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Improving Girls' Literacy Rates in Northern Ghana

Applied Policy Project



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DISCLAIMER

The author conducted this study as part of the program of professional education at the Frank Batten School of Leadership and Public Policy, University of Virginia. This paper is submitted in partial fulfillment of the course requirements for the Master of Public Policy degree. The judgments and conclusions are solely those of the author, and are not necessarily endorsed by the Batten School, by the University of Virginia, or by any other agency.

HONOR STATEMENT

On my honor, as a student, I have neither given nor received unauthorized aid on this assignment.

A handwritten signature in black ink, appearing to read "Daniel Hater".

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KEY ACRONYMS AND DEFINITIONS

Acronyms

BRAC - Bangladesh Rural Advancement Committee

DHS - Demographic and Health Survey in Ghana

GPE - Global Partnership for Education

HIV - Human Immunodeficiency Virus

LING - Literacy in Northern Ghana (Organization and Client)

MOE - Ministry of Education in Ghana

NGO - Non-governmental organization/s

OECD - Organization for Economic Co-operation and Development

PTA - Parent-Teacher Association

UNESCO - United Nations Educational, Scientific and Cultural Organization

Definitions

BRAC Schools - “BRAC schools are inexpensive schools that offer first- and second-grade education to poor children and that allocate 70 percent of their slots to girls” (Arends-Kuennen & Amin, 2004)

Child Marriage - “Any formal marriage or informal union between a child under the age of 18 and an adult or another child... Child marriage is often the result of entrenched gender inequality, making girls disproportionately affected by the practice” (UNICEF, n.d.)

Gross Enrollment Rate - “The ratio of total enrollment, regardless of age, to the population of the age group that officially corresponds to the level of education shown” (Index Mundi, n.d.)

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EXECUTIVE SUMMARY

Currently, literacy rates in Northern Ghana among girls are too low, especially in comparison to urban regions in Southern Ghana. Literacy in Northern Ghana (LING) is working on addressing these low literacy rates as a small non-profit organization run by an educator in Northern Ghana. Literacy skills are important because better life outcomes, financial outcomes, and health outcomes are linked to literacy. Some of the factors that exacerbate these low literacy rates include poverty, parents' lack of education, migration from Northern Ghana to Southern Ghana for more opportunities, child marriage/gender expectations, and low government presence in the region. This report will provide background information, a problem definition, and a literature review on existing evidence. There are three policy alternatives that address either accessibility to the classroom or learning once inside the classroom. The policy alternatives were evaluated using (1) effectiveness, (2) public support, (3) cost to LING assuming partnership, and (4) ability to work with external partners.

The following policy alternatives include:

1. Free and Disposable Menstrual Products (addresses accessibility to the classroom)
2. Free Books and School Supplies (addresses accessibility to the classroom)
3. Expansion of Teacher Literacy and Educational Skills Training (addresses learning in the classroom)

After thorough evaluation, I recommend a two-prong solution to increase access to school for girls and to ensure they are learning the necessary literacy skills in the classroom. The first part of the recommendation is free and disposable menstrual products (alternative 1), and the second part includes expansion of teacher literacy and educational skills (alternative 3). It is essential that LING prioritizes community buy-in through stakeholder coalitions, continual data collection and marketing strategies for successful implementation.

INTRODUCTION

Ghana's youth is the future of the country, so we must empower girls with the literacy skills needed to advance their goals and increase their educational and personal outcomes in life. Yet **too many girls aged 6-15 years old in Northern Ghana have low literacy rates leading to school dropouts and higher rates of early and child marriage.**

I focus on Northern Ghana not only because LING is located there but because Northern Ghana is also a rural region that lacks many of the necessary government resources to help mitigate this issue. Thus, non-governmental organizations (NGO) and advocacy organizations are in a unique position to help mitigate and solve this issue. Girls should especially be prioritized because they are at higher risks of lower attendance rates, lower educational outcomes, and more strenuous gender roles and expectations that put them at a disadvantage when compared to boys.

This is not an easy problem to solve as there are many factors that affect school attendance and school performance, two important factors in literacy rates for girls. However, the following research and proposed solutions provide promising ways to help empower girls and increase their educational and personal success.

Client Overview

Literacy in Northern Ghana (LING) and I work most closely with the founder and managing director, Abdul-Razak Issah. Issah is an educator in Northern Ghana, so he has first-hand experience seeing literacy and education rates among girls in the region. LING is a small non-profit based in Northern Ghana and they are trying to employ ways to increase literacy and STEM education for girls. LING is mostly made up of volunteers and they work to partner with other organizations to bring resource training to Northern Ghana educators.

Some of the interventions LING provides include teacher trainings and literacy lesson plans to help assess and build literacy skills. LING is very interested in helping to solve this problem because it is part of their own core mission. As they are also educators in the region, they are interested in helping their students learn more and have better educational outcomes.

LING's main goal is to increase girls' literacy skills and overall education in Northern Ghana. They want to focus on targeting risk factors like poverty, child marriage, and school absenteeism to ensure that access to education is easier for girls in the region. They recognize that these risk factors affect girls at disparate rates and want to empower them with the necessary skills and resources to improve their outcomes.

PROBLEM DEFINITION

Consequences of Illiteracy

Currently, only 44.3% of girls in Northern Ghana are literate. In comparison, 61% of girls in all of Ghana are literate which highlights the North-South/rural-urban divide in Ghana (Government of Ghana, n.d.). There are many consequences to these low literacy rates in Northern Ghana. First, girls are unable to access as much knowledge and information without knowing how to read and write. This can especially be a barrier in the workplace which may result in lower paying jobs for these girls. Learning new things and gaining access to new experiences can also lead to a better quality of life for these girls (Richmond et al, 2008).

Second, girls will feel less empowered when they are unable to read and write. Without this necessary life skill, they are unable to communicate with others using written language. They are also unable to learn new skills and information through reading that they will use in their own lives to increase feelings of empowerment. Without necessary knowledge about academic, personal, and health care related skills, they may experience less self-esteem and confidence for themselves which is needed to make decisions that benefit themselves and their goals in life (Richmond et al., 2008).

Third, illiteracy is also linked to worse health outcomes for girls. For example, while illiteracy does not directly lead to higher Human Immunodeficiency Virus (HIV) numbers, it does make girls more unaware of treatment and interventions that might help to mitigate symptoms and effects of HIV. They may be unaware of the importance of wearing condoms or getting tested for HIV. Illiteracy is also linked to higher incidence of poverty which makes accessing health care more difficult or virtually impossible for girls and may continue the cycle of poor health outcomes (Medel-Añonuevo et al., 2007).

Causes of Illiteracy

For many girls and families, living in poverty is one of the biggest causes of illiteracy (Watkins, 2013). This may affect several other factors such as access to textbooks, other school supplies, and school uniforms which help to promote learning both at school and at home. It may also affect transportation methods to and from school. To help financially support the family, parents may also ask their children to work instead of going to school. Looking for adequate work often pushes much of Northern Ghana's youth to migrate to Southern Ghana as well where there are more resources, jobs, and bigger urban centers.

