A Study on the Proficiency of Civil Engineers as Procurement Engineers, BAC Secretariat and BAC Technical Working Group in Selected Offices of DPWH Regional Office IV-A

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Abstract – This study assessed the proficiency levels, challenges, and factors contributing to the professional development of civil engineers in procurement roles, specifically as Procurement Engineers, BAC Secretariat members, and BAC Technical Working Group members within selected offices of the Department of Public Works and Highways (DPWH) Regional Office IV-A. Using a quantitative descriptive research design, the study employed a survey instrument featuring a five-point Likert scale to collect data from 50 purposively selected respondents. The survey was divided into three sections focusing on proficiency, challenges, and developmental factors. The findings revealed that while civil engineers generally exhibit strong skills in compliance with procurement regulations and effective coordination, notable gaps persist in access to training, resource availability, and communication with stakeholders. Proficiency development was found to be significantly influenced by factors such as access to specialized training, mentorship opportunities, a supportive work environment, and performance recognition. Challenges included tight project timelines, resistance to new procurement strategies, and limited management support, which hinder optimal performance. To address these issues, the study recommends prioritizing targeted professional development programs for civil engineers. This includes regular workshops and mentorship initiatives to enhance technical expertise and decision-making capabilities in procurement processes. A structured system for recognizing performance improvements is also proposed to promote motivation and accountability among procurement professionals. The study provides important understandings for DPWH and similar organizations, emphasizing the need for holistic strategies that integrate technical skill-building, organizational support, and collaborative approaches to enhance the proficiency and effectiveness of engineers in procurement roles. These findings and recommendations aim to contribute to the improvement of infrastructure project delivery through better procurement practices.

Indexed Terms – Civil engineers/ Procurement roles / Professional development/ DPWH/ Proficiency enhancement

I. INTRODUCTION

Procurement is a critical function in infrastructure development, particularly in government agencies like the Department of Public Works and Highways (DPWH). The success of public infrastructure projects relies on efficient procurement practices, which require the expertise of civil engineers serving as Procurement Engineers, members of the Bids and Awards Committee (BAC) Secretariat, and BAC Technical Working Groups. However, the increasing complexity of procurement regulations and the demand for transparency and accountability necessitate a higher level of proficiency among civil engineers in these roles.

Civil engineers in procurement roles are tasked with ensuring compliance with procurement laws, preparing technical documents, analyzing bids, and coordinating with various stakeholders. A study by Abednego and Ogunlana (2006) shows the critical need for technical competency and decision-making skills in procurement to minimize delays and cost overruns in construction projects. Despite these

responsibilities, there is limited research on the current proficiency levels of civil engineers in these specific roles, particularly in the context of government agencies like DPWH.

Challenges such as navigating complex procurement policies, meeting tight deadlines, and managing stakeholder expectations are frequently encountered in public sector procurement. A study examining the predictive relationship between sustainable procurement practices and performance highlights the importance of top management support, IT infrastructure, and staff competence in improving procurement outcomes. According to a study by Nangpiire, et al (2024), while staff competence did not show a statistically significant effect on organizational performance in some contexts, it remains essential for addressing broader operational challenges. This emphasizes the importance of investing in professional development for procurement roles.

The present study aims to assess the proficiency of civil engineers in their procurement roles and identify the challenges they face. In addition, it seeks to explore the factors that contribute to the development of their competencies in procurement. The research aims to fill these gaps and provide evidence-based recommendations that will enhance the efficiency of procurement processes within DPWH, ultimately contributing to improved project delivery and accountability.

The findings of this study are expected to play a significant role in advancing the professional development of civil engineers by identifying key areas for skill enhancement and addressing existing challenges in procurement roles. These improvements will not only empower engineers to perform their responsibilities more effectively but also strengthen the overall integrity and efficiency of government procurement processes. The study aims to contribute to the broader objective of ensuring transparency, accountability, and excellence in public infrastructure projects by enhancing the capabilities and support systems for civil engineers in procurement roles. Strengthening these areas will help align with the DPWH's mission of delivering high-quality infrastructure that meets public needs while upholding the highest standards of governance and operational efficiency.

