEO – Chief Executive Officer

CPM – Critical Path Method

EQIP – Education Quality Improvement Program

EQIP II – Education Quality Improvement Program II

FGP – Final Graduation Project

GOB – Government of Belize

IFI – International Funding Institution

IDB – Inter-American Development Bank

KPI – Key Performance Indicator

MOECST – Ministry of Education, Culture, Science and Technology

PEP – Project Execution Plan

PEU – Project Execution Unit

PMBOK – Project Management Body of Knowledge

PMIS – Project Management Information System

PMI – Project Management Institute

RAM – Responsibility Assignment Matrix

SBD – Standard Bidding Document

SFTF – Skills for the Future

TOR – Terms of Reference

TS – Technical Specification

UCI – Universidad para la Cooperación Internacional

WBS – Work Breakdown Structure

EXECUTIVE SUMMARY

Within the Ministry of Education, Culture, Science and Technology (MOECST) in Belize is the Project Execution Unit, part of the Policy and Planning Division. The PEU is responsible for implementing education-related projects funded by international financial institutions (IFIs), such as the Caribbean Development Bank (CDB) and the Inter-American Development Bank (IDB). Over the years, the PEU has played a critical role in improving the education system through infrastructure development projects, state-of-the-art technology, and updated curriculum development. Despite these accomplishments, procurement inefficiencies have caused significant project delays, particularly due to the absence of structured project management methodologies tailored to the PEU's operations. Manual processes, limited accountability, and a lack of performance evaluation tools have led to repeated inefficiencies that impede project timelines, financial disbursements, and the overall effectiveness of project delivery.

The justification for this project stemmed from the need to improve procurement outcomes and align procurement practices with MOECST's strategic goals and the requirements of the funding agencies. The use of a formal methodology is necessary to streamline procurement, enhance efficiency, and introduce transparency and accountability mechanisms. By addressing these inefficiencies, the PEU can improve project outcomes, meet international standards, and increase the likelihood of continued donor support.

The Final Graduation Project's general objective was to develop a proposal for the implementation of Agile, Scrumban, and Critical Path Method (CPM) project management methodologies to improve the procurement processes of the PEU. The specific objectives were: i) to identify the existing inefficiencies and challenges that are faced in the procurement processes of the PEU in order to understand the root cause of delays, non-compliance, and misalignment with strategic goals; ii) to assess the relevance and adaptability of the Agile, Scrumban, and CPM project management methodologies by evaluating their core principles against the PEU procurement needs, through comparative analysis and consultation in order to determine their suitability for the project; iii) to design and integrate a project management framework based on the best practices from Agile, Scrumban, and CPM aimed at streamlining procurement workflows and improving accountability; iv) to develop key performance indicators (KPIs) to measure procurement efficiency, transparency, and responsiveness under the proposed framework; v) to propose specific best practices for adaptation from the project management framework in order to optimize procurement operations and support strategic project delivery.

This research followed a mixed-method approach. Primary data was collected through interviews with procurement staff and reviews of internal PEU documents, such as procurement schedules, project execution plans, and contract records. Secondary sources included academic literature, project management standards such as the PMBOK Guide, and procurement guidelines from the IDB and CDB. The methodologies employed included analytical, descriptive, and comparative research methods to identify inefficiencies, evaluate methodologies, and design a procurement framework. Tools such as SWAT analysis, process mapping, key performance indicators, and benchmarking were utilized to assess the current state and design the proposed improvements.

This study concludes that the core inefficiencies in the procurement processes stem from a lack of structured methodologies, inadequate performance monitoring, and limited adaptability to the

dynamic project needs. The integration of project management methodologies demonstrated significant value in addressing these gaps by introducing flexibility, accountability, and strategic alignment. By mapping the existing procurement workflows, it was determined that in applying project management principles, a hybrid approach will not only enhance transparency but also enable real-time adjustments, reduce delays, and improve supplier engagement. The findings underline the transformative potential of adopting tailored project management frameworks for the Project Execution Unit.

Among the most relevant recommendations is the adaptation of a hybrid project management model that leverages Agile, Scrumban, and CPM to streamline procurement operations and improve responsiveness to project milestones. The implementation of a digital procurement management information system is also advised to automate tracking, improve data accuracy, and enhance vendor accountability. Furthermore, the development of standardized Key Performance Indicators (KPIs) and a formal Best Practices Guide will enable the PEU to institutionalize continuous improvement mechanisms. These recommendations are designed to strengthen operational efficiency, ensure alignment with IFI standards, and support the long-term sustainability of procurement reforms within MOECST's strategic framework.

1 INTRODUCTION

The Ministry of Education, Culture, Science and Technology (MOECST) in Belize is tasked with shaping national education policies and implementing sector-wide projects aimed at enhancing the quality of education. One of the core units within the MOECST is the Project Execution Unit (PEU), responsible for managing loan and grant-funded projects supported by institutions such as the Inter-American Development Bank (IDB) and the Caribbean Development Bank (CDB). These projects include infrastructure development, procurement of teaching and learning resources, and the advancement of technological tools within schools. The PEU functions under the Planning and Policy Division of the MOECST and plays a key role in executing initiatives aligned with the Ministry's strategic plan.

Despite its critical role, the PEU faces persistent challenges in its procurement operations. The absence of a formalized project management methodology has contributed to delays in procurement cycles, inefficiencies in communication, and a lack of accountability in vendor performance. While donor agencies provide structured procurement guidelines, they are not designed to address the specific needs of the PEU or its operational context. As a result, procurement activities remain largely reactive, limiting the ability of the PEU to deliver timely and cost-effective outcomes.

Procurement inefficiencies directly impact the delivery of educational services and infrastructure. The current manual systems used to track procurement activities lack integration and do not support performance monitoring. These challenges are exacerbated by the absence of digital tools, inconsistent documentation practices, and limited stakeholder coordination. Furthermore, procurement delays affect project timelines and increase the risk of non-compliance with donor regulations, which may jeopardize future funding.

This Final Graduation Project proposes the implementation of structured project management methodologies, specifically Agile, Scrumban, and the Critical Path Method (CPM), to improve the procurement processes within the PEU. These methodologies offer adaptable, efficient, and results-oriented frameworks that are well-suited for the dynamic environment in which the PEU operates. The project aims to align procurement practices with strategic education goals, enhance transparency and accountability, and promote the timely delivery of project outcomes.

1.1. Background

The Ministry of Education, Culture, Science and Technology (MOECST) is a ministry within the Government of Belize. It plays a crucial role in shaping the educational system in the country. Within the MOECST, under the Policy and Planning division, is the Project Execution Unit (PEU). The PEU is responsible for the execution of loan/grant-funded projects for MOECST. These projects include but are not limited to infrastructure works, consultancies to develop different educational areas, purchase of equipment for schools, and purchase of software for evaluating and teaching students. Some of the projects undertaken by the PEU are the Belize Education Sector Reform Project (BESRP), the Education Quality Improvement Program 1 and 2, and the Skills for the Future Program. All of these projects are funded by an international funding institution (IFI), such as the Caribbean Development Bank and the Inter-American Development Bank. The PEU's mandate is to ensure that all projects are implemented effectively and efficiently, in alignment with the national strategies of the MOECST. For context, it is essential to note that in accordance with loan contracts signed with the different IFIs, the PEU must do regular check-ins and reporting to be in compliance with the loan contracts. The check-ins are done via weekly meetings, semester progress reports, portfolio review sessions, and

country missions with local and international team members.

Despite its accomplishments, the PEU faces significant challenges in its procurement operations. Procurement is a core function within project execution and among MOECST's strategic goals. If procurement is delayed, there will be delays with financial disbursements and project implementation. However, the PEU lacks a standardized project management methodology to guide procurement activities. This gap has resulted in bureaucratic delays, misalignment between procurement tasks and strategic objectives, and the recurrence of inefficiencies across projects. For example, the absence of a vendor evaluation system has led to the repeated engagement of underperforming suppliers. This subsequently causes delays in the delivery of equipment needed for a school year or specific training, which usually has to be postponed to another school year or cohort. Usually, these delays impact the project negatively regarding financial disbursement and attainment of a particular milestone within a particular period.

Historically, procurement within the PEU has been guided primarily by the procurement policies of the IFIs. While these provide essential compliance requirements, they do not offer the flexibility or strategic structure needed to address internal challenges unique to the Belizean context. Without an internal framework or methodology that is created to meet the PEU's needs, procurement operations are reactive rather than proactive, affecting the timely delivery of education services and infrastructure. It also affects the performance of projects with IFIs. The disadvantage in this is that it puts the government, and in particular the MOECST, at risk of not receiving future funds from these IFIs.

Furthermore, the lack of digital tools for procurement tracking and limited integration of risk management practices have constrained the unit's ability to operate effectively. Manual

tracking and fragmented communication have introduced delays in procurement cycles, impacting the effectiveness of educational project delivery. These issues are compounded by the limited capacity of the PEU to evaluate process performance or apply consistent procurement planning approaches across projects.

By recognizing these challenges, in this Final Graduation Project, a structured project management methodology tailored to the PEU's context is proposed. This methodology would help streamline procurement processes, ensure alignment with MOESCT's strategic goals, and improve transparency and efficiency in public project delivery.

1.2. Statement of the Problem

For the Ministry of Education, Culture, Science and Technology's (MOECST) Project Execution Unit (PEU), procurement plays a critical role in delivering multimillion-dollar education projects aligned with the Ministry's strategic plan. The international funding institutions (IFIs), as well as the government, expect efficient use of funds. Consequently, all projects will be executed in a timely manner and give the government value for the money invested. Despite the strategic importance of procurement in these projects, the unit lacks a formalized and standardized project management methodology to guide procurement planning, execution, and monitoring. More importantly, there is no accountability for the bottlenecks and challenges faced throughout these processes.

The absence of a structured methodology has led to several operational inefficiencies. For example, a procurement process that should take about 5-6 months is protracted to up to 12 or even 18 months in some cases. Among the most critical issues are bureaucratic delays caused by manual processes and excessive layers of review and approval. Procurement timelines are often extended, as previously mentioned, due to coordination gaps among internal stakeholders and

external reviewers. These reviewers include the evaluation committee/panel and the IFI, the Ministry of Finance, and the Office of the Contractor General. These delays hinder the timely delivery of key educational infrastructure, learning materials, and services, ultimately impacting the quality of education provided to students.

Moreover, the PEU does not currently utilize a digital system for procurement tracking or performance monitoring. This leads to inconsistencies in documentation, weak accountability mechanisms, and challenges in ensuring value for money. Without the formal tools for vendor evaluation, underperforming suppliers may be repeatedly engaged in future procurement cycles, further compounding the inefficiencies. This occurs because there is no system in place to evaluate and prevent such suppliers from participating.

The lack of a procurement management framework specifically for the PEU results in poor alignment between procurement processes and the strategic objectives of MOECST. Project implementation often suffers from miscommunication, overlooked deadlines, and reactive decision-making. These challenges do not only delay project outcomes but also risk non-compliance with donor guidelines and national procurement regulations. This also has a financial implication for the Government of Belize; delayed projects cost the government millions of dollars in interest payments. This research project aims to address the core problem of procurement inefficiency by proposing project management methodologies that can improve planning, enhance accountability, streamline processes, and support better alignment with MOECST's educational priorities.

1.3. Purpose

The purpose of this study is to design and propose structured project management methodologies to enhance procurement processes with the PEU. These methodologies will

address operational inefficiencies, improve performance, and strengthen alignment with national educational goals and IFI requirements.

Procurement under the PEU is central to the success of various projects aimed at improving the country's education system. In compliance with the IFI loan agreements requirements, the PEU must operate with utmost transparency, efficiency, and accountability. However, as mentioned above, the current procurement approach in the PEU lacks formal structure and strategic direction. Most processes are guided solely by the guidelines from the IFIs, with little internal standardization or performance measurement mechanisms.

Implementation of formal project management methodologies would bring several key benefits.

- It would provide a consistent and repeatable framework to guide procurement planning, execution, and monitoring.
- It would help integrate tools and practices, such as procurement tracking systems, performance evaluation criteria, and stakeholder coordination mechanisms that are currently missing from the PEU's operations.
- It would enable the alignment of procurement processes with the MOECST's strategic goals, ensuring that resources are used effectively to deliver results that matter.
- It would reduce procurement delays by integrating proactive planning, stakeholder engagement, and digital tracking tools.
- It would increase adaptability to evolving project needs and external challenges, such as policy changes and procurement disruptions, or bottlenecks.

Additionally, this research project is timely and necessary, given Belize's broader efforts to modernize and improve the quality of education across the country. The findings and

recommendations will support the PEU's efforts to become a model for efficient project execution within the public sector. The project will also contribute to knowledge in the field of project management by demonstrating how structured methodologies can be adapted to fit the unique context of the PEU.

Ultimately, the justification for this project lies in its potential to create long-term, sustainable improvements. By addressing core gaps in the PEU's current operations, this study will help to ensure that education projects are delivered on time, within budget, and to the quality standards expected by both MOECST and the IFIs.

1.4. General Objective

To develop a proposal for the implementation of Agile, Scrumban, and Critical Path Method (CPM) project management methodologies to improve the procurement processes of the Project Execution Unit (PEU) of the Ministry of Education, Culture, Science and Technology (MOECST), in order to increase efficiency, accountability, and alignment with strategic project goals.

1.5. Specific objectives

1. To identify the existing inefficiencies and challenges that are faced in the procurement processes of the PEU of the MOECST in order to understand the root causes of delays, non-compliance, and misalignment with strategic goals
2. To assess the relevance and adaptability of the Agile, Scrumban, and Critical Path Method (CPM) project management methodologies, in order to determine their suitability for enhancing the procurement processes in the PEU context
3. To develop a structured proposal integrating Agile, Scrumban, and CPM methodologies,

in order to standardize procurement practices and improve process efficiency, transparency, and accountability

4. To develop key performance indicators (KPI) that will assist in the monitoring and evaluation of the effectiveness of the project management methodologies and the tracking of procurement performance. This will support continuous improvement and alignment with educational project outcomes and IFI requirements.
5. To propose specific best practices for adaptation from the project management framework (Agile, Scrumban, and CPM) and demonstrate their application in selected procurement activities, such as the acquisition of equipment for secondary schools, construction of STEAM Lab schools, and consultancy. To conduct evaluations for the Skills for the Future Project and the Belize Education Sector Reform Project in order to optimize procurement operations and support strategic project delivery within the projects timelines

2 THEORETICAL FRAMEWORK

The Theoretical Framework will be utilized for the Project Execution Unit (PEU) under the Ministry of Education, Culture, Science and Technology (MOECST). The MOECST is a ministry under the Government of Belize that is directly responsible for education in Belize.

2.1 Company/Enterprise Framework

This section will provide an overview of the MOECST and the PEU in light of their relevance to the Final Graduation Project. It will include the background of the Organization, mission and vision, organizational structure, and the services offered by the institution.

2.1.1 Company/Enterprise Background

The Ministry of Education, Culture, Science, and Technology (MOECST) is a ministry within the Government of Belize (GOB). The MOECST is governed by the currently appointed minister Honorable Francis Fonseca and minister of state Honorable Luis Zabaneh. The accounting officer of the Ministry is the Chief Executive Officer, Mrs. Dian Maheia. The MOECST is responsible for the education system in Belize, which consists of four levels: pre-primary, primary, secondary, and tertiary. The Ministry is also responsible for the Technical and Vocational Education and Training centers around the country; there is one in all of the six districts. The services provided by the Ministry are: Planning and Development Services (under which the PEU falls), Student Services, Teacher Services, and School Services.

As mentioned, the Project Execution Unit (PEU) is a unit under the Planning and Development Service sector of the MOECST. As such, it is responsible for the execution of various projects in the education sector. The PEU plays a critical role in ensuring that education infrastructure, curriculum improvement, and technological enhancements are implemented

effectively and efficiently.

The PEU was established to manage large-scale educational projects. It is responsible for streamlining project management processes, procurement, and stakeholder coordination. The projects implemented under the PEU have made significant contributions to improving the quality of education in Belize.

So far, the Government of Belize, through the Ministry of Education, Culture, Science and Technology, has signed four loan agreements to be implemented by the PEU. One agreement was signed between the GOB and the Caribbean Development Bank (CDB) to finance the Belize Education Sector Reform Project (BESRP) to the tune of US\$35,000,000. Meanwhile, three agreements have been signed with the Inter-American Development Bank (IDB) for (i) the Education Quality Improvement Program (EQIP) for US\$15,000,000; (ii) the Education Quality Improvement Program II (EQIP II) for US\$15,000,000; and (iii) the Skills for the Future Program (SFTF) for US\$15,000,000. All of these loan-funded projects are being implemented by the PEU.

For context, although the PEU is a unit under the MOECST, it is housed separately from the Ministry and is responsible for its management costs and day-to-day functions. The PEU, however, relies heavily on the MOECST for technical input as it relates to drafting of Terms of References (TORs), technical review and acceptance of deliverables, compliance verification, participation in strategic meetings, and most of the other project management aspects under the PEU. The CEO being the accounting officer for the MOECST, the PEU directly reports to the CEO. The CEO acts as the authorized signatory for the PEU; therefore, all official documents, including contract agreements, must be signed by the CEO.

2.1.2 Mission and Vision Statement

The mission of the MOECST:

The Ministry of Education, Culture, Science and Technology (MOECST) of Belize is charged with the responsibility of ensuring that all Belizeans are given an opportunity to acquire the knowledge, skills, and attitudes required for their own personal development and for full and active participation in the development of the nation. (Ministry of Education, Culture, Science and Technology, n.d.)

The vision of the MOECST:

“The Education System of Belize will be inclusive, accessible, equitable, of high quality, technologically driven and capable of fostering the development of good, productive citizens.” (Ministry of Education, Culture, Science and Technology, n.d.)

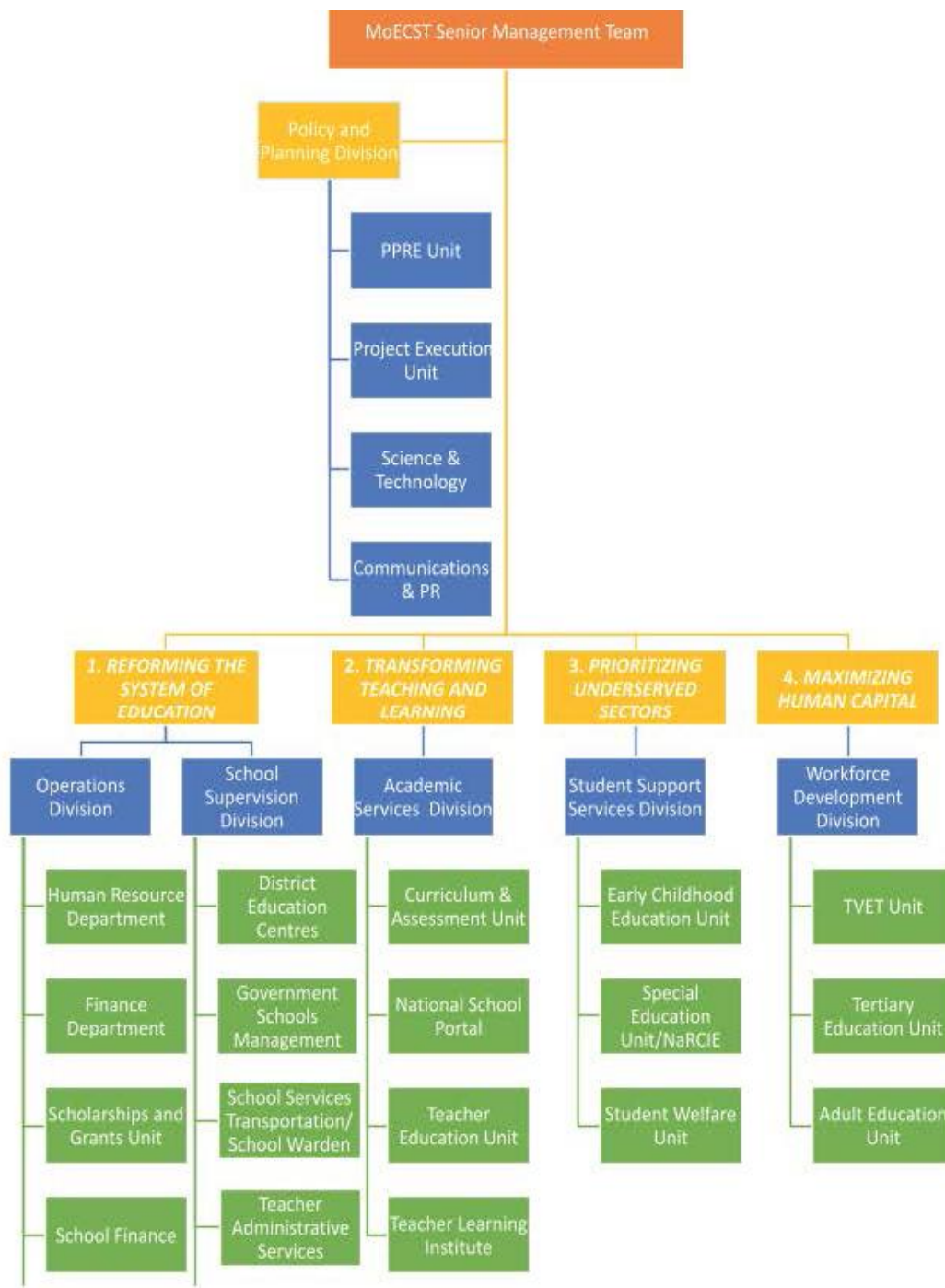
The PEU is governed by the MOECST; therefore, the mission and the vision of the Ministry is adopted by the PEU. The Unit works toward the goals of the Ministry by implementing and executing projects aligned with the goals of the Ministry.

2.1.3 Organizational Structure

In order to understand where the PEU falls under the Ministry of Education, it is important to demonstrate the organizational structure of the MOECST. Below is the organizational structure for both the MOECST and the PEU. However, PEU will be the main focus of this project.

Figure 1

MOECST Organization Structure 1



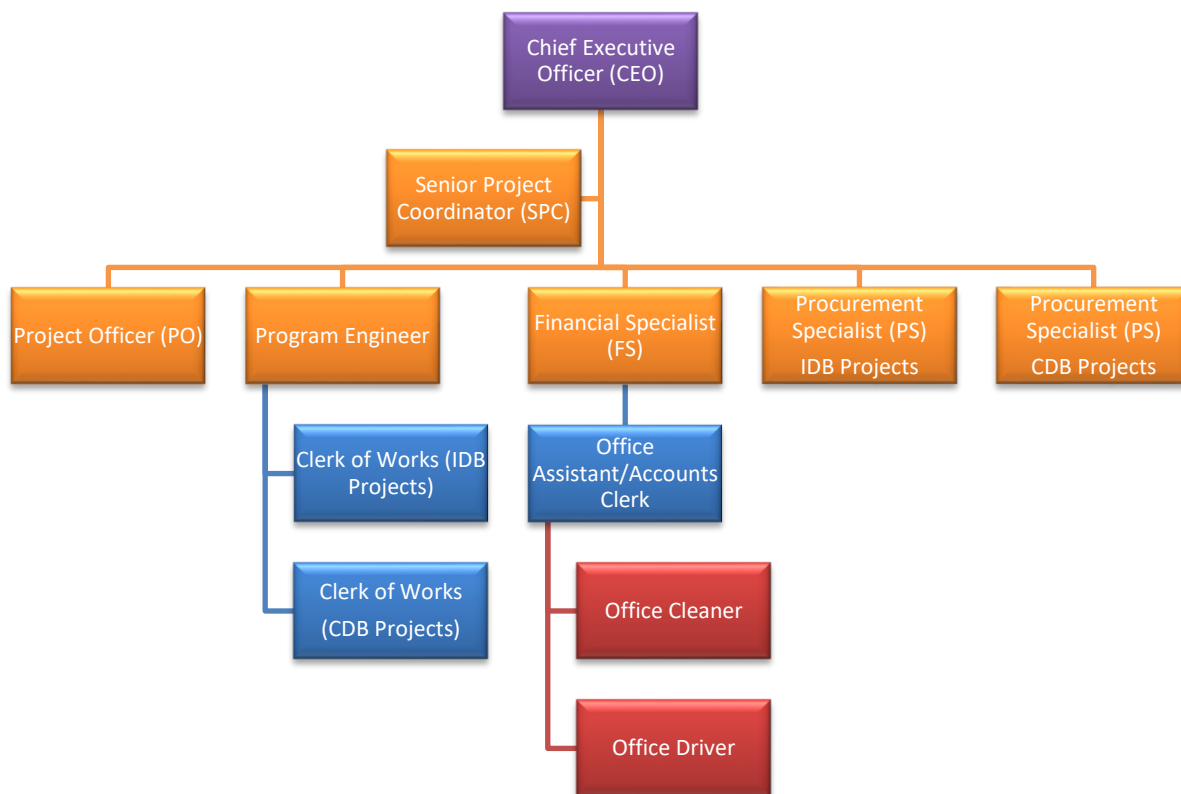
Note. Adapted from “Organizational Structure” by Ministry of Education, Culture, Science and Technology, n.d., Government of Belize. <https://www.moechst.gov.bz/organizational-structure/>. Copyright n.d. by Ministry of Education.

The Ministry of Education, Culture, Science and Technology is a government ministry responsible for education in Belize. Within the ministry, there are several departments with specific responsibilities to deliver educational services nationwide. Each unit plays a critical role in ensuring that the ministry fulfils its mandate.

- Policy and Planning Division is responsible for strategic planning, policy development, oversight of large-scale projects, and all communication from the ministry to the general public. The Project Execution, Science and Technology, Communications and PR, and Policy, Planning, and Research Education Units are within this division.
- Under the Reforming the System of Education, there are the Operation Divisions which handle all the operations of the ministry, and the School Supervision Division, with responsibility to manage the functions of all schools in Belize.
- Under Transforming Teaching and Learning is the Academic Service Division, which is responsible for curriculum and teaching development for the nation.
- Under Prioritizing Underserved Sector is the Student Support Service Division, which is responsible for early childhood learning, special education needs, and student welfare.
- Under Maximizing Human Capital is the Workforce Development Division, responsible for educational audits, tertiary level education, and TVET or trade development within the country.

Figure 2

PEU Organizational Structure 1



Note. Figure created by the author.

The Project Execution Unit, the organizational structure reflects the team focused on project implementation. The Unit is comprised of the Senior Project Coordinator, who leads the Unit and liaises with the Chief Executive Officer. The Project Officer, Program Engineer, Financial Specialist, and Procurement Specialists all work directly with the Project Coordinator. The Support staff handles administrative tasks, logistics, and documentation to ensure smooth operations within the PEU.

2.1.4 Products Offered

The PEU works closely with the Ministry of Education to implement the projects undertaken by the Ministry in order to achieve its objectives. Below are the objectives and services provided by the Ministry to improve the education sector in Belize. In addition, the Ministry offers online teacher learning programs, it offers schools technological support to track their performance virtually, capturing a vast amount of data using the Belize Management Information System (BMIS). The Ministry recently launched the 501 Academy, which is an online platform that provides access to virtual learning. Furthermore, the MOECST has a GIS Hub where educational spatial data can be accessed. Finally, through the PEU, the MOECST has handed over its first GREEN Certified school building in August 2024.

