

Disrupting Gender Stereotypes in STEM Education in Cameroon: Case of Silicon Mountain Buea

Isidore Agem Abah, Angela Etanke Kinge Parh, Julius Che Tita

Department of Journalism and Mass Communication, University of Buea, Buea, Cameroon

Email: ashlyisidore@gmail.com

How to cite this paper: Abah, I. A., Parh, A. E. K., & Tita, J. C. (2025). Disrupting Gender Stereotypes in STEM Education in Cameroon: Case of Silicon Mountain Buea. *Open Journal of Social Sciences*, 13, 154-185. <https://doi.org/10.4236/jss.2025.1311010>

Received: September 21, 2025

Accepted: November 8, 2025

Published: November 11, 2025

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Abstract

This study qualitatively investigates strategies used by female tech professionals in Buea, Cameroon, to challenge gender stereotypes in STEM education. Using in-depth interviews and thematic analysis, the paper identifies key disruptive measures such as academic orientation, lobbying, and the promotion of role models. The findings suggest that achieving gender parity through these efforts has significant positive implications for the education of girls, including increased enrollment, empowerment, and broader career opportunities.

Keywords

Disrupting, *Gender Stereotypes*, *STEM Education*, *Cameroon*

1. Introduction

The adoption of the Beijing Declaration and Platform for Action in 1995 articulated a comprehensive vision for a world in which every woman and girl can exercise their rights and make informed choices. This includes living free from violence, attending educational institutions, participating in decision-making processes, and receiving equal pay for equal work. The principles enshrined in this declaration have catalysed significant advancements for women across various sectors, including leadership roles, political participation, economic empowerment, peace and security initiatives, humanitarian efforts, governance, and nation-building. Nevertheless, despite these achievements, a critical challenge persists: the substantial underrepresentation of women in Science, Technology, Engineering, and Mathematics (STEM) fields.

Recent scholarship has illuminated the underrepresentation of women in STEM as a pressing issue (Corbett & Hill, 2015; Ong, Wright, Espinosa & Orfield,

2011; Patcha, 2015). Corbett and Hill (2015) contend that although an increasing number of women are enrolling in STEM subjects, their representation in STEM careers remains disproportionately low compared to their male counterparts. This imbalance is alarming, as it not only undermines gender equity but also presents a formidable challenge for the future, particularly given the growing importance of STEM disciplines in an increasingly interconnected and technology-driven global landscape. The opportunities for future employment, personal fulfilment, and financial success in STEM careers are vast, making it imperative to address this gender disparity.

Furthermore, education and ongoing training in STEM fields are vital for promoting societal advancement, fostering community development, and ensuring environmental sustainability (AlAli, Alsoud, & Athamneh, 2023). The contemporary relevance of STEM education cannot be overstated (Kareem, Thomas, & Nandini, 2022). As industries transform in response to emerging technologies, the demand for skilled professionals proficient in STEM disciplines continues to escalate. Additionally, societal challenges, ranging from environmental sustainability to advancements in healthcare, necessitate innovative, interdisciplinary solutions. In response, many communities are investing substantially in STEM education. However, a significant global concern remains the systemic underrepresentation of women in these fields, a challenge that is particularly pronounced in Cameroon, and specifically in the Silicon Mountain area of Buea.

The disparity in female admission and participation rates in STEM educational programmes within schools and universities is indicative of a larger societal issue. Despite the global nature of this concern, the underrepresentation of women in STEM disciplines within the context of Africa and Cameroon has not been sufficiently explored in scholarly research. This study aims to address this gap by examining how the Silicon Mountain area of Buea is actively working to disrupt existing gender stereotypes in STEM education and encourage more female students to embrace science and technology. The paper also looks at the implications of gender parity in STEM education on the education of the girl child in Cameroon.

2. Literature Review

Historical Overview of STEM

The concept of STEM (Science, Technology, Engineering, and Mathematics) has increasingly captured the attention of scholars within academia, eliciting diverse perspectives and interpretations (Blackley & Howell, 2015; Hafni, Herman, Nurlaelah, & Mustikasari, 2020; Rifandi & Rahmi, 2019; White, 2014).

This educational paradigm is characterised by its integrative approach, fostering the synergy between the distinct yet interconnected disciplines of science, technology, engineering, and mathematics (Patcha, 2015). The evolution of STEM has stimulated scholarly inquiry into its origins, with White (2014) tracing its conceptual development back to its initial designation as Science, Mathematics, En-

gineering, and Technology (SMET), an initiative spearheaded by the National Science Foundation (NSF). The prime objective of this initiative has been to cultivate critical thinking capabilities, thereby enhancing creativity and problem-solving skills, which are essential for augmenting students' competitiveness in the workforce.

Conversely, Reynolds (1992) posits that the emergence of STEM education can be traced to its application within engineering firms, wherein it facilitated the creation of revolutionary technologies. The Morrill Act of 1862, as the scholar highlights, was instrumental in establishing land-grant universities that initially emphasised agricultural training. Over time, these institutions expanded their curricula to incorporate engineering-based training programmes, thereby integrating STEM education into the workforce.

The post-World War II era significantly influenced the progression of STEM education, catalysing unprecedented technological innovations (Rifandi & Rahmi, 2019). The establishment of the NSF after the war not only recognised exceptional individuals but also aimed to preserve research and documentation associated with ground-breaking technological advancements.

The launch of Sputnik 1 by the Soviet Union in 1957 represented a pivotal moment in the evolution of STEM education. Wilkinson (2024) notes that Sputnik 1, followed shortly by Sputnik 2, rapidly emerged as symbols of Soviet military prowess in the eyes of many Americans. Media narratives underscored the dual nature of Sputnik 1 as both a scientific milestone and a military triumph. Wilkinson (2024) asserts that this development ignited the "Space Race" between the United States and the Soviet Union, compelling the United States to prioritise advancements in space exploration technology. White (2014) underscores the extensive implications of the Sputnik launch, which not only resulted in significant technological breakthroughs but also redefined national priorities in space exploration.

In parallel, the philosophical underpinnings of STEM, as articulated by Jolly (2014), transcend mere categorisation of interconnected disciplines. This philosophy represents an adaptive response to the evolving demands of the 21st-century labour market, nurturing essential mathematical and scientific proficiencies requisite for contemporary industries. In alignment with Jolly's perspective, Arrington (2017) delineates seven critical standards that can enhance the efficacy of STEM education: i) Mastery of content through active learning and practice, ii) Seamless integration of disciplines, iii) Capacity to interpret and transfer knowledge across various contexts, iv) Cultivation of an inquiry-based mind-set, v) Development of logical reasoning skills, vi) Emphasis on teamwork and collaborative problem-solving, and vii) Proficient and responsible utilisation of technology.

Gender Stereotypes in STEM Education

Gender stereotypes in STEM education have emerged as a significant concern in contemporary research, particularly in light of the increasing global demand for STEM professionals. Evidence suggests that individuals in STEM occupations generally experience more favourable labour market outcomes compared to those

in other fields (Hammond et al., 2020). However, there exists a troubling disparity between the burgeoning need for STEM professionals and the number of graduates entering these disciplines.

For instance, Lee and Lee (2025), as cited by Ferati et al. (2023), reported a decline in the global share of STEM graduates in higher education, plummeting from 34.88% to 22.44% between 1998 and 2018 across 143 countries. This decline is particularly stark among women, underscoring their underrepresentation in STEM degree programs.

The paradox becomes even more pronounced when considering that, despite women surpassing men in overall tertiary enrolment and graduation rates worldwide, they remain significantly underrepresented in STEM careers (Mullis, Martin & Foy, 2008; Rubiano-Matulevich et al., 2019; Sjøberg & Schreiner, 2010).

In Nigeria, Ndahi (2002) noted that a considerable percentage of parents expressed scepticism regarding the importance of girls engaging in industrial and technical education, which has reflected in female participation rates in undergraduate STEM courses across the country's six geopolitical zones (Salman, Yahaya & Adewara, 2011). Similar patterns of underrepresentation can be observed in Cameroon and other regions of sub-Saharan Africa.