Parental illiteracy also serves as an important overarching cause of illiteracy for girls. In 2019, only 79% of the adult population in Ghana was literate (World Bank, 2021). This can mean that their daughters may not get the early at home education of basic reading and writing skills which may make the transition to school more difficult. Once in school, students may have more difficulty with homework assignments without parental help at home (Watkins, 2013). In addition to poverty and parental illiteracy, there are two levels to focus on to improve girls' literacy rates in Northern Ghana.

Increasing Girls' Access to the Classroom

The first level is getting girls into the classroom. As mentioned before, poverty can affect access to school given the costs of school supplies and transportation. Poverty can also affect access to menstrual products which is linked to lower attendance rates during menstruation. Girls in Northern Ghana have an absentee rate of 59% during menstruation due to the lack of adequate menstrual products. The fear of being teased or embarrassed, due to the use of cloth period products, leads many girls to stay at home during menstruation to avoid these obstacles (Kumbeni et al., 2021).

High child marriage incidence is also a key factor affecting access to school for girls in Northern Ghana. One of the traditional beliefs is that instead of wasting time or money on education, girls should be married off at a younger age (Amladi, 2020). In Ghana, 1 in 5 girls are married before age 18 and 5% of girls are married before age 15 (de Groot et al., 2018). Child marriage has a direct negative impact on both literacy and school attendance rates for countries in Sub-Saharan Africa, including Ghana. In Sub-Saharan Africa, one additional year of child marriage reduces literacy rates by 7.5 percentage points (Nguyen & Wodon, 2014). According to Wodon, child marriage may also prove to be responsible for about 10-20% of secondary school dropouts among girls in Sub-Saharan Africa as well (Wodon, 2014).

“Girls are at a greater risk of absenteeism, repetition, withdrawal and dropout, and have lower educational achievement than boys in upper primary school” (Iddrisu et al., 2017)

Ensuring Girls are Learning in the Classroom

The second level is ensuring that girls are learning the necessary literacy and educational skills once inside the classroom. For this level, we will focus on the importance of teacher training and resources. A study conducted by the Global Partnership for Education cites three main school level barriers to learning in the classroom: “quality support to teacher development, teaching methods and learning materials...and strengthening systems for recruiting, managing, and engaging teachers” (Akyeampong & De Chaisemartin, 2019). A reading by Bertrams et al. also highlights the importance of having adequate contact/instructional hours with students (Bertrams et al., n.d.).

There are several key factors that affect quality teaching. For teacher development, teachers must be able to receive continual training workshops that target best teaching practices for the modern world. After these best practices are learned, teachers' own knowledge and information becomes extremely important for increasing student performance (Akyeampong & De Chaisemartin, 2019).

Teaching methods and learning materials may be especially difficult to target due to varying degrees of government resources and authority in the Northern Ghana region. Often, teachers may be forced to purchase classroom materials and resources themselves. Lastly, teachers may

be facing low salaries, low morale, and low incentives to continue teaching. This can make turnover very high and can drastically affect the motivation and performance of their students as well (Akyeampong & De Chaisemartin, 2019).

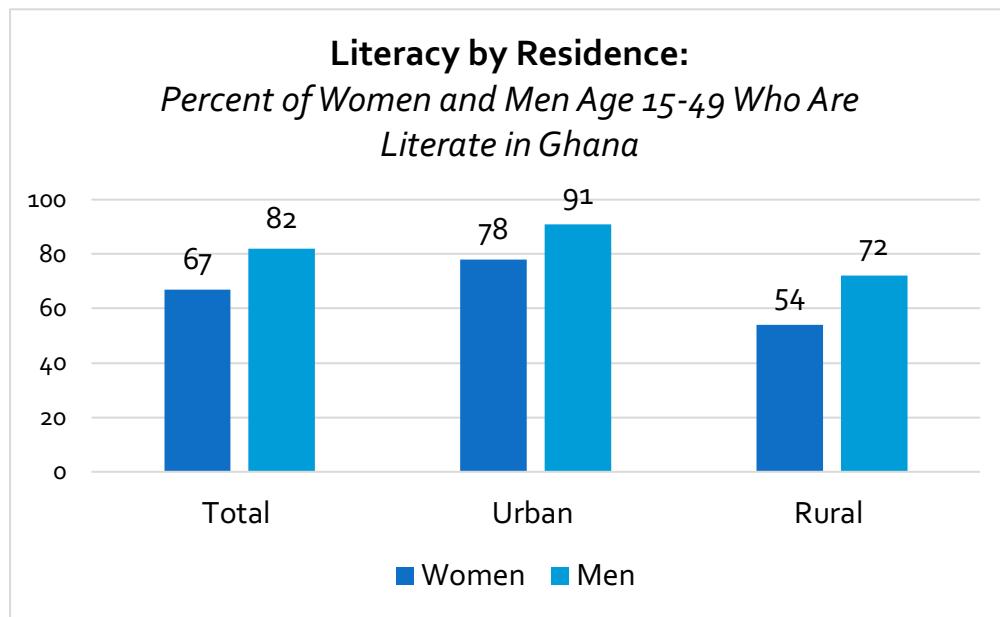


Figure 4: Literacy by Residence (Ghana DHS, n.d.)

Regional Challenges

Northern Ghana also lacks a strong government presence in Northern Ghana which can exacerbate the problem of low literacy and education rates among girls. This is due to the North-South/urban-rural divide in Ghana. As seen in figure 4, 54% of rural women are literate while 67% of Ghana's total female population is literate. We can see the urban rural disparity in figure 4 as well with 54% of rural women being literate compared to 78% of urban women being literate (Ghana DHS, n.d.).

According to LING, the government, which would have the power to enforce better education outcomes (better teachers, more school resources, school attendance), does not have much power or presence in the Northern region. Instead, local tribes have more power and authority to resolve issues. Dagomba is the biggest tribe in Northern Ghana, and they are the tribe that normally resolves any disputes or issues in the area (Issah, 2021).

While the Dagomba tribe normally handles regulation in the area, it is important to be aware of the government positions that do exist in the area. District chief executives oversee administrative duties in the area which include education, health, etc. However, they lack the resources that would make them effective leaders in education. Even though all educational resources come from the Government of Ghana, a lot of those resources go directly to Southern Ghana because the area has more industrialization and bigger businesses (Issah, 2021).

BACKGROUND

Ghana's Education System

The country of Ghana is in Western Africa (see figure 1) has free and compulsory public education for all students. This education system includes two years of kindergarten, six years of primary education, and three years of junior secondary education for students from ages 4-15 years old. In 2017, the government ruled that senior secondary school will also be free of fees (Britannica, n.d.). Some of the biggest goals of the basic education provided by the Ghana government include literacy, problem solving, math skills, and more personal skills for a healthy, balanced lifestyle (Ghana Education Service, n.d.). In addition to public schools, Ghana also has private primary through secondary schooling as well as colleges and universities across the country (Britannica, n.d.).

