

Research Paper



## Public procurement processes: assessing the efficiency and effectiveness of the procurement process

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### ABSTRACT

The efficiency, effectiveness, difficulties, and solutions to these difficulties are the main topics of this study's analysis of the public procurement process. Finding ways to improve the procurement function's performance is the goal of the study. Data was gathered from public procurement officers who have control over the procurement process using a quantitative technique. The study identifies a number of difficulties that public procurement procedures face, emphasizing the necessity of resolving these problems to increase efficacy and efficiency. The findings provide stakeholders with valuable insights into the obstacles hindering public procurement processes and strategies for overcoming them. This research recommends implementing suggested strategies to tackle identified challenges. This study contributes to the existing body of knowledge by investigating the efficiency, effectiveness, challenges, and strategies related to public procurement processes in depth. The outcomes of this research are expected to inform policy decisions and practice, ultimately enhancing the public procurement process.

#### Keywords:

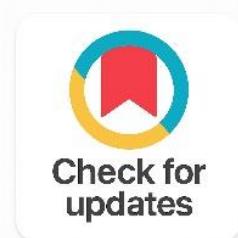
Procurement

Procurement Process

Procurement Performance

Procurement Procedures

Purchasing Products



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## 1. INTRODUCTION

Public procurement processes have gained significant attention due to poor performance and disregard for established procedures [1].

Despite efforts by international organizations, the procurement function remains undervalued in developing countries. The lack of performance metrics and inconsistent methods hinder the procurement function's effectiveness [2].

As stated by [3], in order to curb the challenges in the procurement processes, it should pass through some important factors and strategies. Here [4] emphasized on the quantitative research approach and was chosen for this inquiry since the goal of the study was to build and apply numerical theories, models and hypothesis surrounding natural occurrences. The population of this study consisted of Procurement officers having the lines of influence over procurement function and have also acquired knowledge in procurement processes and performance. Utilizing survey, ethnography, action, case study and experimental research design methodologies advised by [5].

Developing countries have reformed their public procurement laws, with support from organizations like UNCTAD, WTO, and the World Bank. However, these countries struggle to keep pace with the rapidly changing legislation. Internal and external factors, such as professionalism, resources, and environmental issues, influence the procurement function's success [6]. In Ghana, government institutions face challenges like corruption, inefficiency, and lack of adherence to laws and procedures. The Public Procurement Authority (PPA) was established to improve public services, efficacy, and efficiency. However, internal consumers often bypass the purchasing department due to a lack of understanding of public procurement processes [7]. Evaluating the effectiveness and efficiency of public procurement in Ghana is challenging due to limited information. Developing transparent procurement practices and performance criteria is essential. Performance measurement can provide stakeholders with accurate information on procurement performance [8]. However, measuring procurement performance in developing countries faces difficulties, including redundant measurement techniques, standardization challenges, and high costs (Center of Excellence London, 2006).

## 2. RELATED WORK

This section of the thesis examined earlier research that is pertinent to its major theme. This was important since knowing what was already in place helped identify other pertinent topics that should be explored. A practice that connected the past to the present and considered how to bridge the knowledge gaps for the coming decades in a particular field of study [9]. Based on concepts and theories connected to the study, literature on global, African, and Ghanaian perspectives on the procurement procedures, performance, and functions have been studied. This chapter also provided a summary of the different goals. According to [10], Purchasing products or services is an idea that has been around for thousands of years. However, the supply chain's objectives increasingly closely resemble those of procurement and extend far beyond survival. They are to fulfil customer demands for quality, quantity, and time while lowering transportation, storage, and working capital costs. Both disciplines are necessary for a company's success, claims [10]. A company's procurement and supply chain procedures may be considerably more effective with careful planning and implementation. Additionally, the supply chain was facing more modern challenges due to rising social and consumer demands [11]. Numerous studies have been conducted in a range of industries to better understand the ideas of procurement performance, process, and functions. The idea has been researched by numerous academics. Here, [12] performed research on the internal variables influencing the procurement process for supplies in the public sector through a survey of Kenyan government departments. [13] examined the impact of procurement management on Ugandan banks' financial performance using a case study of FINA Bank Uganda Ltd. The study concentrated on how banks' performance was impacted by procurement strategy, controls, and monitoring. examined the

relationships between procurement methods, cooperative partnerships, and the performance of Uganda's SME supply chain (SMEs).

