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BACHELOR OF SCIENCE IN QUANTITY SURVEYING

EXAMINING THE RATE OF ATTRITION OF FEMALE QUANTITTY SURVEYORS FROM THE UGANDAN CONSTRUCTION INDUSTRY

BY

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A final year dissertation submitted to the Department of Construction Economics and Management, School of Built Environment for the award of the degree of Bachelor of Science in Quantity Surveying of Makerere University

June, 2023

DECLARATION

I RUTANGYE JOSEPHINE, declare that this report is as a result of my effort and hard work. It has never been submitted anywhere else for award of degree, diploma, Certificate of Merit or as research work by an individual or group of individuals. Therefore, any similarity of words or ideas brought forward is a result of coincidence of ideas or opinions.

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APPROVAL

This research proposal has been submitted to the Department of Construction Economics and Management with approval of the supervisor.

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ABSTRACT

This study aimed to examine the rate of attrition of female surveyors from the Ugandan construction industry, identified the underlying factors contributing to attrition, and proposed strategies for promoting gender equality and retention. The construction industry has traditionally been male- dominated, and women in surveying roles often face unique challenges that may lead to attrition. However, there is a dearth of research specifically focusing on this issue in Uganda.

Through a mixed methods approach, this study collected quantitative data on attrition rates on survey responses from female surveyors, as well as qualitative data through in-depth interviews. The research explored various factors contributing to attrition, including limited career advancement opportunities, workplace discrimination, lack of mentorship or support, unequal pay, and work-life balance challenges.

The findings of this study provided valuable insights into the attrition of female surveyors in Uganda`s construction industry. By understanding the specific challenges faced by female surveyors and the reasons behind their departure, this research aimed to contribute to the development of targeted interventions. These interventions included policy recommendations, industry wide awareness campaigns, mentorship programs, and initiatives to address work place discrimination and improve work-life balance.

Promoting gender equality and retaining skilled female surveyors is crucial for the long-term growth and sustainability of the construction industry in Uganda. By ensuring equal opportunities, fostering an inclusive work environment, and supporting career progression for women in surveying roles, the industry can benefit from diverse perspectives, increased innovation, and enhanced productivity.

This research holds significance beyond the construction industry, as it contributes to the broader dialogue on gender equality and women's empowerment in the workforce. The findings inform evidence-based policy formulation, promote industry-wide awareness, and drive advocacy efforts to create a more inclusive and equitable working environment not only in construction but also in other male-dominated industries.

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ABBREVIATIONS (ACRONYMS)

QS Quantity Surveyor

VS Valuation Surveyor

LS Land Surveyor

ISU Institute of Surveyors of Uganda

STEM Science, Technology, Engineering, and Mathematics

WQS Women in Quantity Surveying

ILO International Labor Organization

1 CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

The construction industry is a significant contributor to the growth of economies worldwide, providing employment opportunities and facilitating infrastructural development. However, the industry has been facing challenges related to gender inclusivity and diversity, with women being underrepresented in the industry (Yehuda & Brooks, 2008). This underrepresentation is a global issue that has been acknowledged by various stakeholders in the construction industry. Globally, the construction industry has been grappling with gender inclusivity challenges for decades. According to a report by the International Labor Organization (ILO), women make up only 10% of the construction workforce worldwide. The report further highlights that, women are more likely to work in low-skilled and low-paying jobs in the industry, with limited opportunities for career progression (Juntunen et al., 2012). The gender pay gap in the industry is also significant, with women earning up to 30% less than their male counterparts. The low representation of women in the construction industry is a missed opportunity for economic growth, considering the positive correlation between gender diversity and business performance.

In Africa, the underrepresentation of women in the construction industry is a widespread phenomenon. According to a report by the African Development Bank (AfDB), women constitute only 12% of the construction workforce in Africa. The report further notes that women in the construction industry are more likely to work in non-technical roles, with limited access to training and development opportunities. In Uganda, the situation is not any different, with women being underrepresented in various construction professions, including surveying. Women in the Ugandan construction industry face various challenges, including gender stereotypes, cultural barriers, and lack of access to resources and support systems.

In Uganda, the construction industry is a significant contributor to the economy, providing employment opportunities and facilitating infrastructural development. However, the industry is marred by gender disparities, with women being underrepresented in various professions. According to a report by the Uganda Bureau of Statistics (UBOS), women make up only 13% of the construction workforce in Uganda. The report further notes that women in the construction industry are more likely to work in non-technical roles, with limited opportunities for career

progression. Women in the Ugandan construction industry face various challenges, including discrimination, sexual harassment, lack of access to training and development opportunities, and limited access to finance and resource (Eaton & Morton, 2017). While previous studies have examined gender disparities in the construction industry, there is a paucity of research on the rate of attrition of female surveyors from the Ugandan construction industry (Juntunen et al., 2012). This research aims to fill this gap by examining the factors contributing to the attrition of female surveyors from the industry.

The underrepresentation of women in the construction industry is a global issue that requires urgent attention (Akullo et al., 2020). In Uganda, the situation is not any different, with women being underrepresented in various construction professions, including surveying. The rate of attrition of female surveyors from the Ugandan construction industry is a significant concern that requires further examination. This research aims to fill this gap by identifying the factors contributing to the attrition of female surveyors from the industry. The research findings will provide insights into the challenges facing female surveyors in the Ugandan construction industry and inform policies and strategies to promote gender inclusivity and diversity in the industry.

1.2 Problem Statement

Globally, women are still underrepresented in male dominated professions, such as in construction, particularly Quantity Surveying, their share decreases with each step of the professional hierarchy. Although women have infiltrated all levels of the construction industry, a lot of antecedents that made it a male-dominated profession persist in Uganda. The status of female Quantity Surveyors is still lacking as they face many challenges related to stereo-typing that they cannot manage construction work well because they are women, and few managers encourage them to join and stay at work as Quantity Surveyors in the Ugandan Construction Industry. The current study will examine the rate of attrition of female Quantity Surveyors from the Ugandan Construction Industry.

1.3 Objectives of the Study

1.3.1 Main Objective

To examine the rate of attrition of female Quantity Surveyors from the construction Industry.

1.3.2 Specific Objectives

i. To determine the number of female graduate Q. Ss from the universities in Uganda over a 5-year period.
ii. To determine the number of practicing female Q. Ss in the construction industry over the last 5 years.
iii. To establish the annual attrition rate of the female Q. Ss from the industry.
iv. To examine the factors influencing the rate of attrition of the female Q. Ss from the industry.

1.4 Significance of the Study

This study addressed gender inequality in a traditionally male dominated sector, identified the factors contributing to attrition and promoted strategies for a more equitable and inclusive work environment. Retaining skilled female surveyors is crucial for long term industry growth and economic development. The study`s findings informed policies and interventions that foster diversity and inclusion, harnessing the benefits of diverse perspectives and enhancing organizational performance. By understanding attrition rates and implementing targeted measures, the study was expected to promote the retention of talented female surveyors, leading to increased productivity, innovation, and economic gains. Overall, the research was expected to contribute to evidence based policy formulation, support a skilled work force, and create a more inclusive and prosperous construction industry in Uganda.

