



Youth Participation to Solve Relevant, Real-World Sustainability Challenges Using Create2Solve DIY STEAM Kits: My Reflexive Account

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**REFLECTIONS
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ABSTRACT

Young people have the potential to be an investment in their communities, potentially leading solutions to wicked sustainability challenges in developing countries. Still, extant literature highlights that youth of color from low-income neighborhoods are: a) greatly excluded from sustainable development initiatives, and/or b) engaged in learning content that is irrelevant to them. Such deficit-based, tokenistic and alienated learning activities constrict youth engagement and participation, particularly in innovative 21st century learning paradigms, such as science, technology, engineering, arts and mathematics (STEAM) education. In this paper, I present 'Create2Solve do-it-yourself (DIY) STEAM Kits', a project developed in collaboration with a non-profit school in at-risk community. The Project is a community- and learner-relevant project which adopts an asset-based, non-tokenistic lens to view and position young people as civic citizens who are both capable and motivated to 'do STEAM' for community transformation. Particularly, I offer a reflexive account of my experience of designing and implementing Create2Solve Kits as I worked closely with youth. Towards the end, I present an evaluation of key takeaways learned from my experiences of facilitating this process. Through my reflective analysis, I propose that youth are keen to participate in sustainable development projects, provided that such projects: a) position them as capable and resourceful citizens; b) remain relevant to their local community contexts while helping them improve understanding of complex STEAM concepts; c) allow them to substantially contribute to their personal, community, and societal transformation; and d) foster non-tokenistic participation where their input and decisions drive the work.

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INTRODUCTION

The current 21st-century world is facing unprecedented sustainability challenges. These are some wicked systemic, complex, and multi-faceted global issues that are affecting humanity, particularly the youth of today. Young people have the potential to be “an investment to their communities” (Udensi et al., 2019, p. 3), potentially leading solutions to wicked problems in developing countries. Youth are keen to contribute, but they are confronted with three major dilemmas when engaging with community and sustainable development initiatives. First, youth, specifically youth of color from low-income neighborhoods of developing nations, are typically excluded and neglected from sustainability development programs (Cammarota & Ginwright, 2008; Gonick et al., 2021; Udensi et al., 2019; Verma, 2019). Even when allowed to participate, their contributions are reduced to tokenism at traditional sustainability forums and events (Hart, 2008; Taft & Gordon, 2013). Such “invited and managed forms of participation and citizenship” (O’Brien et al., 2018, p. 3) often result in disengagement of youth participating in sustainable development initiatives due to the tokenistic nature or, in some cases, the complete absence of their involvement (O’Brien et al., 2018; Taft & Gordon, 2013). Second, adults often view youth in their communities as ‘problem creators’ and as ‘deficient’ in their abilities and skills to contribute to the development of their communities (Checkoway & Gutierrez, 2006). Third, these young individuals are most often engaged in sustainability challenges that are irrelevant or disconnected from the real-world challenges they encounter in their lives, communities, and cultures (Cammarota & Ginwright, 2008; O’Brien et al., 2018).

Such tokenistic, deficit-based, and alienated learning approaches constrict youth engagement and participation in learning activities that train them as sustainable citizens (Adair et al., 2017). Particularly, this is true with innovative 21st-century interdisciplinary learning paradigms, such as science, technology, engineering, arts, and mathematics (STEAM) education, where youth of color are already underrepresented (Verma, 2019). Guided by a powerful aim — to present a community-relevant project which adopts an asset-based and non-tokenistic lens to view and position young people as civic citizens capable of ‘doing STEAM’ for community transformation — I present the project of ‘Create2Solve Do It Yourself (DIY) STEAM Kits’. Particularly, in this paper, I offer a reflection on this project, while sharing my experience of facilitating this project and working with marginalized youth as they engaged with Create2Solve DIY STEAM Kits.