Research was conducted by [14] to ascertain how information technology affected Kenya's procurement process. A conceptual framework is a way of thinking about a research project as a whole [15]. That is to say, a research project's key concepts, tactics, structures, execution, and practices can all be linked back to the initial conceptual framework [16].

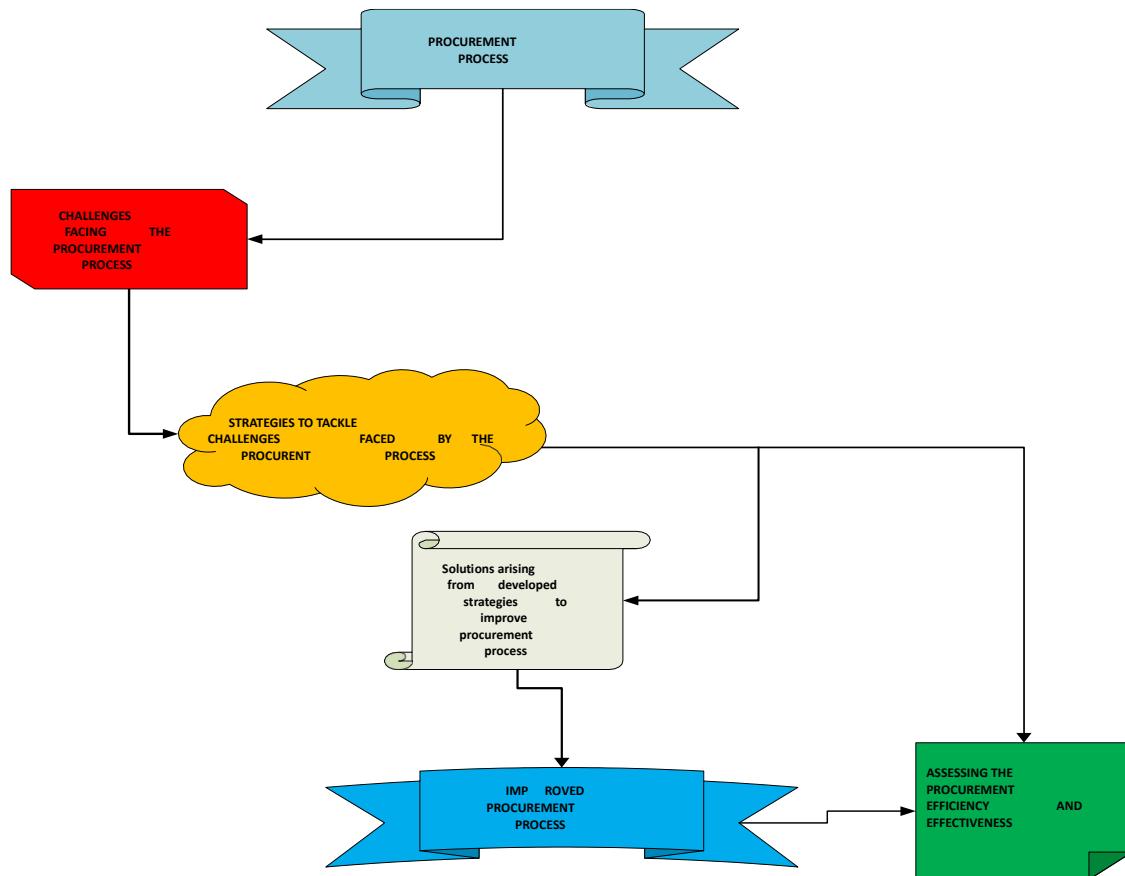


Figure 1. Conceptual Framework on Public Procurement Processes

As shown in Figure 1, the results indicate that Conceptual framework is a way of thinking about a research project as a whole. That is to say, a research project's key concepts, tactics, structures, execution, and practices can all be linked back to the initial conceptual framework. At least conceptually, the aforementioned difficulties surely have a significant impact on the procurement procedure. To lessen their influence on the procurement process, strategies to deal with them must be put into place. The findings of this study contributed to the development of a conceptual framework for procurement process. This framework illustrates how a number of methods may be utilized to address the complications inherent in the procurement process. The framework also reveals the need of adopting effective measures to improve the procurement process.

