Recentering local knowledge and developing collaborative relationships: Reflections on the design of a localized engineering program for former "street-youth" in western Kenya using an asset-based framework

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CONTEXT
Kenya is experiencing a crisis-level expansion in the number of "Street Youth" (S.Y., children who work/sleep on the streets), with estimates of over 50,000 (SFRTF, 2020). Traditionally, programs serving S.Y. have taken a need-based approach (Onwong'a, 2015a). Research shows that S.Y. have a greater risk of depression, learning disabilities, self-harming behaviours, and suicide (Moolla et al., 2008). However, S.Y. also show higher levels of mental health assets, such as resilience, self-esteem, and social cohesion (McCay et al., 2010). In Eldoret, western Kenya's fastest-growing city, practitioners and S.Y. have anecdotally reported how they can use their inherent resourcefulness and skills towards achieving their employment and livelihood aspirations.

PURPOSE OR GOAL
Engineering can offer a contextualized and asset-enhancing education for S.Y. to build 21st-century skills and a meaningful career pathway (Radhakrishnan & DeBoer, 2016). Our prior research at an alternative school for S.Y. in western Kenya has shown that co-designing an engineering course with students and teachers catalyses learner engagement, meaning, and agency and leads to sophisticated products (DeBoer et al., in press). In this paper, we critically reflect on the past 6 years of co-designing the curriculum, learning ecosystem, and pathways using Ebersöhn and Eloff's (2006) framework of asset-based trends in sustainable programs for vulnerable children. We ask, *how does the Localized Engineering in Displacement (LED) approach map to the asset trends in programs for vulnerable children?*

APPROACH OR METHODOLOGY/METHODS
Using Ebersöhn and Eloff's seven key trends defining the characteristics of asset-based programs as a framework we analyzed documents of the LED program's design and implementation since 2015. Our dataset includes journal and conference research articles, funding proposals, field notes, meeting notes, posters, and presentations.

ACTUAL OR ANTICIPATED OUTCOMES
We have identified two critical actions essential for integrating an asset-based approach in the LED program: (i) recentering local knowledge and (ii) developing collaborative relationships. Recentering local knowledge was accomplished by intentionally integrating locally embedded knowledge and practices. The collaborative relationships were critical to the program's success in valuing assets of the relevant stakeholders.

CONCLUSIONS/RECOMMENDATIONS/SUMMARY
This study illustrates how the LED program integrates asset-based trends by empowering learners to be at the core of the design and developing long-term, collaborative relationships. Reflecting on our co-design process can yield guidance for continuous improvement and transferable outcomes for comparable communities. Based on our findings, we argue that engineering education can recognize and elevate S.Y. learners' assets and transform informal S.Y. programs as change-makers in the local community.

KEYWORDS
Localized engineering, asset-based framework, curriculum

Introduction

It is estimated that there are over 50,000 "Street Youth" (S.Y., children who work/sleep on the streets) in Kenya (SFRTF, 2020). S.Y. face a variety of hardships: academic, socioemotional, and physical/psychological and it is hard for them to get the support they need in traditional schools due to transience and taboos (Embleton et al., 2012). They have a greater risk of feelings of hopelessness, depression, learning disabilities, self-harming behaviours, and suicide (Moolla et al., 2008). S.Y. also demonstrate higher levels of mental health assets, such as resilience, self-esteem, and social cohesion (McCay et al., 2010). However, programs serving S.Y. have traditionally been modelled using the need-based approach of solving problems of food, shelter, health, and education, rather than focusing on their assets (Onwong'a, 2015b). Studies on S.Y. have resulted in recommendations for educational, economic, and psychological support as sustainable solutions (Glauser, 2015; Scanlon et al., 1998; Aptekar, 1994; Ennew, 2003). S.Y. rescue, rehabilitation, and reintegration centers all around the world emphasize and place education at the center of their operations (Ennew & Swart-kruger, 2003). To achieve this objective, the educational context must consider available resources and existing social, political, and cultural structures (Choi & Hannafin, 1995).