1.5 Justification

This study was highly justified as it filled a critical knowledge gap, addressed gender inequality, supported industry sustainability, and had broader societal implications. By uncovering the factors contributing to attrition, this study was expected to inform about targeted strategies and interventions to create a more inclusive and supportive work environment. Retaining skilled female surveyors is essential for long term industry growth and productivity. Additionally, creating awareness about gender disparities and drive advocacy efforts for equal representation and opportunities hence holding significant importance in advancing gender equality, promoting industry sustainability, and creating a more inclusive construction sector in Uganda.

1.6 Scope of the Study

1.6.1 Content

The study was about the rate of attrition of the female Quantity Surveyors from the Ugandan construction industry. It examined the number of graduate Quantity Surveyors, those in the field, attrition rates and the factors as to why they opt for other professions, and not the Quantity Surveying field.

1.6.2 Time

This research was intended to be carried out for approximately six (06) months from November 2022 to May 2023. The first three (03) months were designated for proposal formulation while the rest of the time were for data collection, analysis, and report writing after which the research was presented. The report was submitted in May 2023. In terms of the research, the period was for the last ten (5) years from 2017 – 2022.

1.6.3 Geographical

The research study was limited to the female Quantity Surveyors operating in Kampala District, particularly the Central region as shown in Figure 1-1 below.

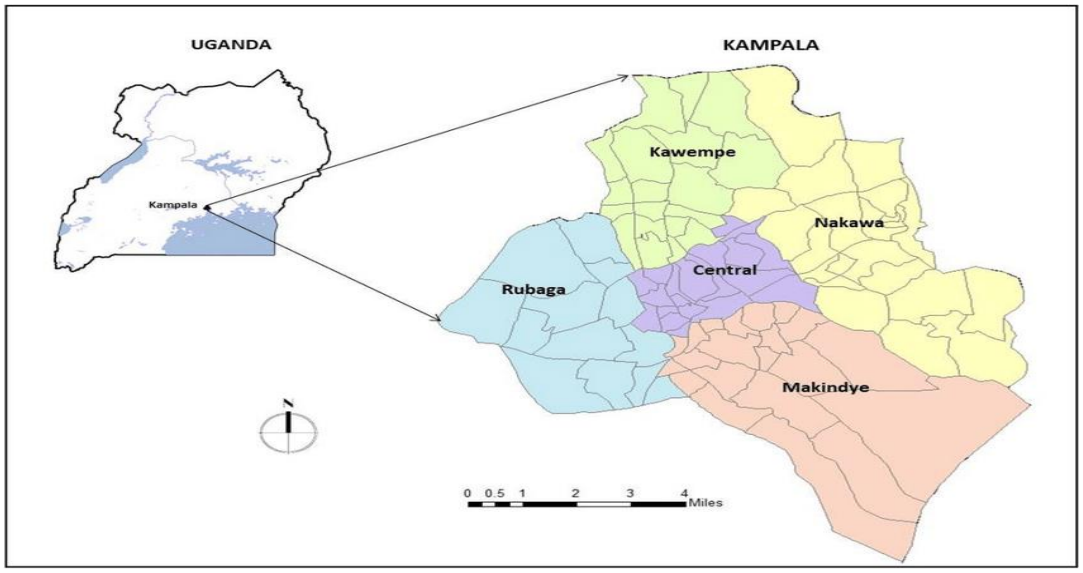

Figure 1-1: Map of Uganda showing Kampala District

2 CHAPTER TWO: LITERATURE REVIEW

2.1 The Number of Female Graduate Surveyors from the University

According to Mujuzi (2019), study investigated gender disparities in career choices among STEM (Science, Technology, Engineering, and Mathematics) fields in Uganda, including surveying. The research revealed that despite an increasing number of female students enrolling in STEM programs, there remains a significant underrepresentation of women in fields traditionally dominated by men, including surveying. Furthermore, Namubiru and Namwamba (2017), examined factors influencing female students' participation in STEM education in Uganda. The study highlighted societal and cultural factors that discourage girls from pursuing STEM careers, including surveying. It emphasized the need to address gender biases, provide mentorship, and create supportive learning environments to increase female representation in STEM fields.

The Uganda National Household Survey provided valuable data on educational attainment and employment across various sectors. While not specific to surveying, this report offered insights into the overall representation of women in higher education in Uganda and provided a context for understanding the enrollment patterns and potential challenges faced by female surveying student (Nabikolo & Najjuma, 2019; Statistics, 2016) in their study investigated barriers to women's leadership positions in the construction industry in Uganda. While not focused solely on surveying, it provided insights into the broader challenges faced by women in the construction sector, including limited opportunities for career advancement and gender biases. These barriers may have influenced the number of female graduate surveyors entering the industry. Akullo et al. (2020), specifically explored factors influencing the career choice of female students in surveying at Makerere University in Uganda. The research identified both internal and external factors, including personal interest, role models, family support, and gender biases, that shape female students' decisions to pursue surveying programs.

Overall, the reviewed literature highlighted the underrepresentation of women in surveying programs in Uganda and identified societal, cultural, and educational factors that contribute to this imbalance. The studies emphasized the need for targeted interventions, such as mentorship programs, supportive learning environments, and challenging gender biases, to attract and retain more female students in surveying programs in Ugandan universities. These interventions are

crucial for increasing the number of female graduate surveyors and fostering gender equality in the profession.

2.2 The Number of Practicing Female Quantity Surveyors in the Construction Industry

Despite the gains in female engineering graduates, only 11.7% of the women are practicing engineers, a figure that has been constant for the past two decades. Juntunen et al. (2012), noted that women have successfully infiltrated all levels of the construction industry. The industry is gradually becoming all-inclusive, unlike its historic male-domination. In the surveying profession, there is a global rise in female surveyors from 6% to 14%; in Africa, 15% of the Royal Institution of Proceedings of the 5th Research Conference of the NIQS (RECON 5), Chartered Surveyors (RICS) professionals are female (Sang & Dainty, 2019). In Nigeria, 456 (or 11%) of the 4126 memberships of the Nigerian Institute of Quantity Surveyors (NIQS) are registered WQS (NIQS, 2019); although the number may be higher, as not all WQS are registered with the NIQS.

According to records from the Surveyors Registration Board of Uganda (2021), the Quantitative Surveying Profession and practice in Uganda is governed by the Surveyors Registration Act (Cap 275). Surveyors, mining and hydrological surveyors, valuation surveyors as well as Land Agents and other Professionals responsible for the management of land and/or buildings. As of 31st December 2020, there were 11 registered female Quantity Surveyors of the total number of 69 registered Quantity Surveyors in Uganda. According to Eaton and Morton (2017), further asserts that even though construction is not an obvious choice for most women, several of them are building successful and fulfilling careers; with female RICS professionals holding senior positions with cost consultants, contractors and developers. WQS possess six core competencies, which are procurement and tendering, quantification and costing of construction works, project financial control or reporting, contract practice, design economics and cost planning, construction technology and environmental services that make them relevant in the industry.

