EMBRACE RELIEF

# ACCESSIBLE COMPUTER TECHNOLOGY FOR UNDERPRIVILEGED STUDENTS (ACT-US)

Program Development Report

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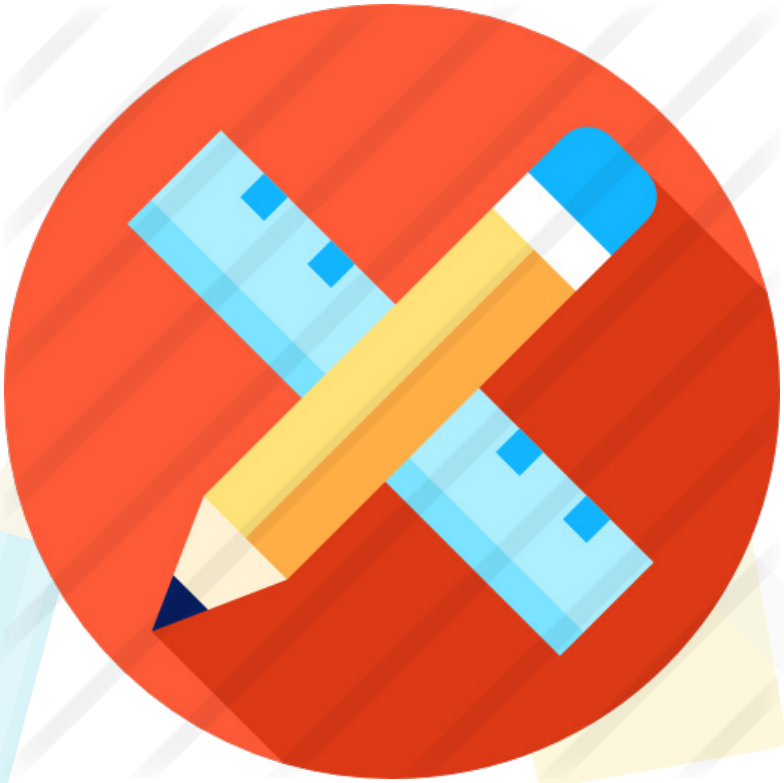


# EXECUTIVE SUMMARY

As a research-based organization, an extensive amount of research is conducted prior to program implementation. In order to ensure that we deliver the best possible programs, we research the communities we intend to serve, the logistical possibilities of projects proposed, assess local needs, and evaluate the expected impact of programs, among other various project components that may affect the quality of our programs. In accordance with this, the following report presents research completed for our Accessible Computer Technology for Underserved Students (ACT-US) program in Tanzania and Uganda.

Digital Literacy and Information and Communications Technology (ICT) programs offer people and communities access to tools and educational resources they never had before. Digital literacy is essential for expanding quality education and promoting sustainability. Tanzania and Uganda are both developing countries that have under-resourced educational systems that will benefit from the introduction of ICT devices. Sub-Saharan Africa has an increasing rate of poverty, and providing quality education can help decrease this alarmingly high rate. Embrace Relief recognizes the importance of education as studies have proven increased education leads to economic progress. Overall, this program intends to provide educational resources while simultaneously decreasing poverty rates in sub-Saharan Africa. Ultimately, this program seeks to alleviate the hardships faced by students in under-resourced schools in Uganda and Tanzania. Upon our assessment, we confirmed a significant need in sub-Saharan Africa for essential educational resources and developed the ACT-US program in order to address this disadvantage.

# INTRODUCTION

Digital Literacy and Information and Communications Technology (ICT) programs offer people and communities access to tools and educational resources they never had before. The American Library Association defines digital literacy as "the ability to use information and communication technologies to find, evaluate, create and communicate information, requiring both cognitive and technical skills."1 ICT equipped devices will allow people to access this information. Digital literacy is essential for expanding quality education and promoting sustainability. That is why the United Nations Sustainable Development Goal (SDG) 9 emphasizes the importance of improving internet access and digital literacy in the developing world. Embrace Relief is committed to helping the United Nations (UN) meet this goal. One of our main objectives is to provide people in sub-Saharan Africa with access to digital literacy and ICT devices. Supplying these tools will enable them to get information previously not available to them so they can use that knowledge to better serve their communities.

