

## RAISING THE NEXT GENERATION OF YOUNG WOMEN IN STEM – A MISSED OPORTUNITY

### Abstract

**Introduction:** There is an explosion of attempts by government agencies responsible for education, development partners and civil society in a bid to increase the enrollment of girls and young women into Science, Technology, Engineering and Mathematics (STEM) related courses at all levels of education, especially in sub-Saharan Africa. In the face of all these efforts, however, school dropouts are on the ascendancy, mostly as a result of unintended pregnancies suffered by adolescent girls and young women. In most cases, the onset of unintended pregnancies constitutes a permanent blockage of the educational ambitions of the girls involved. How can this community of practice, in their attempt to raise the next generation of young women in STEM, ensure that unfortunate girls and young women who fall victim to unintended pregnancies do not get left out of the opportunities available for participation in STEM education? This paper examines the effects of unintended pregnancies on the uptake of STEM education by girls and young women while exploring ways to mitigate the problem of unintended pregnancies through integrated programming.

**Methods:** an extensive literature was review on program reports and publications from government ministries, Civil Society Organizations and United Nation Agencies. The reports reviewed covered a five year period from 2016 to 2020 and focused mainly on programs aimed at increasing the enrollment of girls and young women into STEM education at various levels of education

**Results:** Almost all programs aimed at increasing girls' enrollment in STEM were standalone, without considering the other factors, including Sexual and Reproductive Health and Rights (SRHR) and Open and Distance Learning (ODL) as an opportunity to retain them in formal education, that determine the enrollment and retention of girls in school. In Ghana alone, more than 100,000 girls dropped out of school as a result of unintended pregnancy in 2020 alone.

**Conclusion:** there is a missed opportunity to “leave no one behind” in the attempt of today’s community of practice to raise the next generation of girls and young women to drive innovations in Science, STEM as many of them are lost to unintended pregnancies and are left out of efforts aimed at encouraging them to take up STEM education. We recommend that programs targeted in this regard should be integrated with activities that address other factors, such as SRHR, which affect the general enrollment and retention of girls and young women in school. The emergence of ODL presents an opportunity for victims of unintended pregnancies to continue accessing formal education while at home and without fear of stigmatization.

**Keywords:** STEM/TVET, ODL, Gender Equality, Girls' Education, retention of girls in school.

## INTRODUCTION

The influence of education on Adolescent Sexual and Reproductive Health is almost established, such that, education is protective of adolescents from HIV acquisition, transactional sex and unintended pregnancies (Chandra-Mouli and Petal, 2017). Meanwhile, the school system has again been identified as appropriate for promoting gender equality among children, adolescents and young people (UNESCO, 2018)

Gender inequality is seen through male domination in leadership at higher learning institutions in LMICs though several gender Policy documents exist. Gender parity in STEM education is a topical issue for many governments but the spiritedness to monitor the implementation appears to have challenges (phobia and prospects) which this project seeks to explore and address. STEM disciplines are encouraged and publicized through outreaches, career symposia, bursaries and scholarships but have yielded minimal results in Zimbabwe and Ghana.

The question arises however, as to how well the individual efforts have done, as opposed to an integrated approach to tackling both problems concurrently through the same school system

On one hand, Ghana is signatory to a number of gender specific and sensitive policies: the Maputo Protocol; the Convention on the Elimination of all Forms of Discrimination Against Women (CEDAW); the Beijing Declaration & Platform for Action; National Constitutions; Gender Policies; and the Eleventh Malaysia Plan (2016-2025); all geared towards increasing women's rights to education and work, promoting gender integration and addressing gender imbalances.

On the other hand, The Ghana Health Service estimates the Adolescent Fertility Rate to be 76.3 per 1000 girls aged 15 to 19 years as a proxy to indicate the extent of sexual activity among the demographic group. In 2019, young people 15 to 24 years old accounted for 28% (5,613) with the male and female proportions pegged at 21% (1,205) and 79% (4,409) respectively (GAC, 2019). However, the HIV prevalence among this demographic group is 0.8% according to the Ghana Health Service. (Ghana Health Service, 2017)<sup>1</sup>. A key driver of the vulnerability of girls and young women is the health risk behaviours among this group and the low knowledge gap between them and their male contemporaries (Chandra-Mouli and Petal, 2017). The gap in comprehensive knowledge on HIV among young males (27%) and young females (19%) continues to widen for people aged 15 to 24 years, putting young women at a higher risk of acquiring HIV than young men of the same age bracket.