The asset-based approach

The asset-based approach has gained significant attention in community development since the seminal work by John McKnight and Jody Kretzemen (McKnight & Kretzmann, 1993). Kretzmen and McKnight discuss the asset-based model as an alternative to the traditional needs-based approach for community development. The needs-based model reinforces feelings of deficiencies and powerlessness amongst community members. It also propagates and situates marginalized communities and members as problematic to the overall development, which harms their external presentation and self-image. For example, in 2015, PBS NewsHour reported on the status of education in the U.S.,with a piece titled "More students living in poverty strain the education system" (PBS NewsHour, 2015). The report concluded that schools in high poverty areas had to spend most of the resources to meet students' basic needs, e.g., food, comfort, and cleanliness while ignoring the community's assets entirely. Marginalized communities in the U.S. and around the world are often approached via a deficit model. In education a deficit model particularly portrays marginalized students as "lacking in some way, defective, deficient, needing to be fixed, not as good as…, and needing to develop skills valued by mainstream society" (Gerstein, 2016).

As an alternative, Gerstein proposes an asset or strengths-based thinking seeing students as "having unique strengths, being competent and capable in settings that are important to the learners, having their own personal powers, having much to offer to other learners and their school communities, sources of educating others about their communities and cultures, and thriving in a challenging climate." The asset-based model focuses on the capacities, skills, and resources of individuals and the community and builds on these assets further for development. Various scholars (Celedón-Pattichis et al., 2018; Lindsey et al., 2010; MacSwan, 2020) have commended and acknowledged the assets-based approach as key to achieving equity and access to education and development in low-and-middle-income countries. However, educational programs designed for low-and-middle-income countries targeting marginalized populations remain predominantly needs-based.

The LED program

Engineering is uniquely positioned to offer an asset enhancing and contextualized education for S.Y. to build 21st-century skills and a meaningful career pathway (Radhakrishnan & DeBoer, 2016). The Tumaini Innovation Centre, an alternative school in western Kenya has demonstrated a unique model of rehabilitating and empowering S.Y. through residential support and engineering-based skill development programs. The centre's model builds on

the assets of the S.Y. to equip them with employable skills and self-efficacy (Bandura, 1977). Collaborating with the learners, and the teachers at the centre we have co-created a "localized engineering" curriculum that re-centres the marginalized S.Y. as learners, community leaders, and engaged citizens for community development. In the program, the students identify community's engineering needs, go through our digital resources and hands-on activities, and develop their solution. Our LED approach integrates: a curriculum, a learning ecosystem, and learning pathways (DeBoer et al., in press).

Our prior research has shown that co-designing an engineering course catalyses learner engagement, meaning-making, agency and leads to sophisticated engineering products. The active, hands-on learning is motivating for S.Y. and meets their educational goals. Additionally, our work also shows that students see their teachers as role models who play a critical role in the success of each student (Radhakrishnan et al., 2018). Our aim is to empower the teachers and build the local capacity to lead and innovate through our "localized engineering" approach. Towards this goal, we have also co-designed an engineering teacher development model. The teacher development program enables untrained engineering teachers at the school to efficiently facilitate the engineering curriculum using strategies of reflective practice and action research (Radhakrishnan et al., 2021). In the final phase of the development, the teachers, as matured engineering teachers have become mentors and now train new teachers to sustain the engineering curriculum. Therefore, our research and evaluation efforts demonstrate that the engineering program has impacted the learners, the teachers, and the community.