The Ministry of Education (MOE) is the government branch that manages education in Ghana. Some of the key functions of MOE that are important to the problem of low literacy rates among girls in Northern Ghana include the distribution of resources, the advising of government policies regarding education, and evaluation on implementation of education policies. One of the more recent important education policies to help improve education outcomes is the Strategic Plan for 2018-2030. This plan focuses on “improved learning outcomes, enhanced accountability and equity at all levels of the education sector” (Ministry of Education, n.d.). The improved learning outcomes and the enhanced accountability goals would particularly apply to the current problem.



Figure 1: Map of Ghana in Africa (University of Louisville, n.d.)

Ghana has some legislative policies in place to help expand access to education for the whole country further than free tuition for school. President Nana Addo Dankwa Akufo-Addo promised textbooks, boarding, and meals all free of charge for all public secondary schools (World Education News & Reviews, 2019). Before this rule change, 25% of the students who got selected and placed into senior secondary school through the Computerized School Selection and Placement System did not follow through with enrollment, many because of financial strains. In a country with over 30 million people (BBC News, 2021) and 57% of the population under age 25, free and compulsory education is extremely necessary for all school levels (Akoto, 2019).

Ghana's North-South Divide

Ghana's North-South divide (see figure 2) dates back to Ghana's independence from colonial England in 1957. Northern Ghana is largely rural while Southern Ghana is more urban, has larger cities, and a larger population. When President Nkrumah gained control of the country after British rule in 1960, he established much of his rule in Southern Ghana rather than Northern Ghana. Much of the schools he built were in the Southern region of the country which is why the Southern region now has higher education and literacy outcomes than the Northern region. These educational resources which largely went to Southern Ghana exacerbated the rural-urban divide between Northern and Southern Ghana. Similar to what Issah had said before, many believe that President Nkrumah focused on the Southern region because there were "tribal-nationalist conflicts" in the Northern region (Swaray 2021). This also resulted in fewer government resources and educational materials going to the Northern region.



Figure 2: Map of Ghana Regions (Wikimedia, n.d.)

How Does Ghana Compare?

When comparing Ghana's education and literacy situation to other Sub-Saharan Africa states, they all face similar challenges. In the region, more than 20% of children are not attending school for ages 6 to 11 and about 30% of students ages 12 to 14 are not attending school. Girls specifically face a gender gap in education with 23% of them not attending primary school compared to 19% for boys (UNESCO, 2016). Ghana, with a girls' literacy rate of 92.2% in 2018, has higher rates compared to its surrounding sub-Saharan countries. In 2018, Nigeria's youth female (age 15-24) literacy rate was at 68.2% (UNESCO, 2021) and Cote d'Ivoire's youth female literacy rate was 76.4% (World Bank, n.d.). While Ghana's national girls' literacy rate is higher than others in the region, Ghana still experiences an urban-rural divide with literacy rates in Northern Ghana being significantly lower than the country's average.

EVIDENCE & LITERATURE REVIEW

Introduction

In 2014, only 44.3% of girls in Northern Ghana were literate. In comparison, Ghana's national average for girls' literacy rate was 61.4% (Government of Ghana, n.d.). Adequate literacy is linked to better health outcomes, community development, and better relationships (Project Literacy, n.d.). So, it is essential that these girls have higher literacy rates to achieve these better life outcomes that are associated with literacy.

Literature surrounding girls' literacy rates in Northern Ghana can be difficult to find as the geographic region is very specific. For example, most of the literature surrounding education in Ghana revolves around attendance rates or school dropout rates. Literacy is a much more specific aspect within education and with a specific region within Ghana, there is little literature to access regarding this topic. As a result, some of the literature compares Ghana to other countries with similar characteristics to Northern Ghana.

Free Menstrual Products and Puberty Education

The **first** solution that has been used to address girls' school attendance rates is providing free and disposable menstrual resources. In a study by Kumbeni et al., researchers found that girls in Northern Ghana who were experiencing menstruation had a school absentee rate of 59% (Kumbeni et al., 2021). Researchers cite multiple reasons for this high rate of absenteeism including no private facilities, no running water, embarrassment and humiliation by teachers and peers, and lack of adequate sanitary resources (Dolan et al., 2013).

To expand upon the current situation of girls' menstruation and sanitary resources, most girls in Northern Ghana are using cloth sanitary products. Using these cloth products requires them to be washed between uses as opposed to disposable sanitary products which can be thrown away after one use. Girls who were using cloth sanitary products were 3.21 times more likely to have incidences of absenteeism (Kumbeni et al., 2021). When interviewing girls, researchers also found that the use of cloth sanitary products also led to more fear and embarrassment because many girls were afraid of their sanitary products "giving off a scent" or that they would be "found out" in class that they were menstruating (Dolan et al., 2013).

Dolan et al. introduced an additional initiative that could be grouped with the use of free menstrual products: puberty education. Many girls experienced a "veil of silence" regarding menstruation and puberty causing them to have little knowledge about these processes (Dolan et al., 2013). They also experienced teasing at school in topics associated with menstruation. This teasing and cultural restrictions during girls' menstrual period has led to higher likelihood of girls' absenteeism (Kumbeni et al., 2013). Puberty education combined with free menstrual products decreased school absenteeism by approximately 9% and decreased shame, insecurity, and low self-confidence in these girls (Dolan et al., 2013).

In another study conducted by Benshaul-Tolonen et al., researchers also studied the effect of providing sanitary products to girls in on absentee rates in Western Kenya. They also used unannounced spot-checks to control for the fact that some girls may report that they do not miss school even though they may miss some days. Ultimately, researchers found that providing free sanitary pads decreased school absenteeism for girls by 5.4 percentage points (Benshaul-Tolonen et al., 2019).

These findings can be generalizable, but they are not perfect because some of this research applies to countries other than Ghana. Northern Ghana's lack of governmental resources (Issah, 2021) may make it harder to implement this policy solution. Instead, these free products would need to be provided by NGOs in the area and they would most likely need support in funding. Additionally, it may also be difficult because of the gender roles and expectations that may prevent widespread acceptance of puberty education for these girls (Smikle, 2020).

Free Books, School Supplies, and Other Financial Incentives

The second solution is to offer financially backed incentives, specifically free books, and school supplies, to students and their families in exchange for higher attendance rates. These incentives can come in the form of free books and school supplies, cash transfers, free meals during school hours, free food for the household, or scholarships to cover other indirect costs of public schooling.

Cash transfers seem to be effective for low-income communities in increasing child enrollment in basic education (Akyeampong, 2009). For example, Pakistan implemented community grants to both urban and rural populations to help increase school attendance rates. This program was particularly successful for girls in rural areas who had a 10% higher enrollment level (Patrinos, 2002). This example can be easily applied to Northern Ghana because both regions are rural, low-income dominated areas. However, differing government presences and cultural backgrounds may pose some differences in application.

Additionally, Indonesia implemented 5-year scholarship programs that aimed to reach 6.5 million students with grants. In lower secondary school, specifically, researchers found that these scholarships decreased school dropout rates by about 24% (Patrinos, 2002). The fact that these results were only for lower secondary school may introduce a limitation of the evidence. These results would be more effective if they could be applied to even more students across higher grade levels. Again, while this program is not completely applicable to Northern Ghana, it does pose as a potential solution that can be implemented in Northern Ghana.