### 3. METHODOLOGY

This chapter outlines the approaches used for this exploratory research. The study employed a quantitative research approach to assess the performance of the procurement process, including its efficiency and effectiveness. "Research methods" can be used to refer to any method or strategy used to do research [17]. Pathiranage et al. (2020) stipulated that research methodology covers the entire design process, as well as the theoretical justifications and the data gathering and analysis phases of the study.

Per [17], it might be thought of as a science that examined how scientific research is conducted. The purpose of this study was to evaluate the effectiveness and efficiency of the procurement process. Since the purpose of the study was to develop and apply numerical theories, models, and hypotheses around natural occurrences, the quantitative research approach was used for this investigation. It was required to define the population from which the sample size was drawn after choosing the unit of analysis. A population or universe, according to [18], represents the traits of a certain group, which is the parent bunch from which a sample is to be created. A population, according to [19], refers to the overall amount of a particular kind of people, things, or situations that are crucial to a researcher's topic. Utilizing survey, ethnography, action, case study, and experimental research design methodologies was advised by [20]. A study design, according to Fellows and Liu (2020), was a method for combining data gathering and analysis in order to produce findings and determine the best course of action. Cases may be chosen to produce a representative sample, to highlight certain aspects of the subject, or to show the range of alternatives by meeting criteria analogous to those used in statistical sampling. Studies with known variables are most suited for the experimental form of research, claims [21]. Essentially, one independent variable is changed while all other variables are held constant, and the effect of this change on the dependent variable is then examined. Sociological and related experiments are carried out in dynamic social, industrial, economic, and political contexts rather than in specifically constructed laboratories [21]. After selecting the sampling procedure, the following step was to try to estimate the study's sample size. It was important to emphasize that the population under research was unknown and that the method of purposeful sampling was used. However, [22] believed that while selecting the sample size for a population whose size is unclear, a few factors should be taken into account. The intended and accuracy levels, respectively, were represented by these two confidence levels. But as was said earlier, they are mostly used for probability sampling techniques. None of the probabilistic methodologies could establish the sampling size for this investigation since it used a non-probability sampling strategy. Contrary to what was previously claimed, the confidence level was set at 95% (the typical level for quantitative probabilistic research) and the margin of error was +/- 5% if a probability sampling approach was used. In order to calculate the sample size when the population is infinite.

Schünemann (2019) suggested Cochran formula. That is,

$$N_o = \frac{(\Sigma^2 pq)}{(e^2)}$$

At 95% confidence level,  $\Sigma^2 = 1.960$

P = procurement officers that agrees with the identified variables. Since it is unknown for now, we used

50% (0.5) which is the maximum variability.  $q = 1-0.5=0.5$

5% precision level was assumed = 0.05

$$N_o = \frac{(\Sigma^2 pq)}{(e^2)}$$

$$N_o = \frac{(1.96)^2 (0.5) (0.5)}{(0.05)^2} = 384.16 = 384.$$

**Table 1.** Sample Size Determination

Confidence Level	Sample Size (No.)		
	$e = 0.03$	$e = 0.05$	$e = 0.1$
95%	1067	384	96
99%	1849	666	166

