Closing the Global Opportunity Gap in Open Innovation based STEM Education for Displaced Youth

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Abstract

Both Education for All (EFA) and Millennium Development Goals (MDG) agendas emphasize increasing equality of global educational opportunities and bridging the accessibility gap. Approximately 25% of refugees are deprived of elementary school educational opportunities, and about 65% do not have access to secondary school (Dryden-Peterson, 2010). Studies of Syrian refugees show that the lack of partnership and digital technology in higher education restricts their educational opportunities (Pherali and Abu Mohli, 2021). The recent STEM education reform for IMSA proposes a community-oriented open innovation STEM model that combines community and open innovation (Lee and Jung, 2021). The gap of global educational opportunities can be primarily solved through partnership formation, community-oriented model introduction, and an online education curriculum. This paper explains how IMSA's online education of Ugandan children can provide a curriculum that combines open innovation and STEM to displaced youth worldwide. This paper aims to analyze the field experience of how IMSA's long-standing STEM education experience helps develop this curriculum. It also explores how the IMSA Youth Open Innovation Club created networks with ASA Social Fund and UBpay to raise the necessary resources for Ugandan children. This research case demonstrates that IMSA's Uganda Online Global Education Case is an open innovation that combines STEM knowledge resources inside IMSA and cooperation and support from for-profit and non-profit organizations outside IMSA. Furthermore, this research provides in-depth stories about the obstacles in delivering open innovation STEM education for globally displaced youth.

Keywords: Global education inequality, equity of educational opportunity, displaced youth, STEM, open innovation

I. Introduction

Global Inequality in Education

- Both Education for All (EFA) and Millennium Development Goals (MDG) agendas emphasize increasing equality of global educational opportunities and bridging the accessibility gap.
- Approximately 25% of refugees are deprived of elementary school educational opportunities, and about 65% do not have access to secondary school (Dryden-Peterson, 2010).
- Studies of Syrian refugees show that the lack of partnership and digital technology in higher education restricts their educational opportunities (Pherali and Abu Mohli, 2021).

Solution to Global Education Inequality

- The recent STEM education reform for IMSA proposes a community-oriented open innovation STEM model that combines community and open innovation (Lee and Jung, 2021).
- The knowledge and educational assets of STEM schools can provide various educational programs to disadvantaged global society through civic organizations.
- The gap of global educational opportunities can be primarily solved through partnership formation, community-oriented model introduction, and an online education curriculum.

Purpose of the Study

- The purpose of this paper is to show how IMSA's online education of Ugandan children can provide a curriculum that combines open innovation and STEM to displaced youth worldwide.
- This paper aims to analyze the field experience of how IMSA's long-standing STEM education experience helps develop this curriculum.

II. Establishing Online Education in Developing Countries

Current Status of Internet Infrastructure in Africa

- Africa has the lowest percentage of having access to internet connections—only 22 percent. (International Finance Corporation, 2022)
- Although Africa has the most underdeveloped regions, Africa also has the largest potential for progress.
- With the aid from the World Bank, The African Union has set the goal of connecting every individual, business, and government on the continent by 2030.

Internet Infrastructure in Developing Countries

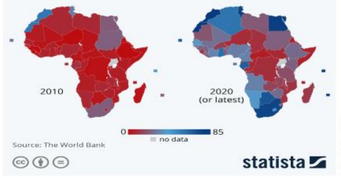
- In order to implement the online education platform, establishing a strong internet infrastructure is required.
- Establishing internet infrastructure in developing countries
- Technology can be implemented into education after a stable internet connection is set.