This technology will equip sub-Saharan Africans with the knowledge they need to escape poverty for generations to come. One of the most impoverished regions in the world, UNICEF estimates by 2030, nine out of 10 children in sub-Saharan Africa will live in extreme poverty if nothing changes. Providing these tools at a young age will not only increase knowledge going forward but inevitably reduce gender inequalities and increase opportunities for men and women alike. Our projects are designed with a focus on supporting women's empowerment because, in order to achieve progress globally, we must invest in girls starting at a young age.

# AFRICAN IMPACT

Extensive research has shown a positive correlation between education level and income, which is why starting children early is so important.3 With critical thinking and problem-solving skills, Africans will be more self-sufficient and better equipped to develop solutions on their own, which will ultimately decrease reliance on foreign aid. ICT will allow students to use these skills to their advantage and connect with the rest of the world. Never has this need been more apparent, as was chronicled during the UNs' Convention on the Rights of the Child. The UNs' Special Rapporteur on freedom of opinion and expression stated in part:

> "access to the internet is not only essential to enjoy the right to freedom of expression, but also other rights, such as the right to education, the right to freedom of association and assembly, the right to full participation in social, cultural and political life and the right to social and economic development."[4]

This investment is, therefore, an essential part of creating equality and economic progress for disadvantaged and underserved populations around the world.

Now more than two decades into the digital age of the internet, countries in sub-Saharan Africa are seriously lagging behind the rest of the world. Their only hope to catch up is by getting better educated through ICT. The problem is they need an ally so they can get this information and knowledge. This is where Embrace Relief can help.

Without proper education and internet access, economic progress stagnates in both local communities and on the national level.[5] At the other end of the continent, in South Africa, it's government started investing in digital literacy in 2003. Taking a hard look at educational and scientific trends, South Africans realized electronic media was taking over the world. They set up several sites across rural Africa to provide ICT programs for areas otherwise too far from internet access. This made a huge difference at the time.[6]

## GLOBAL IMPACT

Digital literacy has an overall positive effect on the world, as can be seen in the documented correlation between education and reduced crime rates.[7] A more peaceful society can thrive and achieve economic success. Because more education creates greater economic opportunity, political stability in these countries will logically follow. In countries around the world going through political turmoil, the common denominator is a lack of economic opportunity. Poverty often spirals into unrest and often violence. By providing the tools for stability, these African countries can establish themselves as valuable trade partners and better their relations with foreign governments.[8]

The continual lack of foreign investment in Africa, as compared with other regions of the world, has always made development more difficult. It's been reported that in recent years foreign direct investment to the continent fell by 21 percent - $42 billion.[9] In contrast, Asian countries received $475 billion in foreign direct investments in 2017. To attract more industrialized jobs in a rapidly evolving technological world the workforce must be able to use these tools. Bringing Africans online will create a very capable workforce, which will then attract foreign investments.