2.3 The Annual Attrition Rate of the Female Quantity Surveyors from the Industry

Globally, women make up less than 20% of the construction workforce Lynch (2007), with 9% in the UK Statistics (2015) and 9.1% in the US. Even with the skills and competencies possessed by women, only two-thirds work in the industry mostly in secretarial/clerical, administrative and

laborer roles; while less than 2% work as professionals in consultancy firms and very few works on construction (Naoum, 2002). According to Foley (2020), challenges faced by women in the construction industry are more understated compared to 30 years ago, but they do exist. Women are also confronted with numerous obstacles working against their participation within the industry EMTA (2002). These obstacles have been extensively reported in extant studies; the key obstacles being male domination and lack of diversity and under-representation in recruitment and retention

2.4 The Factors Influencing the Rate of Attrition of the Female Quantity Surveyors from the Industry

The peculiar challenges that women Quantity Surveyors (WQS) working in the industry face are not highlighted in extant literature as studies in this area are scant, but some studies like that of Foley (2020) noted that WQS faced the challenge of variance in the standard for men and women within the industry, pay disparity, exclusion from leadership events, and negative words to describe positive skills exhibited by women. Furthermore, Eaton and Morton (2017) asserted that women still face countless challenges in construction that men are exempted from such as variance in pay in comparison to their male colleagues of the same grade, a stereotypical bias that women have diminished physical strength, and prejudice and trust in women's capability. She further stressed that there are instances where women are excluded from certain projects as it is believed they cannot handle being on site.

Interestingly, Powell et al. (2008) opined that women experience difficulties in developing their careers within the industry due to barriers that they face. There are societal perspectives and masculinity involved in engineering work for example one female engineer during a public lecture at Kyambogo noted that when she was not successfully offered the Job after a job Interview that she held with one of the principal companies in the country on a reason that a panelist thought she would not be able to lift a minor machine, on top of her quantity surveyor's job or work.

Basically, EMTA (2002) posited that women's participation in the construction industry is low and that one major reason for this is the barriers faced by the women in construction industry. The male dominated nature of the construction industry represents a significant barrier to female recruitment (entry), career progression (development) and retention. The most obvious irritate among the construction industry is sexual harassment (Lynch, 2007). Gurgaon (2006) notes that

the conservative attitude of female Quantity Surveyors has also been identified as another major factor hindering the awareness level of female Quantity Surveying profession. Various traces of conservatism by Quantity Surveyors have also been identified such as lack of good marketing strategy, sub-consultant status, inability to embrace change and inability to invest in necessary technology and lack of career progression.

Nandi et al, (2015) states that some of the constraints portrayed by different authors are as follow recruitment practices biased against women. Women family commitments, a lack of role models, poor career advice, peer pressure and poor educational experiences (Muztagata, 2015), while Okine and Oculi (2004 cited in Muztagata, 2015) identified some of the factors that created drawbacks to the quantitative surveying career pursuits of women such as pregnancy, maternity, child rearing, emotional stress and sexual advances from senior male officers, uncomfortable menstrual cycle pains which will throw the female counter part in balance for some days and opt for off duties. The body structure/ formation of women differs from that of the male counterpart and also the excessive stress weaken female earlier.

Milagros and Florio (2015), as cited in Costa and Pinto (2017), identified the stress experienced by professionals as occupational stress. According to Salam (2016), stress can negatively impact the work quality of a professional. Abdullah, et al. (2013) stated that being a construction professional, a quantity surveyor (QS) working in a construction project has to minimise project cost and achieve value for money while meeting the required standards, which is a challenging task. Bowen, et al. (2013) highlighted that 98% of the QSs working are not satisfied with their jobs despite being entitled to better payments (Pantoja, et al., 2019; Chan, et al., 2020).

Studies on general women participation within the construction industry (English et al., 2006, cited in Patel and Pereda (2016) have increased over the years. However, few have explored professional women's participation. Challenges to the effects of participation of women as professionals need to be investigated as their productivity is reportedly not different from that of their male counterparts in brain tasking job descriptions such as design, preparation of working drawings, estimating and tendering, and cost management (Yehuda & Brooks, 2008). For instance, when considering the important role of financial management (including costing, planning and financial

administration) of all construction activities Quantity Surveyors (QSs) undertake in the industry (Koneke et al., 2018), Quantity Surveyors' work encompasses both on-site and off-site functions.

2.5 Gaps and Conclusion

Most engineering and construction projects are large-scale operations, and completing them involves the investment of considerable amounts of money. A quantity surveyor is, in essence, the financial manager of a large engineering project who is tasked with maximizing the value of the project for his/her client by producing a most favorable financial plan (Chan, et al., 2020), assist in the identification of commercial risks and opportunities and carry out value engineering exercises as required, prepare and manage material procurement schedules, encourage and develop a culture of contractual awareness and ensure that contracts are fulfilled by rigidly maintaining records, contractual notifications, change control and so on, as well as preparing internal cost/value reports for upper management and other departments.

Since no previous study focused on the number of female graduate Surveyors from the university, the number of practicing female Quantity Surveyors in the construction industry, the annual attrition rate of the female Quantity Surveyors from the industry, and the factors influencing the rate of attrition of the female Quantity Surveyors from the industry, the current study will examine the rate of attrition of female Quantity Surveyors from the Ugandan Construction Industry.

3 CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter further describes the techniques and methods that were be used to achieve the objectives of this study. They included the research classification, research strategy, research design, data collection techniques, and data analysis methods. By employing the mixed methods of approach and considering both the qualitative and quantitative approach, these approaches provided a holistic understanding of the challenges faced by female surveyors in the construction industry.

3.2 Research Design

A research design is a plan for descriptive study. It involves having an overall plan for connecting the conceptual research problems to the pertinent empirical research. This articulated what data was required, the research methods and data analysis methods and how all these answered the research problem. This study was non-experimental, since it did not involve the manipulation of variables but rather data collection from the actual field and the use of existing data.

3.2 Research Approach

This was both a qualitative and quantitative study. Qualitative approach mainly looked at people's views and feelings about the study through answering questions about the complex natural phenomena, often with a purpose of describing and understanding the phenomena from the participants' point of view. Quantitative approach involved the statistical analysis of data collected with the purpose of answering questions about relationships of measured variables to explain, predict and control the phenomena.

3.3 Research Strategy

A research strategy is a plan that decides on how the research is to be carried out. It is a general plan for answering the research questions in a systematic manner. This study involved both primary data collection while in the field and the use of secondary data.

3.4 Target Population

The target population of the study were the female member Quantity Surveyors of the Institute of Surveyors of Uganda (ISU).

3.5 Sampling

Purposive sampling was used to select the participants who provided valuable insights into the phenomenon of this study.

3.5.1 Formula

Sample = $\{X_1, X_2, X_3, \ldots\ldots, X_n\}$

The formula provided represented the collection of selected participants where each participant was denoted as = $\{X_1, X_2, X_3, \ldots\ldots, X_n\}$

Random sampling was used for filling in the questionnaires, a number of ten (20) female graduates from each of the five (5) graduate years were selected to represent the rest as stated in the formula below;

$$\bar{x} = \frac{1}{N}\sum_{i=1}^{N} xi$$

Where;

X represents the sample mean

N is the sample mean

χ represents the individual elements in the population

Interviews were also done to obtain information for the research. The respondents to both the questionnaires and the interviews were selected at random without any form of biasness.