Create2Solve DIY STEAM KITS PROJECT: A REFLEXIVE ACCOUNT OF EXPERIENCES

The project of Create2Solve DIY STEAM Kits was part of a more extensive community-based program known as the Create2Solve After-School program. The primary motivation for this program was greatly informed by my firsthand experiences working with an educational non-profit organization in Pakistan, a developing South Asian country and my country of origin. During this work, I noticed that most of the existing interdisciplinary programs (e.g., STEAM initiatives) predominantly catered to affluent communities, making these programs unaffordable and irrelevant for the socially and economically disadvantaged students. In addition, on a more personal level, this lack of affordability and relevance felt particularly poignant to me as a first-generation student who struggled to afford and relate with the expensive science and robotics kits and programming when growing up. This disparity fueled my pursuit of a Master of Science degree in Innovative Technologies in Learning at a national university in Pakistan. During my studies, I initiated the Create2School After-School program in collaboration with a local non-profit school in a socially and economically disadvantaged community located adjacent to my university. My background in engineering and ongoing educational degree program, coupled with my experience working with a non-profit educational organization for the underserved, were all factors that influenced my thinking and planning of the Create2Solve After-School program. The mission of the Program was clear: To use my engineering and educational expertise to design affordable STEAM learning experiences that were not only community-relevant but also affordable for all. With this mission as a guiding principle, the Create2Solve After-School program aimed to bridge educational gaps by partnering with non-profit schools, prioritizing STEAM education for marginalized youth (Kiyani et al., 2020). Starting with community-relevant STEAM projects at a local non-profit school, the initiative expanded into the Create2Solve DIY STEAM Kits project. This Project was dedicated to using a DIY educational kits approach to inspire young individuals from low-income communities to leverage STEAM education for addressing sustainability challenges in their neighborhoods.

Eight youth (12–15-year-olds) consented to participate in the Create2Solve DIY STEAM Kits project. I recorded extensive field notes, observations, and photographs as the youth engaged in the Project. These observations and field notes were based on two aspects – (1) descriptions of what I had witnessed, and (2) details of what I found interesting and/or surprising. I also conducted informal conversations with community members and students

throughout the Project as well as semi-structured interviews at the end of the Project to capture students' thoughts and feedback about their participation. These conversations and interviews were audio-recorded and transcribed verbatim. The entire research process adhered to the ethical guidelines set by the institutional ethics committee, emphasizing inclusivity when working with diverse communities — a core tenet of community-engaged practices (Baker et al., 2023).

The project of Create2Solve DIY STEAM Kits unfolded in three primary phases: a) identifying the themes of the kits based on local community problems; b) designing the DIY STEAM Kits based on themes identified in the first phase; and c) formulating the plan and programming to work with youth as they use these kits. In the subsequent sections, I discuss my experiences during these phases as I step back to recount and reflect on my collaborative work with youth in this Project. I highlight some critical aspects and experiences from the Project, recognizing that I offer these reflections through my adult interpretation, recognizing that the participating youth or facilitators may hold different interpretations.

A) HOW TO MAKE STEAM DIY KITS COMMUNITY- AND LEARNER-RELEVANT?

In this phase of designing community-relevant DIY STEAM kits, my primary goal was to align these kits with the youth's lives, needs, and issues to maximize their meaningful participation (Cammarota & Ginwright, 2008; Checkoway & Gutierrez, 2006; Udensi et al., 2019). With this goal, I set out to explore the following question: What can be the legitimate process for making DIY STEAM kits relevant to students in socially and economically disadvantaged communities?

I drew the motivation to contemplate and respond to this question from Freire's approach to critical pedagogy (Freire, 2000), a theoretical perspective that offers various insights when it comes to 'quality participation' of youth in meaningful and contextually relevant development initiatives. Freire suggested that education must closely align with the social, historical, and cultural needs of the learners (Freire, 2000), such that learners' needs and issues are the basis of the learning (Mahmoudi et al., 2014). Youth are more inclined to participate when the curriculum and learning materials align with their interests and needs (Mattar, 2018), and they can derive direct benefit from it (Udensi et al., 2019).

To design such kits based on real and learner-relevant community issues, a crucial first step, therefore, was to learn about the neighboring community of the non-profit school I partnered with for this Project. This approach also allowed me to analyze the community and socio-cultural tools influencing the cognitive and affective thinking of the learners, while suggesting better ways to tap the youth's motivation and interest. The community partner for this project was a non-profit high school in the village of Noorpur Shahan. A distinct attribute of

this school, further making this partnership an authentic 'community partnership', was its approach of fostering close collaboration between the school staff, community members, and the students' families. Through this community-driven approach, the school delivered both quality education and essential life skills to the youth from the neighboring low-income community. The village surrounding the school, Noorpur Shahan, was categorized as underdeveloped and neglected, even though it was just a few miles from a well-developed capital city of Pakistan (Batool et al., 2015). During our collaboration, the youth voiced major concerns about the critical issue of ineffective waste disposal. This issue stemmed from the lack of waste disposal facilities and municipal committees' negligence toward the neighborhood, leading to unsanitary conditions. Youth also reported severe electricity shortage issues, disrupting basic services and facilities for residents. Despite providing electricity to nearby high-income, affluent neighborhoods, the community was left to grapple with an electricity crisis.