Other potential incentives point to the effectiveness of Food-for-Education Programs, Female Secondary School Scholarships, Bangladesh Rural Advancement Committee (BRAC) programs, and free of charge education. These incentives are provided to the entire family of the student for families and students in Bangladesh. The two villages in this study, conducted by Amin et al., are both largely agricultural with nongovernmental development organizations driving educational change in the area. This similar geographical demographic makes these findings easy to apply to Northern Ghana which shares many of the same characteristics.

These programs, Food-for-Education (primary school), the Female Secondary School Scholarship (secondary school), and BRAC schools (primary school), which cover all direct and indirect costs of education, including free books and supplies, targeted poor students in rural areas. Each of these programs also require consistent school attendance rates at 65% or 85%. For one village, the combination of the Food-for-Education Program and the Female Secondary School Scholarships allowed female student school enrollment rates to increase from 44% to 59%. Additionally, in the second village, the BRAC schools for primary students increased enrollment from 44% to 55% (Amin et al., 1998).

While financial incentives are very helpful, it can be difficult to isolate each effect of each incentive. Most financial incentive programs provide multiple financial incentives in a research study. For example, in a different BRAC program study, researchers combined the use of very well-trained female teachers from the students' community with free tuition as well as free books and supplies in exchange for higher student attendance rates. For this study, it can be difficult to attribute the girls' increase in attendance rates, from 48% in 1992 to 71% in 1996, to either the teacher training, the mentor aspect, the female teacher aspect, the free tuition, or the free textbooks and school supplies (Arends-Kuenning & Amin, 2004).

While Bangladesh is a very different geographic area than Northern Ghana, these results prove that financial stipends provide a viable incentive for higher school attendance and enrollment rates. While the stipends remained small, one limitation may be the high financial costs this may have, especially for Northern Ghana which does not have a big government presence.

Teacher Literacy and Educational Skills Training

The **third** solution is to provide enhanced teacher literacy and educational skills training to educators in Northern Ghana. There is strong evidence that a teacher's own skills and qualities are associated with better student performance. For example, in a research study by Hanushek et al., they found that "increasing teacher cognitive skills by one standard deviation is associated with 10 to 15% of a standard deviation in student performance" for member countries of the Organization for Economic Co-operation and Development (OECD) (Hanushek et al., 2019).

The Global Partnership for Education (GPE) also conducted a program in Uganda which aimed to increase teacher training and skills from 2014 to 2020. This program focused on "training teachers in pedagogical approaches, providing teaching and learning materials, and developing an inspection system to better supervise teachers." This program demonstrated a steady increase in students' ability to read. At the start of the program, in 2016, "only 1% of the grade 1 students could read 20 or more words per minute." However, once in grade 3, 27.5% of these students were able to read 20 or more words per minute (Global Partnership for Education, n.d.).

While the research surrounding teacher literacy and educational skills training for teachers is not as substantive as the first two alternatives, the current evidence does indicate that there is a positive association between quality teachers and student learning, even in rural areas. The application of this research to Northern Ghana does have limitations as most of the research has been done in other countries, like Uganda, or wealthier member countries of the OECD. Despite this, they still provide key insight into the importance of teacher training and skills development.

POLICY ALTERNATIVES

These alternatives address a two-pronged problem of low literacy rates among girls in Northern Ghana. The first problem is the lack of accessibility of education and the need to increase access to the classroom. The second problem addresses learning once girls are in the classroom.

Alternative 1: Free and Disposable Menstrual Products

The **first** solution directly addresses the high school absentee rates among girls and gets them into the classroom. Distributing free and disposable menstrual products (see figure 4) will address the fact that girls who are experiencing menstruation in rural Northern Ghana have a school absentee rate of over 50% (Kumbeni et al., 2021). In this alternative, LING would partner with an external organization, particularly one that sells menstrual products, to provide free and disposable menstrual products in Northern Ghana schools. Some of the companies my LING could try to partner with include Northern Sector Advocacy and Awareness Center, PridePads Africa, and the Pad Project. Each of these organizations' missions is to give menstrual products to girls to make sure that access to sanitary products is not a barrier to getting a quality education. With these free menstrual products in schools, girls will be less inclined to stay at home during their menstrual cycle which causes them to miss crucial time spent in school.

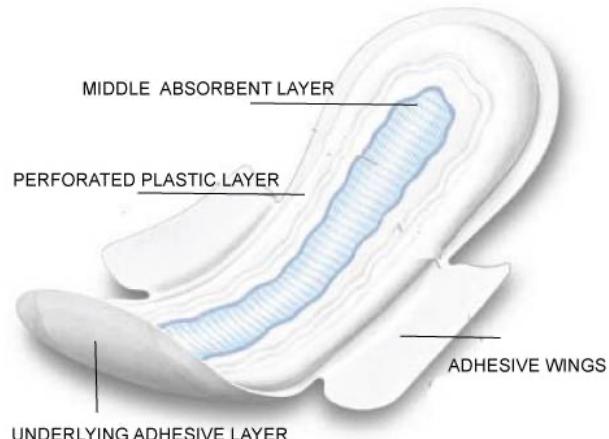


Figure 4: Disposable Sanitary Pad (Glamcheck, n.d.)

With these partnerships, LING should play the role of facilitator of this program instead of investor. LING would identify schools and districts that have the most need in the Northern Ghana region. This would start out as a pilot program where they would distribute to only a few schools at first. As success builds, LING can help expand the program to even more schools in the region. Furthermore, using disposable menstrual products will help girls in Northern Ghana transition out of cloth products which rely on running water and private bathroom facilities which many schools do not have.

Alternative 2: Free Books and School Supplies

The **second** solution is to provide free books and school supplies to students to cover indirect costs of education in exchange for guaranteed school attendance at a determined level of either

65% or 85%. This threshold of attendance ensures that the free books and school supplies are being used to further the girls' education and is a popular way to ensure an increase in attendance. This alternative aims to get girls into the classroom. Despite public school being tuition free, there are still numerous external costs that serve as a barrier to getting girls into the classroom to learn. This alternative would cover the costs of textbooks, notebooks, pens, pencils, exams, and any other classroom and educational materials needed for in school learning.

In a study in rural Bangladesh, when girls were given financial secondary school scholarships that could be used to cover the cost of books and other school supplies in exchange for an attendance rate of at least 65%. As a result, their primary school attendance rates increased from 44% to 59% (Amin and Sedgh, 1998). In this alternative, LING would also serve as the local distributor of these incentives. They would help to identify schools in need and focus on being the community engagement facilitator. This alternative would aim to increase school attendance rates for girls to get them in the classroom for learning.