Apart from “killing two birds with one stone”, an integration of promoting gender equality and SRHR concurrently through the education system, will ensure equitable participation of health girls and young women in education. This will also accelerate progress towards the achievement of multiple Sustainable Development Goals such as goals 3, 4 and 5 concurrently.

## JUSTIFICATION FOR INTEGRATION OF STEM AND SRHR PROGRAMS

This justification is seen from two parallel but complementary perspectives of program design and implementation. First, we look at the integration of STEM and SRHR programs from the perspective of school based programming, and second, we will examine community based programs that can be integrated for the two subjects.

The barriers facing adolescents, especially girls, and young women generally, in accessing quality health care services are much the same when they try to access quality education. These challenges are varied, multifaceted and are experienced at different levels of the social ecology. Ranging from entrenched societal norms and traditions that

encourage, and sometimes, go a step further to enforce early marriages and associated practices for girls at the onset of puberty to rather unhealthy environments that do not support practices around menstrual hygiene management for girls. Also among the barriers are gender considerations that spell out certain roles for boys and girls.

## **JUSTIFICATION FROM THE PERSPECTIVE OF SCHOOL BASED PROGRAMMING**

The general objective of Comprehensive Sexuality Education is to improve equal access to education for girls by preventing unintended pregnancies, Sexually Transmitted Infections, including HIV and reducing school dropout rates among girls. These are all crucial for promoting STEM uptake for girls as well.

Meanwhile, the need for Sexuality Education is not in isolation. It falls within the context of a holistic education that ensures that the individual youth grows up fully aware of their life choices, and in good health, to be able to live to their fullest potential and contribute meaningfully to the communities in which they live and grow.

The **Education 2030 Incheon Declaration** (World Education Forum, 2015) clearly recognizes the synergy between education, gender equality and health in promoting quality lifelong learning opportunities and ensuring that these opportunities, and the benefits thereof, are passed on to future generations. This is the ultimate goal of the fourth Sustainable Development Goal and the recognition of this synergy by the World Education Forum is a clear indication that the important role of education as a main driver of development, including economic development, and good health, cannot be achieved without paying attention to the factors that bring about the inequalities between boys and girls in society. This synergy could be achieved through Sexuality Education, which encompasses health, education and gender equality. The recognition of this synergy is a clear demonstration of the practicality of integration between STEM programs (SDG 4) and SRHR programs (SDG 5).

The environment within which in-school adolescents and young people live and grow must be enabling if we are to achieve this synergy. But there is a challenge; The 2015 Incheon Declaration 2015<sup>iii</sup> further acknowledges that “the challenge for educators, policy makers and all stakeholders is **how to put the 2030 vision into action**, given the acknowledged difficulties of working across and between sectors at local, national and international levels”.

One practical way of putting this into action is through the Comprehensive Sexuality initiative introduced by UNESCO and partners.

UNESCO (2018)<sup>iv</sup> defines Sexuality Education as follow:

Comprehensive sexuality education (CSE) is a curriculum-based process of teaching and learning about the cognitive, emotional, physical and social aspects of sexuality. It aims to equip children and young people with knowledge, skills, attitudes and values that will empower them to: realize their health, well-being and dignity; develop respectful social and sexual relationships; consider how

their choices affect their own well-being and that of others; and, understand and ensure the protection of their rights throughout their lives.

In this context, CSE is supposed to be curriculum based; age and context appropriate; gender based; culturally relevant and context appropriate; transformative, able to develop life skills and health choices; scientifically accurate and based on human rights (UNESCO, 2018). According to UNESCO, (2009)<sup>v</sup>, an unacceptably small number of young people currently have access to adequate information that prepares them for adulthood. This tends to expose them unduly to unplanned pregnancies, abuse, coercion, exploitation and HIV among other Sexually Transmitted Infections.

If the improvement of the agency and self-efficacy of girls is important for their uptake of STEM, it will be a missed opportunity that Comprehensive Sexuality Education, which seeks to improve their agency, will be allowed to be implemented as a standalone, after which we look for additional funding to implement a separate program for improving STEM uptake for the same demographic group.