As shown in Table 1, the results indicate that the Cochran formular was used to determine the sample size, which for this study was in the range of 384. However, it was emphasized that after measuring

our sample size from the field survey, the researcher calculated the confidence level and margin of error, as well as the basis for more study. According to [23], the researcher's judgment is used to choose the group, class, or organization to be investigated in the intentional sampling approach. Because of this, it was occasionally called the selective, subjective, or judgmental sampling strategy. According to [24], purposeful sampling techniques are used when it is difficult to pinpoint the precise number of individuals in a community but simple to identify several groups or organizations that could provide the information. However, based on the goals of the study or the researcher's standards, any of the countless types was chosen or used. To gather data, researchers must employ a range of tools or procedures, and these procedures and tools may differ in complexity, interpretation, design, and administration. Each tool was appropriate for collecting a certain kind of data (Pandey and Pandey 2021). The most effective method or instrument for gathering quantitative data was a questionnaire (Walliman, 2017). According to Frazer and Lawley, surveys may utilize open-ended, closed-ended, or a combination of the two types of questions [25]. The questions could be delivered via mail, phone, online, or in-person surveys.

## 4. RESULTS AND DISCUSSION

This chapter presents the analysis and discussion of the survey results. The following subsections outline the data collection process, response rate, and data analysis methods used in the study.

### Subsection 1: Data Collection and Response Rate

A systematic close-ended questionnaire was used to collect data. After utilizing purposive sampling techniques to distribute the questionnaire online, out of one hundred and fifty-two (152) questionnaires issued, one hundred and seventeen (117) responses were received, representing a response rate of 78.3%. The response rate was deemed suitable for analysis because, according to [26], if the return rate is less than 30 - 40% of the totals disseminated or sampled, the results of a survey may be regarded as inadequate and skewed.

### Subsection 2: Data Analysis and Tools

The questionnaire was divided into four main parts, part A, part B, part C and part D. Part "A" was about the demographics of the study, which included their gender, education level and the years of experience. Part "B" is the measures of efficiency and effectiveness of the public procurement processes, part "C" looked at the challenges of public procurement processes and part "D" concentrated on the strategies to curb the challenges of the procurement process. Descriptive statistics were used to analyze part A, means score ranking for part "B" and one-sample t-test was used for the rest of the parts (i.e part "C" and part "D"). The statistical package for social sciences (SPSS) windows version 25 was used for the analysis, as well as Microsoft excel2019, google forms (for online questionnaire distribution), Microsoft Visio 2019 for diagrams, and Microsoft word 2019 for the writeup. A systematic close ended questionnaire was used to collect data. After utilizing purposive sampling techniques to distribute the questionnaire online, out of the three hundred and eight-four (384) questionnaires issued, one hundred and seventeen (117) responses were received, representing a response rate of 30.5%. The response rate was deemed suitable for analysis because, according to [27], if the return rate is less than 30 - 40% of the totals disseminated or sampled, the results of a survey may be regarded as inadequate and skewed.

#### Gender

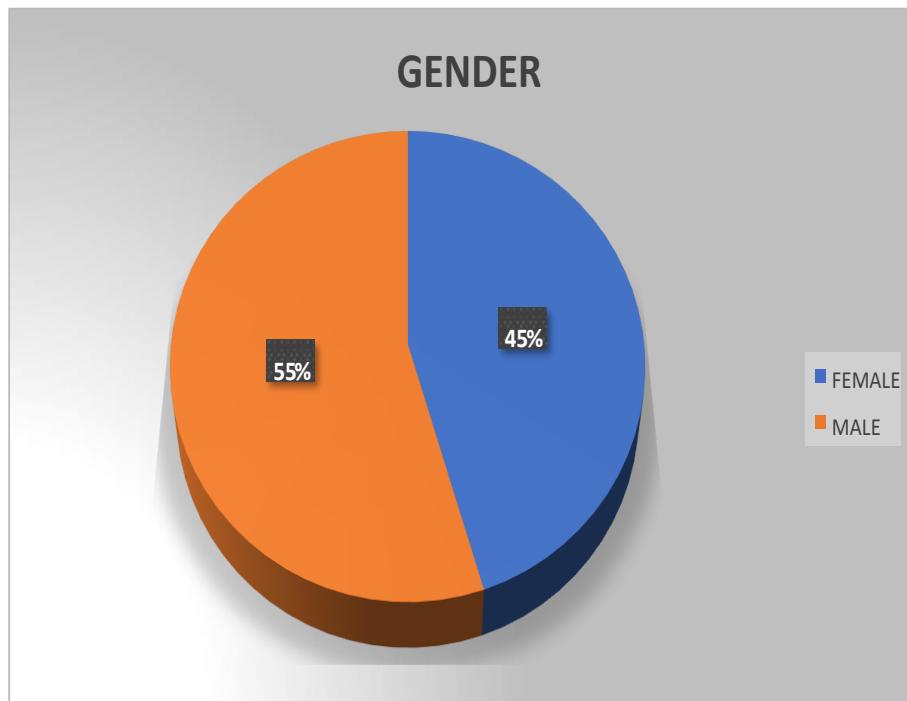
With this question, the respondents needed to let us know their gender. The reason for this question was to let us know the gender of the respondent. [Figure 2](#) and [Table 2](#) shows the gender of various respondents.