The LED program through an asset-based lens

Given the problems associated with a needs-based model, and our own perceptions on the benefits of an asset-based model, we probe the asset-based model relative to our LED program. We have selected our partnership in western Kenya as the context for this study because (1) this is the first location where our program design and implementation began in 2015, and we modelled our translations to other contexts based on the work at the center; (2) we have rich and diverse sources of data from our partnership with the center. In this work-in-progress study, we critically reflect on our efforts over the past six years of co-designing the learning curriculum, the learning ecosystem, and learning pathways for S.Y. We do this using the framework of asset-based trends in sustainable programs for vulnerable children developed by Ebersöhn and Eloff (2006). We ask, *how does the LED approach map to the asset-based trends in programs for vulnerable children?* The purpose of this reflection is to understand how asset-based trends were or were not integrated with the program and how they evolved. Through this reflection of the program development and our experiences, we draw recommendations for engineering education scholars who design programs and research with marginalized communities worldwide.

Approach

Ebersöhn and Eloff (2006) presented successful and sustainable education practices and programs for vulnerable children from the Southern African Development Community (SADC). The authors define vulnerability as the physical, psychological, and sociological circumstances that limit an individual from having their basic needs and achieving their potential, and adopt the groups of children as identified by Smart (2003a), whereby children/ youth living on streets is included. The authors determined common denominators across programs as indicators of sustainability and grouped the common factors to form an asset-based framework. he asset-based framework focuses on the capacities, skills, and social resources of people and their communities (Mathie & Cunningham, 2005). This alternative to the deficit-based models, prioritized thinking about the potential and about the ways the existing potential can be directed towards available opportunities (Ebersohn &

Mbetse, 2003). The approach suggests outside resources can be effectively leveraged by mobilizing an individual or community's resources without ignoring the challenges they face.

The asset-based approach concentrates first on the agenda building and the problem-solving capacities of the local members and communities. Our localized engineering program was developed because of the collaboration with the Tumaini Center since 2015, based on the learners' request for a comprehensive skill-development education that could prepare them for the 21st-century workforce. The curriculum, a product of the long-term relationship with the community, aimed to build the problem-solving capacity of the learners, teachers, and the local community members. Ebersöhn and Eloff (2006) identified seven key trends to be the common characteristics of asset-based programs that we use as a framework of analysis. The seven trends include: (i) community-based participation, (ii) building and strengthening internal capacities, (iii) community-resource mobilization, (iv) Networking and establishing links, (v) advocacy, (vi) use locally embedded (indigenous) beliefs, structures, knowledge, and practices; (vii) information sharing.

Data Sources and Analysis

We benefit a variety of extant documents on the design and implementation of the LED approach since 2015, which we use as data sources for critical reflection against this established asset-based framework. For this paper, we selected five grant applications submitted during five years to different donor programs. We identified these five grant applications as a starting because (1) given their timeline, they can represent a chronological shift in our writings and (2) they are illustrative due to their diversity in terms of the funding amount, donor types, proposal types, and collaborations (see table 1). Other data sources include journal and conference articles, additional funding proposals, field notes, meeting notes, posters, and presentations for ongoing more extensive study.

Table 1: Data sources used in this study

Grant	Submitted Year	Proposal Type	Collaborators
Grant #1	2015	Practice	Community partner, Interdisciplinary schools within the university
Grant #2	2015 & 2016 (2016 submission was an extension request for the awarded 2015 grant)	Practice	Community partner
Grant #3	2017	Research	Community partner
Grant #4	2017	Research	Community partner
Grant #5	2020	Research to Practice	Community partner, Local University

Data analysis

We analyzed the content of the documents using the seven trends laid out by Ebersöhn and Eloff. We performed a deductive chronological analysis of the five data sources. Author 1 coded each grant first according to the seven trends and conducted a discussion session with Author 2. The coding process involved reading through the codes and assigning a code, which is the seven trends from the framework. Then within each trend, the data was re-read to identify patterns, similarities, and they were grouped under assertions. These assertions were then analyzed to identify larger thematic pattern. During the discussions, author 2 reviewed author 1's coding and provided comments and additional reflections based on their experiences. Upon reaching an agreement, authors 1 and 2 considered the emergent reflections on each trend and drafted them. After completing the emergent reflections, author 1 reviewed the data under each trend and identified the two critical themes. Author 2 reviewed the themes and provided feedback and consensus.