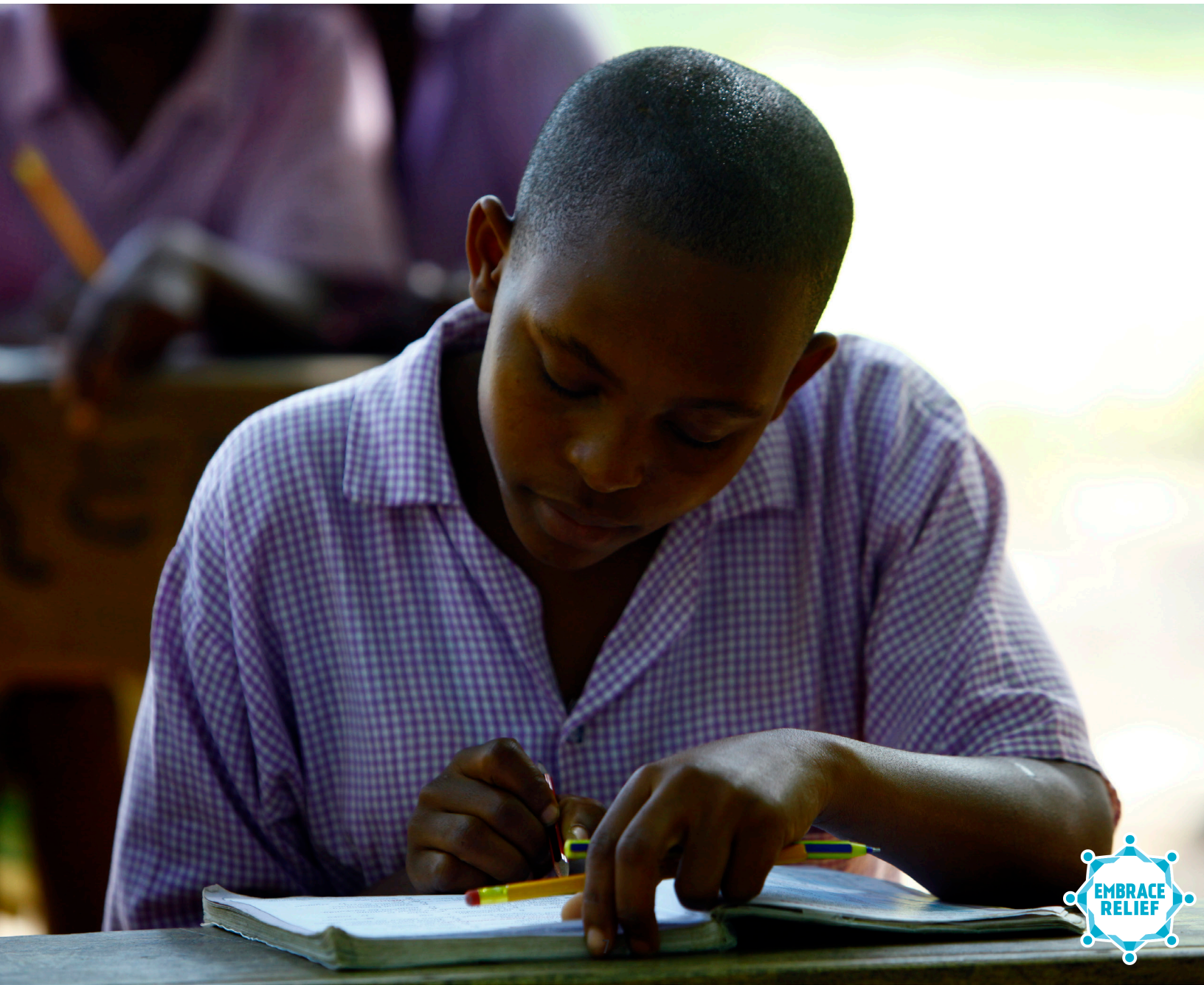
## GENDER EQUALITY

Our project largely focuses on providing ICT access to increase digital literacy for women by starting in the classroom. Compared to the rest of the world, women in Africa experience some of the worst discrimination and oppression. This includes less access to education, basic health care, lower wages, and many other necessary services. Despite seeing an increase in internet access as a whole in recent years, Africa remains the only continent whose digital gender gap has widened since 2013. According to the International Telecommunication Union, in Africa, the proportion of women using the internet is about 25 percent less than that of their male counterparts.[11] When the female population is empowered, families, communities, and national economies benefit in the long run. ICT and digital literacy education have been proven to enable self-employment and higher wages, resulting in an overall better quality of life.[10]

Bringing an additional 600 million women and girls online could boost global gross domestic product by as much as 18 billion USD. Giving them the tools they need to succeed will allow them to break the cycle of poverty by helping close the gender gap in the workforce. Access to better healthcare will help them avoid malnourishment, which will have an effect on their children and generations going forward. By getting closer to achieving these goals, our project will help complete SDG 5, which targets gender equality - a crucial element for achieving economic progress globally.

# CONCLUSION

Digital Literacy and ICT will help poorer communities take a big step forward for their own industrialization and development. Communicating with people around the world and gaining greater access to education will make countries in sub-Saharan Africa more appealing for investment, which will aid in their development and benefit the economies of African countries and those nations involved with them. Our projects will further support development through women's empowerment. Establishing equality in the workforce will improve the lives of women and their families. Increasing knowledge through better education will help these sub-Saharan African nations attain a higher gross domestic product which is imperative for the future of this region.