The World Bank estimates that to tackle developmental challenges, there is a pressing need for an additional 2.5 million engineers in sub-Saharan Africa, amplifying the importance of cultivating both male and female talent within the STEM workforce.

Gender stereotypes are recognised as a significant contributing factor to the observed male-female disparity in STEM education (Gjersoe, 2018). Dele-Ajayi et al. (2018) define stereotypes as simplistic assumptions that attribute specific traits to individuals based on limited information about their group.

These stereotypes often shape individuals' career interests and aspirations in various ways. Hannover and Kessels (2004) argue that an individual's interest in a field correlates with the alignment between stereotypes and their self-perception. Further, Makarova, Aeschlimann, and Herzog (2019) contend that the masculine framing of STEM courses discourages women from pursuing careers in these disciplines.

Instructional materials, particularly textbooks, have been identified as perpetuating gender stereotypes within the sciences (Kerkhoven et al., 2016). Textbooks significantly influence young people's career aspirations and contribute to the beliefs and norms regarding gender roles (Mustapha, 2012; Lee, 2019). Master and Meltzoff (2016) categorise stereotypes related to STEM into two main types: "cultural fit" stereotypes and "ability" stereotypes.

"Cultural fit stereotypes" refer to the assumptions about the typical profile of individuals who are perceived to belong in specific fields. Carli et al. (2016) assert that men are often seen as more aligned with STEM fields, reinforcing the belief that men have a stronger preference for these disciplines than women. Supporting this premise, Cheryan, Plaut, Handron, and Hudson (2013), as well as Margolis

and Fisher (2002), highlight the stereotypes surrounding computer scientists in the contemporary US, depicting them as predominantly male, technologically adept, and socially awkward. Moreover, stereotypes about the culture of computer science often suggest that it is characterised by isolation, lacking qualities such as collaboration or community engagement (Diekman, Brown, Johnston, & Clark, 2010).

In contrast, “ability stereotypes,” as described by Kerkhoven et al. (2016), perpetuate the belief that males inherently possess greater ability, talent, or potential for success in STEM fields. This assertion is supported by multiple studies (Beilock, Rydell, & McConnell, 2007; Schmader, Johns, & Barquissau, 2004; Spencer, Steele, & Quinn, 1999), which suggest that STEM disciplines are often perceived as requiring exceptional intellect, a trait traditionally associated with males (Leslie, Cimpian, Meyer, & Freeland, 2015).

Both cultural fit and ability stereotypes are entrenched by various societal influences, including media portrayals, role models, academic frameworks, parental expectations, and peer attitudes (Cheryan, Master, & Meltzoff, 2015). Consequently, when girls compare themselves to these narrow stereotypes, they frequently perceive a mismatch, leading them to question their suitability for STEM fields (Master, Cheryan, & Meltzoff, 2016).

Barriers Faced by Women in STEM

Gender Research has identified numerous impediments that deter many women from pursuing careers in STEM (Science, Technology, Engineering, and Mathematics) fields. In their scholarly work, *Building Bridges between Psychological Science and Education: Cultural Stereotypes, STEM, and Equity*, Master and Meltzoff (2016) delineate four principal barriers that women face within these domains.

First, prevailing attitudes among parents, educators, and other influential figures often perpetuate the belief that these professions are more suited for males. This assertion is further substantiated by the findings of Eccles, Jacobs, & Harold (1990) and Sadker and Sadker (1994).

Second, the scarcity of visible female role models in STEM disciplines serves as a significant deterrent, a point echoed in the research conducted by Dasgupta (2011), Meltzoff (2013), and Murphy, Steele, and Gross (2007).

Third, there exists a systematic underestimation of girls’ abilities in STEM areas, as documented by Correll (2001) and Ehrlinger and Dunning (2003).

Lastly, gender discrimination continues to obstruct qualified women from accessing equivalent opportunities as their male peers, a phenomenon explored by Moss-Racusin et al. (2012) and Reuben, Sapienza, and Zingales (2014). These barriers collectively hinder women’s ability to fully engage with and thrive in STEM fields.

Why Gender Diversity in STEM is Important

The persistent lack of gender diversity in STEM (Science, Technology, Engineering, and Mathematics) remains a critical issue, despite the heightened focus on this topic in recent years (Holmes et al. 2018; Riegle-Crumb et al. 2012;

Kalpazidou Schmidt & Cacace 2019; Holman, Stuart-Fox & Hauser 2018; Graddy-Reed, Lanahan & Eyer 2019). Researchers have investigated this phenomenon from a variety of analytical perspectives (Ceci et al. 2014; Blackburn 2017; Verdugo-Castro, García-Holgado & Sánchez-Gómez 2022).

Smith (2025) posits that diversity within STEM encompasses the inclusion of individuals from a multitude of backgrounds, considering factors such as race, ethnicity, gender, sexual identity, socioeconomic status, and various abilities. In parallel, the National Centre for Science and Engineering Statistics (NCSES) (2023) defines gender diversity as the equitable representation of all genders, women, men, and non-binary individuals, within academic and professional environments. Notably, both Smith (2025) and NCSES (2023) underscore their concern regarding the historical deficiencies in gender diversity within STEM fields.

Smith (2025) highlights historical inequities, socioeconomic influences, and pervasive cultural stereotypes and biases as significant contributors to the lack of female representation in STEM. He articulates that these systemic barriers have resulted in the exclusion of numerous young women from potential STEM career pathways. Moreover, enhancing the representation of women in STEM disciplines has the potential to mitigate the global scarcity of STEM professionals, as evidenced by reports from the European Round Table of Industrialists (2009) and Langen and Dekkers (2005). Jean (2025) advocates for policymakers to proactively address educational disparities that disproportionately affect women in STEM.

Martin and Fisher-Ari (2021) underscore the manifold advantages of bridging the gender gap and cultivating gender diversity within STEM, which include promoting inclusivity, stimulating economic growth, enhancing products and services, fostering social progress, and improving research outcomes. She asserts that achieving gender diversity in STEM is not merely beneficial but is integral to the advancement of the global community. Effectively addressing the gender gap in STEM necessitates a holistic and sustained approach; nonetheless, the imperative for gender diversity in today's rapidly evolving and innovation-driven environment is unequivocal.

Silicon Mountain and STEM Education

Before engaging in a discussion on the state of STEM education within the Silicon Mountain region, it is essential to provide an overview of Silicon Mountain itself. This contextual framework will facilitate a deeper understanding of the educational dynamics at play in this area.

Overview of Silicon Mountain, Buea

The evolution of Cameroon's tech ecosystem, particularly the advancement within Silicon Mountain in Buea, has been notably influenced by the model established by Silicon Valley. Over the past two decades, this burgeoning ecosystem has demonstrated substantial growth, notwithstanding the considerable challenges, such as limited access to early-stage funding for start-ups. This has catalysed a remarkable increase in entrepreneurial activities, particularly among the youth who are actively seeking alternative employment avenues. The term "Silicon

Mountain” was first coined to describe the tech cluster situated in the Fako Division of Cameroon’s Southwest Region, with Buea as its nucleus, thereby drawing insightful parallels to the influential Silicon Valley (Friederici, Wahome & Graham, 2020).

The global significance of Silicon Valley as a benchmark for innovation and economic growth is widely recognised, as underscored by the works of Avle, Lindtner, and Williams (2017) and Carver (2010). This influence extends to the formation and development of Silicon Mountain in Buea. The term was publicly introduced in 2013 by prominent tech entrepreneur Rebecca Enonchong during the BarCamp Cameroon Conference held at the Catholic University Institute of Buea (CUIB). The pivotal role of the University of Buea in nurturing the local tech ecosystem cannot be overstated; it has served as a vital meeting ground for aspiring entrepreneurs while also fostering the emergence of initiatives such as the AfroVisioN Group, established in 2006. Since then, a variety of tech and business incubation hubs, along with numerous startups, have emerged and thrived within the Silicon Mountain area. Noteworthy entities include the Google Developers Group (GDG Buea), Women Techmakers (WTM Buea), Developer Circles from Facebook (DEVC Buea), Women in Tech (WIT Buea), and several hubs like ActivSpaces Buea and Jongo Hub, as well as startups including Njorku, Makonjo Media, Digital Renter, Efiko, Podcam, Sheva, and Yaoota.