Results and Discussion

Based on the emergent reflections of each trend, we find two significant themes demonstrating how our "Localized Engineering in Displacement" program at the center for street youth in Kenya has evolved and mapped on to the asset-based trends. They are: (i) Recentering and prioritizing local knowledge, and (ii) Developing collaborative relationships.

Recentering local knowledge

For a program supporting vulnerable communities to succeed, the community, the organization, and the vulnerable population themselves must feel that the program matters. For S.Y., this meant seeing whether the curriculum and engagement in engineering activities are relevant. Does the content address issues they are faced with as individuals and in the community? One of the successful ways of making the content relevant is by recognizing and integrating local knowledge into a community-based learning model (Ignas, 2004). Our documents show that the local knowledge held by the youth and the center was valued from the start. However, the level of integration and importance increased over time.

In 2015, we wrote the first grant as a collaborative proposal with multiple partners. It shows that we view the center as a resource to build and translate useful technologies to address community issues and provide a livelihood for the S.Y. While we recognize the center as resourceful, we approach it as a beneficiary, offering our expertise and services *for* their growth. This is evident from the language, such as "utilize the center" and "equip the center."

> We propose to utilize the center as a living laboratory for research, education, and engagement and a jump off point for Kenyans to translate technology to practice through Kenyan owned and run startups and existing businesses. Tumaini center, the street children, and their innate entrepreneurial skills are a key element of the proposed approach. We propose to equip the center to provide a space for application of innovative practices related to Purdue University research and technology. (Grant #1, 2015)

In the same proposal, we further distinguish that we hold the expertise in engineering teaching, learning and research that will be provided to the center. We do not explicitly state the valuable knowledge possessed by the local communities and how that will be integrated.

> As such the first set of engineering modules will build on our unique expertise in engineering education research and introductory engineering teaching. We propose to develop content for students to interact with introductory engineering knowledge, skills, and attitudes (similar to our university's introductory engineering class). (Grant #1, 2015)

After submitting this grant, author 2 visited the center in Kenya for the first time and spent a few days interacting with the youth, the administration, and the international consortium on the ground that was supporting the center's activities. She conducted informal interviews with two youth, who pioneered the effort of voicing their needs and setting up the center. After this visit, grant #2 and its extension the following year was drafted. In this grant, there are subtle changes in the language and perspectives, recognizing the assets and strengths of the street youth. We acknowledge the youth as being resilient and having strengths that could help them be successful. They are more explicitly described as agents in the ecosystem of the partnership.

> Our goal is to break down educational barriers faced by street youth and other vulnerable youth in a changing society, leverage their inherent resourcefulness, resilience, and independence, and equip them with the knowledge and skills they need to not only get off the streets but to have successful and productive careers in their community. (Grant #2, 2015)

Grant #2 and its extension were the grants that were awarded amongst the five. As can be seen from the extracted quote, the approach has changed from just providing them with

resources to breaking down the barriers to growth and excellence of the youth. In 2017, two research-focused proposals were developed at the beginning and end of the year, respectively. By this time, both authors 1 and 2 had visited the center a few times for short visits and continued to identify new ways of engagement while sustaining ongoing programs. In both grants, we see an increase in our acknowledgment that the center's model is revolutionary and that local knowledge and "ways of doing" are indispensable.

> Since 2014, the Tumaini Center has operated as an alternative school, and anecdotal success suggests that it provides the socio-emotional supports S.Y. have not found elsewhere. The ethos of the school shifts the focus from a "vulnerable" deficit construction to a resource/opportunity model (Grant #3, 2017)

In 2020, we co-developed a research translation grant with the center and a faculty at the local university. By this time, both authors 1 and 2 had made multiple visits to the center, had led three summer study abroad programs with students from two American universities to the center in Kenya, and author 1 had relocated to Kenya to be stationed there for a year. From the quote below, it is evident that the assets and capacities of the youth and the center were acknowledged and considered to develop activities and programs at the center.