Alternative 3: Expansion of Teacher Literacy and Educational Skills Training

The **third** solution to address girls' low literacy rates is to expand teacher literacy and educational skills training (see figure 5). This alternative aims to increase girls' learning once inside the classroom. Teachers are essential to increasing quality education and learning outcomes for students (UNESCO, 2016). In a research study conducted in Kenya, researchers found that an increase in teacher workshops, trainings, and quality lesson plans led to school dropout rates decreasing from 5.3% to 2.1% (Jukes et al., 2017).



Figure 5: Teacher Training Workshop (LING, n.d.)

Currently, LING does have a teacher literacy and educational skills training program. However, this initiative aims to expand the current program to incorporate more research and surveys. This will ensure that the current operations of the program contribute to student and teacher success in the classroom. Some ways to help evaluate the current program is to implement more teacher surveys about their views and opinions of the program and require more before and after literacy evaluations for the students. These methods will help LING learn more about public views and efficacy of the program. With new information, LING could enhance their current trainings with best practices or partner with external organizations such as SIL LEAD, Global Partnership for Education, ProLiteracy, and UNESCO's Literacy and Community Development Programme.

EVALUATIVE CRITERIA

Effectiveness

The **first** criterion is effectiveness which measures the rate of increase of school attendance, literacy skills, or other educational outcomes among female students. This criterion should answer the question - does this alternative increase female educational outcomes? I will measure this by using a high, medium, and low scale.

The alternative will score high if educational outcomes increase by more than 10%. The alternative will score medium if outcomes increase by 5-10% and it will score low if educational outcomes only increase 0-5%. Even a small increase in educational outcomes is amazing to help work towards better literacy rates, attendance rates, and other educational outcomes. These cut-offs are based on realistic measures over the course of at least a one-year timeline to ensure that we can see demonstrated effects of each alternative.

Public Acceptance

The **second** criterion is public acceptance which is the degree to which the public will accept these alternatives as sound and practical. This criterion specifically targets any cultural or traditional gender values and stereotypes in Northern Ghana. For example, child marriage rates are higher in Ghana and remains a common practice that has ties to traditional gender stereotypes and extreme poverty. Even if an alternative may be effective, it is important that the people and communities in Northern Ghana support the alternative. So, this criterion should answer the question - will the people of Northern Ghana accept this alternative?

I will measure this on a scale of low, medium, high. The alternative will rank high if it is very likely that the community will accept the alternative. The alternative will rank low if it is unlikely that the community will accept the alternative. It would be ideal to have at least 50 community members' opinions including students, parents, teachers, and other community leaders for each alternative. However, it is also important to recognize that there may not be a lot of resources or evidence for public acceptance in Northern Ghana. Another way to measure this criterion is to use general articles that record feedback on similar programs that have been implemented.

Cost to LING Assuming Partnership

The **third** criterion is cost to LING assuming partnership which will be recorded with both the direct and indirect financial cost. Cost is a very important criteria for LING because they are a small non-profit organization that does not have a lot of money to spare. They rely mostly on donations and partnerships with other organizations for financial and educational resources. So, this criterion should answer the question - how much money will this alternative cost for LING assuming partnership with an external organization over the period of one year? Usually, these alternatives might have costs that include personnel, books, materials, and/or sanitary products.

This criterion will be evaluated on a low, medium, and high scale. The alternative will be ranked high if LING must spend \$1,000 or more per year, medium if the cost is from \$500-\$999, and low if the costs are \$499 or less. LING is a small non-profit organization that relies on the donations of others, so having low to no cost options is essential for a successful and realistic implementation.

Ability to Work with External Partners

The **fourth** criterion is the ability to work with external partners which measures the likelihood that LING will be able to find a larger organization to work with on these alternatives. Due to a small amount of funds available, LING is unable to fund large initiatives that cost over \$2,000 dollars. However, because LING is in a strategic position to help address low literacy rates among girls, partnering with external organizations may be an excellent way to still achieve their mission and address this problem.

This criterion will be evaluated on a low, medium, high scale. It will be measured based on the number of organizations working on the alternative's subject matter. For example, if there are more organizations working on giving free access to books and school supplies in Northern Ghana and Ghana at large, there is a higher possibility for LING to work with one of these organizations. Thus, if there are more organizations working on one of free books and school supplies, the alternative will rank high on. If there are few organizations working on the current initiative, then the alternative will rank low on this scale.

FINDINGS

Alternative 1: Free and Disposable Menstrual Products

The first alternative is to create a pilot program where girls are given free and disposable menstrual products to address the high school absentee rates among girls in Northern Ghana. Currently, according to a study done by Kumbeni et al. 2021, most girls use cloth menstrual products in multiple countries across sub-Saharan Africa (Kumbeni et al., 2021). Cloth products make girls more conscious of their menstrual cycle at school because they are afraid of being called “smelly” and being teased at school. On the other hand, disposable menstrual products do a better job of hiding any odor that a menstrual cycle may cause. The goal of this alternative is to remove the barrier of inadequate feminine hygiene products to increase school attendance among girls.

Criteria 1: Effectiveness

Since most girls in Northern Ghana use cloth menstrual products, using free and disposable menstrual products should start to address some of the teasing that girls experience during their menstrual cycle. According to Kumbeni et al., girls who were using cloth sanitary products were also 3.21 times more likely to have higher incidences of absenteeism (Kumbeni et al., 2021). So free disposable sanitary pads are essential to decreasing absentee rates among girls. There is extensive additional evidence that links lower absentee rates with free disposable menstrual products.

In a study by Dolan et al. in Ghana, the authors explored the idea of coupling puberty education with free sanitary products which decreased school absenteeism by approximately 9% and also decreased shame, insecurity, and low self-confidence in these girls (Dolan et al., 2013). In another study, conducted by Benshaul-Tolonen et al., researchers also find that providing free sanitary pads to schoolgirls in Western Kenya decreased absenteeism by 5.4 percentage points as well (Benshaul-Tolonen et al., 2019). Therefore, alternative 1 ranks medium in effectiveness for increasing accessibility for girls to get into the classroom.

Criteria 2: Public Acceptance

With free and disposable menstrual products, there seems to be a lot of support among the younger generations and advocacy organizations. For example, in Ghana there was a 20% import tax on menstrual products because the government categorized these products as luxury items. Ghanaian youth activists and advocacy organizations conducted a NOPADTAX campaign for 6 months in protest of these high import taxes. These activists also gained the support of 2,000 signatures on a petition to get rid of the menstrual products import tax. After this campaign, Ghana’s vice president pledged to get rid of the import tax to make menstrual products more affordable for girls and women in Ghana (Smikle, 2020). Local Ghanaian advocacy organizations such as the Northern Sector Advocacy and Awareness Center (Suuk, 2018), J-Initiative, and Muslimah Mentorship Network are still conducting campaigns and efforts to eliminate period poverty in Ghana (Smikle, 2020).

However, there are still negative stigmas surrounding menstruation for girls and women in Ghana. For example, there is a widespread belief that menstruation is “unclean” which can lead to the “mismanagement in menstrual hygiene” (Smikle, 2020). In Tamale, a city in Northern Ghana, one woman said that “men will tell you not to touch them [when you are menstruating]” (Suuk, 2018). Therefore, alternative 1 ranks medium in public acceptance for girls to get into the classroom.