[Table 2](#). Gender

Gender	Frequency	Percent (%)
Female	53	44.5

Male	64	55.5
Total	117	100

As shown in [Table 2](#), the results indicate that the majority of the respondents were males which form 55% of the total respondents while the 45% respondents were females.



[Figure 2](#). Gender

As shown in [Figure 2](#), the results indicate the distribution of respondents by gender, providing a visual representation of the majority of male respondents.

#### [Educational Level](#)

Respondents were asked to indicate their highest educational qualification as part of determining the capacity and credibility of the respondents to understand the survey. Data collected from respondents on their highest educational level are presented in [Table 3](#) and [Figure 3](#) below.

[Table 3](#). Educational Level

Degree	Frequency	Percent (%)
Bachelor's Degree	49	41.2
Diploma/HND	41	34.5
Master's Degree	21	17.6
MPhil	3	2.5
PhD	3	2.5
Total	117	100.0

As shown in [Table 3](#), the results indicate that the majority of the respondents had bachelor's degree as their highest qualification which forms 41.2% of the total respondents. The second highest qualification among the respondents was Diploma / HND with a percentage of 34.5. Master's Degree with 17.6% was the third ranked qualification attained by the respondents. MPhil and PhD with a percentage of 2.5 and 2.5 respectively were ranked as the fourth qualification among the respondents.