3.6 Data Collection Methods

The major data collection techniques were questionnaires, interviews and secondary data. Data that was used in the analysis stage were obtained from both primary and secondary data.

3.6.1 Data Sources

The secondary data used were from archival records from the college Heads of Department in the universities, Institute of Surveyors of Uganda (ISU). The primary data was from the data collected from the respondents during the study.

3.6.2 Questionnaire

A questionnaire is self-administered measurement instrument for obtaining data. Questionnaires were used to obtain quantitative data because, they considered the various research options for the systematic gathering of information. It was versatile, cost and time efficient inclusive of having the research done.

Here, questionnaires were employed consisting of both open and close ended questions. This availed freedom to the respondents to give in their honest and truthful opinions, since there was no one to challenge their responses as it is in the case of interviews. This built in complete confidence within the respondents to answer the questions minus shying away or being scared.

3.6.3 Interview

An interview is a face-to-face or virtual meeting of people especially for consultation. An interview schedule was used as a guidance for meeting the respondents. Respondents were key informers thus; they were needed to elaborate on several issues with the sole aim of soliciting for data. This further clarified certain information that were in the questionnaire and cross-checked certain information from the respondents. It also enhanced responses for questions which are regarded to as ‘sensitive.’ Interviews were important since they helped in getting information that was missing out in the questionnaires.

3.6.4 Observation

Observation is the action or process of closely monitoring something or someone through seeing, hearing or noticing. The number of female graduates from the universities for the past five (5) years was observed.

3.7 Data Analysis Techniques and Presentation

This study used statistical packages like Power BI and SPSS to produce statistical diagrams in the form of graphs in order to establish trends and relationships. Microsoft Word was used for compilation of the final report explaining the illustrations of the research outcomes.

3.7.1 Data Processing

Data processing was carried out through data coding to eliminate null value errors, tabulation by using tables to arrange data quickly for analysis; descriptive writing to capture and portray qualitative data captured; through interviews and questionnaires. The data collected was edited by studying the completed research tools to identify, minimize errors, mis clarification, incompleteness and, gaps in the responses obtained from the respondents.

3.7.2 Data Analysis

This is the manipulation of raw data from the field into meaningful information. Data was analyzed through the use of statistical tools such as Power BI, Microsoft word while, the qualitative data will be analyzed through the use of proportions.

3.7.3 Data Quality Control

The questionnaires and interview guides were tested prior to evaluate their reliability and validity. Prior testing was done before the actual field data collection among roughly 15 ladies. The validity of these tools was ascertained through having a one-on-one discussion of the questionnaires with my supervisor. The reliability of the questionnaires was ascertained by checking out the accuracy, completeness and consistency in the responses given by the respondents.

3.7.4 Ethical Considerations

Before the issuance of the questionnaires, a requisition permission letter to conduct the research was taken to the selected organization. Once the letter was approved, a cover letter was attached to the questionnaire, requesting the respondents to engage in the study. The whole research procedure was guided by sound ethical principles while, respecting dignity and rights of the respondents. The following were the ethical issues that were followed;

3.7.5 Informed Consent

No participant was coerced or forced into this research study. They voluntarily involved themselves in this while, having sufficient information so as to provide reasonable judgment on whether to participate or not.

3.7.6 Confidentiality and Anonymity

Responses from the researcher's respondents were treated with utmost confidentiality, rather than being used in a form that can impact injury or harm to them.

3.7.7 Plagiarism

Falsification or copying of someone else's work without their consent, which is an offence was not reflected in this research. To refrain from this, the APA format in referencing and citations was used.

3.8 Limitations of the study

i. The data collection method used such as surveys and self-reporting were inaccurate and biased. This compromised the reliability and validity of the data.
ii. It was a bit so hard to reach out and interview some female interviewees at the field.
iii. The study focused on a narrow set of variables such as attrition rates, work-life balance, discrimination, amongst others. This limited the comprehensive understanding of attrition.

4 CHAPTER FOUR: FINDINGS AND DISCUSSIONS

4.1 Overview of Survey Responses

Out of the 200 potential responses, 139 responses were obtained, representing a survey response rate of 69.5%. It was reported in Yehuda and Brooks (2008) that the average response rate for studies that utilized data collected from individuals was 52.7 percent, while that for studies that utilized data collected from organizations was 35.7. Due to this nature of research which required data collected from all female members of the Institute of Surveyors of Uganda (ISU), a relatively high response rate of 69.5% can be considered adequate. Most (80.4%) of the total respondents were female members of Institute of Surveyors of Uganda (ISU) compared to the remaining 19.6% who were male surveyors as per figure 4-1. This indicated that the participation of men in this survey was relatively low, hence reliable and credible information was expected since the female respondents were better placed to provide data relating to the factors contributing to the high attrition rate of female surveyors in Uganda.

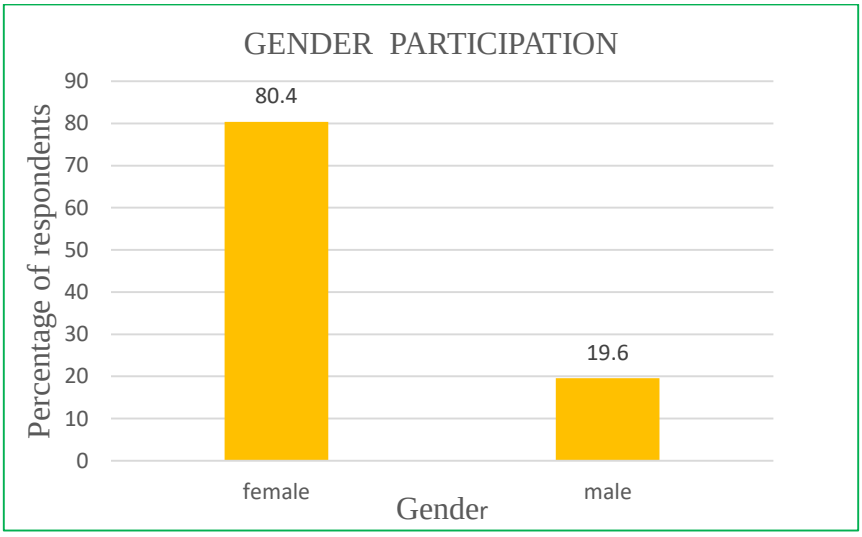

Figure 4-1: Gender Participation

Data in regards to the level of experience of the female surveyors is presented in figure 4-2, whereby 76.1% had experience not exceeding 5 years, 8.7% had above 5 years' experience but less than 10 years, and 6.5% had more than 10 years' experience as shown in figure 4-2.