Criteria 3: Cost to LING Assuming Partnerships

The goal for all alternatives is to try and get their resources subsidized so that LING does not have to incur many costs. While it may be unlikely to get free menstrual products from the biggest menstrual product producers, it may be more likely for LING to work with more local menstrual product distributors. If LING can get all of the menstrual products entirely subsidized by an external organization, there will be minimal costs that LING will have to pay.

Some of these additional costs assuming partnership might include personnel wages for distribution, money to cover the cost of transportation, and potentially wages for those who may present how to use these products for girls. Currently, gas is very expensive in Ghana at \$4.493/gallon (GlobalPetrolPrices.com, n.d.). Due to the organization’s reliance on volunteers, the expected incurred costs should only be transportation costs to and from the school and potential training course for volunteers to take to correctly instruct the girls on how to use sanitary products. Therefore, alternative 1 has low costs.

Criteria 4: Ability to Work with External Partners

This alternative requires partnering with external organizations to help provide and subsidize the costs of these disposable menstrual products which will be subsidized upon distribution to the female students. There are not as many organizations working on period poverty as opposed to free books and school supplies due to the stigma on menstruation as mentioned before. However, organizations like the Ghana chapter of Days for Girls, Muslimah Mentorship Network and J-Initiative are three highly active organizations working on decreasing period poverty, increasing education surrounding menstruation and the use of sanitary pads, and distributing menstrual products to girls in Ghana (Smikle, 2020). Therefore, alternative 1 ranks medium in ability to work with external partners when trying to increase access to the classroom.

Alternative 2: Free Books and School Supplies for Students

The second alternative is to provide a pilot program where LING helps to cover the costs of books and school supplies for students in exchange for guaranteed school attendance. This alternative aims to eliminate a financial barrier to getting girls into the classroom to start their learning. LING will work with bigger, perhaps international, organizations to help get grants or subsidized school supplies for girls in Northern Ghana.

Criteria 1: Effectiveness

Financial incentives are powerful tools for low-income families to increase school attendance and decrease absentee rates. While there is not a lot of specified data regarding financial incentives in Ghana or Northern Ghana, we can look to other studies completed in comparable countries and regions to help inform our analysis. In a study by Patrinos conducted in Mexico,

researchers found that stipends, which includes both conditional cash transfers and scholarships which can be used to cover the cost of books, were the most effective financial incentive in decreasing girls' absentee rates. In the same study conducted by Patrinos in Indonesia, a scholarship program helped in decreasing lower secondary school dropout by 24%. However, the study also stipulates that these scholarships did not have an effect on primary and upper secondary school (Patrinos, 2021).

Furthermore, in a study conducted in Tamale, a rural region in Northern Ghana, researchers argue that even with a free books program, called Free Exercise Books, there is still "a sizeable number of children, especially girls" that are not in school due to extreme poverty (Iddrisu et al., 2017). Thus, while free books and school supplies can help to alleviate indirect costs of school, they do not address the root of the issue, poverty, for girls in Northern Ghana. Due to the lack of conclusive information, alternative 2 ranks medium in effectiveness.

Criteria 2: Public Acceptance

Distributing free school supplies and free textbooks to students should attract high public acceptance, especially from low-income families or families living in poverty. This is especially the case due to current backlash against the Ghanaian government who had pledged to give free exercise books to all public-school students. However, the Executive Director of Africa Education Watch, Kofi Asare, "revealed that the Government of Ghana has not supplied free exercise books to basic schools since 2017." He also discussed how free uniforms and textbooks were going to Senior High Schools, but not basic schools which included rural areas in Northern Ghana (Azongo, 2020). This has important implications for girls in Northern Ghana who already have lower resources, literacy rates, and educational outcomes. Therefore, if LING were able to fill this gap in free textbooks, there would be high public acceptance as many parents and community members are frustrated about the lack of free books.

However, there will be some push back since this alternative is conditional upon school attendance rates for girls. There may be traditional gender roles or expectations that girls must abide by that may divert them from attending school. Some of these traditional gender roles include the expectation of women to marry as the only path to social acceptance, to accept the arranged marriage that a daughter's family conducts, and to give economic control over to one's husband (Klingshrin, 1973). Girls may also be expected to marry before the age of 18 to help her family's financial situation. Currently, child marriage rates remain high with 1 in 5 girls from ages 20 to 24 being married before age 18 in Ghana (UNICEF, 2016). Therefore, alternative 2 ranks low in public acceptance when discussing how this will affect school attendance rates.

Criteria 3: Cost to LING Assuming Partnerships

There are significantly more costs in this alternative to LING assuming partnership even though the goal is to work with an external organization that covers the costs of grants towards free books and school supplies for students. If the external organization sends money to LING, there will be transportation costs involved in driving to a school supply store and to the school for distribution. Currently, gas is very expensive in Ghana at \$4.493/gallon (GlobalPetrolPrices.com, n.d.). However, if the external organization ships schoolbooks and school supplies to LING, LING must pay for transportation costs when driving to the schools for distribution since LING's

projects mostly operates on a volunteer basis in terms of personnel. LING will also have to pay for storage costs to help store all the books and supplies, especially if there LING does not have space in their office. Finally, there may be costs to tracking compliance with the required attendance rates that LING will have to cover. This may require hiring additional staff members to oversee the attendance rates and ensure all students are meeting the required threshold of attendance (65% or 85%). Therefore, alternative 2 has high costs.

Criteria 4: Ability to Work with External Partners

There are hundreds of international organizations working on children's education so it will be easier to find an external partner to work with when helping to provide free books and school supplies for girls in Northern Ghana. While LING may not be able to initially work with bigger organizations like UNICEF, they can work with smaller or more local NGOs and work their way up to the biggest organizations as their pilot program grows in success. Some of these NGOs could include organizations like the Africa Hope Fund or Education Africa. Therefore, alternative 2 ranks medium in ability to work with external partners.

Alternative 3: Expansion of Teacher Literacy and Educational Skills Trainings

The third alternative aims to expand the current teacher literacy and educational skills training that LING is currently employing. LING has worked with external organizations to acquire literacy training materials for teachers to teach and evaluate literacy skills among their students. This alternative also incorporates continual research and surveys of LING's current program to determine efficacy. In addition to continuing to serve their current school partners, this alternative will work to eventually expand their services to more schools in the Northern Ghana area.

Criteria 1: Effectiveness

Efficient teacher trainings are essential to improving students' academic performance in the classroom. Students, especially those whose parents are illiterate, will be learning most of their literacy skills in the classroom. In a research study conducted in Kenya, Jukes et al. 2015 found that teacher trainings in literacy had a "positive impact on three of four primary measures of children's literacy after two years" and decreased school dropout rates from 5.3% to 2.1% (Jukes et al., 2015).

In another study conducted in Uganda, teacher trainings steadily increased the number of students who were able to read 20 or more words per minute over the course of three years. In grade 1, only 1% of students could read 20 or more words per minute, but in grade 3, 27.5% of these students were able to read 20 or more words per minute (Global Partnership for Education, n.d.). Therefore, alternative 3 ranks high in effectiveness to improve girls' literacy skills and academic performance in the classroom.

