**CHAPTER ONE**

**INTRODUCTION**

* 1. **Background of the Study**

Clance and Imes (1978) first used the term "imposter phenomenon" to describe a constant trend of people who consistently feel intellectually phony and secretly incompetent despite their real credentials and accomplishments. An imposter cannot internalize their achievement in the right way. They may take steps to maintain this state (e.g., excessive diligence, intellectual inauthenticity, and charm) because they believe they have succeeded in making everyone else think they are exceptionally brilliant (Clance & Imes, 1978). Reluctance to accept credit for successes, self-doubt, and a propensity to ascribe success to outside factors are among the most typical impostor symptoms (Clance, 1985; Robinson & Goodpaster, 1991). People who suffer from impostor syndrome are continuously concerned that others will expose their forgery and let it be known they do not belong.

The impostor phenomenon, also known as "impostorism," refers to a broad way of thinking that occurs among high achievers who, despite ongoing achievement, doubt the source of their success to be internal aptitudes ([Clance and Imes, 1978](#_ENREF_2)). Impostorism is the practice of attributing success to uncontrollable forces like chance, charisma, or even human error (Harvey & Katz, 1985). An imposter may frequently feel like a fraud, eagerly anticipating that someone would call their bluff and reveal that they somehow tricked their way to the top ([Cokley et al., 2013](#_ENREF_4), [Cover, 2012](#_ENREF_5), [Kumar and Jagacinski, 2006](#_ENREF_12)) (Cokley, McClain, Enciso, & Martinez, 2013; Jostl, Bergsmann, Luftenegger, Schober, & Spiel, 2012; Kumar & Jagacinski, 2006; also Mattie, Gietzen, Davis, & Prata, 2008; Vergauwe Wille, Feys, De Fruyt, & Anseel, 2015, for evidence on impostorism outside of academia).

Previous studies have shown that impostorism is associated with a number of other unfavorable personality traits, such as lower performance expectations (despite prior evidence to the contrary), a more negative self-concept, and greater psychological discomfort (Chrisman, Pieper, Clance, Holland & Glickauf-Huges, 1995; Henning, Ey, & Shaw, 1998; McGregor, Gee, & Posey, 2008).

The tendency to disregard positive feedback (Gibson-Beverly & Schwartz, 2008), to overgeneralize a failure as utter incompetence (Imes & Clance, 1984), and to engage in greater perfectionistic behaviors are also connected with impostor beliefs (Bernard, Dollinger, & Ramaniah, 2002). (Thompson, Davis, & Davidson, 1998). Impostorism, avoidant and anxious attachment styles, as well as a lesser sense of entitlement, are all significantly correlated (i.e., what an individual believes she has the right to expect from others; Gibson-Beverly & Schwartz, 2008).

Fears of impostor among university females were linked to a larger acceptance of the entity theory of intelligence (Kumar & Jagacinski, 2006). Students who adopt an entity viewpoint view intelligence as a fixed characteristic and tend to blame their academic struggles on their lack of intellect. People who believe in the incremental approach, on the other hand, see intellect as flexible and are more prone to see scholastic failures as teaching opportunities (Blackwell, Trzesniewski, & Dweck, 2007; Dweck, 1986). Additionally, impostor beliefs are positively correlated with the amount of hours per week that females spent studying, (academic persistence attitudes) showing that the greater a female student's sense of impostorism, the longer she spent on academic work (King & Cooley, 1995). However, a study of graduate students across fields (46% in STEM) found that impostorism was associated with more "downshifting," especially for women (Collett & Avelis, 2013).

Downshifting is the process of switching from a desired research-intensive job (such as a tenure-track post) to a less desirable non-tenure-track or teaching role. According to Collett and Avelis, women are almost twice as likely to downshift as males are—11% vs 6%, respectively. However, it is plausible that more controllable elements associated to academic perseverance, such as self-efficacy, the training environment, and gender representation, might mitigate the impact of impostor behavior on STEM programmes.