Objectives related services provided by the Ministry:

- Increase the capacity of the MOECST to respond efficiently and effectively to the needs of students and the nation by rationalizing, modernizing, and restructuring its services and organizational model
- Achieve greater value for money through finance reform that assures equitable access to funding for students in need, incentivizes quality teaching and leadership, and ensures accountability for public funds
- Improve efficiency and effectiveness in the management and delivery of education services by strengthening the legislative, regulatory, and policy frameworks and structures that govern the education system
- Improve the relevance and quality of education by reforming the national curriculum to ensure that students develop the knowledge, skills, values, and attitudes needed to participate in national development and lead productive and meaningful lives
- Modernize the education system by building a robust education technology infrastructure and

by harnessing the power of modern technology to transform teaching and learning in and out of the classroom

- Build a culture of continuous improvement by establishing a system of formative, diagnostic, and standardized tests, which can be used to inform and implement practices and policies for improved student learning at the classroom, school, and system levels
- Improve student achievement and wellbeing by increasing the effectiveness and professionalism of the teaching force through innovative teacher education and professional development and support programs
- Increase access to quality early childhood education by expanding services to underserved communities and implementing relevant legislative, regulatory, and policy reforms
- Improve the inclusion and experience of students with special education needs by providing adequate resources and establishing relevant legislation, regulations, and policies
- Expand the availability of relevant skills in the workforce by partnering with industries and the private sector to improve the governance, infrastructure, relevance, and quality of technical and vocational education in the country
- Increase the quality and relevance of the higher education sector by creating the enabling environment and building the capacity of tertiary institutions to deliver quality, relevant education programs and research services
- Improve the capacity of the Belizean workforce and the quality of life of the adult population by implementing and supporting nationwide adult learning and continuing education programs in literacy, numeracy, life skills, technology, and technical and vocational education

2.2 Project Management Concepts

Project Management is a structured discipline that ensures projects meet their objectives efficiently. This section provides an in-depth discussion of the principles, domains, approaches, life cycles, project administration, process groups, and strategy of the PEU relating to the procurement process for education projects.

2.2.1 Project Management Principles

According to the Standard for Project Management (PMI, 2021), project management is guided by twelve fundamental principles. These principles ensure structured and effective project execution. They serve as the foundation for decision-making and process management throughout the project life cycle. The PEU currently uses some of these principles, which will be demonstrated below; on the other hand, the principles that have not been adopted or used to their full capacity will provide some insight into the inefficiencies of the Unit. However, these principles are vital for the PEU procurement processes to improve efficiency and use of resources. They are essential for procurement in government projects, ensuring accountability, cost efficiency, and compliance with the national education strategies.

Stewardship is important for the PEU and especially in the procurement and finance departments. The Project Manager is responsible for acting in the best interest of the organization to ensure that resources are used efficiently, ethically, and effectively. In procurement, this means ensuring compliance with procurement policies, transparency, and regulatory requirements (PMI, 2021). The procurement procedures are straightforward when using loan funds; each funding agency provides guidelines that must be followed for procurement to be compliant with the loan agreement. Procurement methods are determined by the estimated budget, the scope of work or services, and the individual or team needed to carry

out the assignment. For the most part, these documents are prepared in the initiation phase of the project and are provided to the project execution team. However, from time to time there are changes to these plans based on the current circumstances. The Procurement Specialist is usually tasked with making a strategic proposal to the Project Coordinator before the start of the process. Usually, factors such as timeline, estimate, and indicators are taken into account for the planning process. For each procurement process, it must be demonstrated through documentation that the funding agency procedures are being followed, including proof of transparency, and proof of efficiency. Documentation for each step must be submitted to the loan agency for approval before the next step can be initiated.

Team collaboration is vital: a project's success depends on the coordination and cooperation of its team members. Procurement teams must work closely with contract managers, suppliers, stakeholders, and financial officers to ensure smooth execution (Heldman, 2021). Based on the cycle of the procurement processes, many external inputs are needed for success. The procurement processes within the PEU begins with the development of the Terms of Reference (TOR), Technical Specification (TS), or BOQ/Drawings, in collaboration with the MOECST. Once these documents are approved, the other procurement steps are initiated. During the procurement process, the PS is in close communication with suppliers/contractors/consultants; this fosters good working relationships to ensure the success of the project. After the completion of each procurement process, an agreement is signed for the goods, works, or services, thereby initiating the contract management process. This process involves collaboration between the contract manager and the procurement and finance officers to ensure that the agreed upon outcome is achieved. Any breakdown in this process can lead to delays, substandard products, and project failures. Finally, in this process, the end users/stakeholders receive the product. Close

communication is maintained with the stakeholders to ensure that the goods, works, or services are provided to the standard required.

Every project is expected to provide measurable value to stakeholders. In procurement, value delivery is critical as it ensures cost-effectiveness, sustainability, and alignment with strategic educational goals (Kerzner, 2022). This is where some of the PEU's most important work comes into action. Detailed planning is needed when trying to achieve value for money. The plans of the PEU coincide with the school year as well as the implementation of strategic projects for the schools. For example, if the MOECST wants to pilot a virtual learning software, the factors to be considered are: (i) which age group will be targeted; (ii) what method will be used to select schools to participate; (iii) how to ensure that all participating schools meet the requirements for the virtual learning software; (iv) how to ensure that devices are distributed to the schools before the start of the pilot; (v) and how to ensure that the consultant is hired to carry out the pilot. These are just a few of the details needed to make a project successful. If there are delays in any of the steps, the time to implement the project lapses, and resources spent on the earlier completed process are wasted. Granted, all efforts are not completely lost; however, the process is not optimally effective and impactful if all activities are not aligned.

Project managers should exhibit strong leadership by guiding and motivating teams. Effective leadership in project procurements ensures that vendors adhere to quality standards and contractual obligations (Larson & Gray, 2021). The PEU takes this task seriously to ensure that the end users—the students of the country—received the best tools, lessons, and infrastructure possible. Both the IDB and CDB policies stipulate that deliverables are to be prepared and submitted to the quality and standards prescribed by the Ministry. Based on the PEU's organizational structure, the Procurement Specialist takes the lead on ensuring that contracts are

carried out as planned , ascertaining that there's collaboration between the Procurement and Financial Specialist, and checking for compliance before a payment is made. The PEU relies on the technical expertise of the Ministry staff for compliance checks and approvals. As stated before, the PEU has no formalized system; these are merely some interim activities undertaken to ensure compliance with the loan contracts.

Project methodologies should be adapted to fit the project environment. In government procurement, tailoring ensures that methodologies like Agile, Scrumban, or Waterfall align with the legal and operational framework of the organization (Burke, 2019). Tailoring the project management methodology to suit the project is essential; however, this is a gap that has been identified as one of the limitations of the PEU. There are no formal project management methodologies that have been adopted by the PEU, and the effects of this have been visible when it comes to project delays and misalignment of activities.

Maintaining quality is essential across all project phases. Quality in procurement involves vendor evaluation, contract performance monitoring, and ensuring materials/services meet project specification (PMI, 2021). Currently, under the PEU, there are no tools or mechanisms in place to evaluate vendors. Consequently, there was a recent issue with a particular supplier, but there was nothing that could be done to prevent that supplier from participating in future processes. It became clear to the Unit that there should be evaluation procedures in place to weed out or "blacklist," non-compliant vendors. There are procedures in place; however, to track due dates for deliverables to be received, time allocated to review, and time allocated to revise and approve. These tasks are done in collaboration with the Procurement Specialist, Project Officer, Senior Project Coordinator, and Financial Specialist.

Projects, especially in government procurement, involve various complexities, such as

regulatory constraints, political influence, and multi-stakeholder involvement. Project Managers must navigate these challenges effectively (Meredeth & Mantel, 2021). In the PEU, the Senior Project Coordinator answers directly to the Chief Executive Officer of the Ministry; therefore, the political influence that might affect the team is mitigated at the management level. There are instances when the Minister would ask for a building to be designed in a certain way or for the use of a certain color or name to push his political agenda; however, this is not material to the outcome of the project monitoring indicators. Another issue that is difficult to manage by the PEU is the multi-stakeholder involvement: It is difficult to coordinate individuals from across all line ministries for mandatory Project Steering Meetings to make decisions on project processes. There are currently no mechanisms in place to determine how effective the current practices are.

Risk management is identifying and mitigating risks proactively, which is crucial. Procurement processes often face risks such as supply chain disruptions, cost overruns, and regulatory changes, which must be managed to ensure smooth project execution (Inter-American Development Bank, 2021). In the PEU's procurement procedures, it is relatively easy to identify impending risks; however, some actions are out of the control of the PEU. After the COVID-19 Pandemic, it was very difficult for the PEU to source internationally produced goods, and the time period for delivery was double what it was pre-covid. Furthermore, not only the PEU, but all sectors have experienced the post-covid inflation. Some measures that the PEU has put in place, especially as it relates to consulting services, are to change the procurement methods from Quality and Cost Based Selection, to Fixed Budget Selection. This has mitigated the cost-overruns that could occur.

Adaptability and Resilience are important for projects to operate in dynamic environments. Procurement teams must be flexible and resilient to changes in budget allocations,

supplier availability, and geopolitical factors (Caribbean Development Bank, 2021). With Belize being a third world country, there are often uncertainties about the goods and services purchased abroad. The majority of services provided to the PEU are from international individuals and firms as there are limited qualified experts in-country. Therefore, the PEU and the procurement unit plan for such eventualities and any possible risks involved.

Effective stakeholder management ensures alignment with project goals. Conversely, government procurement projects involve multiple stakeholders, including ministries, funding agencies, suppliers, and regulatory bodies, requiring clear and consistent communication (PMI, 2021). In keeping with the work of the PEU, there must be alignment of timelines to execute certain projects, goods must be received on time, and consultants hired on time; furthermore, schools must be informed, teachers prepared, and buy-in must be ensured from all involved.

Procurement processes often undergo changes due to policy updates, market conditions, or stakeholder requirements. Managing change efficiently ensures smooth project execution (Kerzner, 2022). Because the PEU is a small unit with usually one person in a specific role or department, change management, as it relates to work environment, involves informing others of any alterations. Usually, if a change does not directly affect a department, the change management involves simply informing others for awareness.

Sustainability in projects contribute to long-term benefits rather than short-term gains. Sustainable procurement ensures eco-friendly materials, ethical labor practices, and cost-efficient solutions that support educational infrastructure development (Inter-American Development Bank, 2021). The PEU in the recent years, as of 2021, has implemented sustainable procurement practices. An example of this, which is written in all the standard bidding documents (SBD) for work, is that it is a requirement for all contractors to have an environmental plan. The plan must

be submitted for review and evaluation as part of the selection process. Further, all new school infrastructure must comply with GREEN certification, demonstrating energy efficiency, water efficiency, and sustainable practices.

2.2.2 Project Management Domains

Project performance domains represent a group of eight related activities that are critical for the effective delivery of project outcomes. Project performance domains are interactive, interrelated, and interdependent areas of focus (PMI, 2021). The eight performance domains are integral for the PEU and the MOECST. Managing performance enables the Government of Belize to secure loan funds for projects needed for the development of the country.

Stakeholder engagement involves identifying, analyzing, and managing stakeholders to ensure their expectations and interests are aligned with the project objectives. Effective engagement includes regular communication, participation in decision making, conflict resolution, and feedback incorporation (Heldman, 2021). In project procurements, this means keeping government officials, procurement offices, suppliers/contractors/consultants, and funding agencies informed and involved throughout the process to minimize conflicts and ensure alignment with the procurement policies. Stakeholder engagement management under the PEU entails the PEU keeping close communication with the MOECST because of the reliance on technical expertise and necessary approvals. Regarding suppliers/contractors/consultants, the Procurement Specialist practices fairness and transparency by providing necessary updates to these stakeholders throughout the procurement process. Throughout the procurement process also, documented evidence of the communication to stakeholders is kept both physically and electronically. All documented evidence is submitted to the funding agency for review and approval.

Team performance refers to the ability of project teams to collaborate effectively, maintain motivation, and achieve project goals (Kerzner, 2021). In project procurement, the team that exists in the PEU consists of the Procurement Specialist who conducts procurements, the Senior Project Coordinator who provides internal approval for each process and deliverable, the Project Officer who monitors the project schedule and deliverables, and the Financial Specialist who makes payments for approved deliverables. The external parties in these processes are the suppliers, contractors, and consultants. Effective collaboration in procurement ensures timely and cost-effective purchasing, reduces miscommunication, and enhances relationship management. Under the PEU, the management of the processes shows gaps in the systems that need to be improved and streamlined.

“Development approach and life cycle domain” defines the methodology and structure used to execute the project. The primary approaches are predictive (Waterfall), adaptive (Agile, Scrum, Scrumban), and hybrid (a mix of both). For the most part, no established development approach is currently being used by the PEU. However, the financing agencies’ guidelines provide somewhat of a predictive approach since their procurement process must be done in a structured sequential manner. The flexibility of the procurement management process is more related to the adaptive approach.

Planning involves defining project objectives, scope, schedules, budgets, and risk management strategies. In project procurement, planning ensures that the procurement requirements, bidding processes, contract execution, and financial approvals are well-documented and aligned with regulatory requirements. A detailed plan helps avoid delays, cost overruns, and compliance violations (Larson & Gray, 2021). The PEU does extensive planning, but as mentioned in previous sections, the PEU relies heavily on external factors that sometimes

cause delays and other inefficiencies. The Project Office is responsible for preparing and updating the Project Execution Plan (PEP). The PEP is the document used to track all procurement and contract management activities, as well as payments. Payments are linked to the annual financial plan that tracks the disbursements for the projects. All these activities are planned and monitored extensively by the PEU to meet project performance goals and disbursement requirements.

Project work refers to the execution phase of the project. This is where the procurement processes are executed; deliverables are submitted, reviewed, and approved; payments are made; and projects are implemented. Proper documentation and adherence to the procurement management plan are essential. Monitoring work progress ensures that procurement deliverables align with budget, schedule, and quality expectations (Burke, 2019). Currently under the PEU, the only documentation used to monitor work progress are the procurement plan, financial plan, and the PEP. Some gaps in the workflow process need to be addressed.

Delivery focuses on ensuring that the procurement process achieves its intended outcomes. This includes ensuring that the supplier, contractor, or consultant meets the contractual obligations, maintains service quality, and finalizes procurement transaction (Meredith & Mantel, 2021). For project procurements, delivery also means proper auditing, evaluation, and documentation to maintain compliance and accountability. The PEU currently uses acceptance certificates, random sampling, delivery approval, warranties, performance bonds, advance payment securities, and payment retention to manage deliverables.

The measurement domain tracks key performance indicators (KPIs) and metrics to assess procurement efficiency, vendor performance, and contract execution. Some common KPIs are cost variance, schedule performance index, contract compliance rate, and procurement cycle

time. Currently, the PEU only tracks the procurement cycle time through the PEP. There have been many procurement delays for many reasons; some are due to delays in evaluation of bids, delays in approvals, and delays in feedback from the main Ministry. However, there are no formal practices in place to increase accountability and reduce delays.

Uncertainty management domain deals with identifying, assessing, and mitigating risks and uncertainties that could impact procurement. As an example of uncertainty management, the PEU has implemented an evaluation schedule that is shared with the evaluators two weeks in advance of the evaluations to ensure participation. Risk factors in procurement include regulatory changes, supplier performance risks, market volatility, and political influence. Of these factors, the biggest risk is political influence and changes in regulatory practices. If there is a change of political party in government, the new party comes in with its own rules and procedures to follow. The Unit does not have an established risk management plan.

2.2.3 Predictive, Adaptive, and Hybrid Projects

Project management development approaches define how the project is structured, executed, and delivered. The selection of the appropriate development approach ensures efficiency with resources, management of risks, and adaption to project uncertainties. The Predictive or Waterfall approach follows a structured, linear sequence of project phases. This approach is best suited for projects that are well-defined and have a minimum expectation to change. In project procurement, the Waterfall model is used when regulations require fixed budgeting, detailed contract planning, and structured tendering processes. It ensures legal compliance, vendor accountability, and rigorous contract enforcement (PMI, 2021).

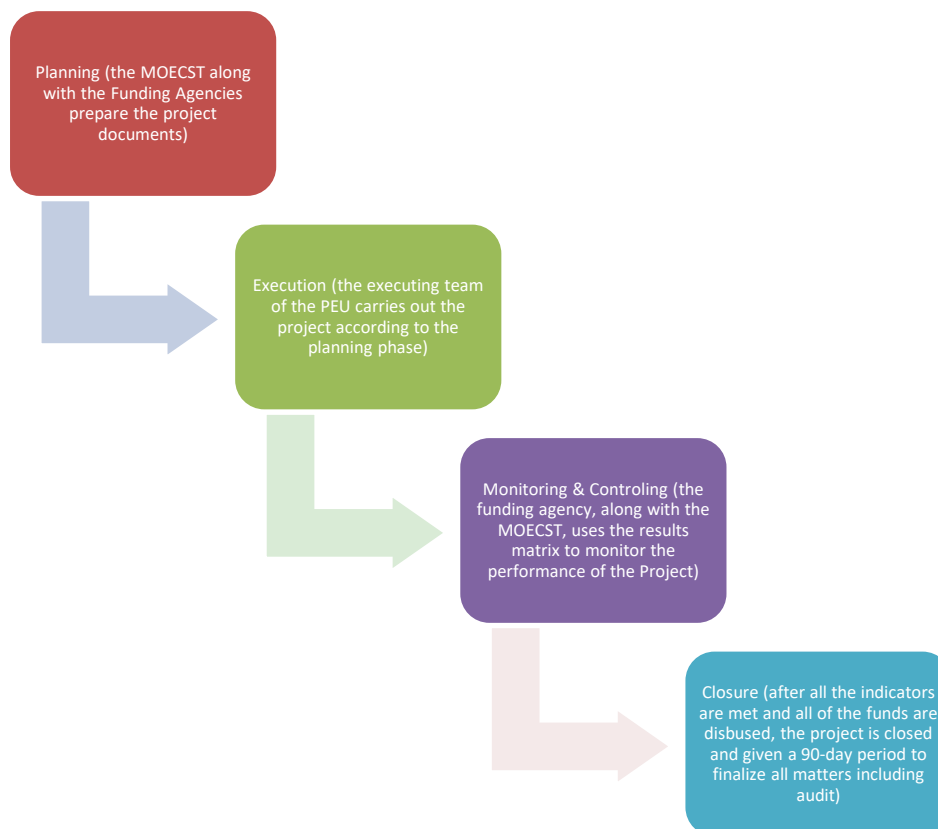
Characteristics:

- A sequential, step-by-step structure (Initiation → Planning → Execution →

Monitoring & Controlling → Closure)

- Comprehensive upfront documentation and planning
- Minimal flexibility for scope changes after execution begins
- Well-suited for projects with clear regulatory compliance and fixed procurement cycles

Figure 3

Predictive Approach 1

Note. Figure created by the author.

The adaptive approach, also known as Agile project management, allows for flexibility and iterative improvements throughout the project life cycle. For education sector procurement, an Agile approach is beneficial when dealing with new technology integration, training programs, and research-based projects, where requirements evolve based on real-time assessments and stakeholder needs (Burke, 2019). This aligns with what the MOECST and the PEU are implementing.

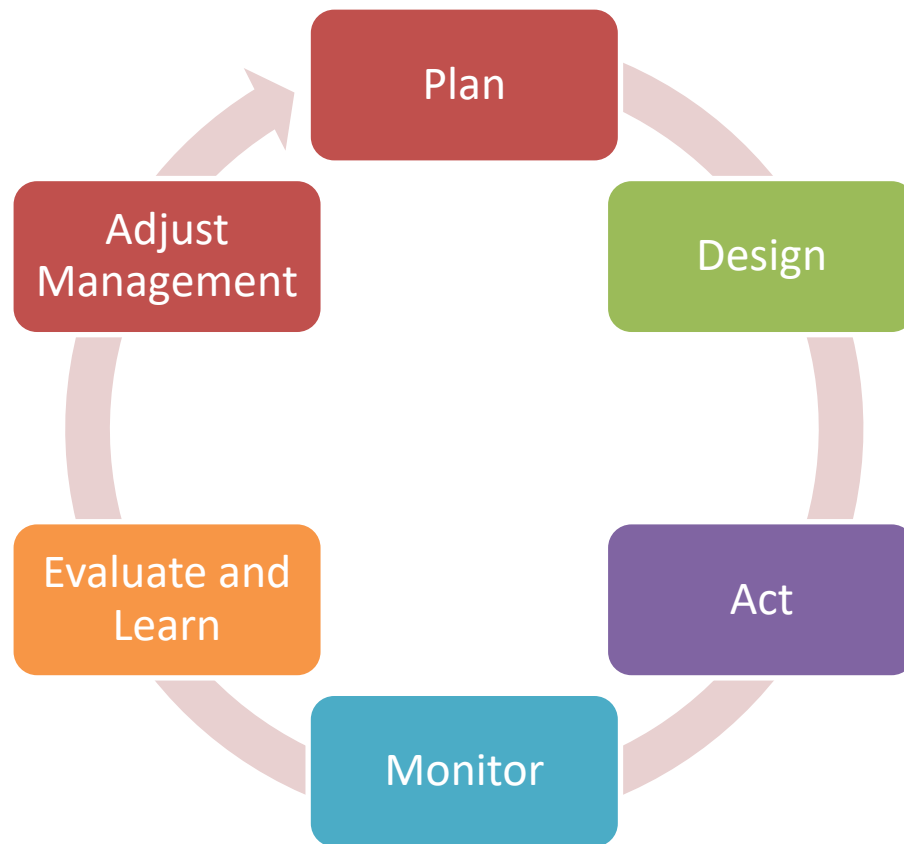
Characteristics:

- Project phases are iterative, with continuous stakeholder feedback.
- Scope changes are manageable throughout the project.

- Best suited for dynamic and evolving project environments.
- Encourages collaboration and rapid decision-making.

Figure 4

Adaptive Approach 1



Note. Figure created by the author.

The Hybrid approach combines the elements of predictive and adaptive approaches; it offers a structured framework with room for flexibility. As mentioned in earlier sections, the procurement process for loan contracts follows a Waterfall approach. However, during execution there are more complexities and changes in plans and outcome; therefore, this hybrid approach is ideal. Furthermore, a hybrid approach is ideal for complex projects in the education sector, where contract structuring follows Waterfall, but execution (vendor management, risk

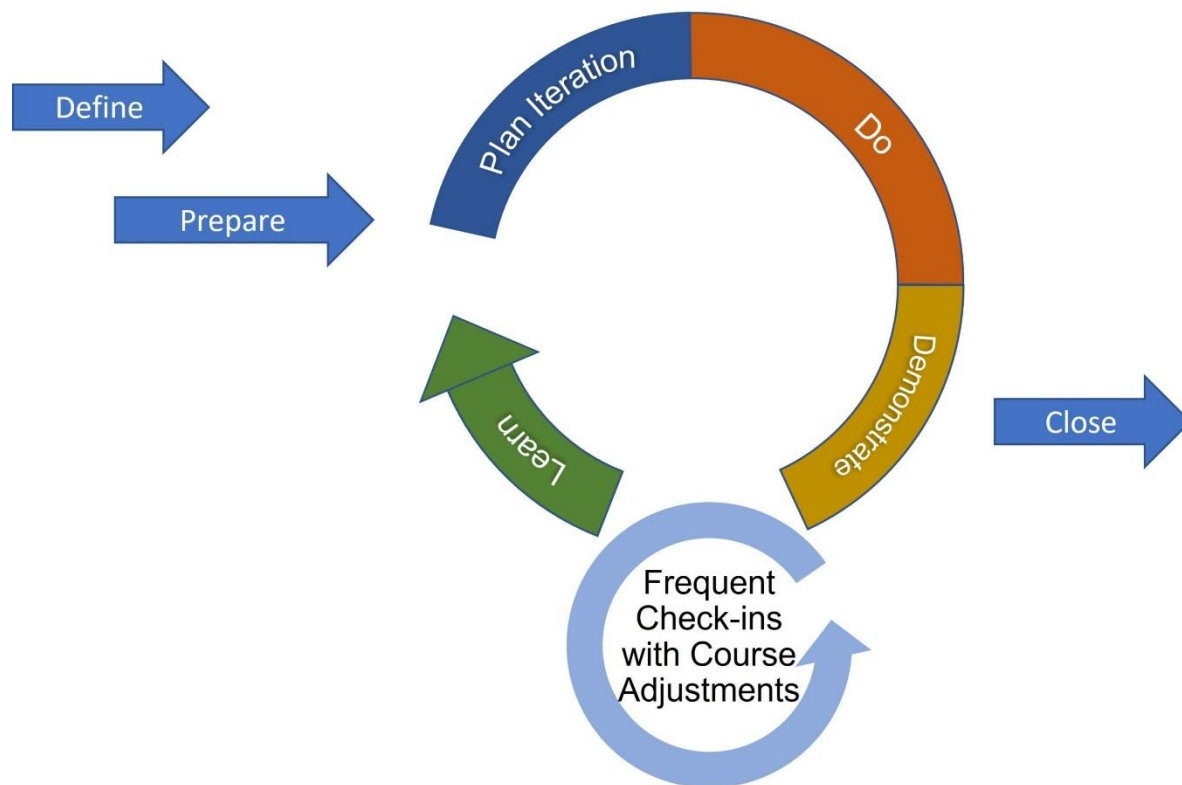
mitigation) incorporates Agile principles.

Characteristics:

- Initial planning follows a predictive approach, while execution allows for iterative adjustments
- Ensures regulatory compliance while integrating real-time feedback
- Supports government procurement where contracting is rigid but implementation requires flexibility

Figure 5

Hybrid Approach 1



Note. Figure created by the author.

2.2.4 Project Management

Project administration, direction, and management are essential components of project execution. These components ensure that the project aligns with the organizational goal. In this regard, the PEU is executing in accordance with the goals of the MOECST. It ensures effective control and meets the quality, budget, and schedule constraints. While project administration focuses on documentation, compliance, and operational oversight, project direction provides strategic leadership, and project management ensures methodical execution of the processes. To some extent, these components exist within the PEU; however, they need to be improved.

These three components have distinct as well as interrelated functions in the project execution process:

- Project administration involves organization support function to ensure that the project is being executed in compliance with the policies, procedures, and documentation practices.
- Project direction involves strategic decision-making and leadership to ensure that the project objectives align with the broader organizational goals.
- Project management is the systematic application of knowledge, skills, tools, and techniques to execute the project successfully.

Table 1

Key Characteristics of Each Project Management Application

| Key Characteristics of Each Component | | |
|--|--|--|
| According to the Standards Set by the Project Management Institute (PMI, 2021) | | |
| Project Administration | Project Direction | Project Management |
| Enforcing regulatory and procedural compliance | Setting project vision and ensuring alignment with business strategy | Planning, executing, monitoring, and closing project tasks |
| Managing project records, approvals, and financial tracking | Engaging stakeholders and ensuring top management support | Managing constraints such as time, cost, and scope |

| | | |
|---|---|--|
| Supporting stakeholder communication and coordination | Making high-level decisions on resources, priorities, and risks | Identifying risks and implementing mitigation strategies |
| Handling procurement, contracts, and documentation | Ensuring adaptability to changing project environments | Coordinating teams, vendors, and stakeholders to achieve project goals |

Note: Table created by the author.

The application of these components, as it relates to the project procurement and project administration, ensures that the contracts signed during the project period follows the regulatory framework of the lending agency as well as the Government, the approvals meet the standards of the Ministry of Education, and that the financial transactions are done accurately and recorded. The application of the project direction ensures that the vendor selection, contract design, and purchasing decisions align with both the Ministry of Education and the lending agencies' strategic objectives. It is important to factor in the lending agency at this point because there are country thresholds that constitute one of the determinants of the procurement process and contracts to be administered.