However, the tech ecosystem encountered a significant disruption in 2016 due to civil unrest, which culminated in an internet outage across the Anglophone regions of Cameroon in 2017. This interruption had widespread repercussions, adversely impacting e-commerce platforms and mobile network operators, resulting in notable declines in both activity and revenue. Despite these adversities, the ecosystem exhibited remarkable resilience, witnessing substantial recovery and growth in 2018 and 2019, following the restoration of internet services. Notably, the collaborative integration between Anglophone and Francophone tech communities, alongside various language training initiatives, has engendered an enriched environment for knowledge-sharing and cooperation, positioning Cameroon as a vital corridor bridging English and French-speaking Africa.

Looking to the future, the Government of Cameroon has articulated plans to establish a new technological hub in Yaoundé, termed “Silicon River,” aimed at emulating the success achieved in Silicon Mountain. This new cluster aspires to provide an essential platform for research and innovation, equipping young software developers and tech entrepreneurs with the necessary support and infrastructure. In summary, the trajectory of Cameroon’s tech ecosystem, particularly through the lens of Silicon Mountain in Buea, highlights both its resilience in confronting challenges and its substantial potential for ongoing innovation and growth within the region’s technological landscape.

Gender Representation in Silicon Mountain

Similar to gender representation within Silicon Mountain, Cameroon encompasses the involvement and roles of various genders in the region’s burgeoning

technological ecosystem. Recognised for its vibrant tech industry and the proliferation of start-ups, Silicon Mountain has gained notable attention for its innovation and entrepreneurial potential. However, akin to many global tech hubs, this region grapples with persistent challenges related to gender disparities.

Several factors influence gender representation, including the accessibility of education and training in STEM (Science, Technology, Engineering, and Mathematics) fields, prevailing cultural attitudes towards women's roles in technology, and the existence of support networks for female entrepreneurs. In response to these challenges, various initiatives have been implemented to encourage greater female participation in the tech sector. These include workshops, mentorship programs, and other interventions designed to cultivate a more inclusive environment.

Enhancing gender representation is not only a matter of equity but also contributes to increased creativity and improved problem-solving capabilities within teams, ultimately fostering innovation within the Silicon Mountain community. The following table summarises the current state of gender representation in Silicon Mountain, providing a quantitative basis for further analysis (**Table 1**).

Table 1. Gender representation in Silicon Mountain.

Tech hubs	Number of females	Number of males	Total
Activ Spaces	4	11	15
AGRO-HUB	5	6	11
Zinger Systems	3	9	12

Abah, Parh and Tita's (2025) fieldwork.

3. Methodology

This study adopted a qualitative research design, specifically utilizing a case study approach, complemented by in-depth interviews for data collection. A total of six female techies were purposefully selected from three tech start-ups (ActivSpaces, AGRO-HUB, and Zinger Systems) located in the thriving Silicon Mountain hub in Buea, Cameroon. The selection criteria for these participants were multifaceted and aimed at ensuring a rich, informed exploration of the subject matter. First and foremost, all participants possessed a minimum of five years of experience within the STEM field, making them well-qualified to provide valuable insights as knowledgeable informants. Secondly, the selected individuals needed to hold professional roles within their organisations, as this gave them a comprehensive understanding of their organisational dynamics and the specific challenges faced by women in the tech industry. Lastly, the participants were actively involved in outreach programs organized by female tech professionals, contributing to an influential think-tank that addresses the myriad challenges confronting women in STEM.

The qualitative research design was meticulously chosen to garner deep insights into real-world issues, echoing the perspectives presented by Moser and Korstjens (2017). Unlike quantitative methodologies that prioritise numerical data, qualita-

tive research seeks to delve into the experiences, perceptions, and behaviours of participants, thereby illuminating the underlying “hows” and “whys” of specific phenomena. This paper aimed to investigate the gender gap in STEM education through in-depth interviews with six female techs, examining the disruptive strategies employed to challenge gender stereotypes in Cameroon. Additionally, the research assessed the implications of achieving gender parity in STEM education on the educational experiences of girls in Cameroon.

An interview guide structured the data collection process and was divided into three distinct sections. Section A focused on disruptive measures against gender stereotypes within STEM education, while Section B examined the consequences of these stereotypes on the education of girls in Cameroon. The final section collected demographic information to contextualise the participants’ experiences. To enhance the reliability of both the research instruments and participant contributions, several key measures were implemented. An initial pre-test of the interview guide was conducted with individuals not involved in the main study to evaluate the relevance and coherence of the questions. Following this pre-test, adjustments were made to the interview questions based on participant feedback, ensuring that they effectively elicited substantive and relevant responses. Secondly, following the transcription of the interview responses, participants were presented with summaries of their remarks. This process allowed them to confirm the accuracy of their contributions, ensuring that their viewpoints were faithfully represented by the researchers. This step was crucial in maintaining the integrity of the data and honoring the participants’ unique perspectives.

For data analysis, thematic analysis was employed, grounded in Bryman’s (2016) six-stage model. The first step involved transcribing all verbal data into written form, with unique identifiers assigned to each participant to ensure confidentiality. Following transcription, the data underwent careful review to identify emerging patterns. Labels and codes were then assigned to participants’ responses on a line-by-line basis. In the subsequent stage, these codes were organised into overarching themes that were refined to align with the study’s research objectives. The analysis also included an exploration of common concepts, facilitating the development of relevant sub-themes. Ultimately, a comprehensive examination of these concepts concluded with the preparation of the final report (Figure 1).



Figure 1. Six stages of thematic analysis (Bryman, 2016).

This methodology was strategically selected for its effectiveness in eliciting meaningful responses that resonate with the research objectives. Additionally, the flexibility of this approach provided the opportunity for a thorough exploration of participants’ perspectives, proving advantageous in fostering deep engagement during the interviews.

Theoretical Framework

This paper is grounded in two theoretical frameworks: Feminist Theory and Social Cognitive Theory. As articulated by Singh and Mathur (2024), Feminist Theory encompasses a diverse array of beliefs and methodologies aimed at exploring the dynamics of gender inequality and advancing women's rights. Its principal objective is to investigate the manifestations of gender inequality across multiple spheres, including personal, social, and political domains. Feminist Theory critically analyses the systemic oppression women encounter within society, with its roots traceable to early works such as Mary Wollstonecraft's seminal text, *A Vindication of the Rights of Woman* (1792) (Wollstonecraft, 2016). Over time, Feminist Theory has diversified, incorporating various perspectives from a multitude of scholars and practitioners. Consequently, this paper seeks to scrutinise the interventions aimed at dismantling gender stereotypes directed against females in STEM education in Cameroon, probing the underlying causes of the limited female participation in this field and the consequential effects of this knowledge gap on the education of girls in the country.

Conversely, Social Cognitive Theory, developed by psychologist Albert Bandura in the 1960s, provides an additional lens for analysis. Initially framed as Social Learning Theory (SLT), it evolved into Social Cognitive Theory (SCT) by 1986. This theory posits that learning occurs within a social context characterised by dynamic and reciprocal interactions among individuals, their environments, and their behaviours. It underscores the significance of observational learning, imitation, and modelling in shaping human conduct. Furthermore, SCT elucidates the interplay of personal, behavioural, and environmental factors that influence an individual's learning and development. In this context, this paper aims to examine the disruptive measures against gender stereotypes affecting females in STEM education in Cameroon further. It seeks to ascertain whether the observed gender disparities in STEM fields arise from personal, behavioural, and environmental influences on the learning processes of both male and female individuals, as well as the implications this knowledge divide holds for the broader educational landscape for girls in Cameroon.

Findings

The findings of this study are analysed and presented in accordance with its established objectives. The primary aim of this research was to investigate the disruptive strategies employed to challenge and mitigate the gender stereotypes that impede female participation in STEM education in Cameroon. The results reveal that, despite the pervasive gender stereotypes affecting women's STEM education in the region, a small but impactful group of female technology enthusiasts is actively working to dismantle these barriers. Their efforts include academic orientation, community outreach initiatives, the promotion of female tech role models, the organisation of technology fairs, advocacy through lobbying, and the provision of scholarships.