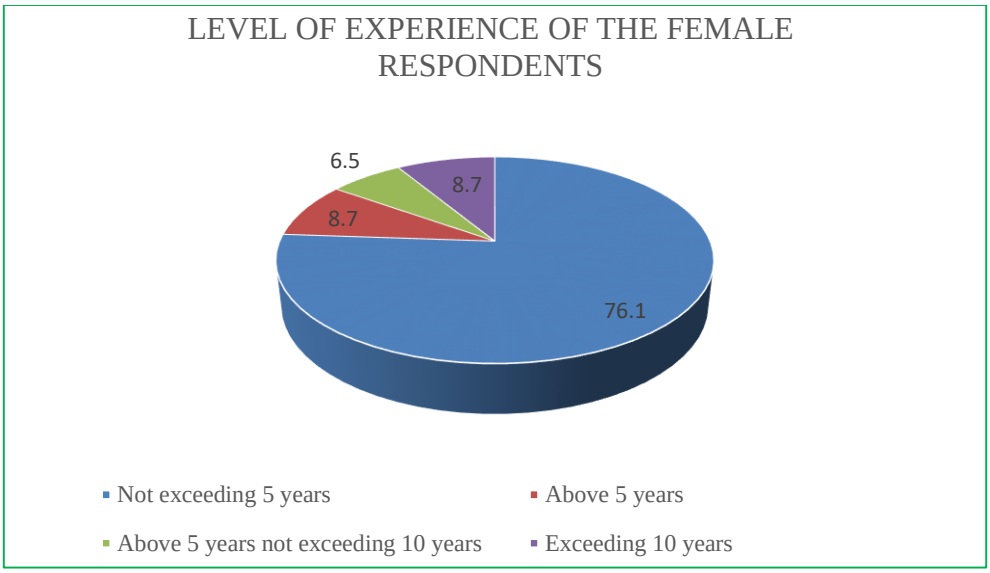

Figure 4-2: Level of Experience of Female Surveyors

4.2 Reliability of the Questionnaire

An analysis was carried out to find out the reliability of the questionnaire as a survey instrument. Reliability refers to how consistent or stable the research instrument regardless of the time that has passed and the conditions the observers present it. In the context of table 4-1 below, "Rating of challenges, Cronbach alpha 0.78" and "Rating of forms of harassment, Cronbach alpha 0.789" indicate the reliability or internal consistency of the measurements used to assess challenges and forms of harassment, respectively. Cronbach's alpha is a statistical measure that assesses the extent to which multiple items within a scale or questionnaire consistently measure the same underlying construct. It ranges from 0 to 1, where higher values indicate greater internal consistency.

In this case, a Cronbach's alpha value of 0.78 for the "Rating of challenges" suggests that the items within the scale or questionnaire assessing challenges in the context being studied are relatively consistent and reliable. Similarly, a Cronbach's alpha value of 0.789 for the "Rating of forms of harassment" indicates good internal consistency among the items used to measure different forms of harassment. These values suggest that the measurements used to assess challenges and forms of harassment have a relatively high degree of internal consistency, providing confidence in the reliability of the data collected for these variables.

Table 4-1: Reliability Statistics

	Rating of challenges	*Rating of forms of harassment*
Cronbach alpha	0.78	0.787

4.3 Number of Female Graduate Quantity Surveyors from Universities

The low level of female surveyors that are absorbed in the Ugandan construction industry prompted the need to assess the number of female graduate surveyors that universities let out at the end of different academic years. The analysis of the data on the number of female graduate surveyors in Uganda over the past five years as shown in Figure 4-3 below revealed a notable increase in the number of members, highlighting a positive trend towards women's education in the country.

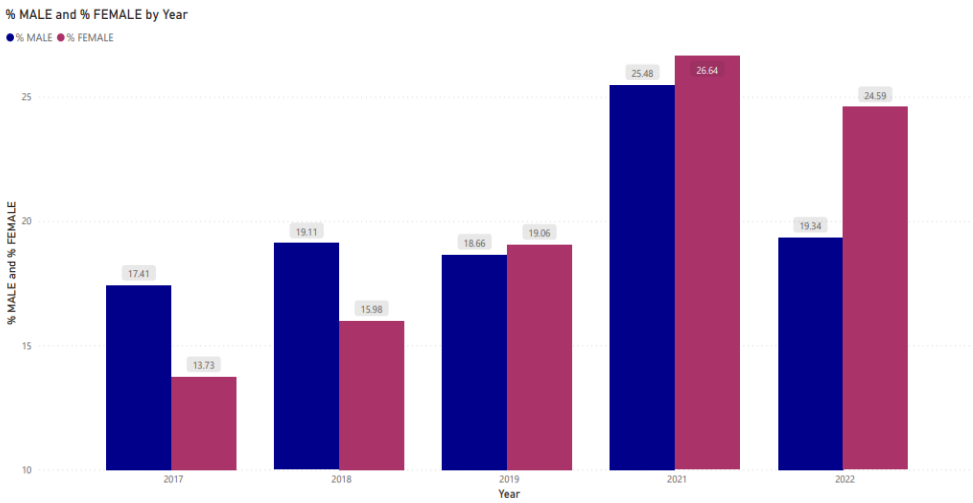

Figure 4-3: A Graph Showing Number of Graduate Surveyors Per Year

According to the figure 4-3 above, there has been a notable increase in trend between 2017 and 2022. Generally, the female graduates surveyors increased by 79.10% and males increased by 11.11%. In 2020, there was no graduates because of the COVID 19 pandemic. Across all metrics, male graduates had the most interesting recent trend and started trending up in 2017 rising by

11.11% in 5 years. Male graduates jumped from 153 to 170 during its steepest incline between 2017 and 2022.

4.3.1 Reasons for the Notable Increase of Graduate Surveyors Between 2017-2022

In the recent years, there has been a notable surge in the number of graduate surveyors emerging from the Ugandan universities. This has been due to the following reasons as presented in table 4-2 below.

Table 4-2: Reasons for the Increase in Female Graduate Surveyors Over Time

Reason	RII	Rank
Government initiative	0.81	1
Increased access to education	0.77	2
Increased awareness	0.61	3
Changing attitude	0.49	4

It was also noted that the reason for the notable increase of female surveyors included; Government initiatives, the Ugandan government has implemented several initiatives to encourage girls' education, including scholarships, bursaries and subsidies. These efforts may have helped to increase the number of female students enrolling in surveying courses. Furthermore, there has been increased awareness.

Over the past few years, there has been a growing awareness of the importance of gender equality and the benefits of educating girls. For example, one of the university objectives is to improve the gender and generational imbalances in the surveying profession. This has motivated more girls to pursue careers in surveying. In addition, there has been an improved access to education. In recent years, there has been an expansion of educational opportunities in Uganda including more schools at universities for example Kyambogo and Makerere University. Lastly, there has been a notable change in attitudes. There has been a gradual shift in attitudes towards gender roles in Uganda with acceptance of more women in traditionally male dominated fields for example surveying.