The Project Management Institute (PMI) advocates for a structured methodology to ensure project consistency and efficiency. Heldman (2021) focuses on the practical aspects of project execution and risk mitigation. Meanwhile, Kerzner (2022) emphasizes the strategic importance of project leadership in ensuring long-term project sustainability.

Table 2

Comparison of Expert Perspectives

| | | |
|---|---|---|
| Comparison of Expert Perspectives In accordance with the Project Management Institute (PMI, 2021) and the Project Execution and Risk-Based Management (Heldman, 2021) and A Strategic Approach to Leadership (Kerzner, 2022) | | |
| PMI (2021): The Role of Standardized Processes | Kim Heldman (2021): Project Execution and Risk-Based Management | Harold Kerzner (2022): Strategic Approach to Project Leadership |
| Using standardized frameworks such as | Clear process documentation | Strong governance structure |

| | | |
|---|--|--|
| PMBOK | | |
| Implementing quality control in procurement management | Risk-based contract management | Proactive risk identification |
| Establishing key performance indicators for assessments | Stakeholder engagement for efficient execution | Integration of procurement planning with organizational objectives |

Note: Table created by the author.

2.2.5 Project Management Knowledge Areas and Processes

According to the Project Management Body of Knowledge (PMBOK Guide), there are five key stages of the process groups; these provide the framework for systematic management of projects from the initiation stage to the completion stage. Each of the five process groups consists of specific activities and processes needed to ensure the projects' success.

The initiating process marks the beginning of the project, where the project is formally authorized, and stakeholders are identified. The objectives include, development of the project charter, identifying stakeholders and their expectations, defining the project's purpose and objectives, and securing approval to proceed.

The planning process focuses on setting detailed project objectives, defining scope, and developing a comprehensive project plan. This phase ensures that all project aspects are well-defined before execution. This is done by defining project scope and deliverables, creating the work breakdown structure (WBS), developing a project schedule and budget, identifying risks and mitigation strategies, allocating resources, and establishing quality and communication plans.

The executing process involves the implementation of the project plan to deliver the expected outcomes. It ensures the coordination of human and financial resources, manages stakeholder expectations, performs quality assurance activities, executes risk response, and communicates project progress.

The monitoring and control process ensures that the project remains on track and meets its objectives. This involves tracking performance and making necessary adjustments by monitoring project performance using KPIs, conducting quality control checks, managing changes through change control processes, and identifying and mitigating potential risks.

The closing process signifies the formal completion of the project or a phase of the project. This process ensures that all project work is finished and stakeholders accept the deliverables through conducting a final review and evaluation. It also involves obtaining formal acceptance from stakeholders, documenting lessons learned, closing out contracts, and making final disbursements.

Table 3

Project Life Cycle

| Process Group | Key Activities | Main Outputs |
|--------------------------|---|-------------------------------------|
| Initiating | Develop project charter, identify stakeholders | Project charter |
| Planning | Define scope, develop schedule, identify risks | Project Management Plan |
| Executing | Assign resources, implement plan, ensure quality | Project deliverables |
| Monitoring & controlling | Track performance, manage changes, mitigate risks | Performance Report, change requests |
| Closing | Obtain acceptance, document lessons learned | Final Report, lessons learned |

Note: Table created by the author.

2.2.6 Project Life Cycle

The project life cycle refers to the sequence of phases that a project undergoes from initiation to closure. According to PMI (2021), the project life cycle consists of five key phases: Initiation, Planning, Execution, Monitoring & Controlling, and Closure. Each phase has specific objectives and deliverables, ensuring that the project is completed effectively and meets its intended goals. The life cycle provides a structured approach to managing projects, helping

organizations allocate resources efficiently, and mitigating risks throughout the project's duration.

Figure 6

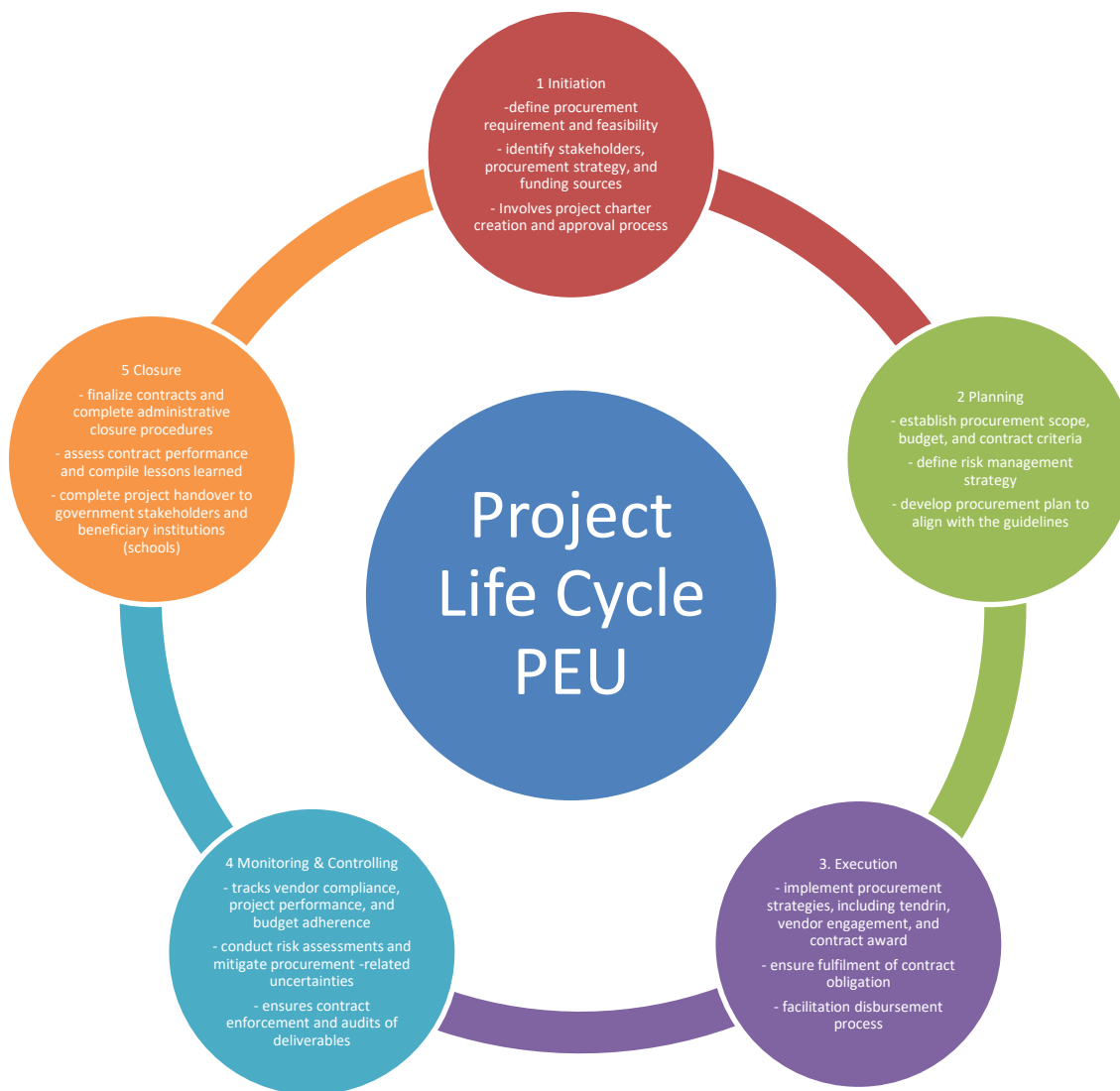
Project Life Cycle Generic 1



Note. Figure created by the author.

Figure 7

Project Life Cycle 1



Note. Figure created by the author.

2.2.7 Company Strategy, Portfolios, Programs and Projects

In project management, organizations utilize structured frameworks to align their goals,

initiatives, and resources efficiently. This is achieved through a hierarchical structure comprising business strategy, portfolio management, program management, and project execution. The Project Execution Unit under the Ministry of Education is tasked with two of these structures, namely, program management and project execution. Each level plays a critical role in ensuring that an organization meets its long-term objectives while optimizing resources. This section will define these concepts based on the perspectives of three renowned authors and explain their significance to the organization.

What is business strategy? According to Johnson, Scholes, and Whittington (2020), business strategy is the direction and scope of an organization over the long term, achieved through resource allocation and competitive positioning. It ensures that the organization adapts to changes in the external environment while achieving its goals; Grant (2019) defines business strategy as a framework that guides decision-making to create sustainable competitive advantage. It emphasizes the need for strategic differentiation and innovation. Kerzner (2022) highlights that business strategy influences the selection and prioritization of projects within an organization's portfolio. Projects that align with strategic goals receive funding and resources, ensuring that investments contribute to the organization's growth and sustainability. By definition, the PEU is closely aligned with the perspective of Kerzner, as the Government of Belize borrows financial resources from the IDB and CDB to fund the projects created by MOECST based on their strategic goals. The projects are then executed/implemented by the PEU. The PEU is guided by the policies of the lending agencies, but most important to mention, the lending agencies and the government must agree on the terms of the contract and scope of the project. The lending agencies create a results matrix to verify that the funds have been used appropriately.

Program management relates to the coordination of activities to achieve benefits that

would not be attainable if managed individually. Thiry (2021) explains that program management focuses on realizing business value through the integration of multiple projects under a common strategic objective; Fernandes, Ward, and Araújo (2018) state that program management ensures alignment with corporate objectives by coordinating resources, managing dependencies, and optimizing benefits realization; and Hofmann and Strobel (2020) suggest that program management is particularly effective in large-scale organizational transformations, where different projects must be executed in harmony to deliver long-term benefits. The programs that are managed under the PEU are closely related to perspectives of Hofmann and Strobel as the PEU takes on large-scale, multimillion-dollar projects from several donors with varying scope. These all work in harmony toward the strategic goals of the MOECST and, in the long-term, benefit the educational system in Belize.

Project management entails temporary activities taken on to create a unique product, service, or result. PMI (2021) defines project management as the application of knowledge, skills, tools, and techniques to project activities to meet specific objectives; Nicholas and Steyn (2020) describe projects as essential building blocks within a program or portfolio, with a defined scope, schedule, and budget. Effective project management ensures that objectives are met within constraints and that deliverables contribute to organizational goals; Kerzner (2022) highlights the importance of standardized project management methodologies, such as Agile, Waterfall, and Hybrid approaches, to enhance efficiency and stakeholder satisfaction. The PEU should be functioning as Kerzner describes, but, unfortunately, there are no project management methodologies implemented. Therefore, the PEU closely aligns with Nicholas and Steyn. The activities are completed within the timeframe to the quality and standards required, but efficiency is not being measured. Structure must be implemented to increase efficiency.

The project falls under the program management and project management categories. This classification is based on the fact that the project is part of broader initiatives under the Project Execution Unit (PEU) of the Ministry of Education, Culture, Science, and Technology (MOECST). Since the PEU manages multiple projects funded by external agencies such as the Caribbean Development Bank (CDB) and the Inter-American Development Bank (IDB), it aligns with the characteristics of program management.

This project contributes to improving procurement processes within the PEU, which directly impacts the efficiency of multiple educational projects. Therefore, it supports the strategic goal of enhancing the project performance/outcomes.

Understanding the relationship between business strategy, portfolio, programs, and projects is essential for organizational success. Business strategy guides the selection of portfolios, which in turn prioritize programs and projects that align with strategic goals.

2.3 Other Applicable Theories/Concepts Related to the Project Topic and Context

To understand some other applicable theories or concepts related to the topic of proposing project management methodologies to improve the procurement processes for the Project Execution Unit (PEU), firstly, a good grasp of the project management theory is essential. Project management is defined as the application of knowledge, skills, tools, and techniques to project activities in order to meet project needs. The five phases of project management are initiating, planning, execution, monitoring and controlling, and closing, which serve as a framework for structured implementation. These principles ensure that projects are completed within scope, time, and cost constraints while maintaining quality standards. By integrating these theories and concepts into the Final Graduation Project, the research provided a

comprehensive, evidence-based approach that enhanced both academic and practical contributions. These frameworks will guide decision-making, improve project execution, and ensure alignment with best practices in the industry.

Agile and Scrumban Methodologies were used for this project. Agile is an iterative approach to project management, featuring the use of software development that emphasizes collaboration, flexibility, continuous improvement, and customer feedback. This will be essential for the PEU as there are best practices being used but not formal methods for efficient procurement execution. Scrumban, on the other hand, divides work into short, time-boxed iterations called sprints, which allows teams to quickly adapt to changing project needs. Applying Agile principles in the PEU work setting can enhance efficiency, foster innovations, and improve stakeholder engagement.

Quality management focuses on ensuring that the project deliverables meet required standards and the expectations, in this case, both of the Government of Belize and the funding agencies. Additionally, the Plan-Do-Check-Act cycle, which was developed by Deming, provides a systematic approach to continuous improvement by optimizing the processes through iterative problem-solving (Deming, 1986). Implementing these principles in the project execution ensures sustained performance and value creation.

With the rapid advancement of technology, digital transformation has become essential in education, especially with the IDB project currently being executed. The Skills for the Future Program focuses on closing the gap in technology as it relates to the fourth industrial revolution (4IR). Technology-driven learning environments leverage digital tools to enhance knowledge acquisition, accessibility, and engagement. Additionally, Industry 4.0 concepts, such as artificial intelligence, big data, and automation, are reshaping corporate structures by improving

efficiency, reducing costs, and enhancing decision-making processes. The integration of these technologies in project management ensures that the organization remains future-ready.

Human Capital Theory emphasizes the role of education, training, and skill development in enhancing workforce productivity and economic growth. Organizations that invest in employee development experience higher efficiency, innovation, and long-term sustainability.

Change management is a structured approach to transitioning individuals, teams, and organizations from a current state to a desired future state. Leadership plays a crucial role in guiding teams through these transitions by fostering a vision, motivation, and strategic decision-making. Effective leadership within a project environment ensures that stakeholders remain engaged, risks are mitigated, and objectives are met efficiently.

2.3.1 Current Situation of the Problem or Opportunity in the Study

The Project Execution Unit (PEU) under the Ministry of Education, Culture, Science and Technology (MOECST) is responsible for executing education projects in Belize. The projects are funded by the Inter-American Development Bank and the Caribbean Development Bank (CDB). The PEU is currently executing two projects: the Belize Education Sector Reform Project (BESRP), which focuses on infrastructure development, and the Skills for the Future Program (SFTF), which aims to close the skills gap for the Fourth Industrial Revolution (4IR).

While these projects are aligned with the strategic goals of the MOECST, procurement inefficiencies frequently delay project implementation, affecting their impact on the education sector. Some of the existing challenges are listed below:

- **Bureaucratic procedures:** The procurement processes lack a standardized methodology, leading to slow decision-making and excessive paperwork. In order for any process to be completed, it requires a complete review from the IDB, the Ministry of Finance, and the Office of the Contractor General.

- Lack of a formal procurement management framework: The PEU does not currently follow a structured project management methodology, leading to misalignment of procurement activities and strategic goals.
- Poor accountability mechanisms: There is no formal tracking system for vendor performance, resulting in repeat engagements with non-compliant suppliers.
- Lack of integration with digital tools: The procurement unit does not utilize modern project management software, leading to inefficient tracking of procurement cycles.
- Limited risk management practices: While the procurement team identifies risks (e.g., supply chain disruptions, cost overruns, political influence), there is no structured approach to mitigating these risks.

These factors contribute to delays in delivering school infrastructure improvements and educational materials, directly affecting students, teachers, and institutional development.

Some of the approaches that are currently being used by the PEU have proved to be inefficient. Over time, various measures have been attempted to improve procurement efficiency, but they have proved unsuccessful.

- Manual tracking of procurement timelines: While this ensured some level of monitoring, it proved time-consuming and inefficient in addressing delays.
- Guidelines from funding agencies (CDB & IDB): These agencies provide procurement policies; however, they are not tailored to the PEU's unique challenges.
- Increased staff collaboration: The procurement team improved coordination with the MOECST, but this did not eliminate bottlenecks in procurement cycles.
- Supplier vetting: Efforts were made to ensure supplier compliance, but lack of evaluation procedures meant that underperforming vendors were not consistently removed from

future procurement cycles. This also does not restrict them from participating in future projects, which repeat the same inefficiencies and delays.

Furthermore, these persistent inefficiencies need a structured project management approach to enhance procurement efficiency, accountability, and decision-making. The proposed solutions include:

- **Implementation of Project Management Methodologies:** Adopting methodologies like Agile, Scrumban, and Critical Path Method (CPM) can streamline procurement workflows and improve efficiency.
- **Digitalization of Procurement Tracking:** The use of Project Management Information Systems (PMIS) can automate procurement cycles, reducing manual workload and human errors.
- **Development of Key Performance Indicators (KPIs):** Introducing measurable KPIs for procurement efficiency (e.g., procurement cycle time, supplier performance, contract adherence) will enhance accountability.
- **Stakeholder Engagement & Change Management:** Training procurement officers and engaging stakeholders will reduce resistance to new procurement methodologies.
- **Risk Mitigation Strategies:** Formal risk management frameworks will be established to handle procurement-related risks effectively.

2.3.2 Previous Research Done on the Topic in the Study

The Project Execution Unit (PEU) under the Ministry of Education, Culture, Science, and Technology (MOECST) is facing reoccurring challenges related to procurement delays, inefficiencies, and accountability. This review summarizes relevant literature that informs the development of a structured procurement management framework, incorporating best practices

from project management methodologies.

The Project Management Institute PMI (2021) defines project management as the application of knowledge, skills, tools, and techniques to project activities to meet objectives. PMI emphasizes the importance of structured methodologies, which would help the PEU ensure efficient procurement execution. The five process groups (initiating, planning, executing, monitoring, and closing) provide a framework to enhance procurement transparency, efficiency, and accountability.

Kerzner (2022) highlights that strategic project leadership plays a critical role in procurement success. He argues that procurement is not just a transactional process but a strategic function that affects cost control, timeline adherence, and project quality. His work supports the notion that a lack of project management methodologies in procurement leads to inefficiencies, corresponding with the current challenges faced by the PEU.

Heldman (2021) provides a practical guide to project execution, emphasizing that clear procurement objectives, well-defined deliverables, and stakeholder engagement are critical for government projects. She introduces the importance of risk-based procurement management, which ensures that procurement cycles align with strategic project goals.

Several studies discuss specific project management methodologies that can enhance procurement efficiency:

- Agile Project Management, as outlined by Burke (2019), promotes flexibility, iterative improvements, and stakeholder collaboration. Applied to procurement, Agile can reduce bottlenecks by allowing adaptive contract management and continuous feedback loops.
- Scrumban Approach: Hybrid methodologies like Scrumban (a mix of Scrum and Kanban) help manage complex procurement tasks by ensuring workflow visualization,

prioritization of tasks, and reducing process inefficiencies (Burke, 2019).

- Critical Path Method (CPM): This methodology is used to identify the longest sequence of dependent tasks to minimize project delays. Larson & Gray (2021) argue that CPM ensures procurement schedules remain optimized, reducing risks of supply chain disruptions and inefficient contract execution.

These methodologies provide structured approaches that can help the PEU address procurement inefficiencies by offering a mix of predictability, adaptability, and accountability. Meredith & Mantel (2021) discuss procurement in government-funded projects, noting that bureaucratic challenges often hinder efficiency. They recommend:

- Clear procurement planning to align with project schedules
- Vendor evaluation frameworks to ensure only qualified suppliers participate
- Key performance indicators (KPIs) to track procurement cycle times, contract compliance, and financial accountability

These findings support the need for a structured procurement management framework in the PEU, integrating best practices from global funding agencies and project management methodologies.

The preliminary bibliographic research provides key insights that inform the development of the Final Graduation Project (FGP). Project management methodologies such as Agile, Scrumban, and CPM can improve procurement efficiency, reduce delays, and enhance accountability. Meanwhile, global procurement standards (IDB & CDB) provide a compliance framework but must be tailored to the PEU's operational needs. Risk-based procurement approaches ensure proactive management of procurement challenges. Furthermore, digital procurement solutions can automate workflow tracking, vendor evaluation, and performance

measurement.

2.3.3 Other Theories Related to the Topic in the Study

Two other theories are related to the topic studied, which is to improve the procurement management function by incorporating project management methodologies. The first is the System Theory, which was introduced in 1968 but is still relevant in this case. Systems Theory views the organization as an interconnected system wherein different components interact dynamically with each other. It emphasizes the need for structured interrelations among various subsystems to ensure efficiency and sustainability. Procurement in the Project Execution Unit (PEU), specifically, operates as a subsystem of the Ministry of Education, Culture, Science, and Technology (MOECST), interacting with suppliers/contractors/consultants, funding agencies, and regulatory bodies.

If the Systems Theory is applied to the procurement function of the PEU, it will highlight areas where various components of the procurement process, such as planning, vendor selection, contract execution, and monitoring, need to function cohesively. Therefore, applying this theory will show that if one component fails, it causes delays, overruns, or inefficiencies. Currently, the Project Execution Unit is experiencing inefficient procurement procedures that are bottlenecks in the system. Furthermore, a lack of digital integration disrupts information flow between procurement officers and vendors, and a lack of a project management framework leads to misalignment of procurement with project execution. A systems-based approach would support establishing a procurement management framework that integrates structured project management methodologies, digital tools, and performance tracking processes. The integration would streamline workflows by ensuring procurement activities align with project milestones, improve communication between departments to reduce approval delays, and enhance risk management by identifying interdependent elements that are affecting the procurement timelines.

Finally, this theory supports the argument that procurement efficiency improves when managed as an interconnected system rather than isolated tasks, reinforcing the need for structured project management methodologies.

Second is the Stakeholder Theory. This theory was developed by Freeman in 1984, and it supports the argument that organizations must balance the interests of various stakeholders, as well as customers, employees, suppliers/contractors/consultants, and government regulators. In procurement, stakeholder engagement ensures transparency, accountability, and alignment with project objectives. Currently, the PEU's procurement processes involve multiple stakeholders, including government agencies, funding institutions (CDB, IDB), and suppliers/contractors/consultants that are participating in bidding processes, and end users such as schools, students, and teachers that are expecting timely project completion. The lack of structured project management methodologies in the PEU leads to stakeholder misalignment that may result in delays, contract disputes, and limited stakeholder feedback mechanisms. The Stakeholder Theory, however, if integrated into the PEU, could develop a structured engagement plan to ensure all stakeholders have a clear role in the procurement decision-making. It could also implement communication platforms to keep suppliers, funding agencies, and MOECST officials informed and introduce accountability measures such as supplier evaluation and stakeholder feedback reports. This theory reinforces the study's premise that procurement efficiency improves when stakeholder interests are aligned through structured project management frameworks.

3 METHODOLOGICAL FRAMEWORK

The information sources used for this project are essential. These sources are materials or references used to gather the data needed, insights, and evidence to support the research.

Information sources serve as the foundation of research, offering factual data, expert opinion, and contextual understanding. Similarly, identifying and evaluating appropriate sources is critical to ensure the accuracy and credibility of research findings.

3.1 Information Sources

3.2 Primary Sources

Primary sources are original materials or first-hand accounts of information collected directly from the field or from individuals involved in the subjects of study. It was stated by Creswell and Creswell (2018) that primary sources include data gathered through interviews, surveys, observations, and original documents that have not been interpreted or analyzed by others. For the Final Graduation Project (FGP) the primary sources of information were interviews with the existing procurement offices and project manager at the Project Execution Unit (PEU) under the Ministry of Education, Culture, Science and Technology (MOECST); the internal procurement document; the Project Execution Plan (PEP); the loan contract agreements; the procurement schedule; and, finally, observational insights from the execution of ongoing projects. The primary sources are crucial as they provide first-hand information about the procurement inefficiencies, workflow structures, and current practices within the PEU.

3.3 Secondary Sources

The secondary sources refer to interpretations, analyses, or summaries of primary data. Secondary sources are typically found in academic books, articles, and reports. They allow researchers to build upon existing knowledge and validate their primary findings (Leedy &

Ormrod, 2020). Some of the secondary sources used in the FGP were:

- Kerzner (2022) – Offers a systems approach to project management and provides strategic insights into procurement leadership and accountability in large-scale projects
- Burke (2019) – Details techniques for planning and control, which help structure procurement workflows and optimize timelines and costs
- PMI (2021) – Provides the PMBOK® Guide, which includes the five process groups and ten knowledge areas vital for organizing and improving procurement activities
- CDB (2021) – Outlines procurement procedures to ensure compliance and ethical standards in donor-funded projects
- IDB (2021) – Establishes regulatory and transparency guidelines tailored to the Caribbean and Latin American education project environments

3.3.1 Information sources (source: Tingling-Cano)

| Objectives | Information sources | |
|---|--|--|
| | Primary | Secondary |
| To identify the existing inefficiencies and challenges that are faced in the procurement processes of the PEU of the MOECST in order to understand the root causes of delays, non-compliance, and misalignment with strategic goals | Internal procurement documents (Project Execution Plan, contracts, procurement reports); Interviews with PEU staff | Kerzner, H. (2022). <i>Project management: A systems approach to planning, scheduling, and controlling</i> . Wiley. Project Management Institute. (2021). <i>A guide to the project management body of knowledge (PMBOK® Guide) – Seventh edition</i> . Project Management Institute. |
| To assess the relevance and adaptability of the Agile, Scrumban, and Critical Path Method (CPM) project management methodologies, in order | Interviews with procurement specialists and project coordinators; Observations during project | Burke, R. (2019). <i>Project management: Planning and control techniques</i> . Wiley. Project Management Institute. (2021). |

| Objectives | Information sources | |
|--|---|---|
| | Primary | Secondary |
| to determine their suitability for enhancing the procurement processes in the PEU context | implementation | |
| To develop a structured proposal integrating Agile, Scrumban, and CPM methodologies, in order to standardize procurement practices and improve process efficiency, transparency, and accountability | Feedback from stakeholders and internal evaluations at PEU | Caribbean Development Bank. (2021). <i>Procurement procedures for projects financed by CDB</i> . Inter-American Development Bank. (2021). <i>Procurement policies and procedures</i> . |
| To develop key performance indicators (KPI) that will assist in the monitoring and evaluation of the effectiveness of the project management methodologies and the tracking of procurement performance, to support continuous improvement and alignment with educational project outcomes and IFI requirements | Procurement cycle records and project execution data from PEU; surveys or interviews with project staff | Kerzner, H. (2022). Leedy, P. D., & Ormrod, J. E. (2020). <i>Practical research: Planning and design</i> (12th ed.). Pearson. |
| To propose specific best practices for adaptation from the project management framework (Agile, Scrumban, and CPM) and demonstrate their application in selected procurement activities. These include the acquisition of equipment for secondary schools, construction of STEAM Lab schools, and consultancy to conduct | Consultations with MOECST management and procurement experts | Heldman, K. (2021). <i>Project manager's portable handbook</i> . McGraw Hill. Inter-American Development Bank. (2021). |

| Objectives | Information sources | |
|---|---------------------|-----------|
| | Primary | Secondary |
| evaluations for the Skills for the Future Project and the Belize Education Sector Reform Project, all in order to optimize procurement operations and support strategic project delivery within the projects timelines. | | |

3.4 Research Methods

The research methods used in the Final Graduation Project (FGP) featured a mixed-method approach, which involves the application of analytical, descriptive, and comparative methods. These methods were used to assess the procurement inefficiencies and propose solutions through the use of project management methodologies.

The analytical method involves examining available information and documents to interpret patterns, identify root causes, and provide evidence-based conclusions (Kumar, 2011). This method is ideal for analyzing procurement records, the procurement plan, and the project execution plan, to identify the inefficiencies within the PEU.