Theme 1.1: Academic Orientation

This theme emerges as a prominent focus throughout the data collected for this

study. The interview participants emphasized that academic orientation serves as a critical mechanism for challenging gender stereotypes that affect female students pursuing STEM education in Cameroon. This assertion is further substantiated by the following excerpts from the interviews.

Throughout my years in the university and even in STEM, I realised that many female students are not properly oriented about the importance and the many opportunities STEM education offers. Because of this lack of proper orientation, most of them do not see it necessary to embrace or enrol in any STEM subjects. So, together with some colleagues who are already into STEM or reading any of the STEM programmes, we thought it wise to start organising academic orientations on STEM for female students (Interviewee 3)

For the past seven years, we have been going to secondary schools in the Southwest region, especially those in Fako Division, to organise academic orientations for female students, targeting students from forms three to upper sixth, and educating them on the importance of embracing the sciences and the STEM field. Our emphasis has been on students who have just gotten into secondary school to have an open mind and not be discouraged that the sciences are difficult or meant for men, which has always been the case (Interviewee 4)

During our academic orientation programmes, while we target mostly female students, we pay special attention to those in form four, five, lower and upper-sixth classes who are already in the sciences. We educate them on the latest trends in the sciences, areas which are underexploited by students and where they can make a difference. This has been yielding positive results as the number of female students who are now embracing STEM is encouraging, going by the number of applications for internships we received from students from universities around Buea are increasing every year (Interviewee 5)

The preceding excerpts elucidate that inadequate academic orientation significantly deters female students from pursuing Science, Technology, Engineering, and Mathematics (STEM) education. One interviewee articulates, “Throughout my years in the university and even in STEM, I realised that many female students are not properly oriented to the importance and many opportunities that STEM education offers.” This observation largely accounts for the underrepresentation of female students in STEM fields. Young individuals universally grapple with dilemmas related to career choices, but this challenge is particularly pronounced in Cameroon, where there is a dearth of institutions and organisations dedicated to providing academic orientation for students. Academic orientation plays a pivotal role in influencing students’ course selections and career trajectories. By facilitating the identification of interests and strengths, it guides individual decision-making and helps students to understand their physical, cognitive, and personal attributes. In this context, female tech practitioners at Silicon Mountain are actively addressing the gap in academic orientation. They are enhancing awareness among students regarding the diverse career opportunities available in STEM, identifying specific STEM roles that align with students’ aptitudes, and delineating the requi-

site skill sets associated with different STEM disciplines.

The theme of academic orientation is intricately connected to Social Cognitive Theory (SCT), which highlights the vital role of social learning and the impact of role models in shaping individual behaviors and attitudes. For female students, academic orientation serves as a gateway to mentorship, structured programming, and nurturing learning environments. These elements collectively provide access to crucial resources and experiences that enhance their confidence and foster a genuine interest in STEM fields. Through the process of observational learning, these students acquire knowledge from mentors and role models, allowing them to emulate successful strategies and behaviors observed in others. This process beautifully illustrates the interdependent relationship among personal, behavioral, and environmental factors as emphasized in SCT. Moreover, academic orientation initiatives, such as workshops and seminars facilitated by accomplished female professionals in technology, create platforms for social interaction and collaboration. These initiatives cultivate a supportive community that not only inspires girls to engage with STEM education but also empowers them to envision their own potential within these fields.

Theme 1.2: Community Outreach

Furthermore, data from this study indicate that female techies in Silicon Mountain, Buea, have been leveraging community outreach programs to challenge and disrupt gender stereotypes that hinder female students in STEM education in Cameroon. As highlighted in the following excerpts, these initiatives seek to promote STEM engagement among young girls, particularly those in secondary schools.

For some time now, we have been organising outreach programmes within communities to encourage young girls, especially those at the secondary level, to seriously engage with science subjects such as mathematics, physics, and chemistry, thereby empowering them to pursue careers in STEM. (Interviewee 1)

Our community outreach programmes have been solely on education programmes, and especially on the sciences that fuel STEM education across the world. While we target both males and females during these community outreach programmes, our emphasis is on the education of the girl child. (Interviewee 3)

A group of us females, who are already into STEM, during the summer holidays, pair ourselves in groups of three or four and go into communities to encourage younger girls to develop an interest in the sciences, especially in STEM. We make use of the many cultural festivals organised in the communities during this time. (Interviewee 5)

Sometimes we partner with prominent elites, politicians, football icons, musicians and civil society organisations to carry out our community outreach programmes to certain communities, especially of these individuals hail from or are carrying out important activities in a community which we have earmarked for our outreach programme. (Interviewee 6)

The preceding excerpts illustrate that female technology enthusiasts at Silicon Mountain Buea are strategically utilising community outreach programs as a

transformative method to confront and dismantle gender stereotypes prevalent in STEM education in Cameroon. Through these outreach initiatives, they disseminate crucial information and, in certain instances, provide pedagogical resources to young girls within the community. This engagement not only serves to stimulate interest in STEM fields but also facilitates access to essential materials and resources necessary for their advancement. Furthermore, these programs cultivate a sense of belonging, promote collaboration among community members, and offer skill development opportunities. Such initiatives significantly enhance the prospects for young girls in pursuing STEM careers, thereby positively impacting their future employability and personal growth.

The theme of community outreach aligns closely with Feminist Theory (FT), which seeks to challenge and transform entrenched power dynamics and gender inequalities in society. This theory underscores the significance of elevating marginalized voices, particularly those of women. In their community outreach efforts, female tech practitioners at Silicon Mountain Buea actively engage with both community leaders and aspiring tech enthusiasts on various fronts. They confront traditional and cultural practices that restrict women's access to STEM educational opportunities, advocating for change within their communities. Simultaneously, these outreach programs create a vital platform for young girls to explore STEM fields, especially in areas that have historically been dominated by males. By facilitating access to resources, mentorship, and skill development, these initiatives help dismantle stereotypes that hinder participation. Furthermore, they foster an inclusive atmosphere where girls can flourish, enhancing their confidence and sense of community identity. Through these outreach activities, the female techies embody core feminist principles, championing equal opportunities for all while promoting collaboration. They not only inspire young girls to envision themselves in STEM careers but also actively contribute to the broader movement for equity in education and professional spaces. This concerted effort not only benefits individuals but also paves the way for a more inclusive society that values the contributions of women in the fields of science, technology, engineering, and mathematics.

Theme 1.3: Female Tech Role Models

The utilisation of female tech role models emerges as a predominant theme from the qualitative data collected and analysed for this study. Participants articulate that they employ the presence of female tech role models as a strategic intervention to combat gender stereotypes in STEM education within the Cameroonian context. Their perspectives are captured in the following excerpts.

For many years, seeing women in the STEM field in Cameroon was very difficult. This may explain why few women were enthusiastic about it. But today, we are making good use of the few prominent ones serving as role models to the younger ones. Prominent female tech experts in Cameroon, like Rebecca Enonchong, Esther Yomba, Estel Lyonga, and Ako Joelle, are changing the narratives. (Interviewee 1)

We have become role models to the younger ones through the various orienta-

tions and community outreach programmes we organise frequently. We provide them with information about STEM and career paths in the sciences in general. (Interviewee 3)

Women like Estel Lyonga, Rebecca Enonchong, and Esther Yomba have become household names for female techies not only in Cameroon but also on the international stage. This makes it easier for us to use them as references to encourage other upcoming female techies to make it big in life, and that there is a life in STEM for them. (Interviewee 5)

One of the many questions we are always confronted with is do women have successful careers in STEM, given that sometimes the training is very rigorous. Women are always subjected to a lot of pressure from families, friends and society at large to get married and start a family. We don't only answer this question in the affirmative, but we also enumerate successful Cameroonian female techies who are married and run successful homes despite the nature of their jobs. (Interviewee 6)

The aforementioned excerpts substantiate the notion that the historical absence of female role models in STEM education has profoundly impacted young women's perceptions and aspirations within these fields. One critical reason for this phenomenon is that many aspiring female STEM students have not encountered sufficient representations of women achieving success in these domains; this lack of visibility has diminished their motivation to pursue careers in STEM. The dearth of female figures in these disciplines has further perpetuated gender stereotypes, suggesting that STEM is not an appropriate pathway for women. Another significant contributing factor to this perception is the resulting limitation of mentorship opportunities for aspiring female tech enthusiasts. Women in STEM often serve as vital guides and sources of inspiration for the next generation. However, in recent years, various academic initiatives and community outreach programs led by women in STEM in Cameroon have begun to shift this narrative. Notable female Cameroonian tech leaders, such as Rebecca Enonchong, are making substantial global impacts, inspiring many young women in Cameroon to cultivate an interest in STEM and the sciences. These young women now benefit from the presence of female leaders who can provide valuable networking opportunities, encouragement, and essential guidance for both personal and professional growth. Additionally, they have greater access to information, academic resources, and mentors who support their journey into STEM. Such elements are crucial for promoting diverse perspectives and innovations, thereby fostering an inclusive environment that benefits all. By addressing these issues, we can effectively narrow the gender gap in STEM education, which is imperative for achieving equity within the field.