II. METHODOLOGY

This study aimed to assess the proficiency levels, challenges, and factors contributing to the professional development of civil engineers in their roles as Procurement Engineers, members of the Bids and Awards Committee (BAC) Secretariat, and BAC Technical Working Group within selected offices of the Department of Public Works and Highways (DPWH) Regional Office IV-A. To achieve this objective, the research adopts a quantitative descriptive research design, employing a structured survey instrument to gather the necessary data. This design is appropriate for describing and analyzing the current state of proficiency, challenges, and development factors among civil engineers in procurement roles. The goal is not to manipulate variables or introduce experimental conditions, but rather to gather data that can provide a comprehensive understanding of the existing conditions and practices. This design allows for a clear, systematic presentation of the respondents' perspectives and experiences, offering valuable insights into the factors that influence procurement practices and professional development within DPWH Regional Office IV-A.

The study is conducted within DPWH Regional Office IV-A, a key region responsible for managing public infrastructure projects. The office plays a significant role in overseeing procurement activities for these projects, making it an ideal locale for exploring the proficiency of civil engineers working in procurement roles. The selection of this region allows for an in-depth examination of the challenges and opportunities faced by these engineers, offering valuable insights into the efficiency of procurement practices and their impact on project outcomes.

The respondents for this study are 50 civil engineers selected through purposive sampling. The purposive sampling method was used to identify individuals who are directly involved in procurement-related roles such as Procurement Engineers, BAC Secretariat members, and BAC Technical Working Group members. The inclusion criteria for the respondents were: (1) current employment in the specified roles within DPWH

Regional Office IV-A, (2) involvement in procurement tasks related to public infrastructure projects, and (3) willingness to participate in the survey. This sampling method ensures that the sample consists of professionals with the requisite knowledge and experience to provide valuable insights into the proficiency and challenges in procurement practices.

The primary data collection tool for this study is a survey questionnaire designed with a 5-point Likert scale. This scale was chosen to measure the respondents' perceptions and self-reported proficiency levels regarding their roles in procurement processes. The questionnaire is divided into three main sections. The first section assesses the respondents' current level of proficiency in tasks related to their roles, such as understanding procurement procedures, ensuring compliance with policies, and managing procurement documents. The second section explores the common challenges faced by civil engineers in their procurement roles, including issues such as insufficient training, lack of resources, and difficulties in meeting deadlines. The third section investigates the factors contributing to the professional development of these engineers, such as access to training, mentorship, and available resources. Each item in the questionnaire is rated on a scale from 1 (Strongly Disagree) to 5 (Strongly Agree), enabling respondents to express their level of agreement or disagreement with each statement.

To ensure the reliability and validity of the survey instrument, several steps were undertaken. First, the instrument underwent content validation by experts in the field of procurement and civil engineering. These experts reviewed the questionnaire for its relevance, clarity, and alignment with the study's objectives. Their feedback helped refine the instrument to ensure that the questions accurately measure the proficiency levels, challenges, and factors affecting professional development in procurement roles. The reliability of the survey instrument was also assessed using Cronbach's alpha, which resulted in a coefficient of 0.985, indicating excellent reliability.

To analyze the data, descriptive statistics were used, specifically focusing on frequency and percentage distributions. Descriptive statistics helped summarize the responses to the survey items, providing an overview of the most common trends and patterns regarding proficiency levels, challenges, and contributing factors to professional development. The frequency and percentage analysis allowed for a deeper understanding of the data, making it easier to identify key areas for improvement in procurement practices and professional training.

III. RESULTS AND DISCUSSIONS

The data in Table 1 presents the level of proficiency of civil engineers in their roles as Procurement Engineers, BAC Secretariat members, and BAC Technical Working Group members within selected offices of the DPWH Regional Office. The respondents were asked to self-assess their proficiency in various aspects of procurement work based on a 5-point Likert scale. The results reveal a generally positive trend regarding the proficiency levels of civil engineers, but also highlight certain areas that warrant further attention and improvement.