The descriptive method of research seeks to provide an accurate picture of the situations, events, or systems in place. It helps to collect detailed information about the current state (Merriam & Tisdell, 2015). It is useful when the objective is to describe characteristics rather than test hypotheses. This method allowed description of existing procurement workflows and practices through interviews and document analysis.

The comparative method involves comparing different models, practices, or systems used to highlight the similarities, differences, and potential improvements (Neuman, 2014). This method supports critical evaluation and benchmarking. For this project, it was used to compare

the PEU's current practices with the project management methodologies suggested: Agile, Scrumban, and Critical Path Method.

3.4.1 Research Method (Source: Tingling-Cano)

| Objectives | Research methods | | |
|--|--|--|---|
| | Analytical Method | Descriptive Method | Comparative Method |
| To identify the existing inefficiencies and challenges that are faced in the procurement processes of the PEU of the MOECST in order to understand the root causes of delays, non-compliance, and misalignment with strategic goals | Analyzed procurement plans and reports to identify inefficiencies and delays | Described procurement procedures through interviews and internal documentation | Not applicable for this objective |
| To assess the relevance and adaptability of the Agile, Scrumban, and Critical Path Method (CPM) project management methodologies, in order to determine their suitability for enhancing the procurement processes in the PEU context | Analyzed methodology principles against PEU requirements. | Described characteristics of Agile, Scrumban, and CPM | Compared current PEU practices with global standards |
| To develop a structured proposal integrating Agile, Scrumban, and CPM methodologies, in order to standardize procurement practices and improve process efficiency, transparency, and accountability | Broke down key components needed for an effective model | Described how the new framework integrates PM practices | Compared proposed framework to PMBOK and donor guidelines |
| To develop key performance indicators (KPI) that will assist in the monitoring and evaluation of the effectiveness of the project management methodologies and the | Interpreted data to propose meaningful indicators | Described each KPI and its purpose in tracking procurement efficiency | Benchmarked against global performance indicators |

| Objectives | Research methods | | |
|---|---|---|--|
| | Analytical Method | Descriptive Method | Comparative Method |
| tracking of procurement performance to support continuous improvement and alignment with educational project outcomes and IFI requirements | | | |
| To propose specific best practices for adaptation from the project management framework (Agile, Scrumban, and CPM), and demonstrate their application in selected procurement activities. These include the acquisition of equipment for secondary schools, construction of STEAM Lab schools, and consultancy to conduct evaluations for the Skills for the Future Project and the Belize Education Sector Reform Project, all in order to optimize procurement operations and support strategic project delivery within the projects timelines. | Synthesized findings to develop tailored solutions. | Outlined how recommendations align with current PEU constraints | Compared suggested actions with past PEU attempts and global best practices. |

3.5 Tools

For the purpose of this Final Graduation Project (FGP), and in project management in general, tools are referred to as instruments, systems, or methods used to facilitate the execution

and to control project activities. According to the Project Management Institute (PMI, 2021), tools are specific mechanisms used to accomplish a technique serving to enhance project planning, execution, and monitoring. Kerzner (2022) emphasizes that tools help project managers enhance communication, control, and performance tracking in projects. The tools are essential to ensure projects meet objectives within scope, time, and cost constraints.

The tools used in the Final Graduation Project were:

- Process Mapping: Used to visualize and analyze current procurement workflows
- SWOT Analysis: To identify strengths, weaknesses, opportunities, and threats in existing processes
- PMBOK Guide Tools: Such as Work Breakdown Structure (WBS), responsibility assignment matrix (RAM), and performance measurement tools such as KPIs
- Survey/Interview Guide: Designed for collecting qualitative data from procurement staff and stakeholders
- Benchmarking: Used to compare PEU practices with international standards
- Digital Project Management Tools such as Excel and MS Project: For planning, scheduling, and tracking procurement milestones

3.5.1.1.1 Tools (Source: Tingling-Cano)

| Objectives | Tools |
|---|--|
| To identify the existing inefficiencies and challenges that are faced in the procurement processes of the PEU of the MOECST in order to understand the root causes of delays, non-compliance, and misalignment with strategic goals | Process Mapping, SWOT Analysis, Survey Guide |
| To assess the relevance and adaptability of the Agile, Scrumban, and Critical Path Method (CPM) project management | Benchmarking Tools, PMBOK Guide Tools |

| | |
|---|--|
| methodologies, in order to determine their suitability for enhancing the procurement processes in the PEU context | |
| To develop a structured proposal integrating Agile, Scrumban, and CPM methodologies, in order to standardize procurement practices and improve process efficiency, transparency, and accountability | WBS, RAM, Flow Diagrams |
| To develop key performance indicators (KPI) that will assist in the monitoring and evaluation of the effectiveness of the project management methodologies and the tracking of procurement performance, to support continuous improvement and alignment with educational project outcomes and IFI requirements | KPI Dashboard, Excel Templates |
| To propose specific best practices for adaptation from the project management framework (Agile, Scrumban, and CPM), and demonstrate their application in selected procurement activities. These include the acquisition of equipment for secondary schools, construction of STEAM Lab schools, and consultancy to conduct evaluations for the Skills for the Future Project and the Belize Education Sector Reform Project, all in order to optimize procurement operations and support strategic project delivery within the projects timelines. | Presentation Templates, Feedback Forms |

3.6 Assumptions and Constraints

By definition, in project management, assumptions are conditions or factors considered to be true, real, or certain without proof or demonstration at the planning stage. According to Verzuh (2021), assumptions allow for the development of project plans based on expected conditions, while constraints serve as boundaries within which the project must operate. Constraints are limiting factors that affect the execution of a project or restrict the options available to the project team (PMI, 2021). Assumptions are related to factors such as access to internal procurement data and staff availability for interviews. Constraints include time, scope,

budget, and data sensitivity, which affect how the project is executed and what outcomes are realistically achievable.

3.6.1 Assumptions and Constraints (Source: Tingling-Cano)

| Objectives | Assumptions | Constraints |
|--|---|--|
| To identify the existing inefficiencies and challenges that are faced in the procurement processes of the PEU of the MOECST in order to understand the root causes of delays, non-compliance, and misalignment with strategic goals | Relevant procurement data would be accessible; PEU staff would participate in interviews. | Confidentiality restrictions may limit data access; staff availability may vary. |
| To assess the relevance and adaptability of the Agile, Scrumban, and Critical Path Method (CPM) project management methodologies, in order to determine their suitability for enhancing the procurement processes in the PEU context | Sufficient literature on Agile, Scrumban, and CPM would be available. | Time limitations would restrict the depth of comparison. |
| To develop a structured proposal integrating Agile, Scrumban, and CPM methodologies, in order to standardize procurement practices and improve process efficiency, transparency, and accountability | Best practices could be adapted to the Belizean government context. | Lack of formal PM methodology at PEU would limit integration. |
| To develop key performance indicators (KPI) that will assist in the monitoring and evaluation of the effectiveness of the project management methodologies and the tracking of procurement performance, to support continuous improvement and alignment with educational project outcomes and IFI requirements | Reliable data sources existed for developing performance indicators. | Inconsistent or incomplete procurement records would hinder KPI development. |
| To propose specific best practices for adaptation from the project management framework (Agile, Scrumban, and CPM), and demonstrate their application in selected procurement activities. These include the acquisition of equipment for secondary schools, construction of STEAM Lab schools, | Recommendations would be aligned with the strategic goals of MOECST. | Implementation would depend on institutional readiness and leadership support. |

| Objectives | Assumptions | Constraints |
|--|-------------|-------------|
| and consultancy to conduct evaluations for the Skills for the Future Project and the Belize Education Sector Reform Project, all in order to optimize procurement operations and support strategic project delivery within the projects timelines. | | |

3.7 Deliverables

The most important part of the Final Graduation Project (FGP) was the deliverables. Deliverables refer to any unique and verifiable product, results, or capability that must be produced to complete a project or a project phase, according to the Project Management Institute (PMI, 2021). Verzuh (2021) indicates that a clear and measurable deliverable allows teams to track progress and ensure stakeholder expectations are met. In the context of the FGP, deliverables were the concrete outputs that would be produced in relation to each specific objective. These included the analysis reports, evaluation documents, proposed frameworks, performance indicators, and recommendation plans that addressed the identified procurement inefficiencies within the PEU.

3.7.1 Deliverables (Source: Tingling-Cano)

| Objectives | Deliverables |
|---|--|
| To identify the existing inefficiencies and challenges that are faced in the procurement processes of the PEU of the MOECST in order to understand the root causes of delays, non-compliance, and misalignment with strategic goals | Procurement Process Analysis Report – A document detailing existing workflows, inefficiencies, and areas for improvement |
| To assess the relevance and adaptability of the Agile, Scrumban, and Critical Path Method (CPM) project management | Evaluation Report – A comparative analysis of Agile, Scrumban, and CPM methodologies as applied to procurement |

| Objectives | Deliverables |
|---|--|
| methodologies, in order to determine their suitability for enhancing the procurement processes in the PEU context | |
| To develop a structured proposal integrating Agile, Scrumban, and CPM methodologies, in order to standardize procurement practices and improve process efficiency, transparency, and accountability | Procurement Framework Document – A proposed model outlining steps to integrate project management practices into the PEU |
| To develop key performance indicators (KPI) that will assist in the monitoring and evaluation of the effectiveness of the project management methodologies and the tracking of procurement performance, to support continuous improvement and alignment with educational project outcomes and IFI requirements | KPI Report – A list of key performance indicators, their definitions, and measurement criteria tailored for PEU |
| To propose specific best practices for adaptation from the project management framework (Agile, Scrumban, and CPM), and demonstrate their application in selected procurement activities. These include the acquisition of equipment for secondary schools, construction of STEAM Lab schools, and consultancy to conduct evaluations for the Skills for the Future Project and the Belize Education Sector Reform Project, all in order to optimize procurement operations and support strategic project delivery within the projects timelines. | Proposal Document– Actionable suggestions to streamline procurement processes and improve overall efficiency |

4 RESULTS

The results section presents the activities and results associated with fulfilling each specific objective. The description includes the methods used, tools designed, and outputs generated to align with the overall goal of enhancing the procurement processes within the Project Execution Unit (PEU) under the Ministry of Education, Culture, Science and Technology (MOECST).

4.1. Specific objective 1: To identify the existing inefficiencies and challenges that are faced in the procurement processes of the PEU of the MOECST in order to understand the root causes of delays, non-compliance, and misalignment with strategic goals

Specific Objective 1 seeks to identify the existing inefficiencies and challenges faced in the procurement processes of the PEU of the MOECST in order to understand the root causes of delays, non-compliance, and misalignment with strategic goals. Below are the steps that were taken and activities conducted to gather and analyze the information available at the PEU.

4.1.1 Review of Documents

The first objective was to conduct a process mapping of current procurement workflows using data from the Project Execution Plan (PEP), procurement plan, and contract documentation. The first activity done was identifying all relevant documents needed for the review process. Documents were chosen based on their relevance to determine how the procurement process works, including the requirements of the Banks, documents used, human resources needed, and external approvals. It was determined that the PEP, procurement plan, and all contract files would be needed for this process. The review of these documents gave a comprehensive insight into the procurement process and identified bottlenecks.

- The PEP was needed because it includes all of the activities that are planned for the execution of a project. It includes the name of the activity, procurement procedures,

key responsibilities, deliverables, and resources.

- From the review of the PEP, it was determined that:
 - There are a total of two main programs that are in execution under the PEU of MOECST: the Skills for the Future Program (SFTF), a USD15 million loan funded by the Inter-American Development Bank (IDB) and the Belize Education Sector Reform Program (BESRP), a USD35 million loan funded by the Caribbean Development Bank (CDB).

There are 28 procurement processes to be completed during the project life cycle for the SFTF program and 24 procurement processes for the BESRP.

Table 4

Procurements for Skills for the Future and Belize Education Sector Reform Program

| Procurement Method | SFTF | BESRP |
|---|------|-------|
| Quality and Cost-Based Selection (QCBS) | 6 | 3 |
| Individual Consultancy | 7 | 3 |
| National Competitive Bidding (Works) | 1 | 13 |
| International Competitive Bidding (Works) | 3 | 4 |
| International Competitive Bidding (Goods) | 2 | 0 |
| Shopping (Goods) | 5 | 0 |
| Direct Contracting | 4 | 1 |

Note: Table created by the author.

- The procurement plan is needed because it includes the procurement categories, timelines, and contracting strategies.
 - The procurement plan provided information on when procurement processes

are expected to start and the estimated contract time, the estimated budget for each activity, and the procurement method to be used for each activity.

- The contract files have all the relevant documentation for each procurement process, from the development of the terms of requirements to the signing of the contracts.
 - From the development of the Terms of Reference (TOR) or the Technical Specifications up to the signing of the contract, all documents to support the procurement process and requirements are filed for fiduciary compliance checks and external audit.
- From the review of the documents, the following were identified:
 - Excessive bureaucratic layers cause delays: procurement delays of up to 18 months in the case of the purchase of E-Learning Devices (ICB – Goods)
 - Lack of accountability mechanisms, resulting in repeated engagement of underperforming vendors
 - Absence of digital procurement tracking, leading to poor record-keeping and inefficient monitoring

4.1.2 Interview with Relevant PEU Staff

- Structured interviews were conducted with procurement staff, the project coordinator, and key stakeholders to identify bottlenecks and recurring inefficiencies. There are two procurement officers within the Project Execution Unit (PEU). One officer is responsible for the Skills for the Future Program (SFTF) funded by the Inter-American Development Bank (IDB) and the other is responsible for the Belize Education Sector Reform Program (BESRP) funded by the Caribbean Development Bank (CDB).

○ Questions Used in Interview with Procurement Staff – Procurement Officer 1

(IDB Projects):

- Workflow and approvals
 - Can you walk me through the typical steps of a procurement process from start to finish?
 - Which stages of the procurement process do you feel are most time-consuming? Why?
 - Are there any approval layers you believe could be reduced or streamlined?
 - How are procurement documents typically reviewed and approved?
- Communication and Coordination
 - How would you describe communication between the procurement team and technical departments?
 - Are there delays caused by waiting on information or approvals from other units?
- Record-keeping and Monitoring
 - How is procurement tracked and monitored, manually or digitally?
 - What are some challenges you face in accessing historical procurement data or documents?
- Vendor Management
 - Are vendor evaluations consistently conducted after contracts

are completed?

- Have you observed repeated engagement with underperforming vendors? What do you think is the cause?
- Suggestions
 - If you could change one aspect of the procurement process, What would it be?
 - What tools or systems do you believe could improve procurement efficiency?

Based on the interview with the Procurement Officers:

- Interview with Project Coordinator
 - Oversight and Bottlenecks
 - From your perspective, what are the main delays affecting the timely execution of procurement activities?
 - Which approval stages typically cause the most hold-ups?
 - How often are procurement timelines adjusted due to internal process issues?
 - Decision-making and Accountability
 - Are responsibilities clearly assigned across procurement stages?
 - Do you believe there are sufficient accountability mechanisms in place for procurement performance?
 - How are underperforming vendors dealt with after project delivery?

- Strategic and Systemic Gaps
 - What challenges do you face in aligning procurement timelines with project milestones?
 - Are there any systemic or policy-related constraints that limit procurement agility?
- Opportunities for Improvement
 - In your opinion, how could procurement be improved to support faster project implementation?
 - Are there any digital tools or workflow changes you would recommend adopting?

Purpose of the interview

The objective of the interviews was to assess the procurement processes and identify inefficiencies, communication gaps, and opportunities for improvement. They also served to gather insight to support the development of a proposal to improve the procurement practices through the application of project management methodologies. The interviews also provided feedback directly from the people responsible for the processes.

Methodology

The methodology consisted of structured interviews with key personnel involved in procurement activities under the Skills for the Future Program (SFTF) and the Belize Education Sector Reform Program (BESRP). The interview questions covered workflow, approval processes, communication, monitoring systems, vendor management, capacity, and technology.

Key Findings

Workflow and approvals: The procurement process typically follows a linear process involving several layers of review and approval. The most time-consuming stages include delays in receiving technical specifications and Terms of Reference from technical officers, as well as lengthy evaluation and approval processes, especially for procurement requiring multi-tiered approvals such as the IFI, the Ministry of Finance, and the Office of the Contractor General. The procurement officers recommended streamlining the approval chain for small-value procurements.

Communication and coordination: Informal communication dominates the interaction between procurement and technical units. There are frequent delays resulting from late feedback on Terms of Reference finalization by the technical team and limited proactive communication between teams. The project coordinator acknowledged that there is a lack of structured timelines and responsibility tracking for these processes.

Recordkeeping and monitoring: The procurement processes are tracked using Excel spreadsheets and email records. The procurement officers cited difficulties in retrieving previously created documentation for audits or references due to improper filing. There is a centralized digital system, but it is not used in the manner it should, which hinders transparency and traceability. The digital system merely stores documents that were uploaded; there is no way to tell if the information is complete or accurate.

Vendor management: This area is lacking, as vendor evaluations are not systematically conducted. The vendor evaluation process has never been undertaken, and no formal process exists to record vendor performance or issue structured feedback. There is also a lack of post-contract monitoring, which contributes to recurring issues with the suppliers' quality of goods and services. The only monitoring system that exists is in the works contract, which has a

defects and liability period that lasts between 6-12 months after construction. Similarly, this process does not have an end-of-contract evaluation of contractors.

Capacity and technology: The current manual system limits efficiency and makes the procurement process prone to human error. There is a recognized need for training on the use of procurement planning tools and digital systems. The staff who were interviewed expressed interest in systems that support workflow automation and tracking. This need was identified because of the many processes occurring simultaneously as well as recurring delays.

Challenges Identified

- Workflow and Approvals – Time-consuming signoffs/approvals and repeated document reviews
- Communication – Lack of structured communication protocols between units
- Monitoring and Tracking – reliance on manual systems, and inefficient use of centralized digital records
- Vendor Management – No formal evaluation or vendor performance tracking
- Capacity and Tools – Limited use of technology and no access to modern procurement software

Proposed Improvements

- Simplify approval procedures by establishing thresholds for delegated authority to reduce delays
- Introduce a centralized e-procurement platform with document version control and status tracking
- Develop formal communication workflows between departments, including service-level agreements

- Standardize vendor performance evaluations and integrate them into contract closed-out procedures
- Train procurement and technical staff on the use of digital tools and preparation of TORs and Technical Specifications
- Implement procurement dashboards for real-time status updates and performance monitoring

Deduction

The interview results highlighted several systemic inefficiencies in the procurement process managed by the Project Execution Unit. These include communication gaps, manual workflow, and a lack of monitoring systems. Addressing these issues through the implementation of project management methodologies such as Agile, Scrumban, and Critical Path Method alongside the adaptation of digital tools will enhance procurement transparency, responsiveness, and performance.

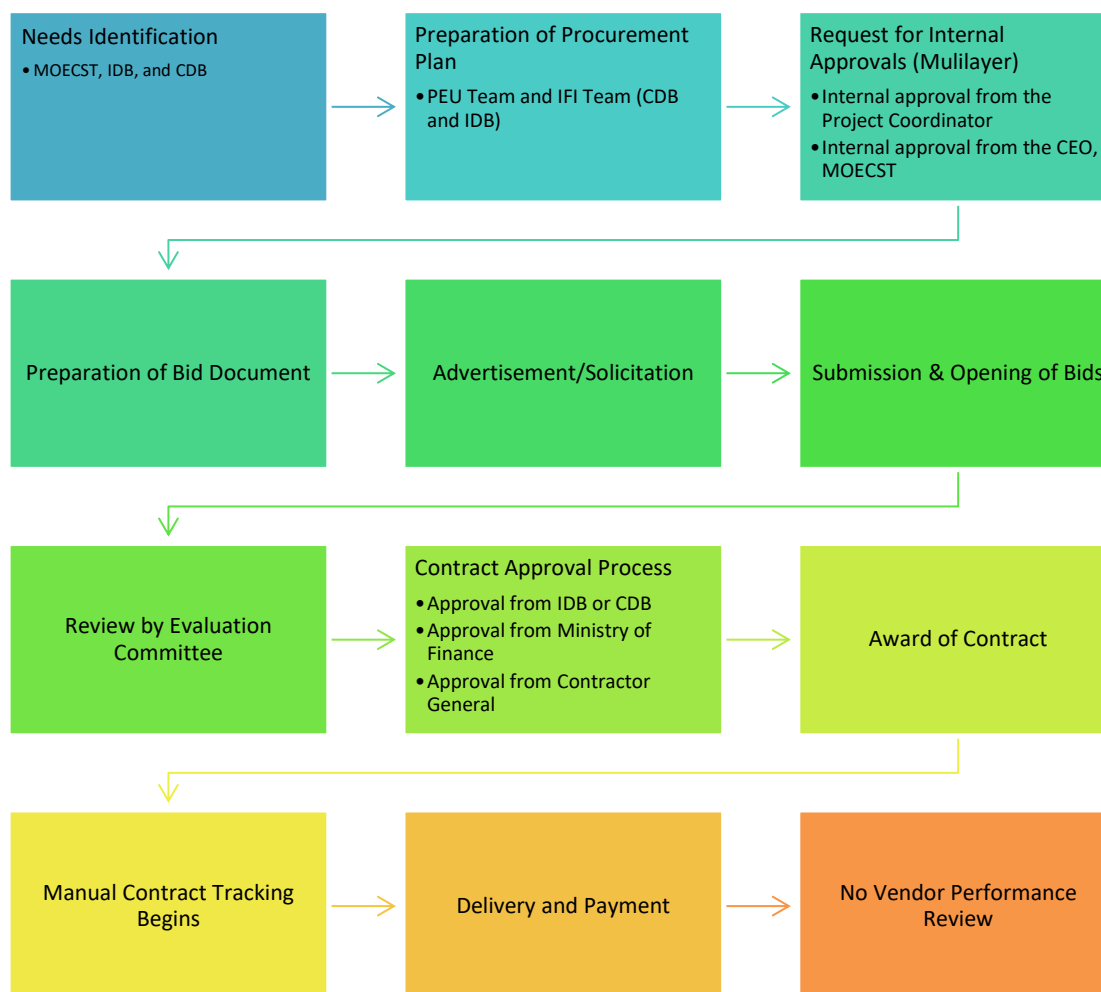
4.1.3 Development of Flowchart

- Flowcharts of the procurement processes were developed, to pinpoint delays caused by multilayer approvals, manual tracking, and lack of an accountability system.

Figure 8 shows a very general and ideal procurement lifecycle, from the development of the project by the MOECST and the Funding Agencies to the delivery of goods and services, as well as performance reviews of the vendors.

Figure 8

General Flowchart



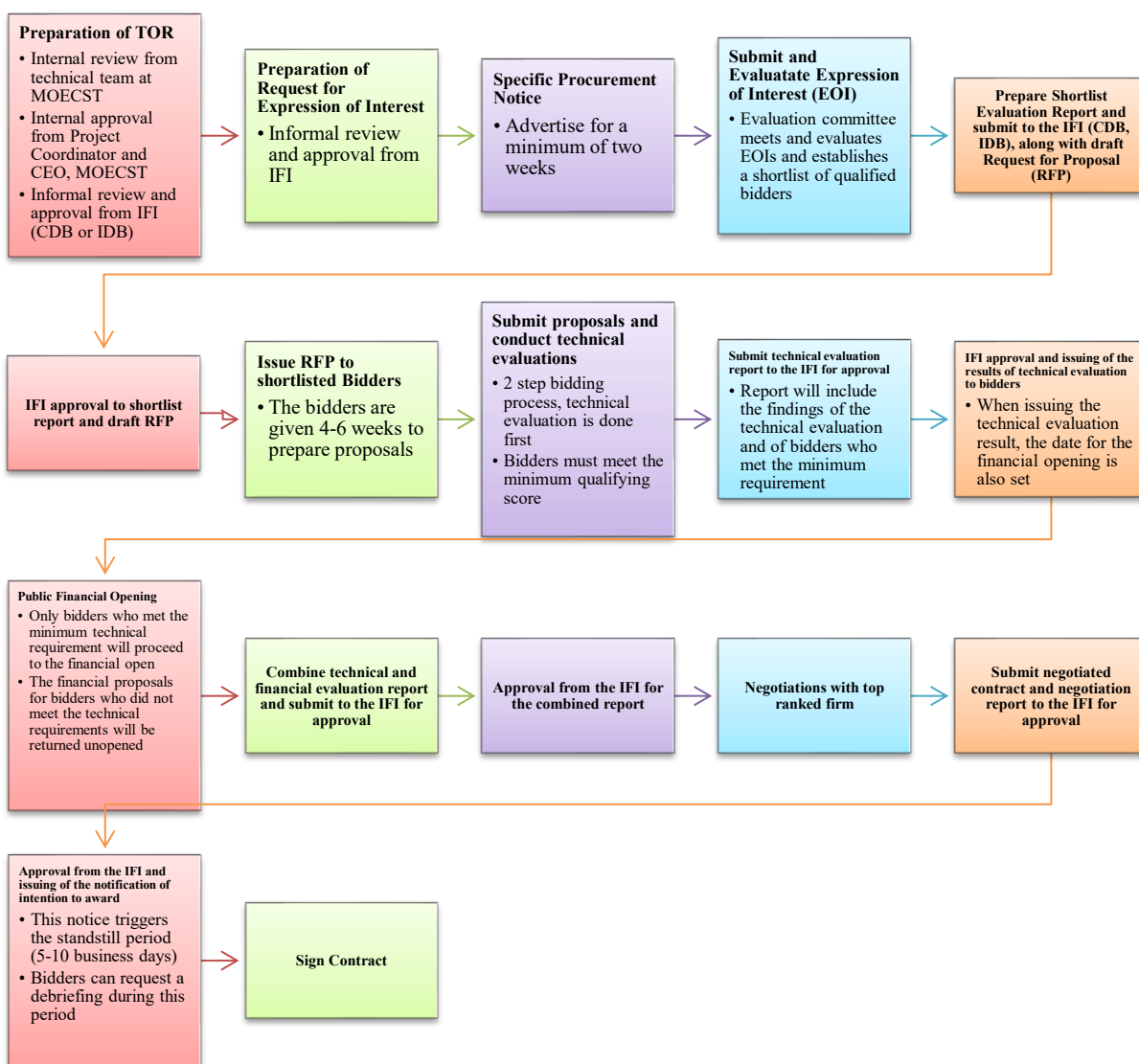
Note: Figure created by author

Figure 9 shows the step-by-step process of the Quality and Cost Based (QCBS) procurement method. This is a multi-stage method used for selecting consultancy services. The process begins with the preparation and approval of the Terms of Reference (TOR) and the Request for Expression of Interest (REOI), followed by public advertisement and the shortlisting of qualified firms based on the EOIs submitted. Once the established shortlist and draft Request for Proposal (RFP) are approved by the IFI, the RFP is issued to shortlisted bidders, who are given between four to six weeks to prepare proposals. A two-step evaluation follows: technical

proposals are evaluated first, and only those meeting the minimum qualifying score proceed to the financial opening. After both evaluations are complete, a combined technical and financial report is submitted for IFI approval. The top-ranked firm is invited to negotiate the contract, which, once approved, triggers the standstill period, followed by the contract signing.