# NEEDS ASSESSMENT FOR ICT DEVICES IN TANZANIA AND UGANDA

Our project, Accessible Computer Technologies for Under-Privileged Students (ACT-US), supplies information and communications technology (ICT) to students in sub-Saharan Africa. Supplying ICT devices will give students the opportunity to learn subjects that were previously unavailable to them. The first phase of our project will bring 324 ICT units to schools in Tanzania and Uganda.

We have chosen to work in these countries for several reasons. First, both countries have educational systems that will benefit from the introduction of ICT devices. Second, the schools chosen have agreed to have their teachers trained on how to use the ICT devices. Similarly, the selected schools within both countries have rigorous safety standards, which ensure that the ICT devices will be safe from theft. Moreover, the chosen schools will also have access to electricity, which will allow for the development of the educational systems and economies.

Tanzania and Uganda are quite similar, and the following reasons exemplify why both countries would benefit from obtaining ICT devices. Tanzania and Uganda both have large school-age populations. In Tanzania, the school-age population represents over half (or 53%) of the entire population. In Uganda, the school-age population is 47% or almost half of the entire population. Both countries are also considered as developing economies that would greatly benefit from the introduction of ICT devices. Tanzania's gross domestic product (GDP) for 2018 totaled 57.4 billion USD, making it the 80th largest economy in the world. Conversely, in 2018, Uganda ranked as the 103rd largest economy in the world, with a total GDP of 27.5 billion USD. Supplying these devices will supplement the growing economy of these developing nations.

By supplying computers with pre-installed educational applications, Embrace Relief is creating a model of self-empowerment. Providing ICT devices addresses the lack of educational resources that students in sub-Saharan Africa are facing, which enables them to significantly improve their educational outcomes and quality of life. Moreover, this model recognizes that increasing access to educational resources will support the creation of a better educated and more prosperous continent.

# THE NEED FOR ICTS IN EDUCATION IN SUB-SAHARAN AFRICA INTRODUCTION

Over the past 30 years, the rate of global, extreme poverty has been on a decline. In every region throughout the world, the number of people living in conditions of extreme poverty has seen a dramatic decline–except in sub-Saharan Africa. Sub-Saharan Africa is the only region in the world that has seen a rapid increase in the number of people living in extreme poverty (World Bank 2018). Four out of every ten people, totaling to 413 million people, live on less than $1.90 a day (ibid.). The vicious expansion of poverty is further aggravated by the large population growth (2.7%) that sub-Saharan Africa is experiencing (World Bank 2019). It is estimated that by 2030, 9 out of 10 children in the region will live in extreme poverty, therefore rapid population growth is correlating to a large expansion in the number of people being born to conditions of extreme hunger (UNICEF 2016). Without outside support, the number of people being trapped in this cycle of extreme poverty will continue to grow.

## ENDING POVERTY IS POSSIBLE WITH EDUCATION

Education is the key to ending global poverty, as "education offers children a ladder out of poverty and a path to a promising future" (UNICEF 2019). Studies show that "on average, each additional year of education a child receives increases his or her adult earnings by about 10 percent. And for each additional year of schooling completed, on average, by young adults in a country, that country's poverty rates fall by nine percent" (UNICEF 2016). Consequently, it is clear that the expansion of education is essential for the eradication of poverty.

## IMPORTANCE OF ICTS FOR EDUCATION IN SUB-SAHARAN AFRICA

In today's technologically-driven world, information, and communication technologies (ICTs) are essential to education. They provide easy access to limitless amounts of information, which can empower people to develop innovative ideas and solutions for the betterment of numerous communities (Xu 2017). The intrinsic tie between technology and education highlights the desperate need for ICTs in sub-Saharan Africa, where accessing information instantly is virtually impossible– a serious hindrance to the expansion of education (Partinos 2016). Technology correlates with education as increased exposure to educational technology enhances the effectiveness of learning. According to an early study performed in 2007 on the use of technology in education, it was concluded that there are, "greater efficiencies and effectiveness in learning, increased individual support and opportunities for personal development, better methods of collaborating and communicating and greater exposure to technology" (Eschenbrenner and Nah 2007). Another study conducted within the past year concluded that using educational technology is an advantage as it allows students to

become “self-learners” and grasp needed skills even if they are put at a disadvantage due to lackluster educational systems within their societies (Lakshminarayanan and Poulakidas 2019). Overall, these two studies from different decades present identical results that support the benefits of educational technology. In order to create a successful platform for education, it is clear that ICTs must be considered essential tools for education.

