RESEARCH ARTICLE:

Gender Perspective on the Study of Information Technology in Schools in Ghana: The Case of Ghana Communication Technology University

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Abstract

Gender disparities in the field of Information Technology (IT) have persisted over time. Globally, women made up only 27.2% of IT workers in 2018. In the United Kingdom, only one in six IT specialists is female. Such extreme male dominance may result in a gender structure that influences women's experiences with IT work. Women face more challenges once hired, and they leave the field twice as fast as men. These disparities stem from a gamut of factors, including the misconception that women are weak in technology. Gender disparities in IT also find expressions in student enrolment numbers in institutions of higher learning. In Ghana Communication Technology University (GCTU), gender disparities in student enrolments are pronounced. In both diploma and degree programs, male students constituted about 90% of the student population. Using a qualitative method, the study randomly distributed open-ended questionnaires to forty students pursuing diploma and degree programs in IT at GCTU. Furthermore, the study randomly analysed the examination scripts of fifty students in the IT department from 2020 to 2023 to determine the gender patterns in their academic performances. In addition, the admission of students into GCTU to study IT programs from 2018-2023 was analysed to determine gender trends. The study concluded that there are ingrained gender perspectives of students both in terms of study and career prospects. The study recommends that GCTU should vigorously pursue a holistic integration of the study of IT to bridge the overt gender gaps.

Keyword: *gender disparity; women experience; information technology; tertiary education*

Introduction

Gender disparities in the field of Information Technology (IT) have been a global concern, including Ghana. Studies have shown that women are underrepresented in IT-related disciplines, leading to a lack of gender diversity and equality in the IT industry (Sample, 2018; Serenko and Turel, 2021). Understanding the gender perspectives on the study of IT in tertiary schools is crucial for addressing this issue.

Technology has earned the distinction of being an outlier over the years. In contrast to most order fields, the IT or technology sphere has not seen many women's professional accomplishments, with the proportion of women in technology peaking as far back as 1984 at 37 percent (Zhang, Gros and Mao, 2021). In 1982, James Johnson, a freelance writer from New Jersey, released an article titled "Can Computers Close the Educational Equity Gap?" regarding inequities in American society and schools. His worry stemmed mostly from women's under-representation in the sciences, and forty years after his article, the gender disparity has not improved. The Global Gender Gap Report in 2021 showed that no nation has achieved gender equality in terms of economic involvement and opportunity, educational attainment, health and survival, and political empowerment (World Economic Forum, 2021). Women continue to be underrepresented in the fields of science, technology, engineering, and mathematics (STEM) (UNESCO Institute for Statistics, 2018; Directorate-General for Research and Innovation Horizon, 2020; Tomassini, 2021). Although many countries have more women than males enrolled in higher education, the

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percentage of women who select STEM fields during their education is about 15 percent, which is very low (UNESCO. Director-General 2009–2017, 2017) and the reasons for low female participation has been attributed to several reasons from cultural to low parental supervision.

Information Technology is extremely important in today's world. As such, it is inextricably linked to the United Nations' 17 Sustainable Development Goals (SDGs), which aim to improve the quality of life and health of the planet. SDG 5 intends to achieve gender equality and empower all women and girls, including in STEM education and practice. The rising significance of technology around the globe during this era in terms of education, communications, employment and entertainment, as well as a tool for addressing global problems, makes women's low and continuous declining underrepresentation a major worry (Smith and Sinkford, 2022; Patón-Romero *et al.*, 2023). Hence, it is key to therefore study this effect of gender disparity in the field of technology as it is now key to all aspects of human existence. According to some studies, technology and engineering are one of the final bastions of male dominance and appear to be resistant to gender transition (Hall *et al*. 2022). Zhang, Gros and Mao (2021) noted that in the usage of electronic toys among males and females, males tend to be involved with more electronic toys than females of the tender same age. This points to the early introduction of various technologies to males as compared to females. Again, they found that the pictures uploaded on the social media pages by a local area grade school robotics exhibition had most participants being males, signifying more male dominance even from a young age.