Figure 9

Quality and Cost Based Selection (QCBS) Procurement Process

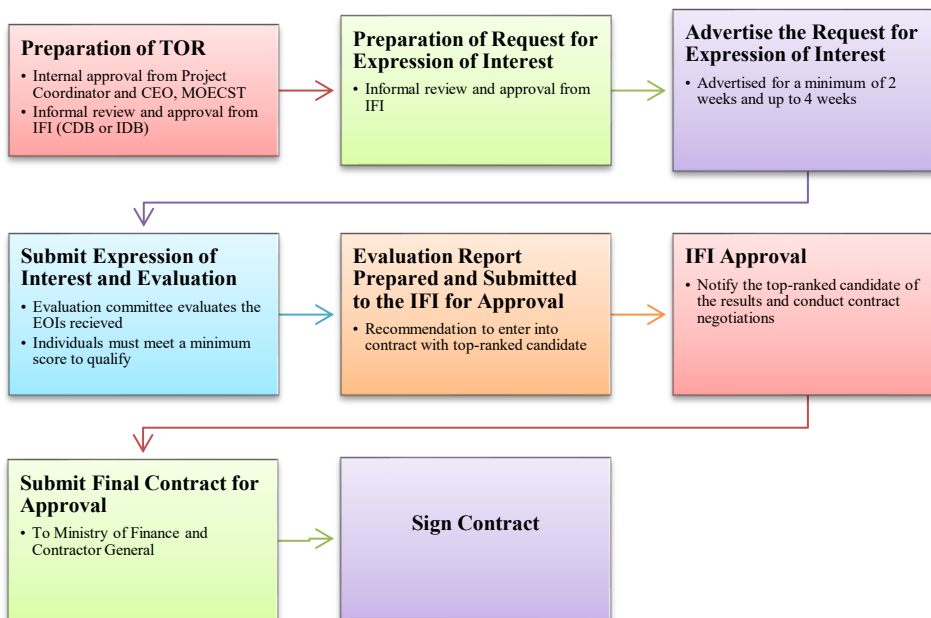


Note: Figure created by author.

Figure 10 shows the step-by-step process for the selection of an Individual Consultant (IC). The process begins with the preparation and internal approval of the Terms of Reference (TOR), followed by the development of the Request for Expression of Interest (REOI) and approval by the IFI. The REOI is then advertised for a minimum of two weeks. Interested individuals submit their Expressions of Interest (EOI), which are evaluated by an evaluation committee based on predefined criteria, with candidates required to meet a minimum qualifying score. An evaluation report is prepared and submitted to the IFI recommending the top-ranked candidate. Once the IFI grants approval and negotiations are finalized, the final contract is submitted to the Ministry of Finance and the Contractor General for review and approval. Upon receiving all necessary approvals, the contract is signed.

Figure 10

Individual Consultant (IC) Procurement Process

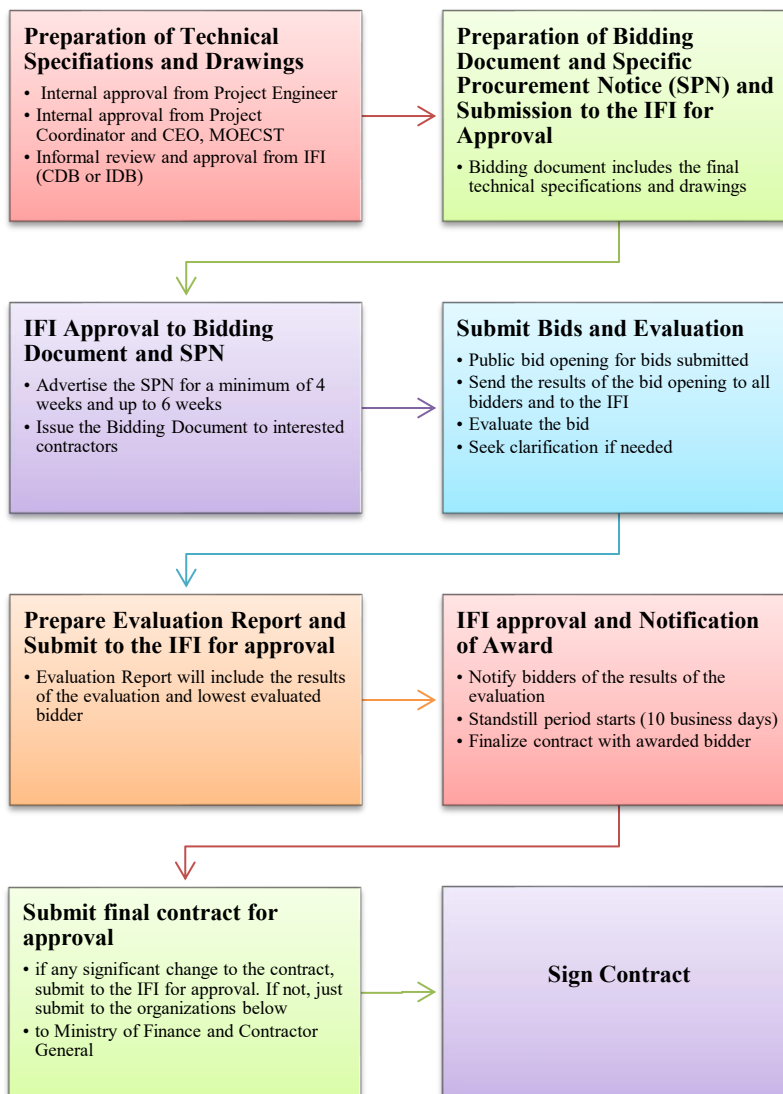


Note: Figure created by author.

Figure 11 shows the step-by-step process for the National Competitive Bidding (NCB) procurement method for 'Works' projects. The process begins with the preparation of technical specifications and drawings by the technical team, followed by internal approvals and informal review from the IFI. The bidding document and Specific Procurement Notice (SPN) are then compiled and submitted to the IFI for approval. Upon approval, the SPN is advertised publicly for 4 to 6 weeks, and the bidding documents are shared with interested contractors. Once bids are submitted, a public opening is conducted, and all submissions are evaluated. An evaluation report is then prepared, recommending the lowest evaluated bidder, and submitted to the IFI for approval. After approval, bidders are notified of the results, which also triggers the standstill period of 10 business days. The final contract is then prepared and submitted for approval to the IFI (if changes were made) or directly to the Ministry of Finance and Contractor General. Once all approvals are obtained, the contract is signed, concluding the procurement process.

Figure 11

National Competitive Bidding (NCB) (Works) Procurement Process

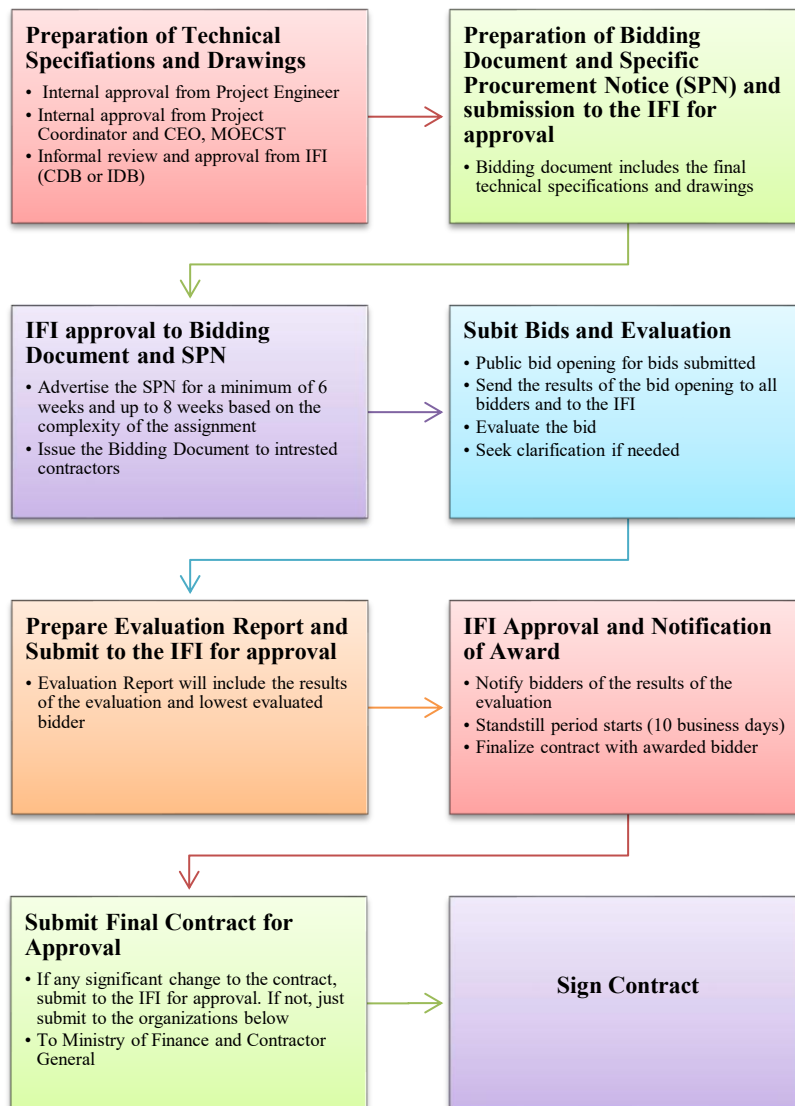


Note: Figure created by author.

Figure 12 shows the step-by-step process for the International Competitive Bidding (ICB) procurement method for 'Works' projects. The process begins with the preparation and internal approval of technical specifications and drawings, including informal review by the IFI. This is followed by the preparation and submission of the bidding documents and the Specific Procurement Notice (SPN) for IFI approval. Once approved, the SPN is advertised for a minimum of six weeks (or up to eight weeks, depending on complexity), and bidding documents are issued to interested contractors. Upon bid submission, a public bid opening is conducted, and all bids are evaluated. An evaluation report, identifying the lowest evaluated and responsive bidder, is prepared and submitted to the IFI. After the IFI approves the evaluation report, the notification of award is issued; this triggers the standstill period of 10 business days. The final contract is then prepared and submitted to the IFI for approval (if changes were made during negotiations) or submitted directly to the Ministry of Finance and the Contractor General for review and approval. The process concludes with contract signature.

Figure 12

International Competitive Bidding (ICB) (Works) Procurement Process

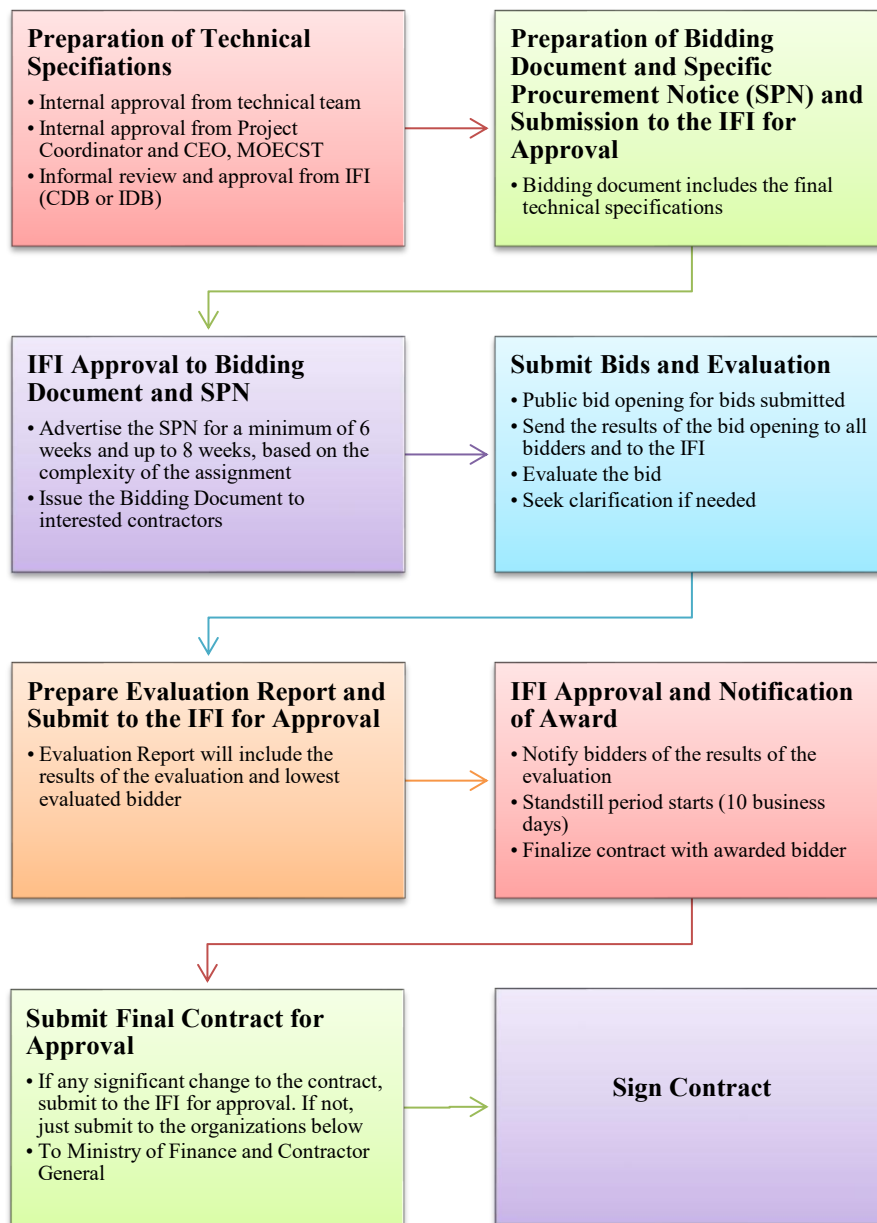


Note: Figure created by author.

Figure 13 shows the step-by-step process for the International Competitive Bidding (ICB) procurement method for 'Goods' projects. The process begins with the preparation and internal approval of technical specifications, including informal review by the IFI. This is followed by the preparation and submission of the bidding documents and the Specific Procurement Notice (SPN) for IFI approval. Once approved, the SPN is advertised for a minimum of six weeks (or up to eight weeks depending on complexity), and bidding documents are issued to interested contractors. Upon bid submission, a public bid opening is conducted, and all bids are evaluated. An evaluation report, identifying the lowest evaluated and responsive bidder, is prepared and submitted to the IFI. After the IFI approves the evaluation report, the notification of award is issued; this triggers the standstill period of 10 business days. The final contract is then prepared and submitted to the IFI for approval (if changes were made during negotiations) or submitted directly to the Ministry of Finance and the Contractor General for review and approval. The process concludes with contract signature.

Figure 13

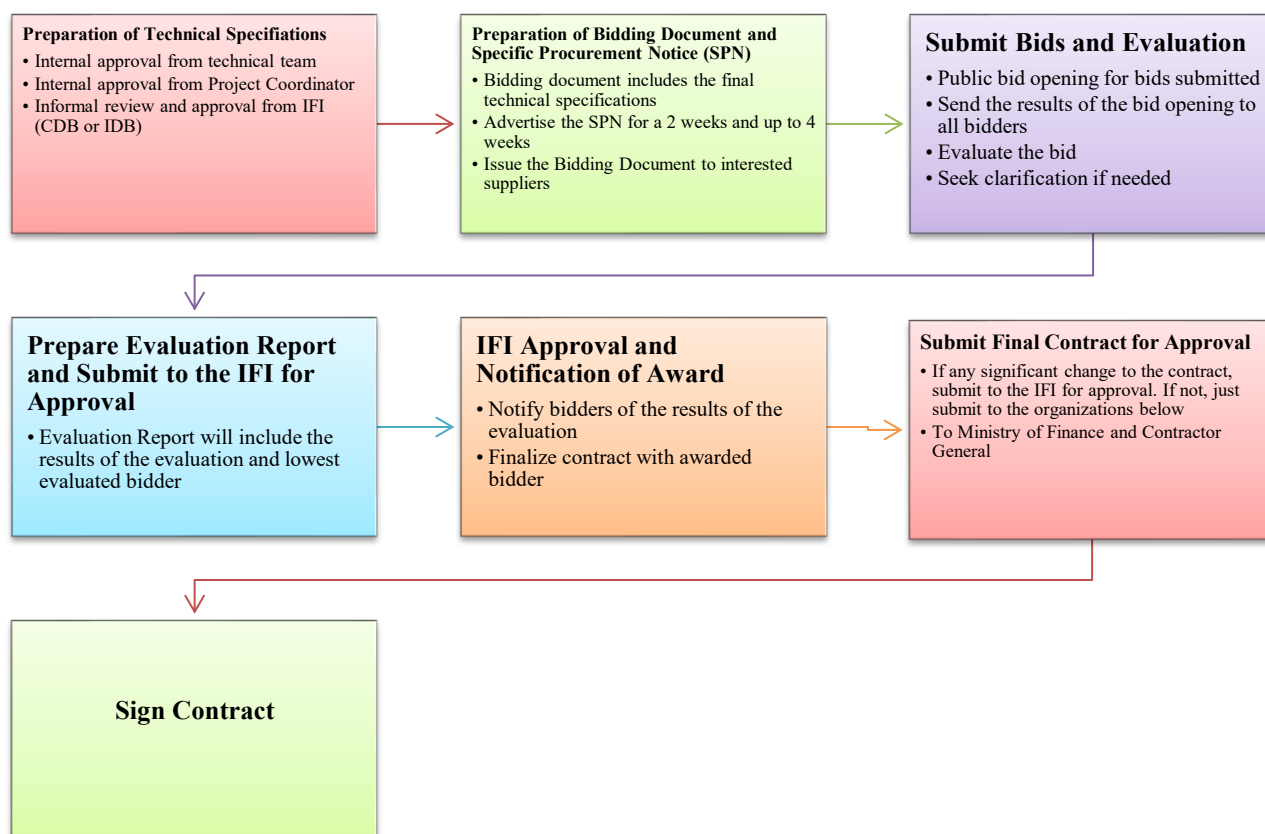
International Competitive Bidding (ICB) (Goods) Procurement Process



Note: Figure created by author.

Figure 14 shows the step-by-step process for the ‘Shopping’ procurement method for ‘Goods’ projects. It begins with the preparation of detailed technical specifications by the internal technical team, followed by approval from the Project Coordinator and informal review by the IFI. The bidding documents and Specific Procurement Notice (SPN) are then finalized and submitted to the IFI for approval. Once approved, the SPN is advertised for a period of two to four weeks, and the bidding documents are issued to interested suppliers. Bids are publicly opened, evaluated, and clarifications are sought if necessary. An evaluation report identifying the lowest evaluated bidder is submitted to the IFI for review and approval. Upon approval, bidders are notified, and the award is finalized. The final contract is then submitted to the Ministry of Finance and the Contractor General for approval, after which the contract is signed.

Figure 14

Shopping (Goods) Procurement Process

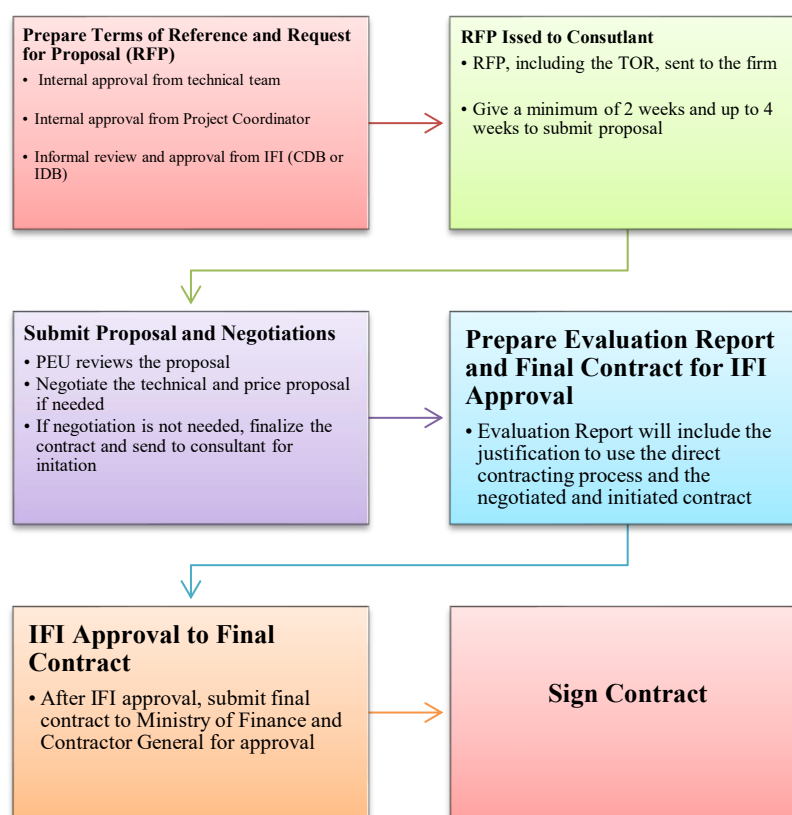
Note: Figure created by author.

Figure 15 shows the step-by-step process for the Direct Contracting (DC) procurement method. The process begins with the preparation of the Terms of Reference (TOR) and Request for Proposal (RFP), which must be approved by the internal technical team and the Project

Coordinator, followed by informal review by the IFI. Once finalized, the RFP, including the TOR, is sent to the selected consultant, who is given a minimum of two weeks to submit their proposals. The PEU then reviews the submission and, if needed, conducts negotiations on the technical and financial proposals. If negotiations are not needed, the contract is then finalized and sent to the consultant to be initiated. An evaluation report justifying the use of the DC process and the draft contract are submitted to the IFI for approval. After the approval is received, the final contract is submitted to the Ministry of Finance and the Contractor General for approval. This is then followed by contract signing.

Figure 15

Direct Contracting Procurement Process



Note: Figure created by author.

4.1.4 Assessment Report

- Documented findings in the Procurement Inefficiency Assessment Report highlights:
 - Average procurement cycle extensions from 6 to 18 months
 - Lack of accountability mechanisms, resulting in repeated engagement of underperforming vendors
 - Communication gaps between the PEU and MOECST technical departments

Introduction of the Assessment Process

This assessment was conducted to evaluate inefficiencies in the procurement processes of the Project Execution Unit (PEU) under the Ministry of Education, Culture, Science and Technology (MOECST). The review focused on operational delays, communication challenges, and the absence of performance accountability mechanisms, all of which impact project execution timelines and value for money.

Objective of the Assessment

- To analyze current procurement workflows and identify key inefficiencies
- To evaluate the impact of delays and systemic weaknesses on procurement outcomes
- To provide evidence-based recommendations for process improvement

Methodology

The following methods were used for this assessment:

- Review of the Project Execution Plan (PEP), procurement plan, and contract documentation
- Structured interviews with procurement staff and project coordinator
- Process mapping of procurement workflows to detect bottlenecks and communication gaps

Key Findings

Extended procurement cycle duration

- In particular, an ICB procurement process that ideally is expected to be completed within 6 months took 16 months to be completed. Items were delivered within 2 months; therefore, the entire process was 18 months.
- The causes of the delay included the multilayered internal and external approvals processes, the evaluation process that took 8 months to be completed because the evaluator could not agree on a qualifying criterion (which means there was a flaw in the development of the technical specifications), manual processing of documentation, and lack of decision-making authority at operational and approval levels. The PEU got little support from the IDB and the Ministry of Finance as it relates to the impasse that the evaluation committee was facing. Both parties did not want to intervene at the evaluation level.

Lack of Accountability Mechanisms

- There is no standardized system in place to track and document delays in the procurement process.
- There is no standardized system in place for evaluating contractors or suppliers' performance after contract completion.
- This cycle reduces quality assurance and increases the risk of project underperformance.

Communication Gaps Between PEU and MOECST Technical Departments

- There is limited structured communication between the PEU procurement team and technical departments.
 - An example of this is that whatever technical review is needed for Terms of

References (TORs) and Technical Specifications (TS), rather than being sent directly by the Procurement Officer, is the documents are first sent to the Project Coordinator, and then they are disseminated to the CEO and technical team. The team's input is then sent back to the Project Coordinator and then to the Procurement Officer.

- Delays often arise when technical specifications, the evaluation process, or feedback on contract implementation are delayed or inconsistent.
 - An example of the delay associated with the technical specifications is when the technical team does not treat the input as priority or does not have the background knowledge regarding the importance of the technical input and the time sensitivity of it. In some instances, a review and input process could take up to 4 months. In one case, the Men and Masculinity Consultancy, the process took 6 months as the documents just bounced around from PEU to MOECST with no consistent follow-up or priority given.
 - The delays associated with the evaluation process are a recurrent issue, and the following bottlenecks exist:
 - The evaluation committee must be comprised of members from the Ministry of Finance and Ministry of Economic Development.
 - The committee must be comprised of an odd number of participants: 3, 5, 7, etc.
 - Evaluations must be scheduled two weeks in advance to get the consensus needed.
 - Delays are often caused by scheduling issues, delays in completing the evaluation

process, and unmet meeting quorums.

- A major delay was caused when the evaluation committee had 3 technical members and were unable to agree on a particular requirement because of their varying views of the process. This dragged out for 8 months.
- An example of delays associated with contract implementation is the receipt of deliverables. The review and acceptance process of each deliverable usually goes beyond the agreed-upon time period because documents are not reviewed in a timely manner.

Implications of Identified Inefficiencies

- **Project Delays:** Delayed procurement directly affects the implementation schedule of donor or government-funded initiatives, leading to unmet milestones.
- **Budget Overruns:** Late procurement may result in cost escalations, especially where prices are time-sensitive or subject to foreign exchange variability.
- **Reputation Risk:** Prolonged processes and repeated vendor issues may erode funding agencies and stakeholders' confidence in MOECST's procurement system.

Proposed Improvements

- **Extended procurement cycles :** Simplify internal approval chains by establishing delegated decision-making authority for lower thresholds.
- **Lack of vendor accountability:** Develop and implement a vendor performance evaluation system, with minimum scoring thresholds for repeat engagements.
- **Manual tracking of procurement steps:** Transition to a digital procurement tracking tool or e-procurement platform.

- Communication gaps within technical departments: Establish scheduled coordination meetings and shared digital workspaces for procurement and technical teams.

4.2 Specific objective 2: To assess the relevance and adaptability of the Agile, Scrumban, and Critical Path Method (CPM) project management methodologies in order to determine their suitability for enhancing the procurement processes in the PEU context.

Specific Objective 2 was to assess the relevance and adaptability of Agile, Scrumban, and Critical Path Method (CPM) project management methodologies to determine their suitability for enhancing the procurement process in the PEU context.