The significance of female role models in STEM education is deeply rooted in Social Cognitive Theory, which highlights the crucial roles of observational learning, imitation, and modeling in the development of behavioral patterns. At Silicon Mountain, the impact of these female role models extends beyond merely chal-

lenging conventional gender stereotypes; they actively show that success in STEM fields is not only possible for women but also attainable. By sharing their journeys and experiences, these role models offer a valuable framework for young girls, enabling them to visualize themselves thriving in STEM careers. Their visibility and achievements serve to reinforce the belief that dedication and perseverance can lead to meaningful success, ultimately nurturing self-efficacy among aspiring female techies. This dynamic not only inspires young women but also contributes to a more inclusive and diverse future in STEM fields.

Theme 1.4: Tech Fairs

Participants in this study indicate that one effective strategy employed to combat gender stereotypes in female STEM education in Cameroon is the organisation of various tech fairs. These events serve as platforms to showcase the work of established female tech professionals and to attract aspiring female tech enthusiasts into the STEM industry. This initiative is illustrated further in the subsequent excerpts.

Some years ago, at one of the annual Silicon Mountain Conferences, one of the biggest tech conferences in Cameroon, we discovered that the number of female techies working at various tech hubs within the Silicon Mountain was really impressive. So we decided to start organising tech fairs on a small scale within the Silicon Mountain to showcase what we are doing. But the main aim of these tech fairs was to attract more females to STEM. We believed that showcasing our work could inspire many young girls into STEM. (Interviewee 2)

Besides the various national tech fairs that we have in Cameroon, which group all those in the STEM fields, irrespective of their gender, areas of specialisation, ethnicity and religious backgrounds, female techies at the Silicon Mountain always organise mini tech fairs to showcase their product. During these mini fairs, like Women in Technology and Female App Developers. During these fairs, we attract young girls with our works, and in return, they get inspired, and some end up following in our footsteps. (Interviewee 4)

We have made the mini-tech fairs within the Silicon Mountain over the years very strategic, allowing aspiring techies to choose from the wide array of areas of specialisation like software development, software engineering, web development, data mining and big data, app development, artificial intelligence (AI), robotics and coding. (Interviewee 5)

The excerpts provided by the interviewees illustrate that technology fairs can play an essential role in fostering female participation in STEM (Science, Technology, Engineering, and Mathematics) by offering a range of opportunities and experiences that enhance engagement and interest in these fields. These events frequently feature female speakers, panellists, and representatives from tech companies that are already thriving in STEM sectors. The interaction between aspiring female technologists and successful women in STEM serves to inspire the former, as these professionals embody relatable role models. Furthermore, the exchanges that occur during these fairs create valuable mentorship opportunities, whereby

aspiring individuals can receive constructive guidance and encouragement from established professionals. Additionally, many technology fairs incorporate workshops and interactive sessions, which allow participants to engage in hands-on activities directly related to STEM. Such experiential learning opportunities enable aspiring techies to collaborate with professionals on projects and experiment with technology, thereby igniting interest and dispelling prevailing stereotypes surrounding these disciplines. Moreover, these events facilitate networking opportunities between aspiring and established tech professionals, thereby fostering community and support within the field. Finally, by showcasing a variety of STEM careers through exhibits and presentations, technology fairs assist female attendees in comprehensively understanding the diverse opportunities available to them.

Tech fairs serve as a vital intersection with feminist theory by actively promoting gender equity and fostering inclusive environments that challenge conventional norms. Organized by women in technology at Silicon Mountain, these events provide a platform for female tech professionals to showcase their skills, innovations, and invaluable contributions to the field. Such exhibitions not only highlight individual expertise but also serve to dismantle pervasive gender stereotypes that continue to plague the STEM field. Through these tech fairs, women in technology gain empowering opportunities to share their experiences, thereby positioning themselves as role models for younger generations. This aligns with the principles of feminist theory, which advocates for women's empowerment and seeks to dismantle patriarchal structures that limit their potential. Moreover, these gatherings facilitate critical discussions about the barriers women encounter in STEM fields, fostering a supportive community that prioritizes equity. By inspiring dialogue and engagement, tech fairs contribute to a cultural shift aimed at enhancing representation and support for women within the technology sector.

Theme 1.5: Lobbying

Lobbying represents another significant theme that emerges from the data collected for this study. Participants acknowledge that they are actively engaging with a variety of stakeholders to challenge and disrupt gender stereotypes associated with STEM education in Cameroon, thereby encouraging greater female participation in these fields. This sentiment is encapsulated in the following excerpts:

After recognising the pronounced gender disparity within STEM fields and among individuals pursuing programs that lead to STEM careers, we have been advocating with civil society organisations that promote the education of the girl child. We aim to integrate the encouragement of female participation in sciences and technology into our advocacy initiatives. (Interviewee 1)

If I can also recall vividly, some two years back, some senior female techies met with senators and parliamentarians from the Southwest regions of Cameroon and lobbied them to push for policy change in the lower and upper houses of parliament that guarantees gender parity in STEM fields. (Interviewee 2)

The greatest lobbying we have done, which is yielding positive results, is with the Ministry of Post and Telecommunications. Annually, the ministry either organises

or partners with female techies in the country to organise symposiums that encourage more women to embrace science and technology. (Interviewee 3)

In the last meetings female techies held in Buea, one of the strongest recommendations arrived at was to lobby the ministries of Vocational Training, Higher, Secondary and Basic Education to review the curricula, introduce and encourage STEM education at different levels, and provide incentives for female students who embrace science and technology. (Interviewee 4)

Extrapolating from the preceding discussions, it is evident that lobbying serves a vital function in promoting the participation of women in STEM (Science, Technology, Engineering, and Mathematics) careers. This can be achieved through the establishment of supportive environments, heightened awareness, and advocacy for meaningful policy changes. A strategic approach to lobbying involves the active promotion of policies that enhance gender equality within education and the workforce. This may include initiatives such as scholarships tailored for women pursuing studies in STEM, the implementation of gender quotas within STEM fields, and the provision of funding for programs that foster girls' engagement in scientific and technological pursuits. Moreover, lobbying can facilitate the representation of female role models in STEM, thereby increasing the visibility and relatability of women in these disciplines. Furthermore, advocacy efforts can underscore the significance of diversity in STEM fields by launching awareness campaigns aimed at schools, communities, and policymakers. Such campaigns can illuminate the unique challenges faced by women and emphasise the advantages of incorporating diverse perspectives in scientific and technological advancements. Additionally, through lobbying, policymakers can be encouraged to allocate resources specifically for STEM education programs that target girls and young women, further enhancing their participation. The role of academic stakeholders should not be overlooked; through lobbying and advocacy, they can modify school curricula to incorporate more STEM-related subjects that particularly resonate with young girls. This targeted approach is crucial for attracting and retaining female students in STEM disciplines. Lastly, engaging traditional leaders in lobbying efforts can be instrumental in challenging and transforming entrenched cultural and societal stereotypes that hinder women's entry into STEM fields. When influential figures address and dismantle these stereotypes, it can significantly reshape societal perceptions, encouraging a greater number of women to pursue careers in STEM.