Further in the professional world, most women feel left out in the processes of job hiring. They feel this way because most interviewers and recruiters often recommend males for the job in IT (Jones *et al*., 2023). Even when women are hired, they face challenges at the workplace which discourage them from continuing the job. Most women tend to leave their roles not because of the difficulty of the role but due to reasons including a lack of access to key creative roles, a sense of being stalled in their career, and "managers' undermining behaviour" (Kamdjoug *et al.*, 2021). In general, women's professional paths in technology have not been nurtured. Interestingly, the adaptation of information technology by women in entrepreneurship is also a problem. They believe that their businesses are too small to benefit from costly IT investment (Kamdjoug *et al.*, 2021) and tend not to use the resources or even invest in IT sectors. Gender differences in IT for developing countries have been associated with culture. This can be seen particularly in most African settings (Robinson and Gottlieb, 2021), as women are not confident enough to take leading roles due to cultural stances that tend to hide their abilities to perform in the STEM field. In dealing with this identified issue, Hamidi *et al.* (2011) argue that there is a need for countries to stay up to date with the current advancement of technology; countries require continuous learning. It is difficult to detach a community's educational system from another societal establishment, including the culture of the people (Schuelka *et al*., 2022), but education, especially in the STEM field, is the fulcrum that will propel developments in the twenty-first century; thus, some effort needs to be made. The educational system is susceptible to change if the people find enough benefit from the change. As society observes the growth women get from STEM, they will be susceptible to changing their ideology of the field being a man's world to get more women into the area. According to a study conducted by Bloodhart *et al*. (2020), women in STEM turn to outperform their male colleagues comparatively; they, therefore, suggested that for the increase in the value of women in STEM, more information about their accomplishments and performance should be publicly made known to influence their role in the field.

The study, therefore, examines how women are performing in one area of STEM education, IT, in Ghana using Ghana Communication Technology University as a case study. This research aims to provide context-specific insights into gender perspectives, identify challenges, and propose strategies for promoting gender equality and inclusivity in IT education in Ghana and the developing world.

Literature Review

Gender disparities in the field of Information Technology (IT) have been a global concern. Studies have shown that women are underrepresented in IT-related disciplines, leading to a lack of gender diversity and equality in the IT industry (Gorbacheva *et al*., 2019). Understanding the gender perspectives on the study of IT in tertiary schools is crucial for addressing this issue. This literature review aims to provide an overview of existing research and scholarly discussions on gender perspectives in IT education in Ghana. Numerous scholars have gained interest in gender and information technology over the years. According to studies such as Gibbs *et al*. (2022) on gender differences in technology use, there are cultural notions that stress masculinity competency in the use and repair and machines as against feminine abilities. Qazi *et al*. (2022) opine that women's use and ability to use the internet

and other technologies differ markedly from those of their male counterparts. During their formative years, young girls lack confidence in technology and have the impression that it is a profession that is made for males (Lang *et al*., 2020). Akgün (2020) reports on the differences in computer attitudes in high school students based on their confidence, impression of computers as a male area, positive teacher attitudes, negative teacher attitudes, and perceived computer usefulness. The study saw greater confidence among boys and a perception of computers as a male area among boys. One of the reasons for the negative female reception of the technology industry may be the level of exposure and availability of technology. Yates and Plagnol (2022) studied female computer science students and found that males and females spend different numbers of hours with technology (computer and internet). Females' exposure to technology is much more visible in college, while males are introduced to it much earlier.

On factors that affected students in choosing their majors, Silva *et al*. (2022) in their paper also reported why females tend not to choose to major in computer science. He found that female students were more likely to reject a degree in computer science because they believe they do not understand what the subject comprises or do not know what it entails. They feel lost and have no sense of belonging in the program. When interviewing and surveying female college students to learn more about their decisions to major or not major in computer science, Höhne and Zander (2019) discovered comparable results. They found out that female students had false impressions about the field of computer science, requiring lots of effort to study. Another major factor that deters female students from choosing IT as a major is a lack of confidence in their abilities (Riegle-Crumb and Peng, 2021). Further studies have shown that male students are more inclined to the potential of career growth and job prospects, whilst female students are most often impacted by their aptitude in the topic of the program (Wang and Degol, 2017). Porter and Serra (2020) found that female students are encouraged to major in IT in college due to the female teachers they understudy during their high school days. Hence, teachers tend to have an influence on female students taking up STEM courses.