4.2.1 Review of Project Management Methodologies

- Conducted literature review and comparative analysis of Agile, Scrumban, and CMP project management methodologies, and mapped their principles to the PEU's needs
- Firstly, the specific management challenges identified
- Then established the goal of aligning suitable project management methodologies with the PEU's operational needs
- Then conducted literature review for
 - Agile Project Management
 - Scrumban
 - Critical Path Method (CPM)
- Extracted core principles for each methodology
 - Agile – uses iterative development, stakeholder collaboration, and flexibility
 - Scrumban – uses visual workflow management, work-in-progress limits, and adaptability

- CPM – uses task dependency mapping, timeline optimization, and schedule-driven control
- Based on the revision of the PEP, Procurement Plan, files, and interviews, the needs identified were:
 - Faster response to changes
 - Better team coordination
 - Clear tracking of tasks, timelines, and resources
 - Proper management of parallel procurement processes

4.2.2 Identifying Strengths of Project Management Tools

- Identifying Agile’s strengths in flexibility and iterative planning, Scrumban’s utility in visual task management, and CPM’s precision in timeline control based on the review of the project management methodologies:

Table 5

Key Strengths for each Project Management Tool

| Project Management Tool | Key Strengths for each Project Management Tool |
|--------------------------------|--|
| Agile | Flexible: Agile adapts to changing project needs or stakeholder inputs, making it ideal for environments with evolving requirements or unforeseen or unmanageable delays. |
| | Iterative planning: The work is broken down into short cycles (sprints); this allows the team to reassess priorities and deliver incremental value on a regular basis. |
| | Stakeholder Engagement: It encourages continuous involvement of end-users, the technical team from the Ministry, as well as the schools and students that are beneficiaries. |
| | Collaboration: Agile enables faster |

| | |
|-----------------------------------|---|
| | identification of problems, allowing for early corrections and reduction of costly delays. It also facilitates cross-functioning teamwork and communication, which helps with coordination gaps between the PEU and other line ministries. |
| Scrumban | Visual workflow: Scrumban uses Kanban-style boards to display tasks, statuses, and responsibilities clearly; this improves transparency and accountability. The Procurement team monitors multiple processes and contracts simultaneously and tracks delays clearly. |
| | Work-in-progress limits: This helps the team avoid overloading by limiting simultaneous tasks, which enhance focus and quality. It prioritizes and avoids overloading, which in turn improves efficiency in managing procurements. |
| | Continuous Flow: It encourages steady and manageable progress rather than a fixed-length sprint, making it suitable for ongoing procurement operations. It identifies bottlenecks quickly by monitoring task movement, especially as it relates to approvals and evaluation delays. |
| | Bottleneck identification: These are visual cues that help to spot delays in approvals, evaluation, or deliverables and it aids in immediate resolution. |
| | Flexible structure: This combines Scrum's planning rhythm with Kanban's real-time flow, making it suitable for the ongoing, adaptive procurement environment of the PEU. |
| Critical Path Method (CPM) | Critical Path Identification focuses attention on the most time-sensitive activities where delays will directly impact the project deadline. |
| | Resource allocation helps to optimize scheduling of personnel, contractors, or suppliers along the critical path. It maps out dependencies and monitoring progress. |
| | Schedule optimization clearly identifies the sequence of dependent tasks and calculates the project duration with start and end |

| | |
|--|---|
| | dates. It calculates the longest path of dependent tasks to determine the minimum time requirement for completion, in this case, the procurement activity. |
| | Milestone monitoring ensures a structured oversight of the procurement stages. This is essential for the project because of the strict timelines and compliance deliverables. |

Note: Table created by the author.

4.2.3 Flow Diagram for Project Management Methodologies

- Flow diagrams were developed to demonstrate how each methodology would function in sample PEU procurement tasks.
- Based on the key strengths of the project management methodologies, below is a demonstration of how they are best applied within the PEU.

Table 6

Application of each Methodology within the PEU

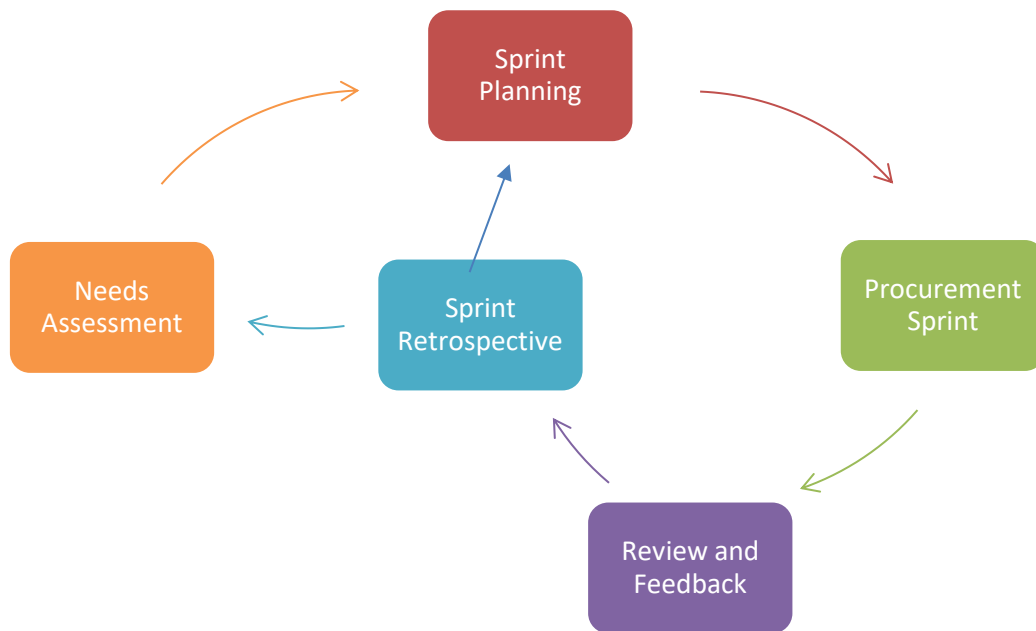
| Methodology | Key Strengths | Best Applied within PEU |
|--------------------|---|--|
| Agile | Flexibility, iterative planning, stakeholder engagement | Managing evolving requirements, improving communication with departments |
| Scrumban | Visual workflow, WIP control, real-time monitoring | Tracking procurement cycles, workload balance, identifying bottlenecks |
| CPM | Timeline precision, Task dependencies, critical path identification | Planning procurement schedules, monitoring execution timelines |

Note: Table created by the author.

Figure 16 demonstrates the iterative flow of the Agile methodology.

Figure 16

Agile Methodology Flow – Iterative Procurement Task



Note: Figure created by author.

Figure 17 demonstrates how task tracking will be done using the Scumban methodology.

Figure 17

Scruban Methodology Flow – Procurement Task Tracking



Note: Figure created by the author.

Figure 18 demonstrates the flow of the procurement process in a controlled timeline using the CMP methodology.

Figure 18

Critical Path Methodology (CPM) Flow – Timeline-controlled Procurement



Note: Figure created by the author.

4.2.4 Adaptation Matrix

- A Methodology Adaptability Matrix was created, summarizing how each approach could address the identified inefficiencies with output from procurement staff and management.

Table 7

Adaptation of Project Management Methodology Matrix

| Identified Inefficiencies | Agile | Scrumban | CPM |
|---------------------------|---|---------------------------------------|---|
| Long Procurement Cycles | Enables adaptive planning and fast feedback loops | Visual flow helps identify slow tasks | Maps timeline dependencies for deadline control |

| | | | |
|---------------------------------------|--|--|---|
| Lack of Task Visibility | Moderate: Relies on communication, not visuals | Strong: Visual boards improve transparency | Lacks visual boards unless customized |
| Vendor Performance Issues | Promotes accountability via team reviews | Basic performance tracking possible | No vendor feedback system by default |
| Rigid Planning & Delayed Adjustments | Allows for quick iteration and change management | Combines planning with continuous flow | Rigid structure; changes are harder to apply |
| Poor Communication Across Departments | Encourages cross-functional collaboration | Real-time board updates support visibility | Helps clarify roles/tasks but not interaction |

Note: Table created by the author.

4.3 Specific objective 3: To develop a structured proposal integrating Agile, Scrumban, and CPM methodologies, in order to standardize procurement practices and improve process efficiency, transparency, and accountability.

Specific Objective 3 is to develop a structured proposal integrating Agile, Scrumban, and CPM methodologies into the procurement processes of the Project Execution Unit under MOECST. This will help to standardize procurement practices and improve process efficiency, transparency, and accountability in procurement operations.

Proposal to Integrate Project Management Mythologies:

a. Rationale for Methodological Integration

Each methodology offers distinct advantages so that, when combined with the others, they create a comprehensive and adaptive project management framework:

- Agile promotes iterative planning, adaptability to change, and collaboration with stakeholders.
- Scrumban supports visual task management, work-in-progress control, and transparency

in the process flow.

- Critical Path Method delivers accurate timeline control, task dependency mapping, and milestone monitoring.

By integrating these methodologies, the PEU can shift from fragmented, manual workflows to a structured, dynamic, and results-based procurement management system.

b. Methodology Application Strategy

The study outlines how each methodology can be applied within specific phases or activities in the PEU procurement lifecycle:

Table 8

Methodology Application

| Procurement Stage | Recommended Methodology | Application |
|--|-------------------------|---|
| Planning and need identification | Agile | Use stakeholder workshops and iterative planning cycles to define needs. |
| Bidding process (including all the steps mentioned in Section 4.1.3) | CPM | Map task dependencies and track progress along the critical path. |
| Daily workflow tracking | Scrumban | Use Kanban boards to visualize procurement stages and control work-in-progress. |
| Implementation and monitoring | Agile and Scrumban | Monitor timeline completion, deliverables, and final acceptance. |
| Contract closure and evaluation | CPM | |

Note: Table created by the author.

c. Flow Diagrams for Methodological Integration

To demonstrate functional integration, the following flow diagrams were developed to visualize how each methodology aligns with the PEU procurement activities:

- Agile flow: Illustrates the iterative nature of Agile project management by showing a

cycle of planning, executing procurement-related sprints, and integrating continuous stakeholder feedback. This approach is particularly useful during the start-up or pilot phases of procurement projects where requirements evolve, and user engagement is key.

- Scrumban flow: Displays a visual workflow that maps procurement tasks through various stages such as backlog, to-do, in-progress, waiting for approval, and completed. This method enables real-time tracking, helps identify bottlenecks, and supports workload balance within the PEU's daily procurement operations.
- CMP flow: Outlines a linear sequence of time-sensitive activities with clearly defined dependencies, from bid preparation to final acceptance. This method is essential for managing large-scale, deadline-driven procurement projects, ensuring that critical tasks stay on schedule and resources are optimally allocated.

d. Benefits of the Proposed Integration

- Process Efficiency – reduced delays through iterative planning, visual tracking, and timeline control
- Transparency – increased visibility of procurement progress and clear documentation trails
- Accountability – clear roles, responsibilities, and performance tracking at each procurement stage
- Stakeholder Engagement – continuous input and feedback mechanisms improve service alignment and satisfaction
- Standardization – methodological structure reduces inconsistencies and strengthens compliance

e. Tools and Implementation Recommendations

To implement the integrated approach, the following tools and practices are recommended:

- Incorporating Kanban boards such as Kanban, Trello, or Jira for Scrumban tracking
- Sprint review templates and retrospective for Agile cycles
- Gantt charts or CPM scheduling software such as MS Projects, Nifty, or Accelo for critical path tracking
- Standard Operating Procedures (SOPs) tailored to each procurement phase

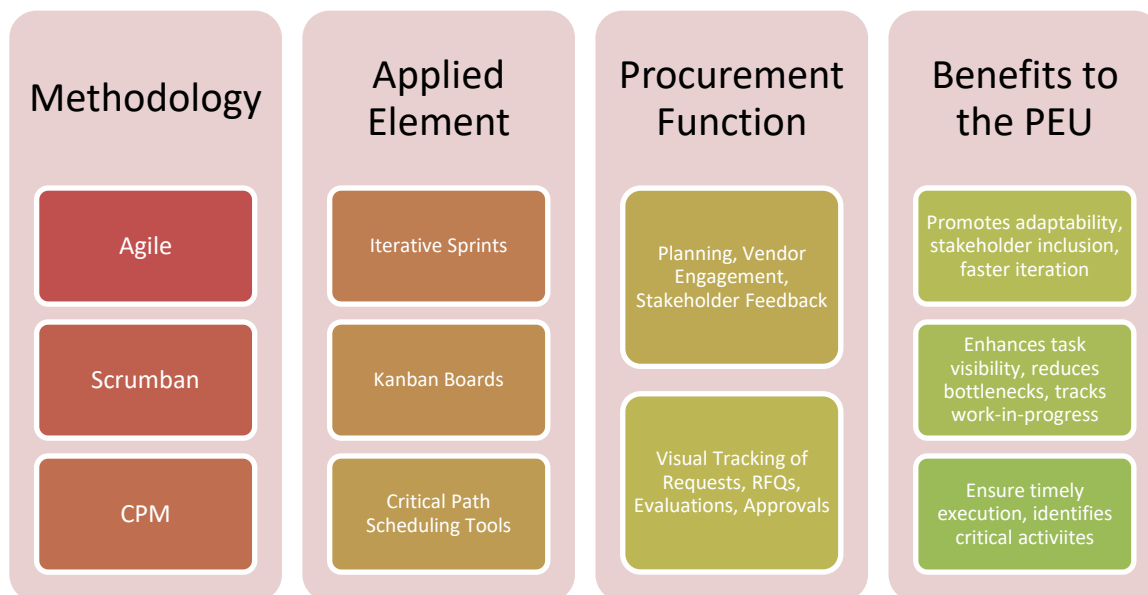
4.3.1 Design Project Management Methodologies Framework

To address the inefficiencies, inconsistencies, and delays in the PEU's current procurement practices, a composite project management framework has been designed. This framework integrates the strengths of the three project management methodologies: Agile, Scrumban, and Critical Path Method to create a cohesive, adaptive, and efficient procurement management system.

- An integrated procurement framework was designed combining as shown in Figure 19:
 - Agile's iterative sprints for planning and vendor engagement
 - Scrumban's Kanban boards for visual tracking of procurement phases
 - CPM's scheduling tools to prioritize and map critical procurement tasks

Figure 19

Framework Components and Integration Strategy



Note: Figure created by author.

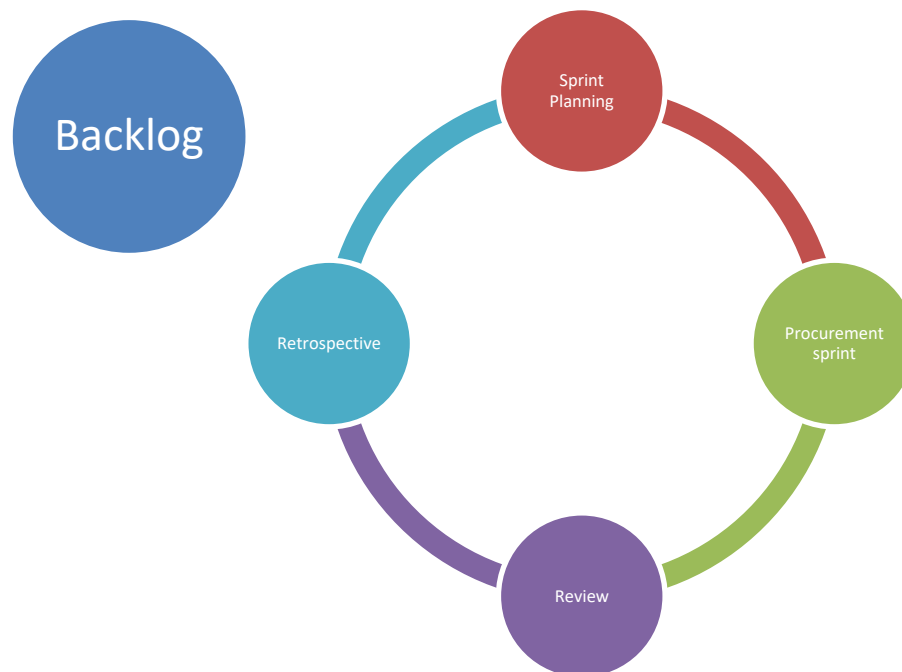
a. How the Framework Functions

i. Agile for Early-Stage Planning and Engagement

- Procurement tasks are divided into short, time-boxed sprints. An example would be a two-week planning cycle or a 4-day evaluation process.
- Each print concludes with a review to adjust procurement requirements or deliverables.
- This will be useful during project initiation or when starting the procurement for the purchase of equipment based on the impact it will have on the project.

Figure 20

Agile Sprint Loop – Adaptive Planning

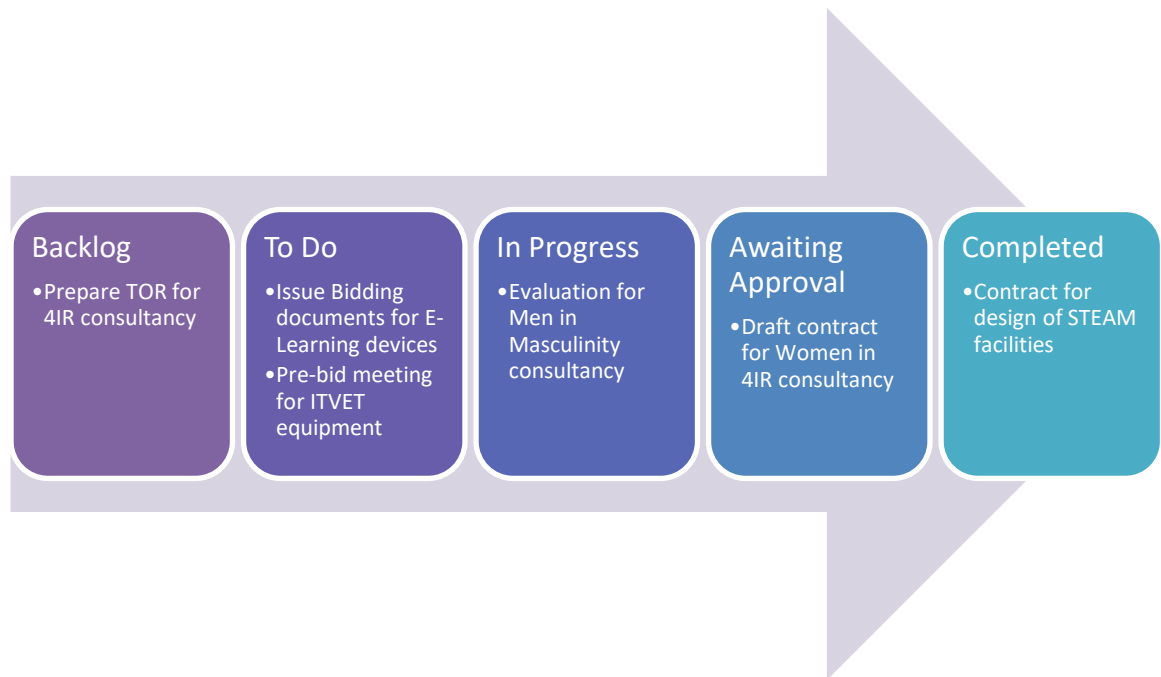


Note: Figure created by author.

- ii. Scrumban for Real-Time Procurement Tracking
- A Kanban board is maintained digitally or physically to show procurement items moving across stages such as (Backlog-To Do-In Progress- Awaiting Approvals- Completed).
 - The work-in-progress limits are used to avoid resource overload.
 - This is ideal for managing multiple, simultaneous procurements while maintaining transparency.

Figure 21

Visual Management of Procurement Tasks



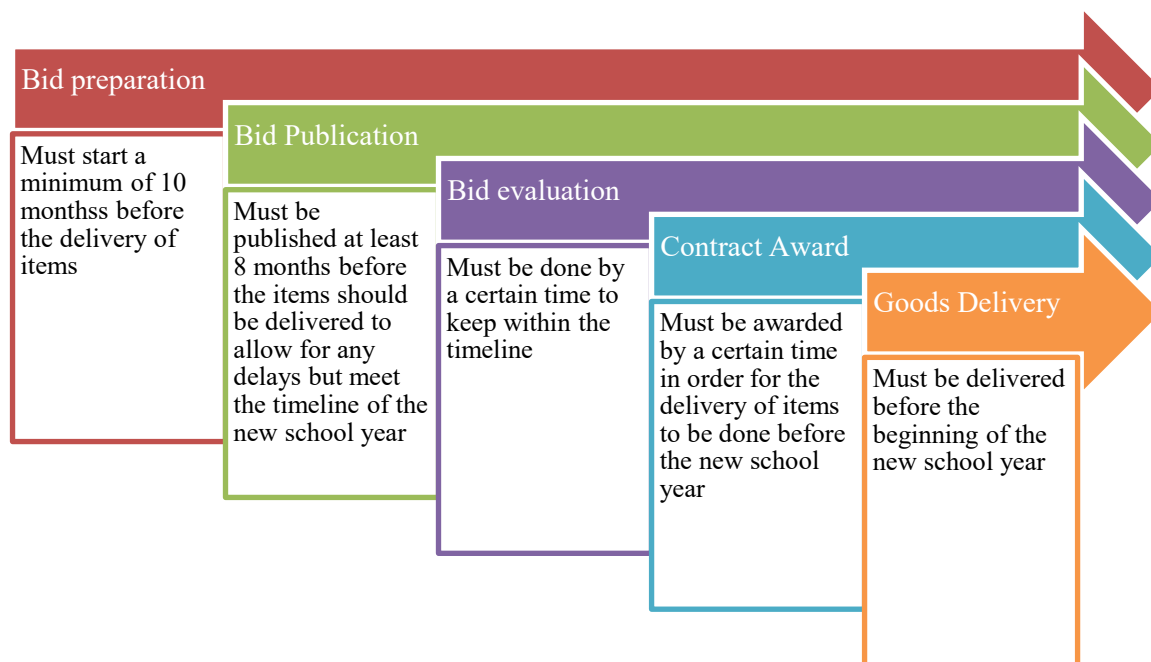
Note: Figure created by author.

iii. CMP for Execution Timeline Management

- All procurement steps, from bid preparation to final deliverables acceptance, are plotted on a critical path.
- Tasks that can delay the entire procurement process are highlighted for priority action.
- This will enable precise scheduling, especially for large-scale and time-bound procurements.

Figure 22

Critical Path Method Timeline Path – Structured Procurement Phases



Note: Figure created by author.

b. Expected Outcome of the Framework

It is expected that there will be a standardization of the procurement tasks through the defined phases and roles. Thorough visual task tracking and sprint-based improvements will create process efficiency. It will improve the transparency and accountability of thorough, regular reviews, real-time status updates, and timeline control.

4.3.2 Operational Template

- Created operational templates and workflow models to support standardization and repeatability.

To support the standardization and repeatability of the procurement processes within the PEU, the following operational templates and workflow models have been created. These templates are designed to align with Agile, Scrumban, and CPM methodologies and ensure consistent, efficient, and auditable processes across procurement activities.

a. Agile Sprint Template

- Sprint Planning sheet: Defines sprint goals, tasks, and responsible team members.

Table 9

Agile Sprint Template

| Sprint Goal | Task Description | Responsible Person | Planned Duration |
|-------------|------------------|--------------------|------------------|
| | | | |
| | | | |

Note: Table created by the author.

- User Story Log: Captures procurement requirements in user story format

Table 10

User Story Log Template

| User Story | Acceptance Criteria | Priority | Assigned To |
|------------|---------------------|----------|-------------|
| | | | |
| | | | |

Note: Table created by the author.

- Sprint Review Checklist: Summarizes completed tasks and lessons learned.

Table 11

Sprint Review Checklist Template


| Task Completed | Comments/ Observations | Verified by: |
|----------------|------------------------|--------------|
| | | |
| | | |

Note: Table created by the author.

- Retrospective Notes: this will be used to document feedback for process improvement.

Figure 23

Template for Retrospective Notes



MINISTRY OF
EDUCATION
SCIENCE
TECHNOLOGY

PROJECT EXECUTION UNIT
Third Floor, 1900 Constitution Drive
City of Belmopan, Belize.
+501 828-5147

(Date)

(process owner)

(topic)

What went well:

Describe the process and what worked

What could be improved:


Describe what could be improved and why; include possible solutions

Action items for next sprint:

Describe and list the next steps to be taken before the next sprint, set a deadline by which these steps should be completed.

(approved by)

(project coordinator)



Government of
BELIZE

Note: Figure created by the author.

b. Scrumban Kanban Board Template

- Columns: The columns to be incorporated are Backlog, To Do, In Progress, Awaiting Approvals, and Completed; however, any other column necessary should be added.

An example is “To Do Today.”

Table 12

Scrumban Kanban Board Template

| Backlog | To Do | In Progress | Awaiting Approval | Completed |
|---------|-------|-------------|-------------------|-----------|
| Task 1 | | | | |
| Task 2 | | | | |
| Task 3 | | | | |

Note: Table created by the author.

- Task Cards: will include procurement activity name, responsible person, start and end date, and status.

Table 13

Task Card Template

| Procurement Activity | Start Date | End Date | Responsible Person | Status |
|----------------------|------------|----------|--------------------|--------|
| | | | | |
| | | | | |

Note: Table created by the author.

- Work-in- Progress Limit Tracker: monitors how many tasks are in progress at one time to avoid bottlenecks.

Table 14

Work-in-Progress Limit Tracker Template

| | Work-in-Progress Limit | Current Tasks | Over Limit |
|--------------------------|-----------------------------------|----------------------|-------------------|
| <i>To Do</i> | 5 | 3 | No |
| <i>In Progress</i> | 4 | 6 | Yes |
| <i>Awaiting Approval</i> | 3 | 2 | No |

Note: Table created by the author.

c. CPM Gant Chart Template

- **Task Breakdown:** This defines the key procurement milestones such as bid publication, evaluation, and contract signing.
- **Timeline Mapping:** Assigns start and end dates and identifies task dependencies
- **Critical Path Identification:** Highlights the most time-sensitive tasks for focused monitoring

Table 15

CPM Gant Chart Template

| Milestone Task | Start Date | End Date | Estimated Duration | Dependencies | Responsible Person |
|-------------------------|-------------------|-----------------|---------------------------|---------------------|---------------------------|
| Project Start | | | | | |
| Bid Preparation | | | | | |
| Bid Publication | | | | | |
| Bid Evaluation | | | | | |
| Contract Award | | | | | |
| Goods Delivery | | | | | |
| Final Acceptance | | | | | |

Note: Table created by the author.

d. Standard Operating Procedures (SOPs)

- SOP for Vendor Selection: Step-by-step guide for managing competitive bidding. The existing procurement policies from IDB and CDB are used.
- SOP for Bid Evaluation: Criteria-based evaluation and documentation process.

Step 1: Establish the evaluation committee.

Step 2: Review technical proposals using predefined evaluation criteria.

Step 3: Document scores, comments, and justifications for each criterion.

Step 4: Open and evaluate financial proposals (only for technically compliant bids).

Step 5: Conduct arithmetic checks and confirm compliance with bid conditions.

Step 6: Consolidate evaluation results and prepare evaluation report.

Step 7: Recommend the best-evaluated bidder for contract award.

- SOP for Contract Close-Out: Final inspection, acceptance, and recordkeeping procedures.

Step 1: Verify that all contractual deliverables are completed.

Step 2: Conduct site inspections or user acceptance testing as applicable.

Step 3: Obtain completion certificates from relevant parties.

Step 4: Release any performance securities or retention amounts if applicable.

Step 5: Archive procurement documents in compliance with donor and legal standards (5 years).

Step 6: Update contract records and document lessons learned.

4.3.3 Framework Implementation Plan

- Developed a Framework Implementation Plan outlining key phases, responsible persons, and timeline milestones for integrating methodologies.

The framework implementation plan guides the phased integration of Agile, Scrumban, and Critical Path Method (CPM) methodologies into the PEU’s procurement operations, ensuring process improvement, standardization, and alignment with institutional goals.

a. Implementation Phases and Activities

Table 16

Framework Implementation Plan

| Phase | Key Activities | Responsible Person(s) | Timeline Milestone |
|--|---|---|--------------------|
| Phase 1: Orientation & Training | <ul style="list-style-type: none"> - Introduce methodologies to staff - Conduct capacity-building workshops | PEU Project Coordinator, Procurement Officer (Project Management Consultant, if possible) | Month 1 |
| Phase 2: Framework Customization | <ul style="list-style-type: none"> - Adapt templates and tools to PEU context - Finalize SOPs and workflow diagrams | Procurement Officer, Project Coordinator, Project Officer | Month 2–3 |
| Phase 3: Pilot Testing | <ul style="list-style-type: none"> - Implement Agile sprints and Kanban boards - Track sample procurement cycle | Procurement Team, Project Officer | Month 4 |
| Phase 4: CPM Integration | <ul style="list-style-type: none"> - Apply critical path scheduling to high-value procurements - Validate timelines | Procurement Officer, Engineer, Project Coordinator | Month 5 |
| Phase 5: Monitoring & Feedback Loop | <ul style="list-style-type: none"> - Collect feedback from staff and stakeholders - Adjust tools and practices | Project Officer, Procurement Officer | Month 6 |
| Phase 6: Full Rollout | <ul style="list-style-type: none"> - Deploy integrated framework across all procurement projects | Project Coordinator, All Procurement Staff | Month 7–8 |
| Phase 7: | <ul style="list-style-type: none"> - Embed framework into PEU policies | HR, Project Coordinator, Chief Executive Officer | Month 9 |

| | | | |
|----------------------|-------------------|--------------|--|
| Institutionalization | - Train new staff | (CEO) MOECST | |
|----------------------|-------------------|--------------|--|

Note: Table created by the author

b. Supporting Tools and Deliverables

- Agile Sprint Templates
- Scrumban Kanban Boards
- CMP Gant Charts
- SOPs for Procurement stages
- Training manuals and feedback forms
- Implementation tracking dashboard

c. Risks and Mitigation Measures

Table 17

Risk and Mitigation Measures

| Risk | Mitigation Measure |
|--|--|
| Resistance to change | Conduct sensitization sessions and involve users early. |
| Limited technical capacity | Deliver hands-on training and peer learning sessions. |
| Misalignment with donor rules | Validate framework against IDB/CDB procurement guidelines. |
| Inconsistent application across units | Establish centralized monitoring and quality control role. |

Note: Table created by the author

4.3.4 Standard Operating Procedures for Procurement

- Drafted Standard Operating Procedures (SOPs) for the procurement team, detailing roles, deliverables, and monitoring checkpoints.