## THE ROLE OF EDUCATION IN THE ECONOMIC DEVELOPMENT OF AFRICA

Supporting the education of children in Africa is important because education directly connects to socioeconomic progress. Both social and economic developments within a country are enhanced through education. Without education, advancements to the economy are minimal or nonexistent. Considering the substantial amount of research confirming the direct positive correlation between education and income, it is imperative that we collectively strive to provide quality education for the rapidly increasing population in Africa. Therefore, organizations such as UNICEF and Embrace Relief take actions towards providing a quality education for children in Africa through various ways, including donating school supplies and other necessities. For example, Embrace Relief’s initiative with Endless Solutions and Endless Network entails providing small electronic devices with downloaded educational applications. These educational applications do not require Internet access and provide the children with an opportunity to effectively learn an array of subjects. These relief actions demonstrate the active pursuit towards a better educated and more prosperous continent. Africa has a severe crisis regarding a lack of quality education for children, and it is important to work towards education for all children. More education has been proven to lower the poverty rate and investing time and effort in Africa to ensure quality education will provide the necessary tools to achieve social and economic progress (UNICEF 2019).

## SUSTAINABLE DEVELOPMENT AND EDUCATION

Sustainable development cannot be achieved without advancing education, which is necessary to help build long-lasting solutions. This connection makes education a top priority for the progression of sustainable development. UNESCO argues that “aiming to improve access to quality education on sustainable development at all levels and in all social contexts, to transform society by reorienting education and help people develop knowledge, skills, values, and behaviours needed for sustainable development,” is a vital component to achieving sustainable development (UNESCO 2019). Embrace Relief’s initiative echoes this sentiment. By giving schools the tools they need to better educate students, these students will be able to empower not only themselves but also their entire community.

# IMPORTANCE OF ICT

In alignment with the UN's 17 Sustainable Development Goals, Embrace Relief makes increased access to education a top priority. The organization plans to increase access to education by providing computers and other ICTs to schools in sub-Saharan Africa. Computers provide access to unlimited amounts of previously inaccessible information. By introducing computers to sub-Saharan Africa, students will have the ability to broaden their knowledge and their economic opportunities. Electronic devices allow children to learn in many different situations since having downloaded educational computer software allows for a child to learn even if there is no access to a teacher or an internet connection. A computer offers more opportunities to learn, as demonstrated by a case study viewed. According to a World Bank case study in Africa, the use of ICTs helps both the economies and education sectors (Souter 2014). The use of ICTs supports improvements within the education system, which leads to a better quality of education.

Supplying ICT devices to children positively affects Africa as a whole as these children will one day seek to contribute to the continent's workforce. This also helps boost business ventures and the economy as a whole as these children will be better equipped to enter the formal economy. Providing ICT units will result in improved educational outcomes and ultimately leads to a better society with a more educated population. The impact of this technology is potentially significant, considering that better education can boost many aspects of life in Africa, including agriculture, economic stability, health, public policy, and the population at large. ICT technology is extremely beneficial and can be used to improve societies through increased quality education, which will result in a better quality of life throughout the continent (Souter 2014). Moreover, computers will also provide a solution to the shortage of teachers in sub-Saharan Africa, one cause of low-levels of education (Watt 2016). According to a 2018 UNESCO report, over 93 countries lack qualified teachers. In particular, "sub-Saharan Africa faces the greatest teacher shortage, accounting for two-thirds of the new teachers needed by 2030. The problem is exacerbated by a steadily growing school-age population" (UNESCO 2018).