TABLE 1
Level of Proficiency of Civil Engineers

Indicators	Strongly Agree		Agree		Neutral		Disagree		Strongly Disagree	
	F	%	F	%	F	%	F	%	F	%
1. I have a comprehensive understanding of procurement procedures and requirements within the DPWH framework	14	28	22	44	12	24	1	2	1	2

2. I am proficient in ensuring compliance with relevant laws, policies, and guidelines in procurement activities.	14	28	20	40	14	28	1	2	1	2
3. I effectively prepare and manage procurement documents in line with DPWH standards.	16	32	25	50	6	12	2	4	1	2
4. I have strong skills in planning and forecasting project procurement needs.	17	34	26	52	5	10	1	2	1	2
5. I am able to analyze procurement data and make well-informed decisions.	7	14	26	52	14	28	2	4	1	2
6. In my role in the BAC Secretariat, I efficiently coordinate with stakeholders involved in the procurement process.	11	22	23	46	13	26	1	2	2	4
7. I am proficient in identifying and managing potential risks in procurement and technical working group activities.	11	22	26	52	12	24	0	0	1	2
8. I effectively communicate procurement requirements and updates to team members and	11	22	25	50	12	24	1	2	1	2

stakeholders.										
9. I demonstrate effective problem-solving skills when addressing issues in procurement processes.	10	20	24	48	12	24	3	6	1	2
10. I manage timelines efficiently to ensure procurement tasks are completed within project schedules.	15	30	25	50	7	14	2	4	1	2

Indicators 1 and 2, which assess the understanding of procurement procedures and the ability to ensure compliance with laws, policies, and guidelines, show strong positive responses. A majority of respondents (72% to 80%) indicated agreement or strong agreement with these statements, suggesting that civil engineers in the DPWH Regional Office IV-A generally feel confident in their knowledge of procurement procedures and their ability to comply with relevant legal frameworks. This finding is significant as it indicates that civil engineers are well-equipped to navigate the legal and procedural requirements that are crucial for efficient procurement processes.

Indicator 3, which evaluates proficiency in preparing and managing procurement documents, also garnered high levels of agreement (82% of respondents either strongly agreed or agreed). This reflects the engineers' ability to handle procurement documentation, a critical aspect of their role in ensuring transparency and accountability in procurement activities. In a similar manner, Indicator 4, which assesses skills in planning and forecasting procurement needs, shows that 86% of respondents felt proficient in this area. Effective planning and forecasting are essential for ensuring that procurement activities align with project requirements, minimizing delays, and optimizing resource allocation. However, some indicators reveal areas where respondents feel less confident. Indicator 5, which assesses the ability to analyze procurement data and make informed decisions, received mixed responses, with 28% of respondents neutral and 6% disagreeing. This suggests that while a majority of respondents are confident in their data analysis abilities, a considerable portion of them may feel less adept at using procurement data to drive decision-making processes. Also, Indicator 6, which measures the ability to coordinate with stakeholders in the BAC Secretariat, shows that while 68% of respondents agreed or strongly agreed, there remains a notable percentage (26%) that expressed neutrality, indicating some uncertainty or lack of confidence in this aspect of the role.

Indicators related to communication (Indicator 8) and problem-solving (Indicator 9) showed relatively balanced responses. While 72% of respondents agreed or strongly agreed that they effectively communicate procurement requirements, 24% of respondents remained neutral. This could point to a need for more focused communication training or better tools for facilitating communication between procurement teams and stakeholders. Similarly, for Indicator 9, although 68% of respondents reported effective problem-solving skills, 12% disagreed or strongly disagreed, suggesting that problem-solving in procurement may present challenges for some engineers, especially in complex or high-stakes situations.

Indicator 10, concerning the management of procurement timelines, indicates strong proficiency, with 80% of respondents agreeing or strongly agreeing. This suggests that most civil engineers are able to effectively manage their time and ensure that procurement tasks align with project schedules, a critical factor in ensuring timely project delivery.

The results suggest that while civil engineers in DPWH Regional Office IV-A demonstrate strong proficiency in technical aspects such as understanding procurement procedures, managing procurement documents, and planning, there are areas where additional support and training may be necessary. The mixed responses to indicators concerning data analysis, risk management, and problem-solving highlight potential gaps in the professional development of engineers in these roles. It is important for the DPWH to address these gaps by providing targeted training and resources to enhance proficiency in these areas, particularly in data analysis and risk management, which are essential for informed decision-making and minimizing procurement-related risks.