The theme of lobbying is intricately connected to Social Cognitive Theory (SCT), as it empowers female tech practitioners at Silicon Mountain to actively engage with key stakeholders, including policymakers, educational institutions and civil society organizations. Through these collaborative efforts, they cultivate an environment that encourages and supports women's participation in STEM fields. Interactive sessions not only provide valuable mentorship opportunities but also showcase role models who exemplify success in these areas, thereby reinforcing the notion that women can indeed thrive in STEM careers. The lobbying initiatives aim to reshape curricula and policies, ultimately transforming the educa-

tional landscape and fostering a more inclusive context for aspiring female STEM students. By addressing systemic barriers and advocating for change, these efforts enhance self-efficacy among young women, instilling confidence and motivation to pursue their ambitions in STEM. In this manner, the theme of lobbying catalyzes progress, promoting greater representation and equity within the field.

Theme 1.6: Award of Scholarships

Data collected for this study reveals that participants have undertaken initiatives to disrupt gender stereotypes in STEM education in Cameroon by offering partial scholarships to female students intending to study sciences and technology. This approach not only alleviates some of the financial barriers these students face but also serves as a powerful incentive for encouraging female participation in traditionally male-dominated fields.

One of the factors that we, as female tech enthusiasts, have identified as limiting more female students from entering the sciences and later STEM fields is financial means. To encourage female enrolment in sciences and technology, we pool our limited resources each year and award partial scholarships to the five best female science students in schools around Buea. These partial scholarships mainly cover their tuition. (Interviewee 1)

The most impactful gesture, which I think we have done as female techies at Silicon Mountain, was to pay the General Certification of Examination (GCE) registration fees of some 10 female students in 2022. Today, all these students are in the College of Technology at the University of Buea. (Interviewee 3)

Through our lobbying efforts, especially during our academic orientations, community outreach programmes, and tech fairs, we get civil society organisations, successful senior tech gurus, parliamentarians and politicians to award scholarships to aspiring female tech enthusiasts to encourage more female students into STEM. (Interviewee 4)

The preceding excerpts illustrate that the provision of scholarships to female students can serve as a transformative element in challenging entrenched gender stereotypes within STEM education in Cameroon. The impact of scholarship awards extends beyond mere financial assistance; they can significantly enhance female participation in STEM fields through various mechanisms. One primary avenue through which scholarships can promote female engagement in STEM involves the alleviation of the financial burdens associated with higher education. By addressing the costs linked to tuition fees, textbooks, and other educational expenses, scholarships can make STEM pathways more accessible to female students, who frequently encounter financial barriers that discourage their pursuit of these disciplines. Consequently, the allocation of scholarships has the potential to drive increased enrollment of female students in STEM programs, serving as a powerful incentive that motivates them to apply and engage with these educational opportunities. Moreover, the intentional offer of scholarships to female students can actively disrupt existing gender stereotypes in STEM, thereby encouraging a greater number of women to explore and pursue their interests in science

and technology.

The theme of scholarship awards resonates strongly with Feminist Theory, which seeks to address the systemic inequalities that hinder women's participation in STEM fields. By dismantling barriers that perpetuate gender disparities, these scholarships create an opportunity for female students to engage more fully in STEM disciplines. The financial support provided through these scholarship awards not only acknowledges but also validates the immense potential of women in these traditionally male-dominated areas. Such initiatives do more than just promote gender equity; they actively challenge societal stereotypes that have long characterized STEM as a male-centric domain. By facilitating access to vital resources, scholarships cultivate an environment in which female learners can excel. This, in turn, contributes to a more equitable educational landscape and bolsters the representation of women within STEM professions. Furthermore, the themes extracted from the data collected in this study demonstrate a clear relationship with the two theoretical frameworks employed. This connection further supports and validates the findings presented in this paper.

The second objective of this paper was to evaluate the implications of achieving gender parity in STEM education on the educational experiences of the girl child in Cameroon. According to the findings presented herein, the implications of gender parity in STEM education are multifaceted, encompassing a range of outcomes such as increased enrollment and retention, expanded career opportunities, the dismantling of stereotypes, enhanced participation in decision-making processes, and overall advancement toward sustainable development. Below, the following themes related to these implications are discussed in greater detail.

Theme 2.1: Increased Enrollment

Among the themes emerging from the collected data, increased enrollment is particularly salient. Several interview participants articulated that one of the significant implications of gender parity in STEM education for the girl child in Cameroon is the noticeable rise in female enrollment in STEM-related programs. Their insights are captured in the forthcoming excerpts.

When a country strives for gender parity in every field of its economy, be it education, health, science, or technology, it would encourage more females to enrol in the various academic programmes that lead to employment in these fields, even those that many people consider difficult programmes. (Interviewee 3)

I believe that gender parity in STEM education can lead to a high retention rate of many females in science, technology and engineering programmes. When many female students are enrolled in these programmes, it would boost the education of the girl child in Cameroon. (Interviewee 5)

The preceding excerpts illustrate that countries striving for gender parity in STEM education can effectively enhance both enrollment and retention rates of girls in STEM programs. This phenomenon can be attributed to the fact that many female students thrive in academic environments that are characterised by serenity, support, and equitable opportunities for both genders. When educational set-

tings foster inclusivity for all students, they promote healthy competition between males and females, motivating them to pursue their educational and career aspirations, particularly in the disciplines of science and technology.

Theme 2.2: Empowerment and Self-Esteem

Another prominent theme emerging from the data collected for this study is the significance of empowerment and self-esteem. As indicated by several participants, one of the critical implications of achieving gender parity in STEM education for the girl child in Cameroon is its capacity to enhance both empowerment and self-esteem. This empowerment is essential as it enables girls to recognise their potential and capabilities, ultimately contributing to their academic success and professional aspirations.

One factor that I have personally observed over the years in my interaction with other female techies, not only in Silicon Mountain, but in other parts of Cameroon, is that their work and exposure in the STEM fields, dominated by males, has empowered them and boosted their self-esteem. I think that if gender parity is extended to other fields, it would empower more women to develop their self-esteem. (Interviewee 1)

In the various academic orientations, community outreach programmes and tech fairs that we have been organising, we have discovered that our little endeavours are helping empower young women to develop interests in STEM and build their self-esteem to pursue the programmes to the end. (Interviewee 6)

The aforementioned excerpts substantiate the assertion that promoting gender parity in STEM education in Cameroon plays a crucial role in empowering the girl child. By equipping girls with essential skills and knowledge requisite for thriving careers in STEM fields, such initiatives not only enhance their self-esteem but also empower them to assert their rights and engage with future career opportunities with renewed confidence and enthusiasm.

Theme 2.3: Broader Career Options

Some participants in this study have identified the expansion of career options as a significant implication of achieving gender parity in STEM education for girls in Cameroon. The following excerpts capture their insights on this vital issue.

Some years back, women were limited to certain professions, as these professions were regarded as reserved for males. However, ensuring gender parity in STEM education in Cameroon would spur more female students to enrol in such academic programmes that were regarded as the preserve of men and, consequently, the career paths that these academic programmes fulfil. (Interviewee 2)

I believe that ensuring gender parity in STEM education would make female students more daring in choosing their academic programmes and career paths. Providing a level field would bring out the ambitious spirit in women to move away from secretaries and administrative assistants to engineering and coding jobs. (Interviewee 4)

The excerpts provided reveal that promoting gender equality in STEM education is pivotal for broadening career opportunities for girls. When female students

engage in academic programs dedicated to STEM disciplines, they gain access to fields such as science and technology that lie at the heart of STEM. These sectors are not only characterised by high demand but are also associated with some of the most lucrative employment opportunities within the global labour market. Furthermore, achieving gender parity in STEM education plays a significant role in mitigating pervasive gender stereotypes that frequently dissuade girls from pursuing careers in these areas. By normalising the presence of women in STEM roles, educational environments enable girls to envision themselves in similar career paths and motivate them to explore their interests.