These problems are emphasized by the Director-General of UNESCO, Irina Bokova, who states, "A quality universal primary education will remain a distant dream for millions of children living in countries without enough trained teachers in classrooms. Teachers are the core of any education system. Hiring and training new and already established teachers is fundamental to protecting children's ability to learn in school" (UNESCO 2018). However, many of these countries facing a shortage of teachers, especially in sub-Saharan Africa, lack the financial resources to invest in education, which often results in recruiting under-qualified candidates to become teachers. Consequently, providing ICT devices to students in sub-Saharan Africa will help remedy the inadequate educational standards caused by the lack of qualified teachers. Endless OS computer technology will provide students with quality materials and the ability to study on their own. By increasing the availability of educational resources, more students will be able to receive a quality education (Partinos 2016).

## COMPUTER SPECIFICATIONS

Our project will provide 324 computers to impoverished schools in Tanzania and Uganda. Endless Solutions will supply the computers, which are designed to combat the limitations of education in developing countries. These computers do not need the internet to work and have the ability to be updated remotely. They are cost-effective and power-efficient. Most importantly, they are simple to use. Each computer will have educational programs pre-installed. These programs cover a wide variety of school subjects including math, science, history, language, and coding. Beyond that, these computers will also be equipped with programs centered on life skills, such as farming, personal finance management, and personal hygiene skills. Together, these computers will expand the accessibility of education in sub-Saharan Africa, which in turn will enable these students to advance their personal and community development (Endless Solutions 2019).

## CONNECTION TO THE UNITED NATIONS' 17 SUSTAINABLE DEVELOPMENT GOALS

This initiative will serve to further help the development of the United Nations' 17 Sustainable Development Goals (SDGs). The first goal that this initiative will help to achieve is SDG 4, "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" (UN SDGs 2019b). The expansion of access to information and communication technologies (ICTs), like computers, will supplement the development of "equitable quality education...for all" (United Nations 2019). Through increasing access to education, this project will also expand the development of SDG Goals 8 and 9. SDG Goal 8 which, "promotes inclusive and sustainable economic growth, employment and decent work for all," will be advanced through the augmentation of education (UN SDGs 2019c). Similarly, SDG Goal 9, which advocates the need to "build resilient infrastructure, promote sustainable industrialization and foster innovation," will benefit from the expansion of education (UN SDGs 2019d). Moreover, this project will support the advancement of SDG 1, "end poverty in all its forms" (UN SDGs 2019a).

## THE ROLE OF ICT IN EDUCATION IN SUB-SAHARAN AFRICA MISSION

Embrace Relief's mission is to provide ICT devices for educational purposes to students in Uganda and Tanzania, who are lacking learning opportunities due to having limited access to resources. Distributing ICT units offers recipients the ability to enhance their knowledge through educational programs for an array of subjects, including math, history, accounting, and health. By supplying ICT devices, Embrace Relief is supporting the expansion of quality education for underserved youth populations, and ultimately, improving their life outcomes.

# PHILOSOPHY

Embrace Relief recognizes that the need to support the education of children in sub-Saharan Africa is important, as education directly connects to socioeconomic progress. Both social and economic developments within a country are enhanced through education. Without education, advancements to the economy are minimal or nonexistent. Considering the substantial amount of research confirming the direct positive correlation between education and income, it is imperative that we collectively strive to provide quality education for the rapidly increasing population in Africa. Embrace Relief's initiative with Endless Solutions is one course of action working towards the goal of improving education in impoverished areas.

By providing computers with pre-installed educational applications, Embrace Relief is creating a model of self-empowerment. Under this model, providing ICT devices addresses the lack of educational resources that students in sub-Saharan Africa are facing, which enables them to significantly improve their educational outcomes and quality of life. Also, this model recognizes that increasing access to educational resources will support the creation of a better educated and more prosperous continent.

# STATEMENT OF NEED

Sub-Saharan Africa is the only region in the world where the number of people living in extreme poverty has rapidly increased over the last thirty years (World Bank 2018). Four out of every ten people, totaling 413 million people, live on less than $1.90 a day (ibid.). The vicious expansion of poverty is further aggravated by the large population growth (2.7%) that sub-Saharan Africa is experiencing (World Bank 2019). It is estimated that by 2030, 9 out of 10 children in the region will live in extreme poverty, therefore rapid population growth is correlating to a large expansion in the number of people being born to conditions of extreme hunger (UNICEF 2016). Without outside assistance to combat the causes and adverse effects of poverty, the number of people being trapped in cycles of extreme poverty will continue to grow.