3.2 Billion

People don't have access to internet

Internet in Africa: Progress and Potential

Share of population using the internet in 2010 and 2020 (or latest)



Source: Statistica https://www.statista.com/chart/26781/internet-penetration-africa-progress/

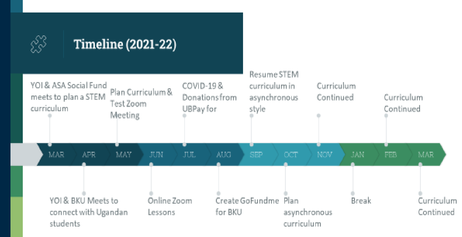
Developing STEM Curriculum for the Disadvantaged Uganda students

- With many gifted high school students in STEM as members, Youth Open Innovation developed a personalized STEM curriculum for Uganda students based on IMSA students' experience in STEM education.
- With IMSA's focus on peer learning, IMSA students have experiences in teaching and explaining foreign concepts to others.
- A curriculum created by STEM high school students is a unique curriculum as it identifies and teaches essential topics in an efficient method.

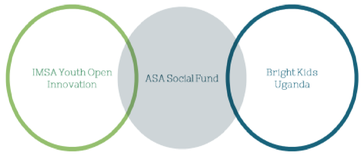
Developing STEM Curriculum for the Disadvantaged Uganda students

- The program consists of different modules, including weekly zoom meetings and quizzes for each lesson.
- The program also provides all the necessary learning materials for the disadvantaged students: funds, tablets, stationery, and papers.
- This curriculum is a uniquely innovative approach for education as students from a STEM school help children in Uganda with their own experience and perspective of various STEM topics.

Timeline (2021-22)



Use charts to explain your ideas



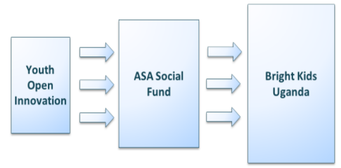
YOI Networks with ASA Social Fund & UBPAY

- IMSA Youth Open Innovation Club created networks with ASA Social Fund and UBpay to raise the necessary resources for Ugandan children.
  - Received $300 donation from UBPay as COVID-19 pandemic relief funds
  - The funds were delivered to BKU through ASA Social Fund.
- This research case demonstrates that IMSA's Uganda Online Global Education Case is an open innovation that combines STEM knowledge resources inside IMSA and cooperation and support from for-profit and non-profit organizations outside IMSA.

III. Example of the Curriculum

Dimensions of Art Market

STEM Tutoring Non-profit Organization Global Community



STEM to STEAM:

The Arts and Its Importance in STEM Education

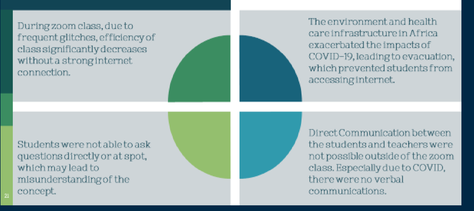
Let's do an activity!

After you saw these artworks....

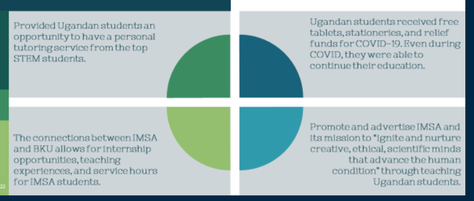
1. What do you **see/notice**?
2. What do you think is **going on**?
3. What do you **wonder**?
4. Choose **a color** that most represents your feelings.
5. Choose **a word** that most represents your insights about this topic.

- After answering the questions, **send a screenshot of your paper** to my email by 12/2/21!

Challenges



Benefits

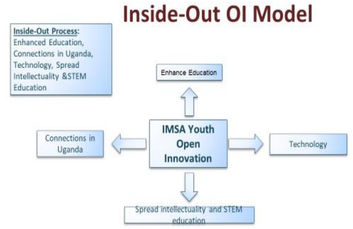


IV. Conclusion

Conclusion

- Many inefficiencies and transaction costs occur when private companies or governments carry out these social innovation projects (Ricciardelli & Manfredi, 2020).
- However, if open innovation emerges through collaboration between STEM school club organizations and civic organizations, global projects for these vulnerable groups can be effectively conducted.
- The vision and of STEM clubs at high schools and the public mind of civic organizations make global education projects for these underprivileged more effective than governments and corporations.

Inside-Out OI Model



Outside-In OI Model