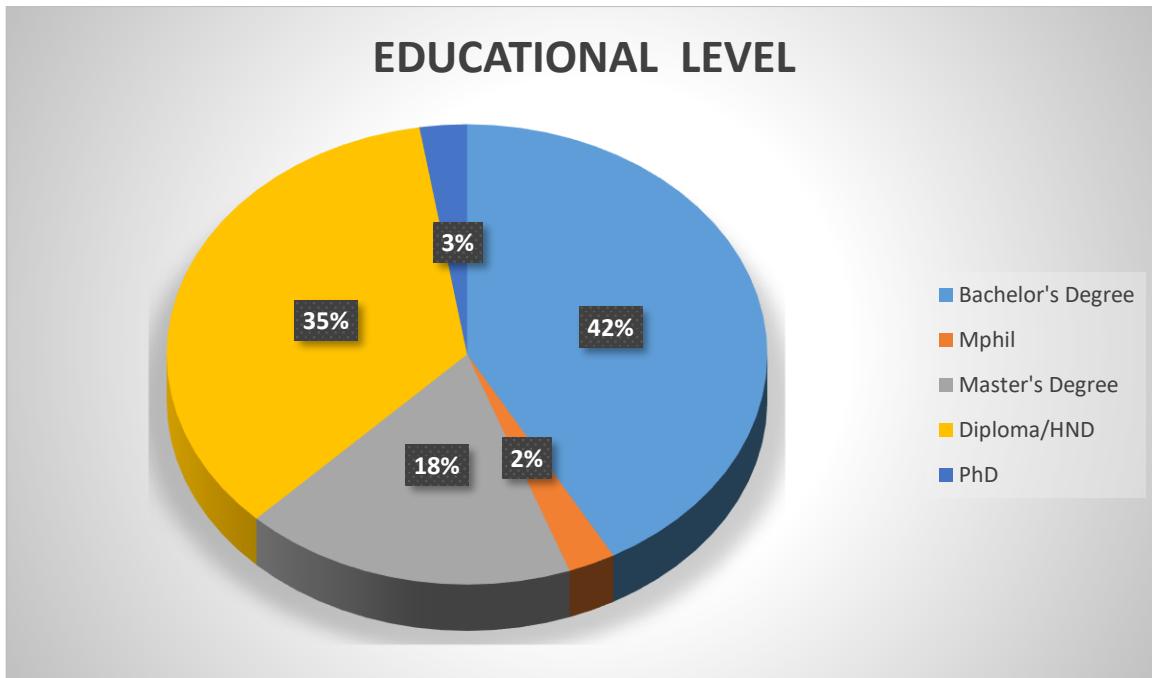


Figure 3. Educational Level

As shown in Figure 3, the results indicate the distribution of respondents by their highest qualification, providing a visual representation of the data; 41.2% Bachelor's Degree, 34.5% Diploma / HND, 17.6% Master's Degree, 2.5% MPhil and 2.5% PhD

#### Years of Experience

In addition, respondents were asked how long they have been working in their various procurement offices. This question was posed to gain a better understanding of the population's occupational characteristics. The major focus here is to determine how experienced they are as well the knowledge they have gained. The experience of the respondents regarding to the procurement processes will determine the importance to be attached to the information retrieve from the questionnaire.

Table 4. Years of Experience

Years of Experience	Frequency	Percent (%)
11 - 15 years	14	11.8
16 - 20 years	2	1.7
5 - 10 years	34	28.6
Less than 5 years	65	54.6
Over 20 years	2	1.7
Total	117	100.0

As shown in Table 4, the results indicate that 65 of the respondents have had experience below 5 years which represented the majority of them with a percentage of 55% of the total respondents. The years of experience of our respondents decreased directly downwards as the year increase. Thus 34 respondents representing 28.6% of the total respondents recorded that they have job experience in the procurement processes between 5 - 10 years. For 14 respondents posing 11.8% of the total respondents have had job experience between 11 - 15 years. 2 respondents representing 1.7% and 2 respondents representing 1.7% have had job experience between 16 - 20 years and over 20 years respectively. Giving the results, it was seen that majority of the respondents did not have so many years of experience. Nonetheless, this did not flaw the study since the procurement process are been updated frequently.