## **JUSTIFICATION FROM THE PERSPECTIVE OF COMMUNITY BASED PROGRAMMING**

Ghana is currently home to over two million child brides and one in five young women in Ghana were married before their eighteenth birthday (UNICEF, 2020). Majority of young women who are currently married gave birth as adolescents, making it important to tackle the problem early at the adolescent stage, thus, informing the choice of adolescents as primary beneficiaries of this project. In a recent survey conducted by the Government of Ghana, it was revealed that over 100,000 adolescent girls dropped out of school in 2020 alone as a result of unintended pregnancy. While Sexual and Reproductive Health still remains shunned in many Ghanaian communities, its effects continue to wreak devastating havoc on innocent and unsuspecting adolescents, most of who fall prey to this phenomenon at the hands of men and boys. This phenomenon is further compounded by negative social norms that serve as a barrier to the independence and leadership and encourage male dominance within most African communities. This proposed intervention is therefore designed from the point of view of preventing child marriages as a harmful practice as defined by the Maputo Protocol (article 6b).

The COVID-19 Pandemic may not have physically destroyed school buildings or other infrastructure but has certainly impacted the use and management of these infrastructures for the purpose for which they were acquired. The COVID prevention protocols, including lockdowns, social distancing and other related protocols have served as ground for the sexual and physical abuse of many girls leading to unprecedented school dropout rates. Implicitly, therefore, many potential STEM students are out of school and need to be reached. These unfortunate young people are usually the target for many community based SRHR programs. Again, it will be a missed opportunity to implement standalone SRHR programs for this group of people and not leverage the same resources and self-efficacies imparted to promote the uptake of STEM for the same girls.

The COVID-19 Operational Planning Guidelines and the COVID-19 Partners Platform to Support Country Preparedness and Response clearly recognizes the fact that the Ministry of Education, the Ghana Education Service and the Ghana Health Service cannot do it all alone. There is the need for Civil Society Organizations promoting health and gender equality to join hands with these government ministry and agencies in charge of education to, not only reduce infection, but also ensure that the effects of COVID are handled holistically. This is another proof of the practicality of integration using existing structures.

## **OPEN AND DISTANCE LEARNING AS A WINDOW OF OPPORTUNITY**

The concept of Open and Distance Learning (ODL) represents an approach that focuses on opening access to the provision of education and training, and in the process, freeing learners from the constraints of time and space (UNESCO, 2002). ODL is a welcome response to the exploding demand for tertiary education in West Africa. It has become an important factor for bridging the gender gap for women and girls in their quest to access tertiary education in Lower and Middle Income Countries such as Ghana. The emergence of COVID-19 and its attendant prevention protocols such as school closures, lockdown and social distancing has highlighted the importance of technology based learning from a distance. Besides, for the over 100,000 adolescent girls who dropped out of school in Ghana in the year 2020 alone, ODL is a viable opportunity for them to continue to access quality education without the fear of discrimination or stigmatization..

When girls drop out of school, they form part of a highly heterogeneous group of young people referred to as “out-of-school youth” (Ghana Population Council, 2000). This group of young people is almost totally out of reach to programs aimed at encouraging school attendance generally and STEM/TVET education in particular. It takes extra effort and extra resources for organizations and practitioners to reach a fraction of such out-of-school youth due to the lack of homogeneity.

Given the high rate of unintended pregnancies of adolescent girls and young women in Ghana, and the resulting rate of school drop outs for them across the country, it is important for both practitioners and policy makers to begin looking closely at the relationship between ODL and SRHR. As the beneficiaries of both efforts are the same, policies and program designing strategies aimed at integrating ODL and SRHR will most likely achieve a synergy that produce great benefits for the individual beneficiaries, their communities and the country as a whole.

## **SIMILARITIES IN FACTORS THAT INHIBIT BOTH STEM UPTAKE AND SRHR**

### **Gender inequality**

Research shows that in parts of Africa, gender norms are established early in life, and this has a significant impact on the agency of adolescents. Therefore, their agency, which emphasizes their ability to make decisions, is further constrained for girls, who are forced by the social construction of gender norms to adhere to norms that limit their ability to say no to sexual advances from stronger and more resourced male adults (Ninsiima et al, 2018). This also affects their capacity to pursue education and, especially, to pursue a STEM course. This disadvantage becomes even direr when the age at first sex is very low for adolescent girls as the negotiation power is almost non-existent for girls at such young age, increasing their risk for HIV acquisition even further (Drakes et al, 2018). In sub-Saharan Africa, gender inequality and its associated dynamics play an important role in determining sexual behavior in much the same way as it determines the ability to pursue male dominated courses such as STEM. Most adolescent girls and young women in Africa feel pressured, coerced and manipulated by their male counterparts in selecting a course of study, and this influence also reflects in their sexual relationships. (Cluver et al. 2013). For instance, it is not common practice for girls and women to demonstrate such interest. This makes boys and men tend to disregard their “no”, taking it to mean “yes”. This “coyness”, which is apparently accepted by many African societies and expected to be normal, tends to predispose women and girls to either drop out of school or study courses regarded as “reserved for women”. In the same way, this also predisposes them to sexual exploitation. This disproportionate predisposition of girls and young women to sexual exploitation accounts for the reason why adolescent girls and young women face a disproportionate burden of HIV as compared to their male contemporaries as nearly three quarters of the HIV burden is attributed to them (Moore et al, (2008) and (Price et al, 2019).