There is a big gender gap in the choices of female IT majors and careers. This discrepancy has led to job instability and other unfavourable work attitudes among women working in the IT industry. Inegbedion *et al*. (2020) found to degree of gender discrimination in organizations influenced by senior management in the IT industry. Also, available data shows that women were paid less than men in the IT industry for the same work done (Ross *et al*., 2022). Other scholars have interrogated gender disparity in IT based on social factors such as access to the internet (Cirillo *et al*., 2020), gender differences in the ownership of computers (Acilar and Sæbo, 2023), the impact of educational and social factors (Master and Meltzoff, 2020). However, Haight *et al*. (2016) reported that the gender gap in IT "will narrow of its own accord", because educational and income differences between men and women are slowly shrinking. In the Ghanaian setting, Wrigley-Asante *et al*. (2023) in their study examined the causes of gender differences in academic performance of STEM subjects at two educational levels. At the senior high school level, males performed better than females, but at the tertiary level, females' performance improved. Whilst gender stereotypes contributed greatly to differences in high school academic performance, teaching methods and styles, parental motivation and support, and women's empowerment advocacy campaigns improved tertiary female academic performance. Quansah *et al*. (2020) also found that school-related characteristics like interest in math and science influenced female tertiary STEM selection as major choices. Female tertiary students' STEM course choices were also influenced by home and personal characteristics, such as parents' education level and socioeconomic status, self-confidence, career indecision, STEM role models, and locus of control.

This study examines further the relationship between gender and the study of IT programs in GCTU. It seeks to add to the Ghanaian perspective – and, to some extent, an African one – the discourse on the relationship between gender and the study of IT, which has not been researched as well as it is supposed to.

Methodology

This study adopted a mixed-methods research design to comprehensively explore the gender perspectives on the study of Information Technology in tertiary schools in Ghana, specifically focusing on the case of Ghana Communication Technology University (GCTU). The research design is essentially qualitative, interlaced with insignificant quantitative data such as descriptive statistical tables. GCTU was selected as the case institution due to its significance and relevance in the field of IT education in Ghana. The institution's representation of the larger tertiary education system and its specific programs related to IT provide valuable insights into gender perspectives in this context. Using Semi-Structured Interviews, forty IT students were interviewed to explore their experiences, challenges, and motivations in pursuing IT education. The interviews delved into their perceptions of gender

dynamics within the field and the institution. In addition, fifty examination scrips of IT students were randomly selected for analysis to determine scores in terms of gender. Furthermore, data on the admission of students in GCTU for IT programs from 2018-2023 were analysed to establish gender trends in the admission numbers over the past five years. The researcher observed IT classes at Ghana Communication Technology to gain insights into the dynamics of student interactions, teaching approaches, and potential gendered patterns or biases within the learning environment.

Findings

Data for this study were garnered from three main sources. First, the study surveyed the trend of admissions in Ghana Communication Technology (GCTU) between 2018 and 2023 to determine the number of female students admitted to study information technology (IT). Second, the study interviewed forty (40) students offering IT programs at various levels to ascertain their views on gender perspectives on the study of IT programs in GCTU. Third, the study randomly analysed the examination scripts of fifty (50) BSc. IT (BIT) and diploma in IT (DIT) students between 2020 and 2023. The study undertook a systematic examination and interpretation of the data garnered from the respondents to establish conclusions. By Act 1022, the Ghana Communication Technology University Act 2020 was passed, which made the University a public university (GCTU Basic Laws, 2021). Prior to becoming a public university, the University, known as Ghana Technology University College (GTUC), had existed and operated as a private university since 2005. Since its establishment, GCTU has admitted thousands of students to offer a degree in information technology (BIT) or a diploma in information technology (DIT). This study examined the trend of admissions in GCTU between 2018 and 2023 to measure the gaps in the numbers of male and female students. Table 1 below gives a statistical picture of the trend of admissions in GCTU since 2018.

Table 1: Trends of student admissions in GCTU, 2018-2023

Academic Year	Program	Total Admitted Students	Males	Females	% of Male Students	% of Female Students	Total %
2018/2019	BIT	819	774	45	94.51	5.49	**100**
	DIT	410	369	41	90	10	**100**
2019/2020	BIT	962	895	67	93.04	6.96	**100**
	DIT	524	477	47	85.31	14.69	**100**
2020/2021	BIT	881	828	53	93.98	6.02	**100**
	DIT	453	422	31	93.16	6.84	**100**
2021/2022	BIT	902	833	69	92.35	7.65	**100**
	DIT	450	408	42	90.67	9.33	**100**
2022/2023	BIT	935	867	68	92.73	7.27	**100**
	DIT	469	408	61	86.99	13.01	**100**