The responses to communication and coordination tasks within the BAC Secretariat suggest that while many engineers feel confident in these aspects, there is room for improvement in fostering better collaboration and coordination across teams and stakeholders. This could be achieved through more effective communication channels and training in stakeholder management.

The strong responses related to managing procurement timelines emphasize the importance of time management in procurement activities and its role in ensuring that public infrastructure projects are delivered on schedule. However, continued focus on time management training and the implementation of more efficient procurement processes would further enhance this strength.

Research on procurement competence in public sector organizations indicates that proficiency in key procurement activities is essential for improving project outcomes and ensuring efficient use of public funds. According to Kabega and Mbera (2016), effective procurement practices contribute to the timely delivery of public infrastructure projects and help mitigate risks associated with cost overruns and delays. The high levels of proficiency in procurement procedures and document management observed in this study align with findings from similar studies by Mutesi and Safari (2021), which emphasize the importance of technical competence in managing procurement tasks to ensure transparency and compliance.

However, several studies suggest that gaps in data analysis and decision-making are common in procurement practices. For instance, Ferri (2022) found that procurement professionals in government organizations often struggle with using procurement data to make informed decisions, highlighting the need for better analytical tools and training. The mixed responses regarding proficiency in data analysis and decision-making in the current study reflect this challenge and suggest a need for additional training in data analytics and decision-making processes.

Furthermore, research by Cooper (2024) on public sector procurement shows the importance of communication and collaboration in ensuring successful procurement outcomes. The study found that effective communication among procurement teams, stakeholders, and suppliers plays a critical role in minimizing misunderstandings and delays. The neutral responses regarding communication proficiency in this study suggest that further efforts are needed to enhance communication skills and tools within the DPWH procurement process.

The findings of this study emphasize the importance of enhancing training and professional development in areas such as data analysis, risk management, and communication within procurement teams. Addressing these gaps can lead to more efficient procurement processes and improved outcomes in the delivery of public infrastructure projects.

Table 2 presents the common challenges faced by civil engineers in their roles as Procurement Engineers, BAC Secretariat members, and BAC Technical Working Group members within the DPWH Regional Office IV-A. The data captures perceptions on various operational and systemic issues, such as training gaps, resource limitations, communication barriers, and organizational constraints. Each indicator reflects the

frequency and percentage of respondents who identified these challenges at varying levels of agreement, from "Strongly Agree" to "Strongly Disagree." This table provides critical understandings into the barriers that impact the efficiency and effectiveness of procurement-related tasks, highlighting areas that require strategic interventions to enhance performance and project delivery.

TABLE 2
Common Challenges Faced by Civil Engineers

Indicators	Strongly Agree		Agree		Neutral		Disagree		Strongly Disagree	
	F	%	F	%	F	%	F	%	F	%
1. I face challenges due to insufficient training opportunities related to procurement processes and best practices.	8	16	10	20	18	36	12	24	2	4
2. I often struggle to navigate complex laws and regulations that govern procurement activities.	4	8	9	18	20	40	13	26	4	8
3. I experience difficulties in performing my role effectively due to limited access to necessary resources and materials for procurement tasks.	3	6	7	14	19	38	15	30	6	12
4. I encounter challenges related to poor communication between team members and stakeholders in the procurement process.	4	8	7	14	15	30	14	28	10	20

5. I find it challenging to meet deadlines due to tight schedules and heavy workloads associated with procurement projects.	5	10	10	20	17	34	15	30	3	6
6. I feel that there is a lack of support from management when it comes to addressing issues faced in procurement tasks.	0	0	6	12	16	32	14	28	14	28
7. I often struggle with inadequate data and information necessary for making informed procurement decisions.	3	6	6	12	15	30	20	40	6	12
8. I face challenges in implementing new procurement strategies due to resistance from colleagues or stakeholders.	2	4	8	16	17	34	14	28	9	18
9. I encounter difficulties in resolving conflicts that arise during the procurement process, which affects overall efficiency.	2	4	7	14	18	36	15	30	8	16