> Historical evidence suggests that Street Youth demonstrates higher levels of resilience and self-esteem while still having a greater risk of emotional and behavioral problems…… Our learners are considered equal decision-makers; they play a critical role in shaping the nature of the program while building their socio-emotional competencies. The program includes a curriculum that integrates technical content, professional skills, and engineering design; all focused-on needs identified by the local students themselves. (Grant #5, 2020).

Over time, we see an increase in the level of our acknowledgment of the assets and capacities of the youth, the center, and the community. We also see progress in leveraging these assets and capacities directly into the program development and refinement. Based on the timeline of activities, we believe one of the key reasons for this change in the level of asset-based development is the consistent travel, interaction, and relationship building with community members. During earlier stages of the project, most development and coordinating activities happened via email and Skype. However, with in-person presence, there was an increase in our understanding of the context and the role of the community. *This is an important reflection that needs to be explored further, in light of the current pandemic situation and the adjustment institutions must make to sustain existing and start new international collaborations while staying true to asset-based models.*

Developing collaborative relationships

Ebersöhn and Eloff recommend that relationships be prioritized over reason and rationality when working with vulnerable communities to enable community-based participation. Since the beginning of our engagement, relationship has been the priority. In 2015, the collaborative relationship was being built on the successful North American universities consortium model in Kenya supporting health programs. Situating ourselves in a collaborative community that valued the relationships and had demonstrated success in global development was crucial to our partnership and engagement.

> The confluence of the AMPATH consortium model, Purdue University involvement with Tumaini center, and Engineering department at the university offers a unique opportunity to develop and ultimately scale a fundamentally new type of partnership with developing nations to the benefit of everyone. (Grant #1, 2015)

References to this successful collaboration of multiple partners continue to be referenced in most of our writings. In the 2020 grant, we have also emphasized the collaborative relationship as a critical strength to our program.

A unique strength of the Tumaini Center is its close collaboration with the global health care program model, an academic collaborative between [local university] in Kenya and several North American universities, working on all aspects of global health delivery and economic development for the last 20 years. This provides us with a vast network of expert trainers and mentors in areas like medicine, business, engineering, agriculture, environmental science, information technology, and energy as well as innovative job opportunities for graduating youth. (Grant #5, 2020)

An essential way of maintaining this collaborative relationship has been the continuous involvement of the community partner's members and affiliates in the program design and development. The level of involvement has changed over time. In the beginning, the members were seen as local experts who can continue to provide relevant local information and participation in testing and feedback, and we designed the curriculum and the technology tool for learning.

The Tumaini center administration, teachers, and students will provide contextualized direction, testing, and feedback to the project outcomes. Working through the center's local affiliates and the P.I.'s local collaborators, we will explore the scalability to other local markets. (Grant #2, 2015)

As we moved from program implementation to research, we continued to involve the members in certain stages of the research processes.

We include the teachers and director as well in data collection to triangulate observations from students. Teachers and director also help to facilitate group data collection. (Grant #3, 2017)

However, from both these extracted quotes, we see that the members were only engaged in segments, where we saw their role to be most fitting. By 2020, there is a drastic change to this perspective, where we engage the members as part of the design and development team from the beginning. First, we recognize and see the center having the potential to bring change in policy and practice due to the collaborative relationship we developed together, and those developed by the center with its local affiliates.

The keystone to the program is our collaboration with local learning space that is invested in long term implementation of the development solutions and have the potential to translate research and influence both policy and practice. (Grant #5, 2020)

Second, we demonstrate how we have been able to scale our partnership and showcase the goals of translating research through evidence.