Criteria 2: Public Acceptance

In terms of public acceptance, it is very likely that the public will be very supportive of teacher trainings. First, since "the quality of teachers is a major determinant of children's learning and

well-being,” better teachers will translate to higher academic performance from students which will benefit not only the student, but their families and society as well (Saavedra, 2021). Second, at the opening of a new teacher professional development program in Northern Ghana, Teacher Futures - Ghana, the principal of Tamale College of Education, Dr. Sulemana Iddrisu, discussed the importance of prioritizing “sustainable development goals” for teacher trainings (Commonwealth of Learning, 2019). This demonstrates that there is wide support from higher level teachers and administrators for teacher trainings.

On the other hand, there does seem to be some apathy regarding school matters from parents in Ghana as well. According to Aryeh-Adjei, “parents and guardians seem not to care about anything that concerns the school” (Aryeh-Adjei, 2021). One of the measures for this conclusion is the lack of attendance at public school Parent-Teacher Association (PTA) meetings. However, this may be because of lower literacy rates and educational outcomes amongst the parents of the current generation (World Bank, 2021). Therefore, alternative 3 ranks high in public acceptance.

Criteria 3: Cost to LING Assuming Partnership

Alternative 3 also does not have many financial costs assuming partnership, especially because LING already has the literacy resources and materials for this alternative such as literacy training plans and classroom literacy activities for teachers to use. This program has been one of the top priorities for LING so the financial costs for LING would mostly be transportation costs to and from schools and the time and money allocated for volunteers to train teachers to use the materials effectively.

LING will be expected to cover the transportation costs for the teachers to and from trainings as well as snacks and beverages during the training. For the transportation costs, gas is very expensive in Ghana at \$4.493/gallon (GlobalPetrolPrices.com, n.d.). LING may also incur time costs needed for planning and coordinating resource roll-out as well. Additionally, there may also be printing costs if resources need to be printed out for the teachers to distribute to their students as well. Therefore, alternative 3 ranks medium in cost when discussing how to improve girls’ literacy and academic performance.

Criteria 4: Ability to Work with External Partners

In terms of the ability to work with external partners, LING has already been working with external organizations to gain their current materials for the teacher literacy and educational skills training. They can keep working with their current external organizations or even use these current organizations to build connections with larger literacy organizations to gain more resources. Therefore, alternative 3 ranks high in ability to work with external partners to improve girls’ literacy skills and academic performance in the classroom.

OUTCOMES MATRIX

	Criteria 1: Effectiveness	Criteria 2: Public Acceptance	Criteria 3: Cost to LING Assuming Partnership	Criteria 4: Ability to Work with External Partners
Alternative 1: Free and Disposable Menstrual Products	Medium	Medium	Low	Medium
Alternative 2: Free Books and School Supplies for Students	Medium	Low	Medium	High
Alternative 3: Expansion of Teacher Literacy and Educational Skills Training	High	High	Medium	High

Color Key

Light Blue	Most Desirable
Medium Blue	Desirable
Dark Blue	Undesirable

RECOMMENDATION

Ultimately, I recommend that LING employs alternative 1, free and disposable menstrual products, along with alternative 3, expansion of teacher literacy and educational skills training. This will ensure that LING is able to increase girls' access to the classroom and to increase student performance once in the classroom.

When evaluating these different alternatives, the criteria of effectiveness and cost are the most important because LING wants the maximum impact with the least amount of financial cost. Alternative 1 and alternative 3 both ranked high in effectiveness and low or medium in cost, so they were both prioritized as recommended courses of action. Even though alternative 1 ranked medium in ability to work with external partners, their effectiveness at increasing girls' attendance rates during menstruation was more important. Similarly, even though alternative 3 ranked medium in cost, they have extensive experience and existing lesson plans and resources which will allow them to mitigate the costs of this alternative.

While free books and school supplies seem like an intuitive solution to increasing literacy rates among girls in Northern Ghana, it consistently ranks medium in effectiveness, high in cost, and low in public acceptance. While free books and supplies does offer a long-term impact in Northern Ghana, there may be high push back from the community for the attendance requirements. This alternative also has high costs associated with its implementation that LING may not be able to afford including transportation costs, storage costs, and costs of tracking compliance with attendance rates. Additionally, free books and school supplies may not more directly address girls' disparate rates of low attendance as much as free menstrual products does. Ultimately, alternative 1 and alternative 3 do the best job at tackling this long-term problem for girls in Northern Ghana.

IMPLEMENTATION

This section will provide additional considerations and key next steps for LING when implementing the recommendation. The following steps will ensure that LING is able to get more girls into school and increase student performance once they are in the classroom. The following implementation steps include involving key stakeholders, prioritizing data collection, and marketing tips.

Key Stakeholders

When working to help solve low literacy rates among girls in Northern Ghana, LING needs to create a working group of key stakeholders for each aspect of the recommendation.

Free and Disposable Menstrual Products Working Group

This working group should include predominately stakeholders who are women or those who menstruate. Teachers, parents, students, and community leaders should all be required stakeholders in this working group. The goal of this group will be to provide input on initial plans to acquire free menstrual products as well as feedback on the maintenance of the program moving forward. This working group should meet at least once a month with discussion centered around the experience of the schoolgirls especially in regard to the difference in cloth vs. disposable sanitary pads. They should also discuss whether students need education (how to effectively use disposable sanitary products) along with the free menstrual products (Montgomery et al., 2012). They should make decisions largely on majority rule, with special attention to the input of the schoolgirls particularly.

Expansion of Current Teacher Literacy and Educational Skills Training Working Group

This working group should include teachers, parents, students, and community leaders as well. The goal of this group will be to assess LING's current teacher literacy and educational skills training program. This assessment will include updates on students' progress, teachers' feedback on the program, and whether teachers find the program effective. This working group should meet at least twice a month with discussion centered around both teachers and students. In these meetings, they should discuss ongoing progress of literacy teaching, literacy assessments, and students' evaluations both before and after teacher trainings.

These continuing assessments will help teachers learn how best to teach literacy content (Murray et al., 2012). They will consult each other on whether major changes need to be made to the literacy lesson plans or teacher instruction. Discussion around potential financial stipends or support for the teachers also needs to be prioritized. Decisions should also be made based on majority rules with a special emphasis on teachers' and students' input. LING will cover any transportation costs to and from each meeting, food and beverages during the meeting, and any potential financial stipends to the teachers.

Data Collection for Teacher Trainings

When working to improve current teacher literacy and educational skills training, LING will need to start with collecting necessary data to determine the efficacy of their current literacy training and tools. Some of the key metrics that will be needed include number of teachers that go through the training, number of teachers that use the training, and literacy rates before and after training. The assessment can be taken once a year at the end of the school year for the next 10 years to evaluate if there is a proven increase in educational outcomes for the students. LING may need to create their own literacy assessment based on other literacy assessments conducted in comparable countries such as Uganda, Kenya, Nigeria, Bangladesh, or Pakistan. These key metrics will allow LING to evaluate the efficiency of the program and indicate any needed changes to ensure that this program is effective. After this data collection, LING can analyze the data to see where they need to provide more training or content on certain subsections of literacy or if teachers need more training in certain areas more than others.