In 2012, undergraduate women obtained over 40% of the degrees in mathematics and statistics, over two-thirds of the degrees in biological and agricultural sciences, and over 40% of the degrees in physical sciences (National Science Board [NSB], 2012). However, the percentage of female students majoring in computer science and engineering has remained below 20%. Over the past 20 years, more women have received degrees in STEM fields than ever before, slightly more than 50% of these degrees coming in the biological sciences, over 50% in the agricultural sciences, and more than 40% in the earth, atmospheric, and ocean sciences (NSB, 2012). However, in the physical sciences (32%), computer sciences (28%), engineering (23%), and mathematics/statistics (21%), women got proportionally fewer doctorates than males did ([Tao and Gloria, 2019](#_ENREF_16)). While the data show considerable progress in tackling gender disparity in STEM-related sectors, persistent patterns of inequality still exist ([Kanny et al., 2014](#_ENREF_11), [Wang and Degol, 2017](#_ENREF_17)). Social cognitive traits like self-efficacy may account for these discrepancies, at least in part ([Byars-Winston et al., 2010](#_ENREF_1), [Hill et al., 2010](#_ENREF_9)). The negative impacts of impostorism on women might provide an alternate explanation for the gender gaps in STEM. This study therefore aims to examine impostorism phenomenon and academic persistence attitudes among women in STEM programmes: the mediating role of Self-efficacy.

* 1. **Problem Statement**

Attracting and retaining more women in the STEM programmes will maximize innovation, creativity, and competitiveness. Scientists and engineers are working to solve some of the most vexing challenges of our time—finding cures for diseases like cancer and malaria, tackling global warming, providing people with clean drinking water, developing renewable energy sources, and understanding the origins of the universe ([Tao and Gloria, 2019](#_ENREF_16)). Engineers design many of the things we use daily—buildings, bridges, computers, cars, wheelchairs, and X-ray machines. When women are not involved in the design of these products, needs and desires unique to women may be overlooked ([Hill et al., 2010](#_ENREF_9)).

Despite the tremendous gains that girls and women have made in education and the workforce during the past 50 years, progress has been uneven, and certain scientific and engineering disciplines remain overwhelmingly male. Some of the largest increases will be in engineering- and computer-related fields—fields in which women currently hold one-quarter or fewer positions ([Lehming et al., 2010](#_ENREF_13), [Quinn, 2010](#_ENREF_15)).

Students and workers who deal with impostor syndrome frequently have increased performance-related stress and anxiety ([Cusack et al., 2013](#_ENREF_7), [Halbesleben, 2006](#_ENREF_8)). They use a lot of energy trying to cover up their sense of inadequacy by working too much and employing avoidance techniques, which leads to low job satisfaction, high emotional tiredness, and a higher risk of burnout ([Crawford et al., 2016](#_ENREF_6), [Hutchins et al., 2018](#_ENREF_10)). While the data show considerable progress in tackling gender disparity in STEM-related sectors, persistent patterns of inequality still exist ([Kanny et al., 2014](#_ENREF_11), [Wang and Degol, 2017](#_ENREF_17)). Impostorism may account for these discrepancies, at least in part (Byars-Winston, Estrada, Howard, Davis, & Zalapa, 2010; Ceci, Williams, & Barnett, 2009; Hill, Corbett, & Rose, 2010). The negative impacts of impostorism on female students might therefore provide an alternate explanation for the gender gaps in STEM ([Tao and Gloria, 2019](#_ENREF_16)).

Dialogue for many women who, despite having expertise or success in a given subject, continue to wrestle with unremitting beliefs about being a fraud ([Tao and Gloria, 2019](#_ENREF_16)). They observed a common experience expressed by high-achieving women in educational and employment contexts, including a chronic fearfulness of being revealed as an “intellectual phony” and undeserving of their achievements. However, the associated effects of impostor phenomenon or “impostorism” on women in science, technology, engineering, and math (STEM) contexts, however, have been examined less. Little research has been done on the impostor phenomenon's (also known as "impostorism") consequences on women who work in STEM fields. This is because representation of women majoring in computer science and engineering continued to hover under 20% ([Clark et al., 2014](#_ENREF_3)).

There are some discrepancies in research findings that revealed that impostor behaviors were shown to be higher for females than for males ([Leonhardt et al., 2017](#_ENREF_14), [Kumar and Jagacinski, 2006](#_ENREF_12)). Though evidence is mounting that mild to severe impostor sentiments are a fairly common occurrence in people of both sexes ([Clark et al., 2014](#_ENREF_3)), 40% are female students ([Yaffe, 2020](#_ENREF_18)). This study therefore aims to examine how imposter behavior and academic persistence affect female students on STEM programmes.