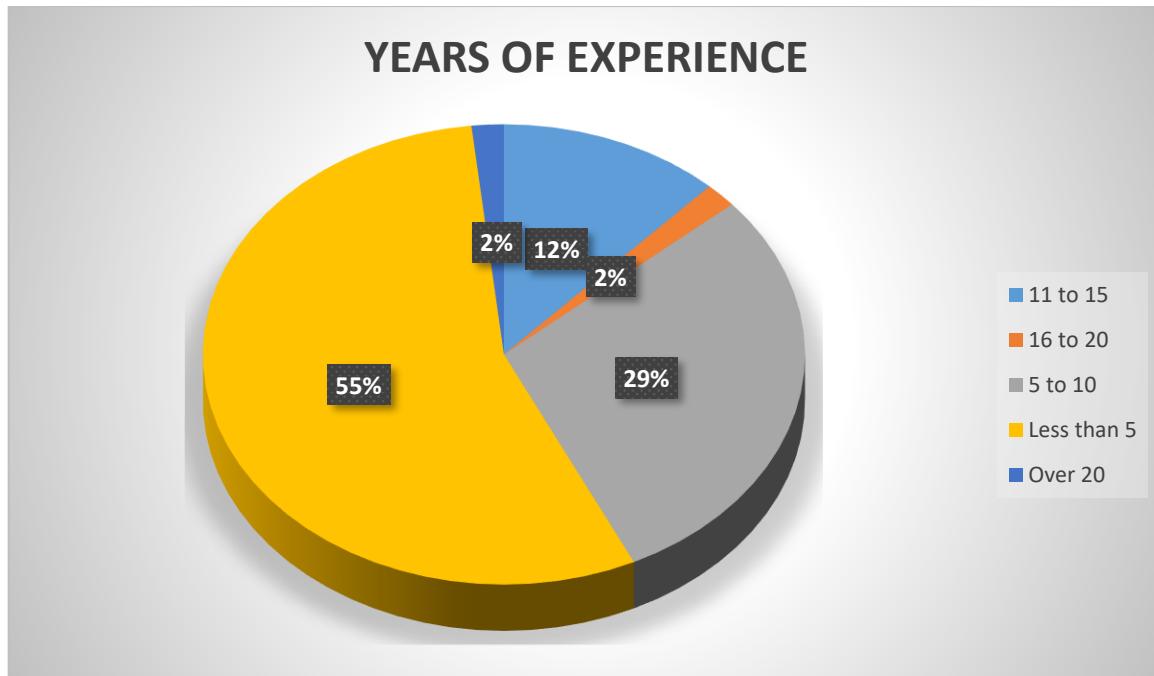


Figure 4. Years of Experience

As shown in Figure 4, the results indicate that the distribution of respondents by their years of experience in procurement processes, providing a visual representation of the data; 55% Below 5 years, 28.6% 5-10 years, 11.8% 11-15 years, 1.7% 16-20 years and 1.7% over 20 years.

### The Strategies to Curb the Challenges of Procurement Process

Table 5. One-Sample Statistics of the Strategies to Curb the Challenges of Public Procurement

S.N.	Challenge	N	Mean	Std. Dv.	Std. Err.	RII	Ranks
1.	Establishing clear procurement procedures	117	4.59	.659	.061	0.918	1ST
2.	Establishing strong anti-corruption and conflict-of- interest provisions	117	4.52	.772	.071	0.904	2ND
3.	Establishing strong anti-corruption and conflict-of- interest provisions	117	4.09	1.095	.101	0.818	6TH
4.	The use of digital platforms and open data	117	4.38	.868	.080	0.876	5TH
5.	Enforcing publication requirements and deadlines	117	4.40	.862	.080	0.880	4TH
6.	Public participation and monitoring	117	4.46	.915	.085	0.892	3RD

As shown in Table 5, the results indicate that the respondents responded that the first strategy to curb the challenges of procurement process was –Establishing clear procurement procedures|| and it had a mean of 4.59, with a Standard Deviation (S.D) of 0.659, a Standard Error Mean (S.E) of 0.061 and relative importance index (RII) of 0.918. –Establishing strong anti-corruption and conflict-of-interest provisions|| was the second response to curb the challenges of procurement process. This variable had a mean of 4.52, with a Standard Deviation (S.D) of 0.772, a Standard Error Mean (S.E) of 0.071 and Relative Importance Index (RII) of 0.904. The third response to curb the challenges of procurement process is –Public participation and monitoring|| with a mean of 4.46, a Standard Deviation of 0.915, a Standard Error Mean of 0.085 and Relative Importance Index (RII) of 0.892. –Enforcing publication requirements and

deadlines|| [mean = 4.40, Standard Deviation (S.D) = 0.862, Standard Error Mean (S.E) = 0.080 and Relative Importance Index (RII) = 0.880], —The use of digital platforms and open data|| [mean = 4.38, Standard Deviation (S.D) = 0.868, Standard Error Mean (S.E) = 0.080 and Relative Importance Index (RII) = 0.876], and —Direct awards of contract and the use of emergency procedures|| [mean = 4.09, Standard Deviation (S.D) = 1.095, Standard Error Mean (S.E) = 0.101 and Relative Importance Index (RII) = 0.818], were ranked fourth, fifth and sixth respectively, with their associated mean, Standard Deviation, Standard Error Means and Relative Importance Index. For —Establishing clear procurement procedures||, it had a  $-t||$  value of 26.111 and  $-p||$  value of 0.000, —Establishing strong anti-corruption and conflict-of-interest provisions|| [ $-t||$  value = 21.307,  $-p||$  value = 0.000], —Direct awards of contract and the use of emergency procedures|| [ $-t||$  value = 10.720,  $-p||$  value = 0.000], —The use of digital platforms and open data|| [ $-t||$  value = 17.143,  $-p||$  value = 0.000], —Enforcing publication requirements and deadlines|| [ $-t||$  value = 17.597,  $-p||$  value = 0.000] and —Public participation and monitoring|| [ $-t||$  value = 17.281,  $-p||$  value = 0.000]. All the  $-p||$  values for the above challenges are less than 0.05 then the null hypotheses were not rejected but the alternative hypotheses were rejected. From extent literature review from various researchers [27], [28], the listed variables above are importance factors the needs to be consider when it comes to strategies to curb the challenges.