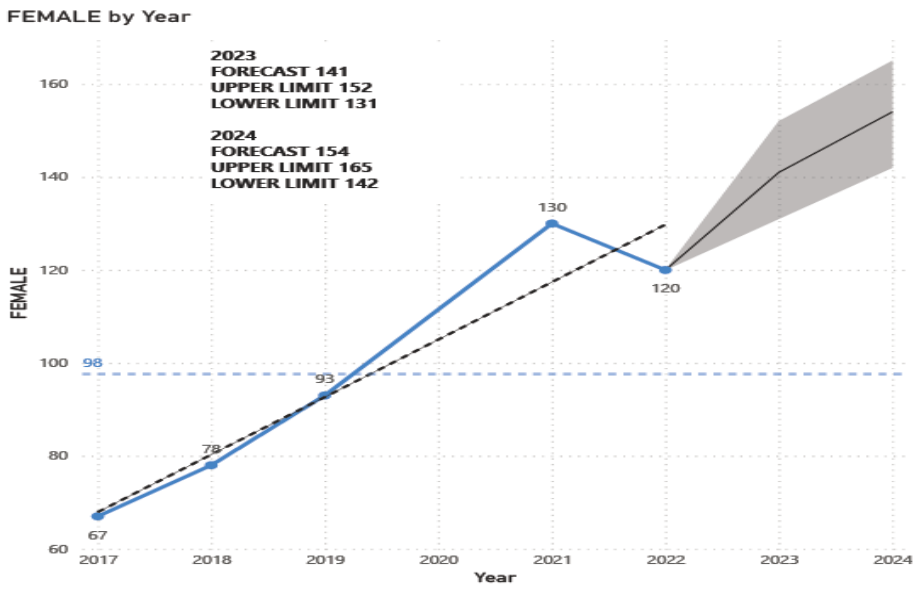

Figure 4-4: Female Forecast

Based on the forecasted data in Figure 4-4 above, it appeared that there will be an increase in the number of female graduate surveyors from the universities over the next two years with a 95% confidence interval. The data suggested that there will be an estimated 141 female graduates in 2023, hence an increase in the number of female surveyors. Furthermore, the number is expected to grow in 2024 with an estimate of 154 female graduates. Trend may be as a result of various factors such as increased awareness, and promotion of gender diversity in the construction industry, efforts to address gender bias and improve opportunities for women in surveying profession and the emergence of female role models and leaders in the field.

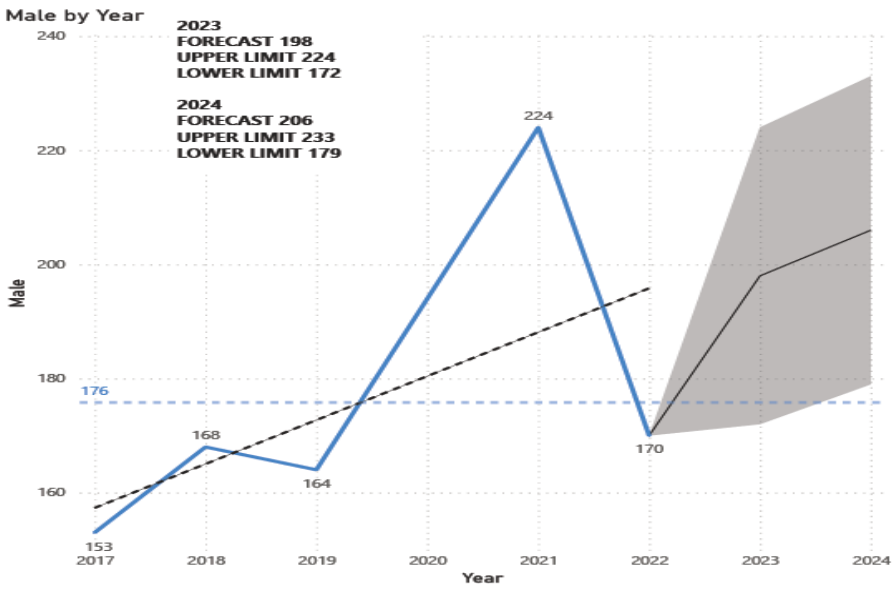

Figure 4-5: Male Forecast

However, in the Figure 4-5 above its suggested that there will be a forecast of 198 male graduates in 2023 and, it's expected to grow in 2024, with a forecast of 204 male graduates. This trend may be due to a number of factors such as increased demand for skilled workers in the construction industry, improved training and education opportunities for aspiring surveyors, and a growing awareness of the important role that surveyors play in construction projects as earlier discussed in (Sang & Dainty, 2019). However, it is important to note that the rate of increase of male graduates may not be as significant as that for females, and there may be a gender gap in the industry even as the overall number of surveyors increases.

4.4 Practicing Female Surveyors in the Construction Industry

Based on the trend analysis in Figure 4-6 below provided by the SRB (Surveyors Registration Board) and ISU in Uganda, there has been a gradual increase in the number of female surveyors in the industry from 2017 to 2022. In 2017, there were only 22 female surveyors compared to 211 male surveyors in Uganda. The gender gap in the industry was quite significant, with females accounting for only 9.4% of the total surveyors. However, there was a slight increase in the number of female surveyors in 2018, with a total of 23 female surveyors, representing 9.8% of the total surveyors. The number of female surveyors continued to increase in the following years, with 29 female surveyors in 2019, representing 11.1% of the total surveyors. In 2021, there was a

significant increase in the number of female surveyors to 45, representing 12.9% of the total surveyors. Interestingly, there was no change in the number of male surveyors between 2021 and 2022, with 305 male surveyors recorded in both years.

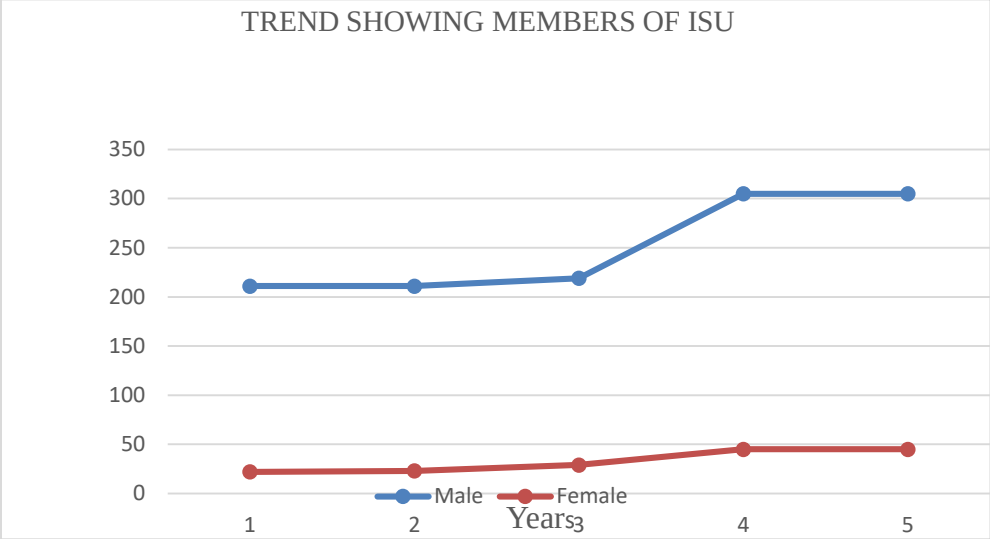

Figure 4-6: Trend Showing Registered Surveyors

Although the number of female surveyors has increased over the years, there is still a significant gender gap in the industry. The percentage of female surveyors has only increased by a few percentage points over the years, and they still account for less than 15% of the total surveyors. The basic descriptive analysis for the number of female surveyors is shown in table 4-3 below.