10. I experience challenges due to intense competition among suppliers, which complicates the procurement decision-making process.	2	4	9	18	20	40	15	30	4	8

The responses show a mixed perception of the challenges, with significant agreement on issues such as insufficient training opportunities (36% Neutral, 24% Disagree), difficulties navigating complex laws and regulations (40% Neutral), and limited access to necessary resources (38% Neutral, 30% Disagree). These findings suggest that while some professionals acknowledge these barriers, others may find ways to navigate or mitigate them in practice. Challenges related to poor communication (30% Neutral, 28% Disagree) and tight schedules (34% Neutral, 30% Disagree) further illustrate operational bottlenecks that can hinder efficiency in procurement tasks.

In addition, the lack of management support (32% Neutral, 28% Disagree), inadequate data for decision-making (30% Neutral, 40% Disagree), and resistance to new procurement strategies (34% Neutral, 28% Disagree) emphasize systemic and organizational issues that could impact the ability of civil engineers to execute their roles effectively. Conflicts during procurement processes (36% Neutral, 30% Disagree) and intense competition among suppliers (40% Neutral, 30% Disagree) were also identified as notable challenges, indicating the dynamic and often complex nature of procurement in public infrastructure projects. The findings emphasize the need for targeted interventions, such as enhanced training programs, streamlined communication channels, and better resource allocation, to address these challenges. Without these measures, inefficiencies in procurement processes may persist, ultimately affecting project timelines and quality.

Research supports these findings, emphasizing the critical role of organizational support, communication, and access to resources in effective procurement practices. For instance, a study by Nangpiire and Nase (2024) found that sustainable procurement practices, bolstered by top management support and strong IT infrastructure, significantly enhance performance, while staff competence alone may not yield desired outcomes without adequate resources and management backing. In a similar manner, communication barriers and resistance to change are well-documented obstacles in procurement, often linked to the complexity of regulations and interdepartmental coordination challenges. Organizations can improve procurement efficiency and outcomes by addressing these factors as suggested in studies of public infrastructure projects globally. These understandings provide a framework for developing solutions tailored to the specific needs of DPWH civil engineers, ensuring both operational efficiency and project success.

Table 3 highlights the factors contributing to the proficiency development of civil engineers in procurement roles within DPWH Regional Office IV-A. The results reveal that the availability of resources and materials to support procurement learning and development ranked the highest, with 98% of respondents indicating agreement. A supportive work environment and opportunities for collaborative learning and teamwork were acknowledged by 94% of respondents, emphasizing the significance of organizational support and peer engagement in enhancing proficiency. Availability of specialized procurement training also garnered substantial affirmation (88%), emphasizing the value of targeted capacity-building programs. Access to mentorship from experienced procurement professionals, regular performance feedback, and participation in professional development programs also received high positive responses, with agreement rates ranging from 80% to 86%.

TABLE 3
Factors Contributing to the Proficiency Development of Civil Engineers

Indicators	YES		NO		NEUTRAL	
	F	%	F	%	F	%
1. Availability of specialized procurement training for civil engineers	44	88	5	10	1	2
2. Access to mentorship from experienced procurement professionals within DPWH	41	82	9	18	0	0
3. Opportunities for on-the-job training in procurement tasks and processes	37	74	13	26	0	0
4. Regular performance feedback and evaluations specifically focused on procurement skills	41	82	9	18	0	0
5. Supportive work environment that encourages professional growth in procurement roles	47	94	2	4	1	2
6. Availability of resources and materials to support procurement learning and development	49	98	1	2	0	0
7. Participation in professional development programs focused on procurement competencies	41	82	9	18	0	0
8. Access to industry best practices and standards in procurement within DPWH	43	86	5	10	2	4
9. Opportunities for collaborative learning and teamwork in procurement tasks	47	94	3	6	0	0
10. Recognition and rewards for proficiency improvements in procurement responsibilities	40	80	10	20	0	0

Opportunities for on-the-job training were rated positively by 74% of the participants, demonstrating the importance of experiential learning in reinforcing technical skills. Meanwhile, recognition and rewards for proficiency improvements were noted by 80%, signifying the motivational role of acknowledgment in driving professional growth. Conversely, areas such as access to industry best practices (86%) and structured evaluations (82%) suggest room for improvement to further solidify development pathways.