The Purdue university and Tumaini center have a history of scaling our partnership in research translation. During the most recent school year, the students were able to develop a variety of engineering products (e.g., solar-powered refrigerator, charcoal briquettes press, farm mechanized vehicles). The semester ended with the students hosting community members for an exposition where they displayed their products, described how they were constructed, and the challenge they solve for the community. (Grant #5, 2020)

Third, the members recognize their role as important and are proud of their developing identities as engineers. For example, we have discussed in the grant proposal our collaboration and ways by which we mainly target female SY to be educated at the center.

Each of the departments relates to an authentic engineering context, community issues, and social impact, and such relevant problems have been shown to be more engaging for female students. Our Co-PI and staff at Moi have conducted a needs assessment with the teachers on PSS and gender-responsiveness training, and with this project be supported in gender-responsive pedagogy training. The successful women teachers who are role models already at Tumaini will lead demonstrations. In a recent research study with the engineering teachers

at Tumaini, we found that the female teachers take a great pride in being engineering faculty, given the negative societal perceptions and stereotypes of engineering and women. The teachers have communicated that a key goal for them in the coming years to serve as role-models and mentor more female SY to take up engineering. We also ensure that male and female student at Tumaini directly and frequently connect to female engineering role models and near peers from Moi university. (Grant #5, 2020)

Collaborative relationships are vital to sustaining programs for vulnerable youth and a key asset-based trend that could define success. We have been privileged to use the existing successful collaborations in the community to build ours. We also recognize and recommend the higher inclusion of community partners and their affiliates in the program's design, development, and research goals from early on to realize their potential and encourage community-based participation.

Conclusion

Two key actions serve as critical process steps that we see as instrumental in integrating the asset-based approach into the design and implementation of the localized engineering approach. They are: (i) re-centring local knowledge, and (ii) developing collaborative relationships. We have presented the localized engineering approach as one of the asset-based educational programs supporting the S.Y. in education. Initially, we identified the asset-based trends in sustainable educational practices for vulnerable children as discussed by Ebersohn and Eloff. We then reflected on the parallels that exist between the asset-based approach and our localized engineering program. We see that the localized engineering program integrates asset-based trends by focusing on empowering learners to be at the core and developing long-term, collaborative relationships with the Tumaini center administration, teachers, learners, and the local community. By evaluating the engineering program using an asset-based framework, we argue that engineering education has the potential to recognize and elevate S.Y. learner's assets and empower the informal spaces working with them as change-makers in the local community.

References

Aptekar, L. (1994). Street children in the developing world: A review of their condition. *Cross-Cultural Research*, *28*(3), 195–224.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, *84*(2), 191.

Celedón-Pattichis, S., Borden, L. L., Pape, S. J., Clements, D. H., Peters, S. A., Males, J. R., Chapman, O., & Leonard, J. (2018). Asset-based approaches to equitable mathematics education research and practice. *Journal for Research in Mathematics Education*, *49*(4), 373–389.

Choi, J.-I., & Hannafin, M. (1995). Situated cognition and learning environments: Roles, structures, and implications for design. *Educational Technology Research and Development*, *43*(2), 53–69.

DeBoer, J., Radhakrishnan, D., & Freitas, C. C. S. De. (n.d.). Localized Engineering in Displacement: An Alternative Model for Out-of-School Youth and Refugee Students to Engineer their own Solutions for their own Communities. *Advances in Engineering Education*.

Ebersöhn, L., & Eloff, I. (2006). Identifying asset-based trends in sustainable programmes which support vulnerable children. *South African Journal of Education*, *26*(3), 457–472.

Ebersohn, L., & Mbetse, D. J. (2003). Exploring community strategies to career education in terms of the asset-based approach: Expanding existing career theory and models of intervention. *South African Journal of Education*, *23*(4), 323–327.

Embleton, L., Ayuku, D., Atwoli, L., Vreeman, R., & Braitstein, P. (2012). Knowledge, Attitudes, and Substance Use Practices Among Street Children in Western Kenya. *Substance Use & Misuse, 47*(11), 1234–1247. https://doi.org/10.3109/10826084.2012.700678

Ennew, J. (2003). Difficult circumstances: Some reflections on 'street children'in Africa. *Children, Youth and Environments*, *13*(1), 128–146.