Table 4-3: Descriptive Statistics

Gender	**Mean**	**Standard Deviation**	**Minimum**	**Maximum**
Male	250.2	43.3	211	305
Female	*32.8*	*11.9*	*22*	*45*

4.5 Challenges Faced by Women in the Industry

A Relative Importance Index analysis was done to rank the factors affecting the female surveyors from the construction industry based on the severity score. The Relative Importance Index (RII) in regards to this study is a statistical tool that is used to determine the relative importance of

different factors or variables contributing to the attrition of female surveyors from the Ugandan construction industry. By calculating RII, different weights were assigned based on the perceptions or ratings from the different participants in the study. This allowed the researcher to quantify the significance or influence of each factor in relation to the attrition of female surveyors. This RII provided a relative ranking of factors, indicating the ones with the highest impact and those that should be prioritized for intervention or further investigation. This is shown in Figure 4-7 below.

Challenge	Severity Score	Severity Score	RII
Conservative industry culture towards women	9	0.09	1.29
Difficulty balancing work and raising kids	9	0.09	1.29
Discrimination against women in hiring	7	0.07	1.00
Exclusion and isolation from male colleagues	3	0.03	0.43
Favoritism towards male colleagues	6	0.06	0.86
Gender discrimination in project allocation	8	0.08	1.14
Harassment from clients and co-workers	5	0.05	0.71
Limited flexibility due to family commitments	6	0.06	0.86
Limited promotion opportunities for women	8	0.08	1.14
Menstrual inequity and stigma in the office	5	0.05	0.71
Microaggressions from male colleagues	4	0.04	0.57
Safety concerns in male-dominated job sites	7	0.07	1.00
Sexism from male colleagues and clients	8	0.08	1.14
Sexual harassment in the workplace	10	0.10	1.43
Unequal pay compared to male colleagues	10	0.10	1.43
Total	**105**	**1.00**	**15.00**

Figure 4-7: Relative Importance Indices

Furthermore, the Figure 4-8 below, illustrated the RII providing valuable insights into the relative significance of various factors, offering a comprehensive understanding of their impact on attrition rates.

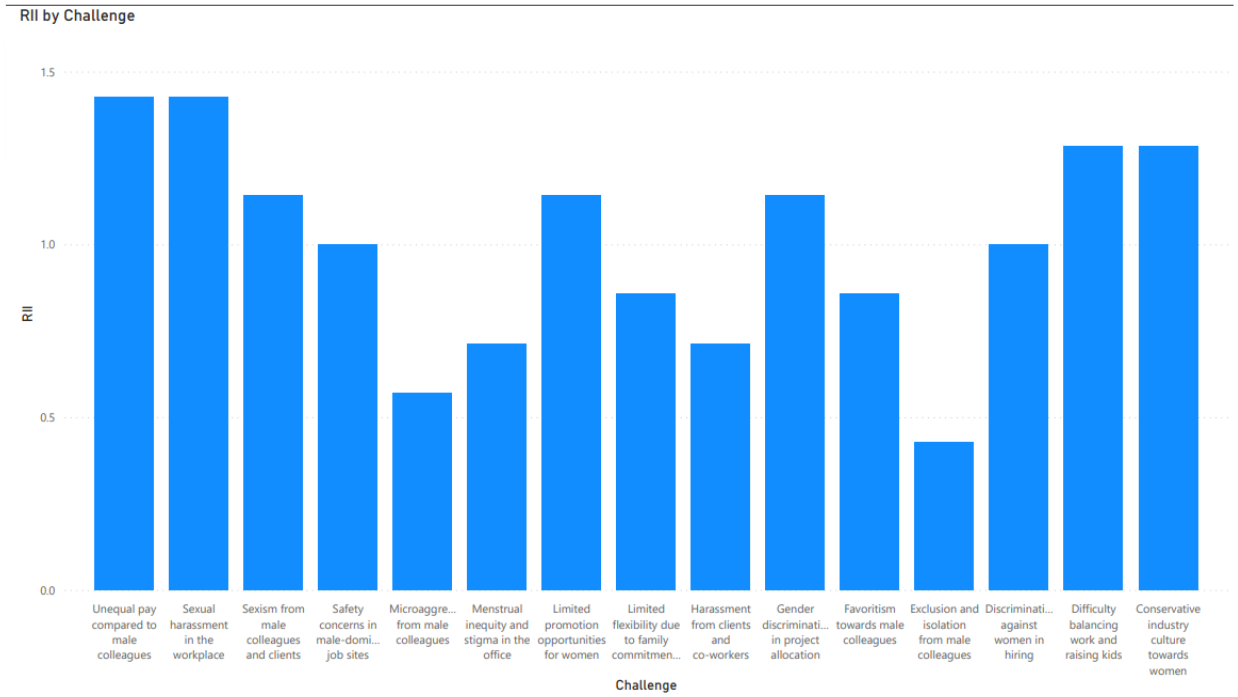

Figure 4-8: Graphical Representation of Relative Importance Indices

4.6 Regression Analysis

In an effort to find the exact moment in time that female quantity surveyors leave the profession, a linear regression was run. The results of this model are summarized as seen in the tables below. First table 4-4 below shows the model summary.

Table 4-4: Model Summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.654[a]	.428	.416	1.1410

a. Predictors: (Constant), SEVERITY SCORE

The R value represents the correlation between the year the females leave the profession and factors that cause the departure. The R^2 value on the other had represents how much of the total variation of the years of experience could be explained by the factors of which the former is a dependent variable and the later independent. This would indicate that 43% of the females in the

construction industry have left because of the factors identified. The severity score and years of experience have a moderately favorable correlation as indicated by the correlation coefficient R of 0.654. This indicates that there is a fine link between the number of years of experience attained prior to leaving and the severity of the factors that led to it.

The coefficient of determination (R-squared or R^2) is 0.428, which indicates that the severity score accounts for about 42.8% of the overall variation in years of experience. Taking into account the sample size and number of predictors, the adjusted R^2 value 0.416. Following the modification of other characteristic, it shows that the severity score accounts for 41.6% of the variation in years of experience. The average discrepancy between the estimated and actual values of years of experience is represented by the standard error of the estimate, which is 1.1410. it gives an insight of how accurate the model's predictions were. The ANOVA table is summarized as seen in table 4-5 below

Table 4-5: ANOVA table

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	46.753	1	46.753	35.912	.000[b]
	Residual	62.492	48	1.302		
	Total	109.245	49			

a. Dependent Variable: EXPERIENCE
b. Predictors: (Constant), SEVERITY SCORE

Based on the F-test result of 35.912 and a significance level of 0.000, the regression analysis is statistically significant (p 0.05). This shows that the regression equation, which takes into account the severity score, accurately predicts the number of years of experience. After taking into consideration the regression equation, the residual sum of squares (62.492) shows the variance in years of experience that cannot be explained. It captures the variation that the severity score cannot account for. The entire variability in years of experience is represented by the sum of the squares (109.245). Thereafter, the coefficients table was returned as shown in table 4-6 below.