This document provides Standard Operating Procedures (SOPs) designed to guide procurement personnel through each stage of the procurement process. It defines key roles,

deliverables, and monitoring checkpoints to ensure transparency, accountability, and efficiency.

a. Project Results Matrix and Planning

Roles Involved: Project Coordinator, Project Officer

Key Deliverables: Approved Procurement Plan, Results Matrix

Monitoring Checkpoints:

- Procurement completeness check
- Plan alignment verification

b. Procurement Document Preparation

Roles Involved: Procurement Officer, Technical Expert

Key Deliverables: Bidding Documents, Evaluation Criteria

Monitoring Checkpoints:

- Compliance with guidelines
- Stakeholder sign-off

c. Bid Solicitation and Opening

Roles Involved: Procurement Officer, Evaluation Committee

Key Deliverables: Bid Invitation, Bid Opening Minutes

Monitoring Checkpoints:

- Timely advertisement
- Secure bid opening

d. Bid Evaluation and Recommendation

Roles Involved: Evaluation Committee, Procurement Officer (Chairperson)

Key Deliverables: Evaluation Matrix, Evaluation Report, Recommended Bidder

Monitoring Checkpoints:

- Score consistency check
- Approval by Evaluation Chair

e. Contract Award and Signing

Roles Involved: Project Coordinator, CEO (MOECST), Procurement Officer

Key Deliverables: Award Notice, Signed Contract

Monitoring Checkpoints:

- Verification of bid validity
- Legal review completed

f. Contract Monitoring and Close-out

Roles Involved: Contract Manager (Project Coordinator), M&E Officer (Project Officer)

Key Deliverables: Progress Reports, Completion Certificate, Deliverables

Monitoring Checkpoints:

- Deliverable tracking
- Final acceptance confirmation

4.4 Specific objective 4: To develop key performance indicators (KPI) that will assist in the monitoring and evaluation of the effectiveness of the project management methodologies and the tracking of procurement performance, to support continuous improvement and alignment with educational project outcomes and IFI requirements.

Specific objective 4 is to develop Key Performance Indicators (KPI's) to assess the effectiveness of the integrated project management methodologies (Agile, Scrumban, and CPM) and to enhance monitoring and evaluation of procurement performance. These KPIs will also support continuous improvement and ensure alignment with PEU project outcomes as well as the requirements of the International Financial Institutions (IFIs) such as those from IDB and CDB.

4.4.1 Define Key Performance Indicators (KPIs)

- Defined a comprehensive set of procurement KPIs, including:
 - o Procurement cycle time
 - o Percentage of contracts completed on schedule
 - o Supplier performance ratings
 - o Budget adherence and cost variance

To support evidence-based decision making, a comprehensive set of KPIs was defined through literature review, analysis of the PEU processes, and alignment with IFI procurement reporting standards. These KPIs serve both operational monitoring and strategic evaluation purposes.

Table 18

Key Performance Indicators

| KPI | Description | Purpose |
|--|--|--|
| Procurement Cycle Time | Measures the average time from preparation of the approval of the procurement plan to contract award | Tracks efficiency and identifies delays in workflows |
| Percentage of Contracts Completed on Schedule | Measures how many contracts are finalized within the planned timeline | Evaluates the reliability of project planning |
| Supplier Performance Rating | Rates suppliers based on quality, timeliness, and responsiveness | Supports vendor management and accountability |
| Budget Adherence and Cost Variance | Compares estimated vs actual cost to detect overruns or savings | Ensures financial control and transparency |
| Percentage of Procurement Aligned with Plan | Measures the number of procurements that follow the approved procurement plan | Promotes planning discipline and minimizes ad hoc requests |
| Work-in-Progress Threshold Compliance | Tracks whether ongoing procurement tasks exceed workflow limits | Supports workload balance and process visibility |

| | | |
|---|---|--|
| Average Time to Resolve Procurement Issues | Measures responsiveness to bidder or stakeholder queries and complaints | Monitors communication efficiency and dispute resolution |
|---|---|--|

Note: Table created by the author.

a. Integration into Monitoring and Evaluation Framework

Each KPI will be linked to specific phases in the procurement and project management lifecycle and is monitored using:

- Scrumban dashboard for real-time work-in-progress workflow tracking
- CMP timelines to evaluate on-time delivery and critical delays
- Agile sprint retrospectives to review process efficiency and stakeholder satisfaction
- Periodic monitoring and evaluation reports to inform project steering decision and donor reporting

b. Expected Outcomes

- Improved performance visibility across procurement and project execution
- Timely interventions to correct inefficiencies and prevent cost/schedule overruns
- Enhanced accountability among procurement staff and suppliers/contractors/consultants
- Alignment with IFI performance reporting standards to support audit readiness and funding compliance

Table 19

M&E Framework Template

| KPI | Target | Current Value | Data Source | Frequency of Measurement | Responsible Person |
|-----------------------------------|--------|---------------|-------------|--------------------------|--------------------|
| Procurement cycle time | | | | | |
| Percentage of contracts completed | | | | | |

| | | | | | |
|---|--|--|--|--|--|
| on schedule | | | | | |
| Supplier performance rating | | | | | |
| Budget adherence and cost variance | | | | | |
| Percentage of procurement aligned with plan | | | | | |
| WIP threshold compliance | | | | | |
| Average time to resolve procurement issues | | | | | |

Note: Table created by the author.




4.4.2 Procurement Performance Dashboard

- Designed a Procurement Performance Dashboard prototype, allowing real-time tracking and reporting
- The dashboard is divided into the following sections:
 - o KPI summary tiles will display current values and status for each procurement KPI.
 - o Progress bars visualize procurement cycle time and contract completion rates.
 - o Color coded visuals will indicate budget adherence, WIP compliance, and supplier performance.
 - o Timeline Gantt chart shows critical milestones and delays across active procurements.
 - o Alerts panel flags overdue tasks, exceeded work-in-progress limits, or

unresponsive supplier/contractor/consultant.

Table 20

Procurement Performance Dashboard

| KPI | Current Status | Target | Indicator |
|------------------------|----------------|----------|---|
| Procurement Cycle Time | 45 days | <60 days |  |
| Contracts on Schedule | 80% | ≥90% |  |
| Supplier Performance | 3.5/5 | ≥4.0 |  |

Note: Table created by the author

- Visual Monitoring Tools
 - Gant chart software such as Excel or MS Projects for timeline tracking
 - Kanban boards like Trello, Kanban, or Jira for workflow status updates
 - Dashboard tools for real-time KPI visualization, such as Power BI or Excel Dashboard
- Dashboard Maintenance and Roles
 - Project Officer: Updates KPI data week and analyzes trends
 - Procurement Officer: Inputs cycle times, cost variances, and supplier scores
 - Project Coordinator: Reviews dashboard outputs during monthly project review

4.4.3 Monitoring and Evaluation

- Prepared a KPI Measurement and Reporting Guide, specifying data sources, measurement frequency, and reporting responsibilities
- This outlines the approach for measuring and reporting Key Performance Indicators (KPIs) to support continuous monitoring and evaluation of procurement performance. It specifies data sources, measurement frequency, and reporting responsibilities.

Table 21

KPI Measurement and Reporting Guide

| KPI | Data Source | Measurement Frequency | Responsible Person | Reporting Format |
|------------------------------------|--|-----------------------|---|--------------------------|
| Procurement Cycle Time | Procurement logs, PO records | Monthly | Procurement Officer | Dashboard/Report |
| Contracts Completed on Schedule | Project timelines, contract records | Quarterly | Project Officer | Performance Report |
| Supplier Performance Ratings | Supplier evaluation forms | Quarterly | Project Coordinator | Dashboard |
| Budget Adherence and Cost Variance | Financial reports, budget tracker | Monthly | Finance Officer | Variance Analysis Report |
| Procurement Plan Alignment | Annual Procurement Plan, Requisition Forms | Bi-annually | Procurement Officer, Project Coordinator, Project Officer | Compliance Summary |
| WIP Threshold Compliance | Kanban Board, Task Tracker | Weekly | Procurement Officer | Scrumban Report |
| Time to Resolve Issues | Helpdesk logs, complaint records | Monthly | Administrative Assistant | Issue Resolution Log |

Note: Table created by the author.

4.5 Specific objective 5: To propose specific best practices for adaptation from the project management framework (Agile, Scrumban, and CPM), and demonstrate their application in selected procurement activities. These include the acquisition of equipment for secondary schools, construction of STEAM Lab schools, and consultancy to conduct evaluations for the Skills for the Future Project and the Belize Education Sector Reform Project in order to optimize procurement operations and support strategic project delivery within the projects timelines.

Specific Objective 5 is to propose specific best practices for adapting the project

management framework (Agile, Scrumban, and CPM) in selected procurement activities to optimize operations and support strategic project delivery.

4.5.1 Sample Application of the Proposed Framework

- Applied the proposed framework to three sample procurement cases:
 - o Acquisition of equipment (Chromebooks) for secondary schools
 - o Rehabilitation works procurement for ITVET Building in Belize City
 - o Consultancy for the Evaluation of the Skills for the Future Program

Each case demonstrates how the selected methodology addresses known inefficiencies and enhances the procurement function.

Case 1: Acquisition of Equipment for Secondary Schools (Chromebooks)

Applied Methodology: Scrumban

Reason for Selection: The process required real-time tracking of procurement tasks, frequent coordination with vendors, and dynamic monitoring of delivery schedules.

Best Practices Applied:

- Visual Workflow Boards: Tasks were mapped using Kanban-style boards to monitor progress and flag delays.
- Work-in-Progress (WIP) Limits: This ensured that only a manageable number of procurement actions were active at a given time to prevent bottlenecks.
- Regular Checkpoints: Weekly coordination meetings with the procurement team and suppliers enabled fast resolution of issues.

Benefits Observed:

- Improved visibility of procurement progress
- Faster identification and escalation of issues such as customs clearance delays

- Increased accountability for supplier deliverables

Case 2: Rehabilitation Works for ITVET Building in Belize City

Applied Methodology: Critical Path Method (CPM)

Reason for Selection: The procurement involved civil works with strict regulatory oversight, dependencies among activities, and contractual deadlines.

Best Practices Applied:

- Detailed Activity Sequencing: A full work breakdown structure (WBS) and activity network diagram were developed to establish task dependencies.
- Critical Path Identification: This enabled prioritization of tasks that directly affected the project timeline.
- Float Time Analysis: This highlighted tasks with scheduling flexibility to reallocate resources as needed.

Benefits Observed:

- Greater precision in procurement scheduling and contractor mobilization
- Enhanced ability to anticipate delays and apply corrective measures
- Strengthened alignment with construction milestones and donor timelines

Case 3: Consultancy for Evaluation of the Skills for the Future Program

Applied Methodology: Agile

Reason for Selection: The procurement required close stakeholder collaboration, iterative deliverable review, and adaptive planning based on feedback.

Best Practices Applied:

- Sprint Planning: Activities were divided into iterative 2-week cycles to prepare the TOR, conduct shortlisting, and finalize evaluations.

- Stakeholder Engagement: Continuous collaboration with the MOECST technical team ensured alignment on scope and evaluation criteria.
- Backlog Management: Maintained a prioritized list of outstanding tasks, such as evaluator approvals and clarifications.

Benefits Observed:

- Higher responsiveness to changing information needs
- Faster procurement cycle through incremental task completion
- Stronger buy-in from stakeholders due to their active participation

Expectations:

The application of best practices from Agile, Scrumban, and CPM across different procurement scenarios demonstrated measurable improvements in:

- Procurement cycle time reduction
- Enhanced transparency and documentation
- Alignment with project timelines and donor expectations
- Stakeholder engagement and accountability

These case applications validate the adaptability of each methodology to specific procurement types and show how an integrated framework can be strategically leveraged to strengthen procurement performance within the PEU.

4.5.2 Proposed Best Practices Strategy

- Documented best practice recommendations, include:
 - Sprint planning cycles for responsive supplier engagement: Adopt short, time-boxes planning cycles, such as 2-week sprints to manage procurement steps such as bid evaluation, TOR finalization, or contract negotiations. This

iterative approach allows procurement staff to remain adaptive, respond promptly to stakeholder feedback, and accelerate supplier/contractor/consultant onboarding, especially in time-sensitive or multi-phase procurements.

- Visual task boards for managing parallel procurement tasks: Implement digital Kanban boards or physical visual trackers to monitor procurement workflow stages, such as drafting, approval, evaluation, and contracting. This facilitates real-time status visibility across teams, prevents bottlenecks, and promotes accountability. Work-in-Progress limits should be used to maintain focus and avoid overload in high volume procurement cycles.
- Critical path schedules for time-sensitive construction phases: Apply CPM techniques to civil works procurement, such as school construction or rehabilitation. Develop detailed activity sequencing, identify dependencies, and map out the critical path to avoid delays in key milestones. This will ensure efficient resource allocation, better coordination with contractors, and alignment with project implementation schedules agreed with IFIs.

4.5.3 Development of a Best Practice Guide and Change Management Plan

- A Best Practice Guide and Change Management Plan was developed to facilitate staff training, stakeholder engagement, and long-term adaptation.
- To ensure the sustainable adoption of the proposed project management methodologies and to institutionalize improvements in procurement processes, a comprehensive Best Practice Guide and a Change Management Plan were developed. These tools are intended to support both capacity building and organizational transformation within the Project

Execution Unit (PEU).

Best Practice Guide:

The guide consolidates standardized procedures, tools, and workflow models derived from Agile, Scrumban, and Critical Path Method (CPM) frameworks. It includes:

- Step-by-step process maps for procurement planning, execution, and monitoring
- Templates for sprint plans, Kanban boards, and CPM schedules tailored to PEU procurement activities
- Roles and responsibilities matrix to support interdepartmental coordination
- Checklist tools for vendor evaluation, deliverable tracking, and contract closeout

Change Management Plan

The Change Management Plan provides a roadmap for guiding staff and stakeholders through the transition to the new procurement framework. It includes:

- Training modules for procurement officers, project staff, and MOECST technical teams on the new methodologies and tools
- Stakeholder engagement strategies to build buy-in and encourage feedback loops
- Phased implementation plan to allow gradual adoption of new practices without disrupting current operations
- Resistance mitigation tactics, including leadership alignment, quick wins, and peer champions

Together, the Best Practice Guide and Change Management Plan serve as a foundation for continuous improvement, institutional learning, and long-term performance enhancement within the PEU.

5. CONCLUSIONS

The conclusion of the analysis revealed that there are procurement inefficiencies in the Project Execution Unit (PEU) under the Ministry of Education, Culture, Science and Technology (MOECST).

- 1.) The procurement inefficiencies often stem from bureaucratic delays, inadequate planning, and limited integration of adaptive project management tools. The conclusions. These issues result in cost overruns, delivery delays, and misalignment with project goals. This emphasizes the critical need for a structured yet flexible approach to procurement that allows for timely adjustments and improved responsiveness to stakeholder needs. The PMBOK advocates for tailoring project processes based on the environment which supports a flexible structure. It also stressed the importance of engagement and responsiveness to stakeholder needs throughout the project lifecycle. The Agile methodology is ideal for flexibility, continuous feedback, iterative planning, and collaboration. In complex environments such as the PEU, Agile allows teams to adapt to changing needs such as delays, change in technical requirements, or evolving stakeholder expectations. Further, the ability to adjust procurement strategies that are in progress ties into change control processes and risk mitigation planning, which helps to ensure procurement remains aligned with evolving project goals. These insights validate the critical need for structured reforms to streamline operations, improve responsiveness, and mitigate recurring operational bottlenecks within the PEU.
- 2.) The evaluation of Agile, Scrumban, and Critical Path Method (CPM) methodologies

demonstrated their strong potential to address the operational and strategic gaps currently affecting the PEU's procurement processes. Mapping the procurement cycle uncovered key points particularly during planning, evaluation, and contract execution phases where bottlenecks frequently occur. By aligning the procurement cycle with project management principles, especially time-bound milestones and feedback loops, opportunities for streamlining tasks and reducing redundancies were identified. This offers a strong foundation for introducing process improvements through selected methodologies (Agile, Scrumban, and Critical Path (CPM)).

- 3.) The application of Agile, Scrumban, and Critical Path Method (CPM) demonstrated distinct advantages when tailored to procurement processes. Agile and Scrumban foster iterative planning, team accountability, and real-time task tracking, which enhances adaptability. CPM provided clarity in sequencing activities and identifying dependencies. When applied together, these methodologies offer a hybrid model that improves control over procurement timelines, stakeholder collaboration, and deliverable quality. The research determined that a hybrid framework incorporating these three methodologies offers the most adaptable and comprehensive solution, aligning both with the rigid compliance requirements of IFIs and the PEU's need for flexibility in managing evolving procurement activities. The framework also allows for continuous process improvement, addressing longstanding inefficiencies in a sustainable manner.
- 4.) Establishing procurement Key Performance Indicators (KPIs) such as procurement

lead time, supplier performance, and cost variance enabled a more structured approach to monitoring and continuous improvement. The development of a KPI tracking dashboard and reporting guide allows procurement teams to evaluate performance in real time, take corrective actions quickly, and support evidence-based decision-making aligned with IFI (Inter-American Development Bank and Caribbean Development Bank) and national requirements. The development of KPIs specific to procurement performance under the proposed project management framework marks a major step toward institutionalizing performance measurement within the PEU. Ultimately, this data-driven approach supports a culture of continuous improvement and informed decision-making within procurement operations.

- 5.) The application of Agile sprint cycles, Scrumban visual boards, and CPM timelines to real procurement cases such as equipment acquisition and STEAM Lab construction demonstrated measurable improvements in coordination, timeline adherence, and stakeholder satisfaction. These best practices, when embedded into procurement operations, support a cultural shift toward proactive management, collaborative planning, and strategic project delivery within scope, time, and cost constraints. This fosters continuous improvement for the Project Execution Unit.

6. RECOMMENDATIONS

Based on the outcome of this Final Graduation Project, the recommendations below highlight what can be done to improve the procurement functions of the Project Execution Unit (PEU) under the Ministry of Education, Culture, Science and Technology (MOECST).

- 1.) The PEU should institutionalize a formal procurement management framework that includes standardized workflows, roles, responsibilities, and communication protocols. This framework should address the current lack of structure and help mitigate procurement delays caused by overlapping reviews and unclear accountability. Additionally, internal Standard Operating Procedures (SOPs) should be developed and institutionalized to minimize delays caused by lengthy reviews and manual documentation. This change will equip the procurement officers with clear processes, decision-making frameworks, and measurable performance indicators, which foster consistency and efficiency across projects.
- 2.) The PEU is encouraged to adopt a hybrid project management model that will blend Agile, Scrumban, and CPM methodologies to manage procurement processes. This model should be tailored to accommodate Belize's public sector context by using Agile for iterative planning, Scrumban for visualizing procurement tasks, and CPM for critical scheduling. Training programs should be implemented to familiarize staff with these methodologies. This will build technical capacity, improve adaptability to changing project demands.
- 3.) It is recommended that the MOECST arrange a digital Procurement Management Information System (PMIS) to enable real-time tracking of procurement cycles,

contract statuses, and supplier performance. This system should be integrated with performance dashboards and allow for automated alerts, document version control, and timeline monitoring to ensure transparency and accountability. This system will help to improve the overall efficiency of the unit, as it allows for early detection of bottlenecks and possible delays.

- 4.) The PMIS will be used to increase visibility, reduce manual errors, and improve procurement tracking. This system should support end-to-end procurement management, including requisition tracking, contract timelines, vendor performance evaluation, and reporting dashboards. Integration with financial and project execution data will help ensure alignment with disbursement schedules and donor compliance requirements. This digital transformation is critical to enhancing efficiency and accountability. This will strengthen the unit as it will enhance data-driven decision-making and support proactive risk management.
- 5.) The PEU should create and maintain a centralized vendor performance registry that records supplier, consultant, and contractor performance across all procurement activities. This registry should include metrics such as delivery timeliness, quality of goods/services, responsiveness, and compliance with contract terms. The evaluation results should be used as part of future eligibility assessments and procurement decisions, thereby reducing the risk of repeated engagement with underperforming vendors and promoting fair competition. Embedding performance feedback into daily practice will reinforce a culture of accountability, continuous learning, and professional growth.

- 6.) The PEU should develop and implement a robust Key Performance Indicator (KPI) monitoring framework with metrics such as procurement cycle time, on-time delivery rate, cost variance, and vendor quality ratings. These indicators should be reported quarterly to the Chief Executive Officer (CEO) of MOECST and shared with funding agencies to demonstrate performance improvements and ensure alignment with IFI requirements. This will institutionalize performance measurement, enabling procurement officers to track progress, justify decisions to stakeholders, and align procurement activities with the necessary requirements.
- 7.) A set of procurement best practices should be formally documented by the PEU in collaboration with MOECST and integrated into a Procurement Best Practice Guide. These practices should include sprint planning for urgent procurements, task boards for transparency in procurement stages, and critical path maps for high-value contracts such as infrastructure projects. The guide should be disseminated to all staff and referenced during procurement planning and audits. Additionally, change management strategies should be implemented to support staff transition, and efforts should be made to scale successful practices across other departments within the MOECST and future donor-funded projects. Formalizing and sharing best practices will standardize excellence, improve knowledge transfer, and enhance officers' capability to manage diverse procurement scenarios while maintaining high compliance and quality standards.

7 VALIDATION OF THE FGP IN THE FIELD OF REGENERATIVE AND SUSTAINABLE DEVELOPMENT

Sustainable development is known globally as a concept aimed at meeting current human needs without jeopardizing the capability of future generations to satisfy their own needs. This idea was made popular in the report titled “Our Common Future,” published in 1987 by the World Commission on Environment and Development, commonly known as the Brundtland Commission. Sustainable development places emphasis on an integrative approach that balances environmental stewardship, economic prosperity, and social equity.

Environmental sustainability is one of the foundational pillars of sustainable development, which involves responsible management and protection of natural resources, biodiversity conservation, pollution reduction, and climate change mitigation. Economic sustainability, another critical aspect, deals with fostering economic growth and development that is inclusive, equitable, and environmentally responsible. It encourages economic practices that reduce waste, optimize resource efficiency, and maintain a balance between production and consumption. Social sustainability, the third pillar, emphasizes human rights, equity, and social justice, ensuring inclusive participation in development benefits across communities. It seeks to eliminate disparities by promoting accessible education, healthcare, adequate housing, gender equality, and community empowerment.

Regenerative development, on the other hand, goes beyond sustainability by actively restoring and enhancing the ecological and social conditions impacted by human activities. It recognizes ecosystems as living systems with inherent regenerative capacities, promoting practices that restore ecological integrity and improve social systems rather than

merely sustaining their current states. This proactive approach aims for net-positive outcomes, contributing to ecological renewal, enhanced biodiversity, and improved community resilience.

Regenerative development focuses on principles such as ecological restoration, biodiversity regeneration, soil health, water management, and community revitalization. Unlike sustainability, which primarily aims to do no harm, regenerative practices actively seek to repair past environmental damage, regenerate depleted resources, and strengthen social cohesion and community well-being.

In project management, integrating sustainable and regenerative principles has become necessary. Modern project management frameworks emphasize the need to balance project deliverables with ecological and social responsibilities. Projects must be planned, implemented, and managed in ways that will ensure environmental protection, resource conservation, and social equity. Integrating sustainable development principles into project management involves assessing environmental impacts, minimizing resource use, and ensuring ethical procurement practices. Project managers must also consider long-term project impacts, lifecycle assessments, and compliance with international sustainability frameworks such as the Sustainable Development Goals (SDGs).

Moreover, regenerative development principles encourage project managers to adopt practices that proactively restore ecological and social conditions. Project planning and implementation should include strategies for ecological restoration, biodiversity enhancement, soil regeneration, and social revitalization.

Sustainable and regenerative development in project management ensures that

projects deliver substantial and lasting benefits. By adopting these principles, the Final Graduation Project, aimed at improving procurement processes through Agile, Scrumban, and Critical Path Method (CPM) methodologies in the Project Execution Unit (PEU), can significantly contribute to a sustainable and regenerative future for Belize’s educational infrastructure.

7.2 Relationship of the project to the Sustainable Development Goals

The Sustainable Development Goals (SDGs) were adopted in 2015 at the United Nations General Assembly as part of the 2030 Agenda for Sustainable Development. They consist of 17 goals and 169 associated targets that aim to end poverty, protect the planet, and ensure peace and prosperity for all. These goals are universal, meaning, they apply to all countries, and they are interconnected, recognizing that development must balance social, economic, and environmental sustainability.

| Sustainable Development Goals | Purpose | Relevance to the Final Graduation Project |
|-------------------------------|---|---|
| No poverty | End poverty in all its forms everywhere | Indirect: By improving procurement efficiency, public funds can be better allocated to essential services such as education, which helps reduce poverty in the long term |
| Zero hunger | End hunger, achieve food security, improve nutrition, and promote sustainable agriculture | Minimal: The project does not directly relate to food or agriculture but may support school programs such as feeding initiatives, through improved procurement |

| | | |
|--|---|--|
| | | logistics |
| Good health and well-being | Ensure healthy lives and promote well-being for all | Indirect: Timely delivery of school infrastructure and supplies can create a healthier and safer learning environment, especially post-COVID-19 |
| Quality education | Ensure inclusive and equitable quality education and promote lifelong learning | High: This is the core of the project. Improved procurement directly supports the delivery of educational materials, infrastructure, and services |
| Gender equality | Achieve gender equality and empower all women and girls | Moderate: Procurement policies can promote gender inclusion by encouraging participation of women-led suppliers and ensuring equitable access to project benefits |
| Clean water and sanitation | Ensure the availability and sustainable management of water and sanitation | Indirect: Improved procurement can facilitate the construction of school facilities with adequate sanitation |
| Affordable and clean energy | Ensure access to affordable, reliable, sustainable, and modern energy | Indirect: Energy-efficient and green-certified school buildings supported by procurement contribute to clean energy use |
| Decent work and economic growth | Promote inclusive and sustainable economic growth, employment, and decent work | Strong: Transparent procurement creates job opportunities, ensures fair labor conditions, and supports local businesses |
| Industry, innovation, and infrastructure | Build resilient infrastructure, promote sustainable industrialization, and foster | Strong: The FGP supports the construction of educational infrastructure and |

| | | |
|---|---|---|
| | innovation | introduces innovative project management methods |
| Reduce inequalities | Reduce inequality within and among countries | Moderate: Equitable procurement practices ensure fair distribution of resources and services across geographic and social boundaries |
| Sustainable cities and communities | Make cities inclusive, safe, resilient, and sustainable | Indirect: Sustainable educational infrastructure contributes to community development |
| Responsible consumption and production | Ensure sustainable consumption and production patterns | Strong: The project encourages efficient procurement and resource use, aligning with responsible consumption |
| Climate action | Take urgent action to combat climate change and its impacts | Moderate: Procurement of green-certified buildings and environmentally friendly materials contributes to climate goals |
| Life below water | Conserve and sustainably use the oceans, seas, and marine resources | Not applicable: The project does not involve marine ecosystems |
| Life on land | Protect, restore, and promote sustainable use of terrestrial ecosystems | Indirect: Environmental safeguards in procurement may contribute to conservation goals |
| Peace, justice, and strong institutions | Promote peaceful and inclusive societies, provide access to justice, and build effective institutions | High: Strengthening procurement systems contributes to transparency, accountability, and institutional integrity |
| Partnership for the Goals | Strengthen the means of implementation and revitalize the global partnership for sustainable | Strong: The project enhances partnerships among the MOECST, donors, and |

| | | |
|--|-------------|--|
| | development | stakeholders, fostering collaboration and resource sharing |
|--|-------------|--|

7.3 Analysis of the Project According to Standard P5

The P5 standards are people, planet, prosperity, peace, and partnership, which are all included in the project sustainability framework developed by GPM Global. These standards encourage project managers to evaluate and improve the sustainability impacts of their projects by analyzing how a project interacts with key dimensions of sustainable development. The analysis ensures that sustainability is included in the project's design, execution, and outcomes, promoting regenerative and long-term value. It aligns with regenerative and sustainable development values by identifying how projects contribute to or detract from systemic well-being.