# RATIONALE

Education is the key to ending global poverty, as "education offers children a ladder out of poverty and a path to a promising future" (UNICEF 2019). The eradication of poverty has a clear correlation to increased levels of education. Studies show that "on average, each additional year of education a child receives increases his or her adult earnings by about 10 percent. And for each additional year of schooling completed, on average, by young adults in a country, that country's poverty rates fall by 9 percent" (UNICEF 2016). Consequently, it is clear that the expansion of education is essential for the eradication of poverty.

In today's technologically-driven world, information, and communication technologies (ICTs) are essential to education. They provide easy access to limitless amounts of information, which can empower people to develop innovative ideas and solutions for the betterment of numerous communities (Xu 2017). According to an early study performed in 2007 on the use of technology in education, it was concluded that there are, "greater efficiencies and effectiveness in learning, increased individual support and opportunities for personal development, better methods of collaborating and communicating and greater exposure to technology" (Eschenbrenner and Nah 2007). Another study conducted within the past year concluded that using educational technology is an advantage as it allows students to become "self-learners" and grasp needed skills even if they are put at a disadvantage due to lackluster educational systems within their societies (Lakshminarayanan and Poulakidas 2019).

The intrinsic tie between technology and education highlights the desperate need for ICT units in sub-Saharan Africa, where accessing information instantly is virtually impossible– a serious hindrance to the expansion of education (Partinos 2016). Moreover, computers will also provide a solution to the shortage of teachers in sub-Saharan Africa, one cause of low-levels of education (Watt 2016). According to a UNESCO report, over 93 countries are lacking well-qualified teachers. In particular, "sub-Saharan Africa faces the greatest teacher shortage, accounting for two-thirds of the new teachers needed by 2030. The problem is exacerbated by a steadily growing school-age population" (UNESCO 2018). Many of these countries facing a shortage of teachers, especially in sub-Saharan Africa, lack financial resources to invest in education, which often results in recruiting under-qualified candidates to become teachers. Providing ICT devices to students in sub-Saharan Africa will help remedy the inadequate educational standards caused by the lack of qualified teachers. Endless OS computer technology will provide students with quality materials and the ability to study on their own despite their limited access to technology. By increasing the availability of educational resources, more students will be able to receive a quality education (Partinos 2016). Consequently, in order to create a successful platform for education, it is clear that ICT units must be considered essential tools for education.

## PROGRAM DESCRIPTION/COMPUTER SPECIFICATIONS

Through supplying ICT devices, students in sub-Saharan Africa will no longer face many of the hardships in seeking a quality education. Our project will provide 324 computers to impoverished schools in Tanzania and Uganda. Endless Solutions will supply the computers, which are designed to combat the limitations of education and lack of access to technology in developing countries. These computers do not need the internet to work and have the ability to be updated remotely. They are cost and power-efficient. Most importantly, they are simple to use. Each computer will have educational programs pre-installed. These programs cover a wide variety of school subjects, including math, science, history, language, and coding. Beyond that, these computers will also be equipped with programs centered on life skills, such as farming, personal finance management, and personal hygiene skills. Together, these computers will expand the accessibility of education in sub-Saharan Africa, which in turn will enable these students to advance their personal and communal development (Endless Solutions 2019).

## COMMUNITY IMPACT

Providing ICT units to students in sub-Saharan Africa will positively impact not only the students but also entire communities since improving educational outcomes will lead to the expansion of economic opportunities and reduced levels of poverty. Fundamentally, by increasing the availability of computers to students, the opportunity for economic development and innovation will increase. More opportunities allow for a prosperous society where everyone can benefit due to the creation of economic progress. Expansion of education remains the best method to improve these conditions. By increasing the availability of computers to students, the opportunity for economic development and innovation will increase. This will lead to the advancement of economic opportunities on an individual and national level, which will result in a reduction in poverty and improved life outcomes.