Source: Author's compilation of GCTU admissions, 2018-2023

From the trend of admissions over the past five academic years, as shown in Table 1, it is evident that the number of female students admitted in each academic year was low. In terms of nominal figures, the number of female students admitted for BIT and DIT programs since 2018 has been in the 60s except in the cases of 2018/2019 (45 female students for the BIT; 45 female students for the DIT program), 2020/2021 (53 female students for BIT program and 31 female students for DIT program) and 2021/2022 (42 female students for DIT program). From the table above, it is obvious that the trend of admissions of female students remained the same; it has not changed since the University became a public university in 2021. Similarly, the preponderating number of male students over their female counterparts did not assume any different pattern since GCTU became a public university in 2021.

The overt high numbers of male students vis-à-vis their female counterparts cannot be overlooked; it requires a critical enquiry to establish the reasons. To unravel the quagmire, the study interviewed forty (40) students offering

BIT and DIT in the current levels – level 100 to 400. The breakdown is given in Table 2 below.

Table 2: Sample size and distribution

Level	Male Participants	Female Participants	Total
DIT Level 100	4	2	7
DIT level 200	4	2	7
BIT level 100	5	2	7
BIT level 200	5	2	7
BIT level 300	5	2	7
BIT level 400	5	2	7
Total	**28**	**12**	**40**

Participants were asked several questions in the interview. Answering the question: Why are there more male students than their female counterparts offering IT programs in GCTU? Participants proffered different answers. The overarching view supported the notion of the IT divide in terms of gender. Of the 40 participants, 34 upheld the view that males generally had competencies, skills and interests in IT than their female counterparts. Providing insights into this view, a participant said:

> *Naturally, males have the same competencies, skills and interest in IT as their female counterparts. In the days of internet cafes, one would find more males in the cafes using the internet for a number of activities. Males generally find it easier to grasp the concepts of IT than their female counterparts. Similarly, males are far more capable of translating IT concepts into practice than their female counterparts. Given the overt natural differences in the competencies of males and females in IT, it is not uncommon for GCTU to have more male students reading IT programs than their female counterparts*. (Interview with a level 300 BIT male student. GCTU, 14th April 2023).

Collaborating this view, a female student said:

> *"IT and other STEM programs are for male students just like language programs are for females. There is a gender gap in the study of IT and STEM programs in favour of males just as there is a gender gap in the study of languages in favour of females" (Interview with a level 400 BIT male student. GCTU, 20th April 2023). Another participant put it differently. According to her, the ingrained perceptions in Ghana are to blame for the gender gap in the study of IT in tertiary schools in Ghana.*

Beyond the reasons for the gender divide, other accounts show that social factors also play a key role in the explanation of the gender gaps in the trends of GCTU's admissions since 2018:

> *"The mere mention of IT program in a Ghanaian society associates it to a male program. Ghanaians erroneously believe that IT programs are masculine-oriented programs. Sometimes, when I tell people in my community that I am studying IT in GCTU, they express shock. They are quick to find out why I am studying a program more suited for males than females. Hence, by default, the Ghanaian society has established IT as a program suited for males than females. They would ask me why I did not apply to study business-related programs instead. This ingrained perception deters potential female students from applying for admission to study IT programs in GCTU and other universities in Ghana"*. (Interview with a level 400 BIT female student. GCTU, 22nd April 2023).

Of the total 40 participants, 8 imputed the gender gap in reading IT programs in GCTU to social factors such as parental decisions, lack of hostel accommodation for students (particularly female students), and the low brand of GCTU compared to other universities in Ghana. In view of one of the participants, *"parents are preferential – they would allow their sons to read IT programs but would not consent to their daughters to read IT programs. Rather, they would prefer their daughters read law, languages and business-related programs"* (Interview with a level 100 DIT female student. GCTU, 19th April 2023).

The parental control factor or theory "pushed so many potential IT students away, and forced them to read other programs. *My female friend, who had wanted to read IT in GCTU was forced by her parents to study law in UPSA instead. I believe the parent control factor is pervasive, and it is the cause of the male-female gender gap in the numbers of students in GCTU"*. (Interview with a level 100 BIT female student. GCTU, 19th April 2023). Pushing the frontiers of the parental control theory further, a student blamed the imbalances in the ratio of male and female

students studying IT programs in GCTU on the lack of accommodation facilities in the University. *According to her, "parents would prefer to let their daughters enrol for programs in tertiary schools in Ghana that have accommodation facilities. Most parents abhor the situation whereby their daughters would commute from home to school daily. The lack of accommodation facilities in GCTU makes the University unattractive to female students, and ultimately, accounts for the low numbers of female students studying IT programs at various levels"*. (Interview with a level 200 DIT female student. GCTU, April 19th, 2023).