Observing the severity of the above issues, the themes of waste disposal and electricity shortage were selected for the Create2Solve DIY STEAM kits. These themes were not just arbitrarily selected, but were deeply informed by many informal conversations we had with youth, community residents, and school staff about life in Noorpur Shahan. Understanding the gravity of these problems and their local relevance, I believed they would resonate with the students and align with their community's actual needs and challenges, steering clear of imposing alien or 'imported' issues. Given the shared objective of the community partner (the school) and this Project to develop students' STEAM skills, I held high hopes that this collaboration would offer mutual benefits to both partners, as advocated by Baker et al. (2023). This approach was used to align the learning content with the interests, preferences, needs, and socio-cultural contexts of learners (Shor, 2018) and engage youth in sustainability initiatives that allow them to work on the problems that matter to them (Mahmoudi et al., 2014; Mattar, 2018; O'Brien et al., 2018). Using community problems in the Project was helpful to examine how young people collectively respond to critical challenges in their neighborhood. This also gave me a chance of "learning from young people about their own pedagogies of love, hope, and healing" (Cammarota & Ginwright, 2008, p. 6) and their ingenious ways of thinking and doing.

B) WHAT SHOULD BE THE DESIGN CONSIDERATIONS FOR COMMUNITY-RELEVANT STEAM DIY KITS?

Following the identification of the themes for the kits, the next phase involved designing low-cost STEAM DIY kits with the goal of actively involving youth in community-relevant STEAM programming. During this phase, I developed two STEAM DIY kits, Create2Solve Waste Management kit, and

the Create2Solve Recycled Electronics kit. These kits were named ‘Create2Solve’ to underscore the overarching agenda and motto, emphasizing that the design and creation processes were purposeful, meaningful, and geared towards fostering collaborative and creative solutions to pressing community problems. This phase involved continuous reflection on various design considerations. Questions such as the following were central to the design process: What materials should be included in the kits to ensure that young participants do not find them alien and become hesitant to explore? How can the kits’ design be interactive and playful for a diverse group of learners, motivating them to be curious and engaged? Given such design considerations, I used low-cost items in the kit design that were familiar to the youth and readily available in the community. Using low-cost technology ensured that the kits were accessible and affordable in disadvantaged settings and for learning environments that lacked laboratory resources for tinkering and design (Wijayawardana & Kaumal, 2017; Zidny et al., 2019). As part of the goal to develop ‘learner- and community-relevant DIY culture’, I provided youth with all kit components except the recyclable and reusable waste materials, such as used plastic bottles and old cardboard boxes. Before participating in the kits’ programming, youth collected the recyclable and reusable items from the neighboring community through their facilitator’s guidance and support. This approach not only bridged the gap between classroom learning and community environment, but also allowed the students to use familiar and locally available materials to design products (Wijayawardana & Kaumal, 2017). The final products, thus, remained inexpensive and playful, aimed at empowering youth to think about ways to address relevant issues.

Each kit was designed to encourage small group work across different age groups, providing youth of various ages with the opportunity to interact and learn from one another in a safe space. This approach was inspired by the vision of ‘Youthtopia’ space (Cammarota & Ginwright, 2008), where “young people depend on one another’s skills, perspectives, and experiential knowledge, to generate original, multi-textual, youth-driven cultural products that embody a critique of oppression, a desire for social justice, and ultimately lay the foundation for community empowerment and social change” (p. 3). While youth were encouraged to tinker with DIY kits without constant supervision, two school teachers, Sana (all names are pseudonyms) and Maya, joined the Project as facilitators. We took great care to ensure that the Create2Solve space continued to serve as a social space for young people to exercise their agency and connect with peers, ideas, experiences, and activities aimed at addressing pressing community problems, sometimes in collaboration with facilitators and sometimes independently.

C) HOW TO PROMOTE YOUTH’S AUTHENTIC PARTICIPATION IN STEAM DIY KITS?