Theme 2.4: Critical Skills Development

The advancement of critical skills emerges as a fundamental theme throughout the data collected for this study. According to the feedback from participants interviewed for this research, one noteworthy implication of gender parity in STEM education on the educational experience of girls in Cameroon is the facilitation of critical skill development. Ensuring equitable access to STEM education not only equips girls with essential knowledge but also fosters the broader skill sets necessary for success in an increasingly complex and technology-driven world.

Over the years, females have often been considered emotional and not critical beings, which is not entirely true. However, today, women in the sciences and technology are proving that women are more critical than people think. Ensuring gender parity in STEM education would further develop these critical thinking skills in the girl child. (Interviewee 4)

Critical skills sometimes need time, resources, and skilled humans to develop them. Oftentimes, women do not have this privilege. Providing an enabling environment where both males and females can develop these critical skills would be exceedingly beneficial to the education of the girl child. (Interviewee 6)

Drawing from the aforementioned excerpts, it is clear that achieving gender parity in STEM education in Cameroon is critical for fostering the development of essential skills in the girl child. The intrinsic nature of STEM disciplines, encompassing science, technology, engineering, and mathematics, necessitates the cultivation of critical thinking, problem-solving, and analytical abilities. Consequently, individuals who engage in STEM education must not only exhibit these competencies but also experience significant enhancement of these skills through their academic pursuits in this field. Encouraging female students in Cameroon to participate actively in STEM education will consequently equip them with valuable competencies that transcend the boundaries of STEM careers, proving advantageous in a diverse range of professional pathways.

Theme 2.5: Participation in Decision-making Processes

Furthermore, the promotion of gender parity in STEM education is also associated with an increase in the participation of girls in decision-making processes. This dimension highlights the transformative potential of gender equality in educational contexts, as it allows for the inclusion of diverse perspectives in critical decision-making spheres. The perspectives and insights of participants elucidate

the multifaceted implications of fostering gender parity within STEM education, as detailed in the excerpts that follow.

There has been a near-absence of the voices of women, or their points of view, in issues relating to science, technology and engineering in Cameroon. I think ensuring gender parity would not only increase their voices but also ensure that points of view are taken into consideration. (Interview 4)

Women have been encountering a lot of challenges in how to excel in STEM. This is because most of the policies guiding STEM education were adopted with little or no input from women. (Interviewee 5)

Engaging in decision-making processes is pivotal across various sectors. Primarily, it empowers participants to articulate their ideas and perspectives, fostering an environment where diverse viewpoints can be expressed. This richness of perspectives enhances the comprehension of issues, illuminating aspects that may have previously gone unexamined. The findings of our paper show that ensuring gender parity in STEM education will encourage a greater number of female students to pursue programs that pave the way for careers in STEM fields. Consequently, these women will be equipped not only with the requisite knowledge in STEM but also with the confidence to join discussions and participate actively in decision-making processes pertaining to technology and innovation. Such involvement is likely to yield more inclusive policies and practices, ultimately benefiting the broader community.

Theme 2.5: Role Models for Future Generations

The analysis of the collected data reveals a prominent theme concerning the significance of role models for future generations. Participants indicated that achieving gender parity in STEM education has profound implications for the education of girls in Cameroon. It has the potential to cultivate a cadre of female professionals who can serve as role models for young girls. These role models can inspire and motivate the next generation, demonstrating that careers in STEM are attainable and inviting for women. The following excerpts encapsulate their insights on this vital issue.

The disparity we currently observe in this country between males and females in the STEM field is that, in the past, the only people we saw in the sciences were men; technology men, and especially, engineering was still dominated by men. Many people did not realise that their female children could also excel in these fields, just like their male children. Some of us only began developing an interest in STEM when we started seeing women in other countries doing well in these same fields, which we once thought were only meant for men. (Interviewee 1)

If the educational programmes are made level, favouring both males and females, one of the implications of gender parity in STEM education on the education of the girl child in Cameroon would be that it would give birth to role models for future generations. (Interviewee 3)

At Silicon Mountain today, we have female techies in the diverse fields of STEM. So we are also serving not only as role models to young female students

who are dreaming about getting into the sciences, technology and engineering, but also nurturing the next role models who will serve future generations. (Interviewee 6)

The excerpts above illuminate the critical importance of role models across various fields. Participants in the study attribute the notable gender disparity in STEM (Science, Technology, Engineering, and Mathematics) to entrenched cultural, academic, and gender stereotypes. Addressing this imbalance is essential, as enhancing gender parity within STEM not only creates opportunities for women but also cultivates a new generation of role models who can positively influence underrepresented segments of society. Role models serve as vital sources of inspiration, guidance, and concrete exemplars of success, particularly for individuals who are just beginning to explore or commit to a career path. Their experiences illustrate that success is attainable through dedication, resilience, and hard work, effectively alleviating fears and doubts that may hinder career choices. Moreover, role models impart invaluable advice and insights derived from their own experiences, detailing how they navigated obstacles and overcame complex challenges to achieve their aspirations. The emergence of successful women in STEM fields inevitably leads to a ripple effect; as more girls excel in these disciplines, they become role models themselves for younger generations. This cycle of increased representation not only fosters greater participation among women in STEM but also serves to inspire and empower future cohorts. Ultimately, the presence of diverse role models is a transformative factor in bridging the gender gap and nurturing an inclusive environment in STEM fields.

Synthesizing Research Outcomes

The relationship between disruptive strategies aimed at challenging gender stereotypes and the advancement of gender parity in the education of girls in Cameroon appears to be inherently interconnected. This section synthesizes the findings of this study to illuminate how these disruptive strategies have notably contributed to promoting gender equality, particularly within the domains of Science, Technology, Engineering, and Mathematics (STEM) for the girl child in Cameroon. The following paragraphs will explore the interrelatedness of the study's research objectives.

To begin with, the various academic orientations undertaken by female tech professionals in Silicon Mountain represent a key disruptive strategy that has resulted in a significant increase in the enrollment of female students in STEM-related programs. These initiatives have not only expanded career opportunities for women across Cameroon but have also empowered them to acquire essential skills. This empowerment enables them to take part in decision-making processes and positions them as inspirational role models for future generations. In addition, the community outreach programs implemented by the female techies at Silicon Mountain Buea serve as another effective disruptive strategy. Through these initiatives, they have engaged with community leaders to raise awareness about the necessity of abandoning cultural and traditional practices that restrict women from pursuing careers in certain fields, particularly in STEM. These dialogues

have fostered a positive shift in mindsets within the community, facilitating an increase in the enrollment of women in STEM programs. As a result, this shift has led to expanded career options, the development of critical skills, and the emergence of female tech professionals as role models for younger individuals, thereby reinforcing the cycle of empowerment and education for girls in Cameroon.

Again, the incorporation of female role models during academic orientations and community outreach initiatives has proven to be a transformative approach in reshaping perceptions about STEM fields among young girls. By witnessing accomplished women thriving in their respective STEM specialties, these girls are encouraged to overcome the stereotype that these disciplines are predominantly male-dominated or overly challenging. The visibility of these role models not only ignites an enthusiasm within young girls to pursue STEM programs but also fosters aspirations for them to emulate the success of the women they admire. This engagement not only opens the door to a wider array of career opportunities but also empowers these girls to cultivate critical skills, ultimately enabling them to inspire future generations as role models themselves.

Additionally, the implementation of tech fairs as an innovative strategy by female technologists at Silicon Mountain has created a valuable platform for interaction between established industry professionals and aspiring STEM enthusiasts. These events serve as occasions for professionals to share insights on navigating the enrollment process for STEM fields, exploring available career paths, and identifying essential skills necessary for success in these areas. The informal exchange of ideas during tech fairs cultivates a supportive environment, driving interest and participation among young female aspirants.

Moreover, lobbying emerges as an effective strategy for fostering engagement among various stakeholders to achieve targeted outcomes. Female tech advocates at Silicon Mountain have actively lobbied policymakers to implement tax incentives and breaks for academic institutions that prioritize STEM education, particularly those initiatives encouraging girls' participation. Their efforts have also been directed toward persuading educational institutions to develop curricula that not only inspire young girls to explore STEM fields but also address systemic barriers hindering their involvement. Furthermore, these advocates have sought the support of community leaders to challenge cultural and traditional practices that restrict girls' educational opportunities, thereby promoting gender equality and ensuring inclusive participation in STEM initiatives. As a result, these lobbying efforts are anticipated to enhance female enrollment in STEM, providing access to broader career options and facilitating the acquisition of vital skills for success.