Beyond the parent control theory, participants averred that the GCTU brand is unattractive compared to other universities in Ghana. Some "*female students would prefer universities with a big brand, such as University of Ghana and would not bother reading any program even if it does not have a bearing on current job requirements. All that such ladies want is a university where they would have more social interactions, and they find that in other universities than in GCTU"* (Interview with a level 200 BIT male student. GCTU, 24th April 2023). So pervasive is the socialization factor to the extent that "*some female students in GCTU have made it the habit of going to University of Ghana almost every week to enjoy or partake the social flavour in the university"* (Interview with a level 200 BIT female student. GCTU, 17th April 2023). Suppose the GCTU works out mechanisms to construct hostel facilities for its teeming students, especially female students. In that case, it will go a long way to serve as a catalyst to attract more prospective female students to sign up for its programs, including IT programs. There are other considerations that explain the wide male-female gaps in the number of students studying IT programs at GCTU. The structure of the IT programs has contributed significantly to female students" disinterest in them. I appear that the course structures contain lots of concepts, theories, calculations and practical components that are abhorrent to female students. Of the 40 participants interviewed, 24 attributed the low attrition of female students" interest in IT programs to the complexities of the course structures of the programs. *According to a participant, "the mathematic, diagrammatic, theoretical and conceptual components of the courses in IT are complicated, and they make the IT programs unattractive to students in general, particularly female students"* (interview with a level 300 BIT female student. GCTU, 15th April 2023). Outside GCTU, there is the perception that IT programs are generally difficult and complex to study as a male participant put it.

Many potential female students are aware of the complicated course structures of the IT programs at GCTU. They get this insight from the University's website. With this insight, many potential female students for IT programs are deterred from applying for admission. *" In fact, my sister refused to apply for admission to GCTU to study IT when she realized that some of the courses contain lots of calculations, practical activities, theories and concepts. Some friends have shared similar situations about their siblings and lady friends who decided not to apply for admission to GCTU to study IT because of the perceived complex nature of the IT programs".* (Interview with a level 400 BIT male student. GCTU, 15th April 2023). Though the quotation is nothing but a public perception, it finds expressions in the realities some female students face in studying IT programs.

Some of the participants, both male and female students, argue that the complex nature of the IT program makes it unattractive to students, particularly female students. As a female participant aptly put it, the BIT course structures are complicated and inundated with calculations, practical activities, concepts and theories that are difficult to comprehend. "*On a number of times, some of my female colleagues and I had contemplated quitting studying IT program in GCTU entirely because the program is difficult. In fact, I know some few female friends who have abandoned studying the IT program because of this reason. I think the course structures should be reviewed to make them less complex and appealing to students in general, particularly female students"* (Interview with a level 200 BIT female student. GCTU, 19th April 2023). At each level, participants identified a number of their colleagues that have discontinued their studies in IT because they could not come to terms with the rigours of the program. Many of them were female students. For instance, in the current level 400 class, participants claimed that 13 students had dropped out over the past three years. Out of this number, 10 were said to be female students. The overarching reason advanced for the drop-out phenomenon was the difficulty of the students to cope with the rigours of the IT program. Similar trends of more female dropouts over the phenomenon of the complexity of the IT program abound at other levels.

Students Drop out of IT Programs

In the current DIT level 200 class, for example, participants claimed 7 female students have dropped out since they signed up for the program last year (2022), citing the difficulty of the courses in IT as the underlying cause. Similarly, the current level 200 BIT class was not spared of the drop-out phenomenon. Participants claimed they knew about 6 female students and 5 male students who were part of their class when they began their program

last year but have subsequently dropped out due largely to their inability to cope with the rigors of the IT program. In some rare cases, the complexity of the course structures of the IT programs has compelled some female students to change their programs. At all the levels of the IT programs, both BIT and DIT programs, participants claimed that some of their colleagues, mostly female counterparts, changed their programs at the beginning or during the IT program due to their inability to cope with the rigours of the IT program. Given this problem, it is imperative for GCTU to reconfigure the contents of courses in IT programs aimed at making them malleable and comprehensible.