The findings imply that civil engineers' proficiency development in procurement roles is significantly influenced by a combination of organizational support mechanisms, targeted training opportunities, and a conducive learning environment. These factors collectively enhance their ability to navigate complex procurement tasks, comply with regulatory standards, and contribute to efficient project implementation.

The results align with existing literature emphasizing the critical role of training, mentorship, and organizational culture in professional development. For instance, studies by Dadzie et. al. (2024) highlight that specialized training and exposure to best practices are essential in equipping procurement professionals with the necessary competencies to handle technical tasks effectively. The integration of training and development initiatives results in the formation of a workforce that possesses not only a high level of proficiency but also the ability to adapt quickly and anticipate future challenges. Furthermore, Cheng et. al. (2021) emphasizes the value of on-the-job training and peer collaboration as mechanisms for skill reinforcement and knowledge exchange. Staff development and training on the modern practices of procurement is also an important recipe in the formation of solid ground which can lead to better performance of an organization. As mentioned by Mebrate and Shumet (2024), employees can get more knowledge and skills on procurement subjects which can enable them to have an easy time in their daily operations of offering procurement services. In addition, according to Vorosmarty, et.al. (2019), the recognition of achievements and continuous feedback is often cited as key drivers of motivation and performance improvement in procurement roles, as noted in studies on public sector efficiency. The integration of these factors into civil engineers' professional development frameworks can enhance their proficiency, fostering a more competent and capable workforce within DPWH.

IV. CONCLUSIONS AND RECOMMENDATIONS

The findings of the study revealed that civil engineers in procurement roles within DPWH Regional Office IV-A demonstrate varying levels of proficiency, with strengths in managing procurement tasks, ensuring compliance with regulations, and coordinating effectively with stakeholders. However, significant challenges persist, particularly in areas such as access to adequate training, tight project schedules, limited resources, and communication issues among team members and stakeholders. These barriers hinder the consistent and optimal execution of procurement responsibilities and underscore the need for targeted interventions to address these gaps.

Furthermore, the study emphasized the critical factors that contribute to the development of procurement-related competencies among civil engineers. These include the availability of specialized training, supportive work environments, mentorship from experienced professionals, and opportunities for collaborative learning. Access to essential resources and recognition for performance improvements were also identified as vital components in fostering professional growth and enhancing proficiency. These understandings emphasize the importance of a holistic approach to professional development that integrates technical, organizational, and interpersonal dimensions.

To address the challenges and enhance proficiency in procurement roles, DPWH is encouraged to prioritize the development of targeted training programs for civil engineers. Regular workshops, certification courses, and access to external learning platforms can significantly strengthen their technical capabilities and understanding of procurement processes. Establishing mentorship programs would also allow less experienced engineers to benefit from the expertise and guidance of seasoned professionals, fostering skill transfer and confidence in decision-making.

Also, on-the-job training and collaborative learning opportunities should be expanded to provide practical experience and promote teamwork. Assigning engineers to team-based projects and cross-functional collaborations can enhance their problem-solving abilities and facilitate knowledge sharing. It is equally important to ensure the availability of updated resources and materials, such as procurement guidelines and industry best practices, by creating a centralized database that engineers can easily access.

Introducing a performance recognition system is another essential recommendation. In acknowledging and rewarding engineers who demonstrate significant improvements in their procurement responsibilities, DPWH can promote motivation and a culture of excellence. Addressing communication challenges through the development of clear communication protocols and training in interpersonal and intercultural communication will further enhance stakeholder coordination.

Finally, strengthening organizational support for procurement teams is crucial. Management should actively address workload concerns, allocate resources efficiently, and establish mechanisms to promptly resolve conflicts. Through the implementation of these recommendations, DPWH can create an environment conducive to professional growth, enabling civil engineers to excel in procurement roles and contribute to the successful delivery of infrastructure projects.

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