Finally, the provision of scholarships as a strategic initiative by female technologists at Silicon Mountain Buea aims to mitigate the financial challenges that often deter female students from pursuing STEM fields. Financial barriers significantly contribute to the underrepresentation of women in these disciplines. By alleviating such burdens through scholarship awards, more young women are positioned to enter and thrive in STEM programs. The resultant increase in female participation not only expands career possibilities but also promotes essential skills de-

velopment and bolsters self-esteem.

The interrelationship between these strategic initiatives underscores the critical implications for advancing gender parity and promoting the education of girls. These targeted approaches not only aim to increase female representation in STEM but also cultivate an environment conducive to nurturing the next generation of female leaders in the field.

4. Conclusion

This paper examines the disruptive strategies employed to tackle and mitigate gender stereotypes that obstruct female participation in STEM (Science, Technology, Engineering, and Mathematics) education in Cameroon. It further evaluates the implications of achieving gender parity in STEM education on the educational advancement of the girl child in the country. Through a comprehensive analysis of the subject, the study reveals that female technology professionals in the Silicon Mountain region of Buea are implementing a diverse array of strategies to challenge the stereotypes that limit female engagement in STEM fields. These strategies encompass academic orientation programs, community outreach initiatives, the establishment of female tech role models, the organisation of tech fairs, targeted lobbying efforts, and the provision of scholarships. The findings underscore that fostering gender parity in STEM education holds profound implications for girls' education in Cameroon. Key outcomes of this promotion include increased enrollment and retention rates, expanded career opportunities, the reduction of entrenched stereotypes, enhanced participation in decision-making processes, and a significant contribution to sustainable development. Ultimately, ensuring gender parity in STEM education not only empowers female students on an individual level but also drives societal transformation, stimulates economic growth, and contributes to the sustainable development of the nation as a whole.

To achieve meaningful advancements in promoting gender equity in STEM education, the concerted efforts of various stakeholders are essential.

Policymakers

Their role is crucial in implementing strategic initiatives aimed at dismantling gender stereotypes and fostering greater female participation in STEM fields within Cameroon.

First and foremost, policymakers must consider the implementation of tax incentives, such as tax breaks, for academic institutions that prioritize STEM education, especially for underrepresented groups like girls. These financial incentives would not only spur collaboration between the public and private sectors but also significantly enhance the enrollment of girls in STEM disciplines. In addition, the establishment of national STEM awareness campaigns is vital. These campaigns ought to emphasize the pivotal role that STEM education plays in a nation's development, showcasing it as an integral component of progress. Highlighting female STEM role models during these campaigns can inspire young girls, encouraging them to pursue careers in these fields. Such initiatives could include

engaging media events, outreach programs, and interactive workshops conducted in schools, all designed to cultivate interest and enthusiasm for STEM among girls. Moreover, policymakers need to work towards developing and implementing an inclusive and gender-sensitive curriculum. A curriculum that reflects diverse perspectives and experiences will not only engage female students but also nurture their interest in STEM subjects. Finally, the establishment of community tech hubs is a crucial step in this direction. By providing free access to technology and internet resources in underserved areas, these hubs can create opportunities for girls to explore and engage with STEM fields, ultimately stimulating their interest and potential in these disciplines. Through these concerted efforts and strategic initiatives, policymakers can play a transformative role in empowering girls in STEM, fostering a more inclusive and equitable educational landscape.

Educational Institutions

Educational institutions play a pivotal role in challenging and dismantling gender stereotypes. To effectively combat these stereotypes and inspire more females to explore and pursue careers in Science, Technology, Engineering, and Mathematics (STEM), institutions can implement several strategic initiatives:

- Educational institutions should design technological and engineering programs that not only attract young girls but also cultivate their interest in STEM fields from an early age. These programs can integrate engaging content that resonates with female students, making STEM subjects more accessible and appealing.
- To further disrupt traditional gender norms, educational institutions ought to integrate project-based learning into their curricula. By embedding real-world STEM challenges into their educational framework, educators can foster an environment that actively engages students, promotes creativity, and encourages collaboration and skills that are essential for success in STEM fields.
- Establishing supportive platforms for female mentors and mentees in STEM disciplines can significantly enhance the educational experience for girls. By facilitating mentorship relationships, educational institutions can provide invaluable guidance and encouragement, thereby improving retention rates and helping to sustain girls' interests in STEM throughout their academic journeys.
- Educational institutions should prioritize the training of STEM educators in gender-responsive teaching practices and innovative pedagogical strategies. By equipping teachers with the necessary tools and knowledge to inspire all students, especially underrepresented groups like girls, institutions can create a more inclusive and equitable learning environment.
- Finally, forging partnerships with local industries through Memoranda of Understanding (MoU) can open doors to practical experiences for students. By providing internship opportunities, workshops, and guest speaker events, educational institutions can expose students to the real-world applications of STEM, thus broadening their career horizons and highlighting the diverse possibilities within these fields.

By implementing these recommendations, educational institutions can become

instrumental in breaking down gender stereotypes, empowering young girls, and fostering a more inclusive future for all in the STEM workforce.

Recommendations for Community Leaders

Community leaders play a crucial role in challenging and transforming gender stereotypes that affect female students in STEM education in Cameroon. While they serve as opinion leaders within their communities, they also uphold cultural and traditional practices that may inadvertently perpetuate these stereotypes. To effectively combat these challenges, community leaders can implement several strategic initiatives aimed at fostering a more inclusive environment for women in STEM. Firstly, by organizing local STEM fairs and competitions, community leaders can create platforms that invite participation from all genders. Such events not only highlight innovative STEM projects and inventions but also ignite interest and investment in STEM fields across the community. Through active engagement, these fairs can inspire young minds and emphasize the importance of women's contributions in these disciplines.

Secondly, community leaders can advocate for programs that promote gender equality and inclusion for girls and women across various aspects of life, including STEM-related discussions and initiatives. By championing gender equality, leaders contribute to creating an environment where female representation in STEM becomes the norm rather than the exception. Furthermore, establishing focus groups within the community can provide a valuable opportunity for educating parents about the significance of STEM education. By offering resources and guidance, these groups can encourage parents to support their children, regardless of gender, in pursuing educational paths in STEM fields.

Lastly, community leaders can mobilise local resources to provide scholarships for girls pursuing STEM education. This financial support can alleviate the economic barriers that often hinder female students from accessing academic opportunities and, subsequently, careers in STEM. By implementing these recommendations, community leaders can significantly disrupt entrenched gender stereotypes and cultivate a more equitable educational landscape for future generations.

Limitations of the Study

A significant limitation of this study is its relatively small sample size, which comprises only six female tech practitioners from the Silicon Mountain tech hub in Buea, Cameroon. This limited scope may hinder a comprehensive representation of the diverse perspectives within the broader national context of the STEM industry in Cameroon. While the insights provided by these six participants are invaluable, they may not capture the full spectrum of experiences and viewpoints among female tech professionals in other regions of the country. Cameroon's bilingual status further accentuates this representation issue, with English and French as its official languages. Consequently, the experiences of female techies in the English-speaking region, such as Silicon Mountain, may differ significantly from those of their counterparts in the French-speaking areas.

Additionally, the study's focus is confined to the technology sector, which rep-

resents just one aspect of the broader STEM (Science, Technology, Engineering, and Mathematics) fields. As a result, the experiences of women in other disciplines, such as science, engineering, and mathematics, remain unexamined. This limitation restricts the generalizability of the findings across the various domains of STEM education in Cameroon. Nevertheless, it is essential to note that the small sample size underscores the pressing issues faced by females in STEM fields within the country. There is an urgent necessity for increased female participation in these areas to fully leverage the opportunities that STEM offers, thereby contributing to a more equitable and diverse industry landscape.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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