Once the design considerations for the Create2Solve DIY STEAM Kits fell into place, the next critical step was to reflect on some key questions, such as: What are ways to promote youth’s authentic participation in Create2Solve kits? What theoretical or conceptual frameworks can guide in ensuring that youth’s participation in these STEAM kits remains meaningful and non-tokenistic? While reflecting on ways to promote youth’s authentic participation in Create2Solve kits, I gained insights primarily from two frameworks, which include: a) Arnstein’s ladder of participation (Arnstein, 1969); and b) asset-based approach (Cammarota & Ginwright, 2008; Mejia et al., 2018).

Arnstein’s Ladder of Participation

In constructing my discourse around youth participation, it is essential to first identify what participation entails and how it can be distinguished as authentic or non-tokenistic. To understand ‘participation’ — and to differentiate between, and target the higher levels of youth participation in my project — I used Arnstein’s (1969) eight-rung ‘ladder of participation’. Arnstein’s model describes participation as ranging from lower rungs of ‘non-participation’ (where there is no power, such as in manipulation), through mid-level rungs of ‘tokenism’ (where power is superficial, such as in consultation), to the highest rungs of ‘citizen control’ (where actual power is exercised, such as in partnerships). According to this framework, moving beyond the tokenistic participation requires advancing to the levels of partnership, delegation, and complete citizen power with the youth; citizen power and control being the highest levels of participation (Arnstein, 1969; Botchwey et al., 2019; White, 2021). To ensure authentic youth participation, it is essential to increase their agency, voice, and involvement throughout the decision-making processes that inform their participation, rather than merely ‘informing’ or ‘consulting’ them about their potential participation in any space or learning intervention (Arnstein, 1969). This can only be achieved if youth are involved in a ‘partnership’ (level 6) that enables them to negotiate and engage in trade-offs with those in positions of higher power, such as research leads and facilitators. Or, as the top-most rungs of Arnstein’s ladder indicate, youth achieve ‘delegated power’ (level 7) or full ‘citizen power’ (level 8), where they become the primary decision-makers, or hold full managerial power. While Arnstein’s (1969) model is not without its criticisms and challenges (Botchwey et al., 2019; Contreras, 2019), applying this framework provides valuable insights, such as: it is close to impossible to ensure youth’s authentic and non-tokenistic participation in any learning space or project unless they are engaged at these high levels of partnership and citizen power. As Contreras (2019)

highlights, Arnstein's ladder of participation implies that the "individual and community empowerment is the ultimate goal of participation" (p. 222).

Asset-Based Approach

The crux of working with young people, particularly in youth partnerships, lies in how we 'view' or perceive them. Young people, especially those from marginalized communities and of color, are frequently stigmatized as delinquents, drug users, or school dropouts (Cammarota & Ginwright, 2008; Checkoway, 1998; Kennelly, 2011). Given these 'problematic' framings, the wisdom, knowledge, contributions, and, most significantly, the voices of these young people are often undervalued, conveniently dismissed, and overlooked (Gonick et al., 2021). Checkoway and Gutierrez (2006) argue that young individuals frequently internalize the negative perceptions of their deficiencies imposed by adults or others, rather than recognizing themselves as potential agents of change and transformation. To counter this deficit-based perspective on youth civic behavior, I adopted the 'asset-based' approach when working with the youth. The asset-based approach allowed me to harness the wealth of rich and powerful knowledge, skills, and practices of youth of color and their communities, as shown elsewhere (e.g., Cammarota & Ginwright, 2008; Mejia et al., 2018). This approach was particularly meaningful in my current context of informal STEAM space, a space that has historically been criticized for promoting inequitable and hegemonic practices (Verma, 2019). By acknowledging and leveraging individual and collective strengths, the use of a strength-based approach allowed me (to attempt to) transform the informal learning spaces into more relevant, empowering, and engaging environments for young people.

As I reflect on youth's participation in this Project, Arnstein's ladder of participation and asset-based approach serve as foundational frameworks of this collaborative work.

A REFLEXIVE ACCOUNT OF YOUTH'S PARTICIPATION IN PROJECT: KEY LESSONS AND TAKEAWAYS

Under Create2Solve DIY STEAM Kits project, youth participated in two programs: the Waste Management program using 'Create2Solve DIY Waste Kit' and the Recycled Electronics program using 'Create2Solve DIY Recycled Electronics Kit'. Each program lasted for 2 months, with youth attending sessions twice weekly, contingent upon the school's calendar, availability of facilitators and youth themselves. Table 1 outlines key phases and learning activities of the Project that served as an underlying framework of each Program. Following an overview, I highlight four key lessons derived from

a reflexive account of youth's participation in both programs, that may serve as guiding principles for those interested in doing similar work.