Table 4-6: Coefficients Table

Coefficients						
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	T	Sig.
1	(Constant)	4.115	.467		8.815	.000
	SEVERITY SCORE	-.381	.064	-.654	-5.993	.000
a. Dependent Variable: EXPERIENCE						

The regression equation's constant term has the value 4.115. When the severity score is zero, this shows the projected years of experience. The severity score's coefficient is -0.381. This therefore means that for each unit rise in the severity score, a change of -0.381 is noticed in the projected years of experience. Additionally, the severity score has a moderately negative impact on the expected years of experience, as shown by the standardized coefficient (Beta), which is -0.654. The coefficient's significance is quantified by the t-value (-5.993). The severity score coefficient in this instance is statistically significant (p 0.05), indicating that it significantly contributes to the prediction model. The research shows that the severity score is a statistically significant predictor of years of experience, in conclusion. A higher severity score is correlated with a lower expected period of experience prior to leaving the profession. In terms of explaining the disparity in years of experience, the severity score accounts for 42.8%.

From the coefficients, we can now derive the equation that predicts the exact moment in time that the female quantity surveyors leave the field. Based on the analysis made from the collected data, it is feasible to make predictions on the amount of experience a female surveyor will have before leaving the field based on the severity score. In order to make a prediction on a particular female in the profession, one would need to know their severity score. The expected duration of experience before they depart may be determined by inputting the coefficients from the analysis into the regression equation. The equation would take the form of:

$$y = mx + c \text{ i.e., } y = 4.115 - 0.381x$$

Where; y would be the predicted years of experience

m would be severity score

x would be Coefficient for severity score and

c would be a constant.

For instance, the computation might be as follows:

Predicted Years of Experience = 4.115 + (2 * -0.381) = 3.353 in the case where the severity score for a specific female surveyor is 2, and the constant term in the equation is 4.115. As a result, according to this forecast, the female surveyor with a severity score of 2 will leave her career after 3.353 years of experience.

5 CONCLUSIONS

The analysis of data related to the number of female graduates in surveying from universities highlighted a concerning trend. Despite efforts to promote gender diversity in the field, the representation of female graduates in surveying programs remains disproportionately low. This underrepresentation at the educational level has had a significant implication for the future gender balance within the industry. This was due to various factors such as social and cultural biases, limited awareness and promotion of the profession among young women, inadequate supply networks, potential barriers to access and success in higher education. By creating the number of female graduates in surveying from universities, we can create stronger talent pipeline of diverse professionals who are equipped to contribute to the construction industry. The findings indicate that the representation of female surveyors in the surveying programs is significantly lower, specifically out of the total graduates in surveying, only 25.4% are females, then about 9% are absorbed into the industry compared to their male counterparts based on the ISU records. Furthermore, the research findings on the rate of attrition of the female surveyors from the universities revealed significant challenges and factors contributing to this issue. The study identified gender biases, limited career advancement opportunities, work - life balance challenges, and workplace culture as key factors leading to about 43% of these females leaving the construction industry. It was further predicted that the females tend to leave the construction industry at least after three (3) years of experience in the career due to the issues that affect them the most.

6 RECOMMENDATIONS

Promote awareness and visibility by implementing targeted awareness of campaigns to highlight the role of female surveyors in the construction industry. This can be achieved by showcasing successful female surveyors as role models to inspire young women to consider surveying as a career path.

Furthermore, support networks should be improved especially for undergraduates in their first years at the university by establishing mentorship programs that pair experienced female surveyors with aspiring professionals. These programs will provide guidance, support, and networking opportunities, helping female surveyors navigate their careers and overcome challenges.

It is imperative to establish industry-wide policies by working with professional associations, industry bodies and government policies to develop and implement policies that promote gender equity and diversity within the construction industry. These policies shall address equal opportunities for career advancement, gender pay gaps, and workplace discrimination. However, there should be continuous monitoring and collection of data on the attrition rates of female surveyors. This will regularly assess progress and evaluate the effectiveness of implemented initiatives. This data-driven approach will provide insights for refining strategies and interventions.

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APPENDICES

Appendix I – Research Work Plan

ACTIVITY SCHEDULE																												
YEAR	2022						2023																					
MONTH	November		December				January				February				March				April				May					
WEEK	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4		
ACTIVITY																												
Definition of Topic																												
Background and Problem Statement																												
Objectives ,Justification & Scope																												
Literature Review																												
Progress Reporting																												
Methodology and Appendices																												
Submission of Proposal																												
Presentation of Proposal																												
Data Collection																												
Data Analysis																												
Presentation of Findings																												
Discussions and Results																												
Conclusions and Recommendations																												
Submission of Draft Report																												
Final Presentation																												

Table 0-1

Appendix II – Project expenditure

No.	ITEM	QUANTITY	UNIT COST (UGX)	AMOUNT
1	Transport	Item	150000	150000
2	Airtime	Item	25000	25000
3	Internet (software tutorials)	Item	70000	70,000
4	Power	Item	30000	30000
	BI installation			
	TOTAL			**275,000**

Table 0-2

RESEARCH QUESTIONNAIRE

TOPIC: EXAMINING THE RATE OF ATTRITION OF FEMALE SURVEYORS FROM THE UGANDAN CONSTRUCTION INDUSTRY

Dear Participant, my name is Rutangye Josephine, a Quantity Surveying student currently in my final year. I would like to invite you to take part in this questionnaire aimed at **"Examining the rate of attrition of female Surveyors from the Ugandan construction industry."**

Your participation in this study is highly appreciated and will contribute to my understanding of the challenges faced by women in this field."

Thank you!

1. What is your gender?

Male

Female

2. How many years have you been working in the construction industry?

Not exceeding 5 years

Above 5 years

Above 5 years not exceeding 10 years

Exceeding 10 years

3. Have you ever experienced discrimination in the work place?

- Yes
- No
- I prefer not to say

4. Have you ever experienced harassment in your work place?

- Yes
- No
- I prefer not to say

5. If yes, please rate the following forms of harassment or discrimination as stated below.

1. Never 2. Once 3. Frequently

Sexual harassment

1
2
3

6. Have you ever experienced discrimination in the work place?

- Yes
- No
- I prefer not to say

Gender discrimination (treated miss fairly because of their gender)

1
2
3

7. Miso aggressions (disrespectful comments towards one's identity)

1
2
3

8. Harassment from Co-workers/Clients

1
2
3

9. Exclusion and Isolation (being isolated from the rest of the team)

1
2
3

10. Other challenges faced by a female surveyor in the construction industry. Please rate this.

1. Never 2. Once 3. Frequently

Raising children

1

2

3

11.

10. Female Conservatism

1

2

3

11. Family Commitments

1

2

3

13. What other challenges do you feel are important in this research?