The purpose of P5 Impact Analysis is to:

- Evaluate potential positive and negative impacts of a project
- Promote ethical decision-making and transparency
- Guide sustainable and regenerative project planning
- Align project objectives with the UN Sustainable Development Goals

| Impact Type | Subcategory | Element | Cause of Impact | Potential Impact | Proposed Response | Score Before | Score After |
|-------------|--------------|----------------|---------------------------------------|--------------------------------|---|--------------|-------------|
| People | Stakeholders | Staff Workload | Manual tracking of procurement cycles | Employee burnout, inefficiency | Introduce a digital procurement system (e.g., | -2 | 2 |

| | | | | | | | |
|------------|------------------|-----------------------|---|--|---|----|---|
| | | | | | PMIS) | | |
| People | Community Access | Project Delays | Delayed procurement for school infrastructure | Reduced access to learning environments | Streamline procurement using Agile and CPM | -3 | 3 |
| Planet | Resource Use | Paper Consumption | Paper-based workflows | High paper use, waste generation | Implement digital document workflows | -2 | 2 |
| Planet | Emissions | Travel for approvals | Physical meetings across ministries | Increased carbon footprint | Use virtual collaboration tools | -1 | 2 |
| Prosperity | Local Economy | SME Participation | Complex vendor requirements | Local businesses excluded | Simplify bidding documents and provide training | 0 | 2 |
| Prosperity | Budget | Cost Overruns | Procurement delays | Risk of exceeding project budgets | Apply Critical Path Method for planning | -2 | 2 |
| Processes | Governance | Procurement Planning | Lack of methodology | Inconsistent planning, delays | Implement tailored Agile/Scrumban framework | -3 | 3 |
| Processes | Compliance | Vendor Evaluation | No performance system | Repeat underperformance, no accountability | Develop and apply vendor evaluation criteria | -2 | 2 |
| Products | Quality | Educational Materials | Delays in procurement | Inadequate or outdated materials | Timely vendor selection and monitoring | -2 | 2 |
| Products | Infrastructure | Green Standards | No sustainability | Schools built without eco-standards | Require green certification | -1 | 3 |

| | | | | | | | |
|--|--|--|--------------|--|----------------------|--|--|
| | | | requirements | | in procurement specs | | |
|--|--|--|--------------|--|----------------------|--|--|

7.4 Relationship of the Project to the Dimensions of Regenerative Development

Regenerative Development is an approach that contributes to the restoration and vitality of ecological, social, economic, political, cultural, and spiritual systems, as well as avoiding harm to these systems. It emphasizes creating conditions for these systems to thrive and evolve in harmony.

The dimensions of regenerative development are:

- Environmental – by respecting and restoring ecological systems
- Social – by enhancing equity, cohesion, and community well-being
- Economic – by supporting local economies and sustainable prosperity
- Political – by fostering governance transparency and inclusive decision-making
- Cultural – by respecting traditions, languages, and heritage
- Spiritual – by supporting purpose, belonging, and historical well-being

The Sustainable Development Goals (SDG12) aligns with the project as it relates to responsible consumption and production, SDG 16: peace, justice, and strong institutions, as well as SDG 4: quality education. By improving the procurement processes within the Project Execution Unit, the project ensures transparency, accountability, and efficiency in resource use, directly supporting sustainable institutional practices.

P5 Analysis:

| P5 Element | Project Impact |
|-------------------|--|
| People | Enhanced staff capabilities and collaboration through Agile training and tools |
| Planet | Digitized procurement reduces paper use and promotes eco-efficiency |
| Prosperity | Better use of public funds through transparent, timely procurement |
| Peace | Improve trust and clarity in procurement supports institutional peace |
| Partnership | Agile and Scrumban approaches promote cross-functional teamwork |

Impact on the Dimensions of Regenerative Development:

| Dimension | Impact | Explanation | Mitigation or Enhancement |
|------------------|-------------------------|--|---|
| Environmental | Positive | Reduced use of physical resources from digital workflows | Promote green procurement policies |
| Social | Positive | Increases transparency and inclusivity | Provide training to ensure accessibility for all |
| Economic | Positive | Better procurement boosts value for public spending | Monitor for cost savings, reinvest wisely |
| Political | Positive | Strengthens governance with clear, traceable processes | Engage all relevant stakeholders for feedback |
| Cultural | Neutral/mildly positive | Can be tailored to respect local procurement norms | Include culturally relevant procurement practices |
| Spiritual | Indirect | By promoting equity and harmony in systems | Encourage a value-based approach in leadership |

The validation of this project in the regenerative development context confirms that it contributes meaningfully to strengthening institutional practices while respecting and

enhancing broader systemic well-being. Through targeted mitigation strategies and alignment with the P5 standard, the project not only improves procurement but also contributes to Belize's sustainability and regenerative development path.

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8. APPENDICES

Appendix 1: FGP Charter

CHARTER OF THE PROPOSED FINAL GRADUATION PROJECT (FGP)

1. Student Name

Tamara Tingling-Cano

2. FGP Name

Using Project Management Methodologies to Enhance the Procurement Processes for Government Projects in the Education Sector

3. Application Area (Sector or activity)

Education

4. Student Signature

5. Name of the Graduation Seminar Facilitator

Carlos Brenes Mena

6. Signature of the Facilitator

7. Date of Charter Approval

8. Project Start and Finish Date

9. Research Question

How can project management methodologies effectively enhance the procurement processes' efficiency of education projects in the public sector?

10. Research Hypothesis

It is possible to reduce delays and increase efficiency in the procurement processes for government projects by incorporating project management methodologies.

11. General Objective

To propose project management methodologies such as Agile, Scrumban, and Critical Path Method that will enhance the efficiency of the procurement processes carried out for government projects in the education sector.

12. Specific Objectives

1. To analyze the current procurement processes that are being used in the government projects in the education sector and identify the inefficiencies, bottlenecks, and areas for improvement
2. To evaluate project management methodologies to verify the impact they will have on the procurement processes
3. To design a framework that will integrate project management best practices to streamline procurement workflow and enhance accountability
4. To develop key performance indicators to measure the effectiveness of the project management methodologies in improving procurement efficiency
5. To propose recommendations to adopt the project management methodologies that will optimize the procurement processes

13. FGP Purpose or Justification

- a. Currently, there is no existing procurement management plan in place at the Project Execution Unit under the Ministry of Education of the Government of Belize. The Unit is currently executing two projects: one through a US\$35 million loan from the Caribbean Development Bank and the other through a US\$15 million loan from the Inter-American Development Bank. There have been reoccurring/consistent procurement-related delays and inefficiencies that hinder timely project execution. By integrating project management methodologies, it is

possible to streamline procurement workflows, enhance accountability, and reduce delays.

- b. A quantitative analysis of the procurement delays in the education projects shows an average project delay of 10% and budget overruns of 15% annually. The implementation of Agile and Critical Path Method approaches can reduce these delays and improve cost efficiency.
- c. This research project will aid in the development of a structured procurement framework that will incorporate procurement management practices, improving project delivery outcomes.

14. Work Breakdown Structure (WBS)

- 1. FGP
 - 1.1 FGP profile
 - 1.1.1 Introduction
 - 1.1.2 Theoretical framework
 - 1.1.3 Methodological framework
 - 1.1.4 Preliminary bibliographical research
 - 1.1.5 Annexes (FGP schedule, FGP WBS, FGP Charter)
 - 1.2 FGP development
 - 1.2.1 Procurement Process Analysis Report (Objective 1)
 - 1.2.1.1 Existing Procurement Practices Analysis
 - 1.2.1.2 Bottlenecks and inefficiencies identification
 - 1.2.1.3 Procurement process report document
 - 1.2.2 Evaluation of Project Management Methodologies (Objective 2)
 - 1.2.2.1 Agile Methodology Analysis
 - 1.2.2.2 Scrumban Methodology Analysis
 - 1.2.2.3 Critical Path Method Analysis
 - 1.2.3 Framework Design for Optimized Procurement (Objective 3)
 - 1.2.3.1 Propose Integration of Best Practices
 - 1.2.3.2 Workflow Optimization Model
 - 1.2.3.3 Accountability Mechanisms
 - 1.2.4 Development of Key Performance Indicators (KPI) (Objective 4)
 - 1.2.4.1 Identification of Procurement Performance Metrics
 - 1.2.4.2 Creating of Measurement Tools and Criteria
 - 1.2.4.3 Data Collection and Benchmarking
 - 1.2.5 Propose Recommendations (Objective 5)
 - 1.2.5.1 Procurement Strategy Improvements
 - 1.2.5.2 Best Practices for Acceptance
 - 1.2.5.3 Change Management and Training Plan
 - 1.2.6 Conclusions

- 1.2.7 Recommendations
- 1.2.8 Reference Lists
- 1.2.9 Annexes
- 1.2.10 Tutor Approval for Reading
- 1.3 Reader's Review
- 1.4 Board of Examiners Evaluation

15. FGP Budget

The estimated budget to develop the Final Graduation Project (FGP) is BZ\$652

Costs to be covered are software licenses for project management methodologies and costs associated with data collection, interviews, and analysis, such as transportation and printing.

16. FGP Planning and Development Assumptions

1. Procurement data on the two existing projects will be accessible for analysis.
2. The research will be completed within the designated timeframe, providing that there are no delays.
3. Interviews with the procurement and management officers will be conducted as planned.
4. The proposed project management methodologies will be created for the education sector.

17. FGP Constraints

1. Time constraint: Any delays in compiling the information might compromise the timely completion.
2. Scope constraint: This research will only focus on the procurement processes for the Project Execution Unit under the Ministry of Education.
3. Budget constraint: Based on the budget, price will be a key factor in the assessment of project management software.
4. Quality constraint: The available data might be disorganized or difficult to compile; therefore, more time would be needed to avoid compromising the quality of the final product.

FGP Development Risks

1. Limits to data access: The budget for each procurement might not be available because this information is treated as confidential and restricted, which may impact the research.
2. The Government of Belize is scheduled to have its general elections in March 2025. A change in control of the government would impact the procedures that are currently in place.
3. Change in staffing: If there is any change to the current staff of the Project Execution Unit under the Ministry of Education, it would impact the research at the interview stage.
4. Technological barriers: Limited familiarity with project management software could create resistance from users.

18. FGP Main Milestones

Milestones are related to deliverables on the second level (deliverables) and third level (control accounts) of the WBS of section 14 of this Charter. At the same time, the deliverables are related to the specific objectives.

| Deliverable | Completion estimated date |
|---|--------------------------------------|
| 1.1 FGP profile | April 29, 2025 |
| 1.1.1 Introduction | March 3, 2025 |
| 1.1.2 Theoretical Framework | March 12, 2025 |
| 1.1.3 Methodological Framework | March 19, 2025 |
| 1.1.4 Preliminary Bibliographical Research | March 26, 2025 |
| 1.1.5 Annexes (FGP schedule, FGP WBS, FGP Charter) | April 2, 2025 |
| 1.1.6 Graduation Seminar Approved | April 7, 2025 |
| 1.2.1 Report on Current Procurement Process | June 17, 2025 |
| 1.2.1 Procurement Process Analysis Report | June 18, 2025 |
| 1.2.1.1 Existing Procurement Practices Analysis | June 20, 2025 |
| 1.2.1.2 Bottlenecks and Inefficiencies Identification | June 23, 2025 |
| 1.2.1.3 Procurement Process Report Document | June 24, 2025 |
| 1.2.2 Evaluation of Project Management Methodologies | June 25, 2025 |
| 1.2.2.1 Agile Methodology Analysis | June 26, 2025 |
| 1.2.2.2 Scrumban Methodology Analysis | June 30, 2025 |
| 1.2.2.3 Critical Path Method Analysis | July 2, 2025 |
| 1.2.3 Framework Design for Optimized Procurement | July 3, 2025 |
| 1.2.3.1 Propose integration of Best Practices | July 4, 2025 |

| | |
|---|-------------------|
| 1.2.3.2 Workflow Optimization Model | July 8, 2024 |
| 1.2.3.3 Accountability Mechanisms | July 10, 2025 |
| 1.2.4 Development of Key Performance Indicators (KPI) | July 11, 2025 |
| 1.2.4.1 Identification of Procurement Performance Metrics | July 14, 2025 |
| 1.2.4.2 Creating of Measurement Tools and Criteria | July 16, 2025 |
| 1.2.4.3 Data Collection and Benchmarking | July 18, 2025 |
| 1.2.5 Propose Recommendations | July 18, 2025 |
| 1.2.5.1 Procurement Strategy Improvements | July 21, 2025 |
| 1.2.5.2 Best Practices for Acceptance | July 23, 2025 |
| 1.2.5.3 Change Management and Training Plan | July 25, 2025 |
| 1.2.6 Conclusions | August 11, 2025 |
| 1.2.7 Recommendations | August 25, 2025 |
| 1.2.8 Reference Lists | August 25, 2025 |
| 1.2.9 Annexes | August 25, 2025 |
| 1.2.10 Tutor Approval for Reading | August 25, 2025 |
| 1.3 Readers' Review | September 2, 2025 |
| 1.4 Board of Examiners Evaluation | September 4, 2025 |

19. Theoretical Framework

19.1 Estate of the “Matter”

The Project Execution Unit under the Ministry of Education is currently executing two projects financed by the CDB and IDB. For the project financed by CDB, the primary focus is on the improvement of infrastructure of schools in Belize. The primary focus of the project financed by the IDB is on closing the skills gap as it relates to the Fourth Industrial Revolution (4IR). These projects are supposed to align with the goals of the main Ministry. Therefore, all the deliverables/outcomes from these two projects should be achieved in a systemic manner. However, there have invariably been inefficiencies and delays with procurement. Procurement-related delays affect the deliverable schedules for the products under these projects. These are caused by bureaucratic procedures, lack of accountability, and poor project planning.

19.2 Basic Conceptual Framework

List of the basic concepts to be included in the document:

- Project management
- Agile project management
- Scrumban Methodology
- Critical Path Methodology
- Procurement process optimization
- Sustainable procurement practices
- Public sector procurement
- Key Performance Indicators
- Procurement Best Practices

20. Methodological Framework

| Objective | Name of deliverable | Information sources | Research method | Tools | Restrictions |
|---------------------------------------|--------------------------------------|--|---------------------------------------|---|---|
| Analyze current procurement processes | Report on procurement inefficiencies | Project Execution Plan, Results matrix | Qualitative and quantitative analysis | Bibliographical review, process mapping | Limited access to certain confidential procurement data |
| Evaluate PM methodologies | Evaluation report | Academic sources | Comparative analysis | Surveys, expert panels | Availability of stakeholders |
| Design framework | Procurement framework | Literature review, case studies | Model design | Project management tools | Methodology adaptability |
| Develop KPIs | KPI report | Benchmarking studies | Performance measurement | Statistical tools | Data reliability |

| | | | | | |
|-------------------------|--------------|-------------------------------|---------------------|---------------|------------------|
| Provide recommendations | Final report | Creation of research findings | Analytical approach | Documentation | Time constraints |
|-------------------------|--------------|-------------------------------|---------------------|---------------|------------------|

21. Validation of the Work in the Field of Regenerative and Sustainable Development:

The Final Graduation Project (FGP) contributes to regenerative and sustainable development by enhancing procurement efficiency, accountability, and strategic alignment within the Ministry of Education, Culture, Science and Technology (MOECST) by acting through the Project Execution Unit (PEU). Sustainable development is widely defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Regenerative development goes a step further by actively restoring, renewing, and revitalizing the social and environmental systems it touches.

The FGP aligns with sustainable development principles in the following ways:

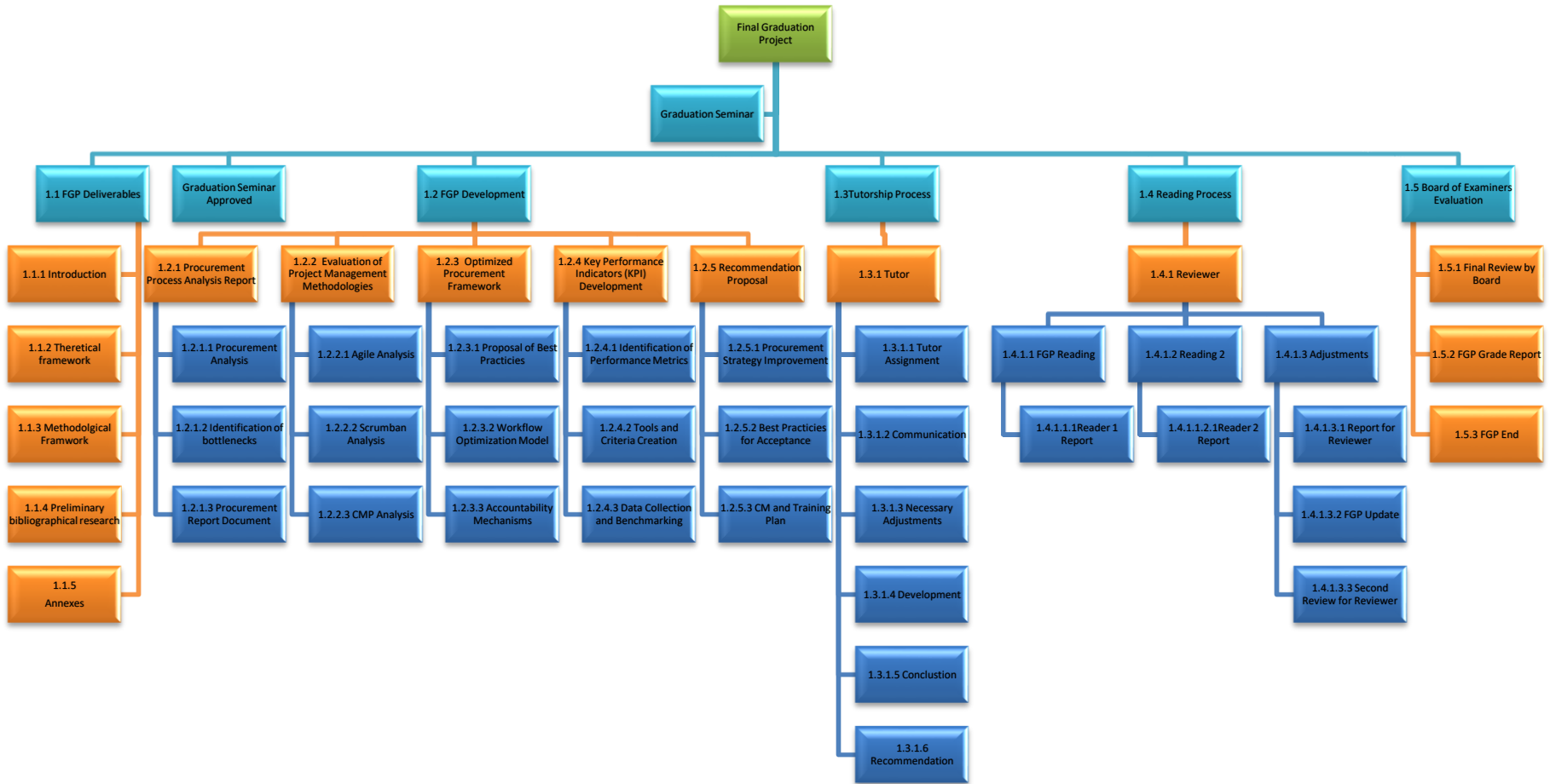
- **Environmental Responsibility:** By promoting standardized procurement practices that require contractors to include environmental management plans, the project supports green building initiatives and eco-friendly infrastructure.
- **Social Inclusion:** Improved procurement processes ensure equitable access to resources and educational opportunities by reducing delays in project delivery, particularly for underserved communities.
- **Economic Efficiency:** By streamlining procurement cycles and reducing bureaucratic delays, public funds are used more efficiently, contributing to long-term economic sustainability.
- **Institutional Resilience:** The integration of risk management and digital tools enhances the PEU's capacity to adapt to uncertainties, including political changes, inflation, or external disruptions such as pandemics.

The project contributes to regenerative development by fostering:

- **Capacity Building:** Through the adoption of Agile and Scrumban methodologies, staff capacity is developed to manage projects more adaptively and efficiently.
- **Stakeholder Empowerment:** Improved communication and stakeholder engagement mechanisms foster trust and collaboration, regenerating institutional relationships.
- **Knowledge Transfer:** The proposed monitoring and evaluation systems ensure that lessons learned are documented and used to inform future projects, creating a regenerative loop of

| continuous improvement. | | | |
|--------------------------------|--|---|-----------------|
| Indicator | Description | Measurement Tool | Frequency |
| Procurement Cycle Time | Time from TOR approval to contract award | Digital tracking system/PEP | Quarterly |
| Vendor Performance Score | Quality, timeliness, and compliance of deliverables | Evaluation matrix & performance reviews | Per contract |
| Stakeholder Satisfaction Index | Perception of efficiency, transparency, and involvement | Surveys/interviews with MOECST, suppliers, and IFIs | Bi-annually |
| Environmental Compliance Rate | % of procurement processes with valid environmental management plans | Compliance checklist & document review | Per procurement |
| Capacity-building Rate | % of staff trained in Agile/Scrumban and digital tools | Training records & feedback forms | Annually |
| Green Procurement Ratio | % of contracts that include sustainable or green solutions | Procurement report analysis | Annually |

APPENDIX 2: FGP WBS



APPENDIX 4: PRELIMINARY BIBLIOGRAPHICAL RESEARCH

1. Burke, R. (2019). *Project Management: Planning and Control Techniques*. Wiley.
 - This book provides an in-depth understanding of project planning and control methodologies, which are essential for structuring procurement workflows efficiently.
 - It offers techniques that can be applied to improve scheduling, risk management, and cost control within government procurement processes.

2. Caribbean Development Bank. (2021). *Procurement procedures for projects financed by CDB*. Caribbean Development Bank.
 - This source provided official procurement guidelines, ensuring compliance with CDB funding requirements. It was crucial in understanding the legal and ethical aspects of procurement, transparency, and competitive bidding in project management.

3. Heldman, K. (2021). *Project Manager's Portable Handbook*. McGraw Hill.
 - This handbook serves as a practical guide for project managers, offering real-world strategies to manage projects effectively.
 - It includes best practices, checklists, and templates that can be directly applied to enhance procurement efficiency in the education sector.

4. Inter-American Development Bank (IDB). (2021). *Procurement Policies and Procedures*. IDB Publications.
 - This publication is crucial because it outlines procurement policies and procedures specific to Latin America and the Caribbean, which are relevant to government projects in the education sector.
 - It provides insight into procurement compliance, regulatory frameworks, and transparency requirements that must be followed in public sector projects.

5. Kerzner, H. (2022). *Project Management: A Systems Approach to Planning, Scheduling, and Controlling*. Wiley.
 - This book is a cornerstone in project management literature, providing a

systems approach that integrates various project management methodologies.

- It is particularly useful for understanding how structured approaches like Critical Path Method (CPM) and Agile can be applied to procurement processes.

6. Larson, E. W., & Gray, C. F. (2021). *Project Management: The Managerial Process*. McGraw Hill.

- This resource focuses on the managerial aspects of project management, such as leadership, decision-making, and stakeholder engagement.
- These concepts are essential for improving coordination between procurement officers, government agencies, and suppliers.

7. Meredith, J. R., & Mantel, S. J. (2021). *Project Management: A Managerial Approach*. Wiley.

- This book presents a managerial perspective on project management, offering tools for handling procurement challenges through structured methodologies.
- It also covers cost-benefit analysis and performance measurement, which are crucial for evaluating the efficiency of procurement processes.

8. PMI. (2021). *The Standard for Project Management and A Guide to the Project Management Body of Knowledge (PMBOK Guide) (7th ed.)*. Project Management Institute.

- The PMBOK Guide is the global standard for project management and is fundamental to understanding best practices in procurement and project execution.
- It provides frameworks that can be adapted to streamline procurement activities, ensuring alignment with international best practices.

9. Project Management Institute. (n.d.). *Tools and templates*. PMI.
<https://www.pmi.org/learning/tools-templates>

- PMI offers implementation guides, templates, and case studies to help organizations integrate project management methodologies effectively.

10. Turner, J. R. (2016). *Gower Handbook of Project Management*. Routledge.

- This handbook is a comprehensive resource that covers various project management disciplines, including procurement strategies.
- It offers insights into contract management, risk mitigation, and performance measurement, which are key components of an effective procurement process.

11. Ministry of Education, Culture, Science, and Technology. (n.d.). Home.
<https://www.moecst.gov.bz/>

- This website provides general information about the Ministry of Education.

APPENDIX 5: OTHER RELEVANT INFORMATION

University of Belize

University Drive
P.O. Box 340
Belmopan**Faculty of Education and Arts**Tel: +501-822-3680
Extension 1126

July 21, 2025

To Whom It May Concern

Re: Thorough review and editing (line editing, copyediting and proofreading) of Final Graduation Project submitted by Tamara Tingling-Cano in partial fulfilment of the requirements for the Master's in Project Management (MPM) Degree

Dear Sir or Madam:

I hereby confirm that Tamara Tingling-Cano has made all the corrections to the Final Graduation Project document as I have advised. In my opinion, the document now meets the literary and linguistic standards required of a student at the Master's Degree level.

Sincerely,

Ivory Kelly

Lecturer, Department of Languages & Literature, University of Belize
Email: ikelly@ub.edu.bz

University of Belize



*The Council of the University of Belize,
upon recommendation of the Faculty of Education, has conferred on*

Jhory Elizabeth Kelly

*who has completed the prescribed studies and fulfilled all requirements thereof
the degree of*


Bachelor of Arts in English Education

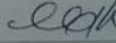
*with all the rights and privileges pertaining to that degree, given at Belize City, Belize
this second day of June, two thousand and two.*



DEAN


VICE PRESIDENT, ACADEMIC



PRESIDENT


COUNCIL CHAIRMAN