First, my experience working with youth has reaffirmed that when young individuals are recognized and celebrated as assets and experts with rich knowledge, skills, perspectives, and experiences, their contributions are truly transformational and empowering (Freire, 2000). For example, during the waste management program, participants highlighted that most community members suffer from waterborne diseases due to the alarming situation of ineffective waste disposal, and still, the elected government officials would not respond well to their concerns. These socio-political discussions serve as the foundation for building critical consciousness among the youth, allowing them to connect neighborhood issues to their own lives (Cammarota & Ginwright, 2008). Valuing youth's perspectives and opinions proves meaningful not only for training them as critically conscious citizens but also serves as a catalyst for motivation and the development of self-assurance in their abilities. For instance, in the Create2Solve Project, youth reported developing increased confidence and self-efficacy in their ability to achieve their goals. This was observed despite the youth initially reporting the least confidence in what they could achieve or design by participating in Create2Solve DIY kits. Saira (all names are pseudonyms) shared her sense of accomplishment, stating, "*In the start, I didn't know if I will be able to design such useful products, but I am happy that I was able to do it.*" Youth assume the role of change agents within their communities when they are treated as the custodians of the future capable of making substantial "investment to [their] communities" (Udensi et al., p. 3). This way, youth who are often overlooked from sustainability development initiatives (Udensi et al., 2019), and marginalized by the lack of opportunity within formal education (Cavallo et al., 2004), experience a combined boost in self-confidence and tangible leadership and problem-solving skills.

Second, use of authentic and real-life examples helps students improve their understanding of complex STEAM topics, such as electric circuits, as also observed by others (e.g., Zidny et al., 2019). For example, youth in our study developed a better understanding of the 4R (reduce, reuse, recycle, and recover) waste management technique when they implemented it during the community field trip. Similarly, designing paper electric circuits from home-based materials helped the students develop a better understanding of electricity and electric circuits. Suleman, one of the participants, expressed how "*[his] concepts about electronic principles were highly improved.*" Despite learning about the STEAM concepts in their classrooms, it is quite challenging for youth to connect with and implement these concepts in real-life community contexts or problems that are strictly discussed as scientific concepts with little to no connection to learners. Cammarota and

PHASE OF PROJECT	EXAMPLES FROM MAIN ACTIVITIES	A SNAPSHOT
1 — Reflective Dialogue and Socio-political Discussion	Critical dialogue about the alarming situation of ineffective waste disposal within the community and the associated health risks	
2 — Community-Relevant and Interactive STEAM Learning	Learning about waste management techniques through interactive lessons, community field trip and photo-prompted whole-class reflection.	
3 — Intentional and Meaningful Design	Designing small-scale and localized solutions to solve the identified issues, like creating hand-held battery-operated flashlights and fans using waste items collected during community field trip	
4 — Self-Assessment, Reflection and Future Plans	Completing reflective exit-tickets, STEAM-based rubrics, leading similar sustainability initiatives in the school and community, e.g., Green Leaders Initiative	

Table 1 Overview of the Create2Solve Project.

GINWRIGHT (2008) had a similar observation where youth of color reported learning the same “boring, European-centered stuff” (p. 16) in the traditional classrooms that does not relate to, or help them in any meaningful way. Offering youth an opportunity to learn these concepts through locally relevant examples and implement them in community contexts strengthens their scientific and STEAM knowledge.

Third, young people are keen to actively engage in such sustainable and community projects that allow them to positively impact the living conditions for themselves and the communities they live in (CHECKOWAY & GUTIERREZ, 2006; FREIRE, 2000; MAHMOUDI et al., 2014). Their motivation is driven by a connection to the projects, whether it involves using familiar and locally available materials (WIJAYAWARDANA & KAUMAL, 2017) or the opportunity to work on real issues geared