As part of efforts to provide empirical evidence to support the claim that the course structures of the IT program are complex and that they serve as a disincentive to students, the study analyzed the scores of fifty (50) DIT and BIT students in levels 100 to 300. Level 400 students were excluded from this analysis because they belong to other universities, and their grading systems are different from those of GCTU. The breakdown of the sampled scripts of the IT students in terms of gender was as follows:

Table 3: Randomly sampled scripts of IT students according to gender

Program	Males	Females	Total
DIT level 100	5	2	8
DIT level 200	4	3	8
BIT level 100	7	5	12
BIT level 200	8	4	12
BIT level 300	6	6	12
Total	**30**	**20**	**50**

Source: Author's field research in GCTU, 2023

Scripts of students were sorted according to the grading system in GCTU, namely, A, A-, B+, B, B-, C+, C, C-, D and F. Samples of scripts were taken from each grade – five each from the ten different grades. The sampled grades showed obvious gender differences. Most of the higher grades were scored by male students, while their female counterparts scored average to poor grades. For instance, of the 15 students who scored between B+ and A, 11 of them were male students; only 4 were female students. On the other hand, out of the 20 students who scored between a grade C and a grade F, 6 were male students; the remaining 14 were female students. From the distribution of the grading system in terms of gender scores, it can validly be concluded that more male students obtained grades at the higher rungs of the grading system, while more female students studying IT scored grades at the lower rungs of the grading system. The dichotomous gender performances of students in courses in IT support the assertion that female students find the IT program relatively difficult compared to their male counterparts. The distribution of the sampled grades of 50 students according to gender is shown in Table 4 below.

Table 4: Distribution of grades of randomly sampled 50 scripts of IT students according to gender

Grade/Scores	Interpretation	Number	Male students	Female students
A (80+)	Outstanding	5	5	0
A- (79-75)	Excellent	5	4	1
B+ (74-70)	Very Good	5	4	1
B (69-65)	Good	5	3	2
B- (64-60)	Above Average	5	3	2
C+ (59-55)	Average	5	2	3
C (54-50)	Pass	5	1	4
C- (49-45)	Pass	5	2	3
D (40-44)	Pass	5	1	4
F (39-0)	Fail	5	2	3

Source: Author's field research in GCTU, 2023

Participants have also added a financial component to the repertoire of reasons adduced to explain the atrocious male-female gaps in the number of students studying IT programs at GCTU. Described as the "economy of studying in GCTU," participants argued that financial complications could not be eliminated from the equation of the explanation of the low female enrolment to study IT programs in GCTU. Out of the 40 participants, 18 claimed there is a financial dimension to the problem of low female numbers in the IT program at GCTU. In general, they argued that the high school fees make it difficult for some parents to enroll their children in school. Though this problem is not gender-oriented, participants argued that it contributes to the low number of female students

studying IT in GCTU, just as it contributes to reducing the number of potential male students studying IT and other programs in GCTU. As a participant put it, "GCTU fees are relatively high compared to other universities. The fees are more than twice the fees students in the University of Ghana, KNUST, UEW, UDS, and UCC pay. It is also over 300% higher than the fees students in technical universities in Ghana pay. Most of these technical universities offer IT programs; hence, their low fees enable them to attract more students than GCTU. The more students they attract, the higher the number of female students they get. If GCTU fees were to be same as those in other universities, GCTU would equally have attracted more students, which would invariably increase the number of female students studying IT" (Interview with a level 100 DIT male student, GCTU, April 12, 2023). Though the financial problem cannot be dismissed, participants claimed that some of the male students are able to undertake menial jobs to personally finance their education. Hence, the financial problem does not contribute to reducing the number of potential male students in GCTU studying different programs than it does to potential female students because they can hardly undertake menial jobs to finance their education personally. To overcome this conundrum, it is imperative for the management of GCTU to repackage the University's fee structures to make them relatively affordable.