## 5. CONCLUSION

The goal of this study was to assess the measures of efficiency and effectiveness of public procurement processes as well as the challenges of public procurement processes and the strategies to curb the challenges of public procurement processes. It was thoughtfully divided into five chapters, allowing for a discussion of the study's objective in a context that allowed for quick assimilation. The research's background was covered in the first chapter. Here, the researchers defined the problem, mentioned the study's aim and objectives, discussed its significance, specified the research methodology, established the study's scope and, ultimately, illustrated how the thesis would be structured. The three main objectives of this study were accomplished by collecting data through survey methods and carefully examining the survey data. In order to find out what other scholars, writers, and authorities thought about the goals of this study, the researcher examined earlier studies in the second chapter, which was a review of the literature. Consequently, the researcher was guided through numerous pertinent books, journals, and other publications. The research techniques utilized to accomplish the study's goals were then covered in great length in the third chapter. These techniques included how to construct questionnaires, how to collect data, how big the sample should be, how to code the data after it was obtained, and how to evaluate the findings. Chapter 4 examined the collected data in detail using a number of analytical methods judged suitable for the stated goals. It addressed all of the main topics discussed in the study's final chapter. By providing recommendations for additional research initiatives and fields to address the study's shortcomings and conclusions, the final chapter concluded the investigation. Therefore, this chapter summarizes the goals and questions before concluding the investigation. It also offers a synopsis of the results in line with the goals of the study. A few suggestions are made in view of the results.

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### Authors Contribution Statement

Name of Author	C	M	So	Va	Fo	I	R	D	O	E	Vi	Su	P	Fu
Samuel Owusu Antwi	✓	✓	✓	✓	✓	✓		✓	✓	✓			✓	
Frank Amoako Atta		✓				✓		✓	✓	✓	✓	✓	✓	
Seth Kofi Owusu	✓		✓	✓		✓			✓		✓		✓	
Richmond Annie					✓		✓			✓		✓		✓

C : Conceptualization

M : Methodology

So : Software

Va : Validation

Fo : Formal analysis

I : Investigation

R : Resources

D : Data Curation

O : Writing - Original Draft

E : Writing - Review & Editing

Vi : Visualization

Su : Supervision

P : Project administration

Fu : Funding acquisition

### Conflict of Interest Statement

Regarding the study "Public Procurement Processes: Assessing the Efficiency and Effectiveness of The Procurement Processes," the author states that there is no conflict of interest. The impartiality and integrity of the research findings have not been impacted by any financial, personal, or professional considerations because this study was carried out independently.

### Informed Consent

Prior to participating in the research, all participants in "Public Procurement Processes: Assessing the Efficiency and Effectiveness of The Procurement Processes," gave their informed permission. The goal, methods, possible hazards, and advantages of the study were all explained in detail to the participants. They received assurances that their involvement was entirely voluntary and that they may leave at any moment without facing any repercussions. All information gathered was utilized only for research, and confidentiality and anonymity were rigorously upheld.

### Ethical Approval

Verification that the study did not contravene any ethical standards was required. As a result, the following measures were taken: The manner the study questions were designed did not put the research participants in an uncomfortable or embarrassing situation. The researcher ensured that respondents were given the greatest secrecy about the data they provided. The data they provided remained confidential. The respondents' consent was requested before they took part in the study. The researcher made every effort to be as objective and cautious as practical during the research period.

### Data Availability

The corresponding author may provide the data supporting the conclusions of this study, "Public Procurement Processes: Assessing the Efficiency and Effectiveness of The Procurement Processes," upon reasonable request. Certain data may be withheld to protect participant privacy due to confidentiality agreements and ethical issues.

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