Ennew, J., & Swart-kruger, J. (2003). Introduction: Homes , Places and Spaces in the Construction of Street Children and Street Youth. *Children, Youth and Environments*, *13*(1), 81–104.

Gerstein, J. (2016). *Approaching Marginalized Populations from an Asset Rather Than a Deficit Model of Education*. User Generated Education. https://usergeneratededucation.wordpress.com/2016/05/08/approaching-marginalized-populations-from-an-asset-rather-than-a-deficit-model/

Glauser, B. (2015). Street children: Constructing and reconstructing childhood. *Contemporary Issues in the Sociological Study of Childhood*, 128-.

Ignas, V. (2004). Opening doors to the future: Applying local knowledge in curriculum development. *Canadian Journal of Native Education*, *28*(1/2), 49–60.

Lindsey, R. B., Karns, M. S., Karns, M., & Myatt, K. (2010). *Culturally proficient education: An asset-based response to conditions of poverty*. Corwin Press.

MacSwan, J. (2020). Academic English as standard language ideology: A renewed research agenda for asset-based language education. *Language Teaching Research*, *24*(1), 28–36.

Mathie, A., & Cunningham, G. (2005). Who is driving development? Reflections on the transformative potential of asset-based community development. *Canadian Journal of Development Studies/Revue Canadienne d'études Du Développement*, *26*(1), 175–186.

McCay, E., Langley, J., Beanlands, H., Cooper, L., Mudachi, N., Harris, A., Blidner, R., Bach, K., Dart, C., & Howes, C. (2010). Mental health challenges and strengths of street-involved youth: The need for a multi-determined approach. *CJNR (Canadian Journal of Nursing Research)*, *42*(3), 30–49.

McKnight, J., & Kretzmann, J. (1993). Building communities from the inside out. *A Path toward Finding and Mobilizing a Community's Assets*.

Moolla, A., Myburgh, C., & Poggenpoel, M. (2008). Street children's experiences of aggression during interaction with police. *Journal of Psychology in Africa*, *18*(4), 597–602.

Onwong'a, C. M. (2015a). The Effectiveness of Street Children Interventions in Eldoret, Kenya. *International Journal of Science and Research*, *4*(9), 423–429.

Onwong'a, C. M. (2015b). The Effects of Socio-Political Factors on Street Children in Eldoret, Kenya. *International Journal of Science and Research*, *4*(9), 430–435.

PBS NewsHour. (2015). *With more U.S. students living in poverty, education system faces strain*.

Radhakrishnan, D., Capobianco, B. M., & DeBoer, J. (2021). Kenyan engineering teachers building reflective practice. *Reflective Practice: International and Multidisciplinary Perspectives*. https://doi.org/10.1080/14623943.2021.1961126

Radhakrishnan, D., & DeBoer, J. (2016). Utilizing an Innovative Engineering Skills Curriculum and Technology to Expand Classroom Learning in Low-Resource Settings. *Paper Presented at 2016 ASEE Annual Conference & Exposition*. https://doi.org/10.18260/p.27175

Radhakrishnan, D., DeBoer, J., & Kimani, S. (2018). Teachers as Guides: The role of teachers in the facilitation of technology-mediated learning in an alternative education setting in western Kenya. *ASEE IL-IN Section Conference*. https://docs.lib.purdue.edu/aseeil-insectionconference/2018/k12ol/4

Scanlon, T. J., Tomkins, A., Lynch, M. A., & Scanlon, F. (1998). Street children in Latin America. *BMJ*, *316*(7144), 1596–1600.

SFRTF. (2020). *2018 NATIONAL CENSUS OF STREET FAMILIES REPORT*. Ministry of Labour and Social Protection, Kenya. https://www.socialprotection.go.ke/wp-content/uploads/2020/11/National-Census-of-Street-Families-Report-.pdf

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