Discussion

One striking conclusion drawn from the analysis of the study is that there is an obvious gender gap in the study of IT at GCTU. This was due to several circumstantial and extenuating factors, such as gender differences in competencies and interests in IT, social factors, and complexities of the course structures in IT programs, among others. This conclusion finds expressions in arguments in existing literature. For instance, Gibbs *et al*. (2022) and Gorbacheva *et al*. (2019) argued that there is an asymmetry relationship between males and females in the study of technology in general. Whether in the study of computer science or technology in general, the differences and representations are strikingly ubiquitous. The social exigencies and gender differences in competencies established in this study are in tandem with Qazi *et al*. (2022: 104) argument that "cultural notions of masculinity stress competency in the use and repair of machines." It also feeds into the debate that women's use, sense of, and ability to use the internet and other technologies differ markedly from those of their male counterparts (Lang *et al*., 2020).

The study further found that there are gender differences in coping with the rigours of the course structures in IT programs. The study found that males have strengths and the upper hand in IT courses that contain theories, concepts and calculations and that the difficulty of female students in GCTU to cope with the rigours of the complexity of the courses in the IT programs has contributed to the low numbers of female students in the University. This conundrum has also contributed to the drop-out rate of female students offering IT programs. At the same time, the complexity of the course structures in the IT programs at GCTU has made the program unattractive to potential female students. This finding does not find expressions in the existing literature. Other studies have explained the gender choices of technology programs, imputing the choices to the gender differences in understanding the programs (Silva *et al*., 2022) and gender differences in confidence Akgün (2020). Beyond these studies, no systematic studies on gender and technology have established the extent to which gender differences in comprehending and coping with the rigors of the course structures in IT programs have contributed to the gender disparities in the study of technologies in schools. Neither has any studies found a link between the complexities of the courses in IT programs and gender disparities in the study of IT. The finding of this study contributes to the studies on gender in IT by providing a new dimension by which to interrogate the existing gender disparities in the study of IT in schools.

Finally, the study revealed that social factors are critical to the interrogation of gender disparities in the study of IT programs at GCTU. It established that the lack of hostel facilities to accommodate female students, as well as the low social feeling in GCTU, does not create an attractive environment for potential female students to apply to study IT programs in GCTU. The arguments in existing literature are silent about the social factors. Scholars have mentioned social factors such as discrimination (Inegbedion *et al*., 2020), access to the internet (Cirillo *et al*., 2020), and gender differences in the ownership of computers (Acilar and Sæbo, 2023). The closest argument to this finding is the argument of Haight *et al*. (2016), which points to the fact that educational and economic factors are contributing to bridging the gender gaps in IT. According to him, the gender gap in IT "will narrow of its own accord because educational and income differences between men and women are slowly shrinking" (Haight *et al*., 2016). Furthermore, the study established that the "economy of studying IT" cannot be taken out from the mix of the study of the reasons accounting for gender differences in the study of IT in schools. It found that the relatively

high fees at GCTU, coupled with parents" inability to afford the high fees, contributed to the gender disparities in the study of IT programs at GCTU. This finding does not find expressions in arguments in the existing literature; neither does it relate to any argument in the existing literature. This finding this study has widened the horizon of the study of the reasons for the gender disparities in the study of IT by weaving the financial component into the mix.

Conclusion

The study examined gender disparities in the study of IT programs in GCTU. The study found that gender disparities in the study of IT programs in GCTU are prevalent, as there are more male students than female students studying IT since 2018. The study found that several factors are responsible for the gender disparities in the study of IT programs at GCTU. Key among the factors is the gender differences in the competencies and interests in the study of IT programs. Other factors included gender differences in coping with the complexities and rigours of the course contents of IT programs, financial constraints, and social factors. To overcome the quagmire of gender differences in the study of IT in GCTU, the study recommends that GCTU adopt an affirmative action that would extend admissions to prospective female students beyond its cut-off points or grades. Furthermore, it is imperative that GCTU work assiduously to construct hostel facilities to solve the acute accommodation conundrum that is making the University unattractive to prospective female students. In addition, there is the need for the University to reconfigure its course structures in IT programs to make them "malleable" and comprehensible to all students alike. This study is significant for two reasons. First, it broadens and brings new nuances to bear on the discourses on gender disparities in the study of IT by adding the Ghanaian perspective to it. Second, the findings of the study provide useful recommendations that can be used by policymakers in GCTU to overcome the conundrum of gender disparities in the study of the University's IT programs. The study may be limited by the size of the sample, making it challenging to generalize findings to a broader population. The participants may not represent the entire spectrum of individuals studying Information Technology, leading to potential biases in the results. Further studies are recommended on the digital divide of women in Ghana.

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