Marketing Steps for Free and Disposable Menstrual Products

The most important marketing strategy will be to use social media to help promote the free disposable menstrual products initiative. According to Ocansey, in 2016, about 13% of Ghana's total population uses the internet regularly and half of those use Facebook. Youth in Ghana and around the world are increasingly using the internet for access to social media (Ocansey, 2016). So, in order to increase access to youth, LING should start a social media campaign and work with bigger Ghanaian activists and advocacy organizations to boost their audience. One way to achieve this is to work with activists who had previously promoted the NOPADTAX such as Northern Sector Advocacy and Awareness Center, J-Initiative, and Muslimah Mentorship Network who are all still currently advocating for the elimination of period poverty in Ghana.

Through social media and other marketing strategies, LING can use the importance of storytelling in promoting this initiative. Many girls suffer from period poverty which keep them out of school with high absentee rates (Kumbeni et al., 2021). LING can use the story of one girl who cannot afford menstrual products and connect it to her academic performance. By using "sticky" messaging, which prioritizes simplicity, unexpectedness, concreteness, credibility, emotion, and stories, LING can ensure their social media campaign is truly impactful (Heath & Heath, 2008).

Potential Risks

There may be potential risks or pushback that also needs to be addressed to have successful implementation. First, there may be potential setbacks when trying to ensure continuing attendance at stakeholder meetings. These stakeholder meetings are essential to evaluate success of these programs and ensure community buy-in. However, it may be difficult to get all members to attend even with the transportation charges and the free beverages and snacks. Therefore, LING may have to provide more incentives to ensure continual attendance. LING may try to prioritize giving more agency to the stakeholder members instead of managing them. The teachers and other stakeholders may be able to take the lead in meetings which will help to empower the stakeholders (Clayton, n.d.). Potential financial stipends for teachers may also help incentivize attendance.

Another big risk may be if external partners are not responding to outreach from LING. This can be a big potential roadblock because the recommendation cannot be implemented without communication and partnership with bigger organizations that can afford to subsidize menstrual products (Porter, 2012). Some ways to help mitigate this is to build on their existing relationships with organizations like STEM Punks. Perhaps they might have partnerships with other big technology companies that may have connections with organizations prioritizing period poverty. LING can practice building on these existing relationships to get to bigger brands that may have more connections to big businesses that sell menstrual products. LING can also employ the use of the “sticky” framework to ensure that their initiative is prioritized and can draw the attention of these external partners (Heath & Heath, 2008).

CONCLUSION

In conclusion, to help mitigate girls' low literacy rates in Northern Ghana, I recommend that LING create a program to distribute free and disposable menstrual products (alternative 1) and expand teacher literacy and educational skills training (alternative 3). When considering the successful implementation of this recommendation, LING must prioritize working groups for both recommendations that include key stakeholders, continual data collection to evaluate the efficacy of the program, and key marketing strategies to increase program participation.

Increasing literacy rates among girls in Northern Ghana will ensure that these girls have better financial outcomes, health outcomes, and personal outcomes such as higher self-esteem and confidence. These girls can use their higher incomes to help their families fight poverty. With more economic independence, girls may also help decrease reliance on child and early marriage, giving them more agency in their own lives. Higher literacy now may also help to encourage more parental involvement in schools and higher educational outcomes among future generations.

LING is in a unique position, as a local community organization, to increase community buy-in and bring together different community groups to help solve this problem. By bringing together students, teachers, parents, and community leaders, LING can work not only help these girls but also the greater Northern Ghana community.



Figure 7: Students in Northern Ghana (LING, n.d.)

APPENDIX A: COSTS TO SOCIETY

Direct Costs

If girls' low education and low literacy rates are not addressed, there will be large health care related direct costs to society. This would occur because female students who have low literacy rates or drop out of school are at a higher risk of getting pregnant or getting married earlier. These problems would have to be solved by those in Northern Ghana's society. For the purposes of this research, I will calculate costs for the entirety of Ghana, rather than just the Northern Ghana region. According to a 2013 study by Dalaba et al., the average cost of delivery services in Ghana is \$11,543 (Dalaba et al., 2013). Because these maternal services are free, society would be forced to bear these costs. With more than 5 million girls in Ghana (UNICEF, n.d.), if a quarter of these girls get pregnant, this would cost \$14,428,750,000. However, this number would only apply if every single adolescent girl was pregnant and used maternal services.

There may also be increased risk of gender-based violence financial costs that society may have to bear. These costs could include medical costs, police report costs, or costs of physical damage (Merino et al., 2019). While the evidence may not be 100% applicable to Ghana or Northern Ghana, according to a study cited by One.org and conducted by the Education and Policy Center, higher education levels among girls may lead to a decreased risk of gender-based violence by 37% (O'Donnell, 2017). Due to this statistic, a second direct cost of low education and literacy rates would be hospital visits for survivors. Globally, violence against women and girls costs the global economy \$8 trillion. In a 2019 study conducted by Merino et al., 11% of Ghanaian women estimated that they spent about \$53 for gender-based violence costs in the last 12 months (Merino et al., 2019). If these costs occurred to a quarter of female adolescents in Ghana, it would cost a total of \$66,250,000.

Externalities

One externality of uneducated women and girls are lower self-esteem and confidence and higher crime rates (often gender-based violence crimes). While there may be disagreement about how these factors should be measured, they are important to identify. One way to measure lower self-esteem and confidence is to use the annual costs of mental health resources. The average mental healthcare for a household in Ghana is about \$60USD (Addo et al., 2013). If 1,250,000 girls needed to pay for mental healthcare costs, it would total about \$75,000,000.

Opportunity Costs

The opportunity cost is the loss of economic stimulation from these girls' lack of lifetime productivity and earnings. This economic stimulation could include the value of lost time working due to a lack of education, salary loss for the girls, or less payment in the form of taxes from the lower salaries. According to a World Bank report, low levels of education and barriers to education for girls in low-income countries constitute a worldwide financial cost anywhere between \$15 trillion and \$30 trillion (The World Bank, 2018).

More specifically, the average salary in Ghana is \$11,560. A sales manager might earn an average of \$32,670, an engineer may earn about \$20,780, and an accountant's average salary is \$18,039 (Kovacheck, n.d.). If all 5 million girls did not finish their primary and/or secondary education, Ghana and Ghana's economy might lose out on the potential of having more sales managers, accountants or engineers who all have much higher salaries than the average salary. For example, all 5 million girls in Ghana might, altogether, earn \$57,800,000,000. However, if all 5 million girls in Ghana got a full education, they might earn, altogether, \$163,350,000,000. The difference between these two is \$105,550,000,000. So, Ghana's economy might lose out on a total of \$105,550,000,000 if these girls do not get a full and quality education.

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