* 1. **Objective of the Study**

The main objective of this study is to examine impostorism phenomenon and academic persistence attitudes among women in STEM programmes with Self-efficacy as the mediating role. To achieve this objective, the study specifically seeks to:

1. Examine the relationship between impostor phenomenon and female students in STEM progammes.
2. Test the association between academic persistence attitude and female students in STEMS programmes
3. Examine the relationship between self-efficacy and STEM programs among female students
4. Test the moderation effect of self-efficacy on the relationship between imposter behavior and STEM programmes.
   1. **Research Questions**

To achieve the research objectives set above, the following research questions were posed:

1. What is the relationship between imposter phenomenon and female students in STEM programmes?
2. What is the relationship between academic persistence attitude and female students in STEM programmes?
3. What is the relationship between self-efficacy and female students in STEM programmes?
4. What is the moderation role of Self-efficacy on the relationship between imposter phenomenon and STEM programmes?
   1. **Significance of the Study**

This research would be carried out in response to the effect of imposter behavior and academic persistence attitudes by females in STEM programmes (Sezen & Cankaya, 2013). This study looks at the impact of imposter phenomenon on STEM programmes, using self-efficacy as a moderator. The findings of this study will be beneficial to a variety of agencies and organizations. Universities that are offering STEM programmes in developing nations, female students, and the government are among these professionals.

The outcomes of this study are expected to distribute empirical information important to STEM universities, allowing them to assess their admission processes, courses and method of teaching in order to improve studies among females. As a result, the research aims to educate female students and other scientist on the importance of incorporating self- efficacy and academic persistence attitudes among females in STEM programmes in order to improve their performance and encourage more females to enroll in STEM programmes since it can help contribute more to national development. The findings and suggestions from the study may be utilized as the foundation for policy reforms and practice towards the enrollment of female students.

The study is also going to make theoretical and empirical contribution to literature on imposter behavior, academic persistence and STEM which are so scarce in developing economic perspective for future studies. Introduction of self-efficacy on imposter phenomenon and academic persistence attitudes is novel and would therefore expand the horizon for further studies. The study would enrich the achievement goal theory and other behavioral theories that relates to personal achievement and self-worth.

* 1. **Scope of the Study**

The analysis of how imposter behavior and academic persistence attitudes impacts female students in STEM programmes is the subject of this study. Contextually, the study's goal is to look at the effects of imposter phenomenon and academic persistence among female students in STEM programmes. The research is limited to only female students in STEM programmes at KNUST. The study would be conducted in the Kumasi Metropolis in terms of geographical breadth in KNUST.

* 1. **Limitations of the Study**

There are a few limitations to this research. These limitations include a limited geographic area. The study took place in the Kumasi Metropolis, KNUST to be precise. The generalizability of the conclusions from this study may be unrealistic due to the study's limited geographical scope. When comparing the findings of this study to future investigations, future academics should keep this in mind.

Due to the tight deadline for completing the thesis, the research was constrained by lack of time. As a result, the researcher focused mainly on female students in STEM programmes at KNUST and was unable to expand the scope of the study to cover all universities in Ghana. In addition, the researcher found respondents' hesitation as a major barrier to data collection. Some respondents were unwilling to answer the surveys. In order to avoid that, the researcher informed respondents that all information collected was confidential and only for academic purposes. As a result, the respondents were no longer afraid of being victimized, and they freely answered all the questions in the questionnaire.

* 1. **Organization of the Study**

The study is organized into five chapters. The first chapter provides an overview, including background information, the research subject, objectives, and research questions. The significance of the study, scope and limits, as well as the study's organization, are all described in this chapter. The literature review, which is presented in second Chapter, examines the theoretical foundations as well as the empirical setting of the investigation. The third chapter discusses the methodology adopted for the study in detail. The study's design, population, sample selection devices, and sample determination approach are all discussed. This chapter covers data collecting sources and instruments, techniques, as well as data processing and handling. In addition, the models built for the research, as well as methodologies for estimations and analytic systems, are offered in the Chapter. The findings of the research are presented in fourth Chapter along with a discussion of the results. The fifth Chapter summarizes the study's findings, makes a conclusion, lays out policy suggestions, and points the way forward for further research.

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