### **Poor Negotiating Power**

Men, especially, older men, who are more likely to be employed and having the wherewithal, have the upper hand in negotiating what course a girls should study. This is mainly because they are the ones paying the fees. In the same way, negotiating for sex is heavily skewed, with men having the greater negotiating power (Dana, Adinew and Sisay, 2019). Because of these disproportionate power dynamics between young women and their older sexual partners, unprotected sex is more likely to be reported by young women who engage in age-disparate relationships (Maughan-Brown et al, 2016). Cultural norms in most African settings are such that they accord more negotiation power to males than females. As part of the normalized male dominance and hegemonic masculinity that runs through many African societies, the culture of almost total subordination, for instance, enjoins the female to agree more than disagree (Cluver et al, 2013). This is usually due to the high levels of male provision that have been found to be associated with higher levels of the males' perceived community approval of their power to make sexual decisions. However, high levels of male provision have, at the same time, been associated with lower levels of perceived peer approvals for adolescent girls and young women's power to make sexual decisions as well as the decision to pursue STEM

### **Socio-cultural and religious activities**

Research indicates that religious affiliation has a strong positive influence on the agency of girls. This positively affects their ability to take decisions, including the pursuance of STEM courses and knowledge about HIV among women in Ghana though the findings however did not indicate a change in protective behavior, particularly condom use (Takyi, 2003). Meanwhile, young women aged 15 to 24 years who engage in religious activities more frequently have a lower risk of engaging in cross generational sex as compared to those who do not belong to any religious group (Drakes et al, 2018). In the same way, the frequency of school attendance is associated with adolescent girls and young women having age-disparate relationships; young women who attended fewer school days (<80%) have a risk difference of 9.9% while the risk difference for those who dropped out was 17.2% (Stoner et al, 2017). This is because the school serves as a social system, having rules and regulations by which the students must abide, and failure to abide by those rules is punishable. The school system, especially the study of STEM, protects girls and young women from excessive fashion, night clubs and other risk factors of transactional sex, which also predisposes them to engaging in age-disparate sexual relationships and cross generational sex (Stoenebau et al, 2017).

## **CHALLENGES OF INTEGRATION OF STEM AND SRHR PROGRAMS**

The factors inhibiting the integration are many and varied. STEM is seen as a subject purely related to education (SDG 3), and perhaps to some extent, gender equality (SDG 5) while SRHR is regarded as a purely health (SDG) problem. As recognized by the Incheon Declaration, there is major problem with getting players in these different fields to work together. As a result, policies for integration do not exist for SRHR and STEM programs. Consequently, practitioners are unable to design programs across board. There is a significant need for the introduction of Open and Distance Learning (ODL) into STEM Programs. This is key to the rehabilitation of victims of school dropouts.

## **CONCLUSION**

Open and Distance Learning is a welcome strategy aimed at providing access for education and training for people who are constrained by time and space, including adolescent girls and young women who dropped out of school due to unintended pregnancies and Gender Based Violence. Integrated programming for SRHR and ODL is therefore expected to produce great synergies for beneficiaries. Studies are scarce on this subject. However, given the similarities in the target group, which is mainly adolescent girls and young women of school going age, and the fact that the school system is a fertile ground for promoting both, this is worth exploring for the sake of better program outcomes and policy formulation in both directions. It is therefore recommended that further studies be conducted on this subject to determine the specific advantage, in terms of health, educational outcomes as well as economic advantage of integrating programs that aim at promoting SRHR with those aiming at improving STEM uptake for girls and young women. School dropouts are usually the target of many SRHR programs; this offers a good opportunity to reach the potential girls who dropped out of school as a result of unintended pregnancies and abuse, especially, during the COVID-19 lockdown period. The inalienable relationship between ODL and SRHR is therefore worth exploring.

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