toward community transformation (MAHMOUDI et al., 2014). For example, in the Create2Solve project, youth ingeniously designed complex electronic products to help solve the electricity cut-off issue in their community at a small scale, such as flashlights and battery-operated fans, by collecting recyclable and reusable materials (e.g., plastic bottles). Notably, beyond designing these items, they initiated a continuous dialogue on using waste items for the collective benefit of themselves and their communities. Youth reflected on the potential of such programs to inspire others in their community to contribute to community transformation. For example, Abdullah mentioned, “I will make a flashlight to be used at night. When I will use it, my community members will see that and then ask about it. Then, I will teach it to them and this way, a learning cycle will start. Due to this, less electricity will be consumed by everyone.” Using

community-relevant, low-cost STEAM kits tailored to the needs of both youth and the community at large can effectively engage, motivate, and empower young individuals to address local community challenges. This approach aligns with their desire to solve their own problems, those affecting their families, neighbors, and communities, as opposed to issues imported from national and global contexts that may feel foreign or irrelevant to them (Mahmoudi et al., 2014; Mattar, 2018).

Fourth, when youth are constantly assured that their decisions and input are crucial to the project design and implementation, their participation drastically increases, moving beyond tokenistic and superficial levels. While the project aimed for a high degree of youth engagement from the outset, this goal was not immediately achieved. Initially, when facilitators asked the youth to identify the problems they wanted to address and how they wished to proceed, the participants were hesitant and struggled to articulate their needs and desires. This hesitancy might have stemmed from the tendency of young individuals to internalize negative perceptions of their capabilities imposed by adults or others, rather than recognizing their potential as agents of change and transformation (Checkoway & Gutierrez, 2006). This led to a somewhat tokenistic start to youth participation, where facilitators engaged in a series of ‘consultations’ with the youth before identifying the key issues that would serve as themes of the Create2Solve Kits. However, by deliberately positioning the youth as change agents and continuously reminding them of their power and agency to make decisions, the project gradually saw a transition towards higher degrees of participation. Contrary to Arnstein’s (1969) static depiction of participation levels, I found that the youth in this project progressed through the ladder of participation over time. For example, later in the project, the youth actively negotiated with facilitators to finalize the solutions they would design to address community challenges. Through this two-way dialogue and communication, both facilitators and students finally decided to proceed with the flashlights and fans in an attempt to solve the electricity cut-off issue. This negotiation process elevated the youth to a level of “partnership,” where they collaborated with facilitators as equal contributors rather than passive recipients of instructions. By the Project’s conclusion, the youth seemed to have reached instances of full ‘control and power.’ During the final phase, where students reflected on their learning and design experiences, they initiated dialogues on using their new knowledge to promote sustainable development within their school and broader community. They took the lead in creating the “Green Community” initiative to drive sustainability efforts that would also “*help them be mindful of their role as Green Leaders on the campus*” (Abdullah). It was particularly fulfilling to observe that the youth not only expressed a desire to continue their engagement but also showed a commitment to initiating and leading

similar sustainability actions within and beyond their school community. When Sana and Maya prompted youth to share the updates on the progress of the ‘Green Leaders,’ they described how they had collaborated with the school’s sewing center to design sustainable, reusable tote bags as part of their waste management awareness efforts. These instances show that through this Project, the youth’s participation evolved into a genuinely empowered and non-tokenistic experience, where they became the primary drivers of both their learning journey and community transformation. This approach demonstrates how creating opportunities for youth to take ownership of their contributions can lead to sustainable and impactful outcomes.

CONCLUDING THOUGHTS

In this reflexive stepping-back work, I share my experience of designing community-relevant STEAM DIY kits for youth in the community and analyze my experiences working with the youth who used them. I believe that the Create2Solve DIY STEAM kits project, albeit small-scale, was nonetheless a transformative learning experience that enabled young people to acquire a greater appreciation for STEAM education and sustainable development initiatives. By encouraging youth participation in a project that galvanized their interest and generated benefits for them, while simultaneously leading them to expand their views concerning STEAM education within the context of their own community, a transformative educational experience was created, or at the minimum, initiated for the youth. The use of asset-based and Arnstein’s (1969) ladder of participation frameworks proved instrumental in identifying ways through which youth of color can be established as ‘assets’ for community and sustainable development, while ensuring their participation moves beyond tokenism to a more authentic experience. For future studies, it might be more valuable to invite youth to reflect on their perspectives about the potential outcomes of these frameworks. For instance, asking participants to identify where they perceive their participation falls on the ladder of participation could provide a more genuine and non-tokenistic analysis, as it centers the voices and insights of the youth themselves in assessing their level of involvement and decision-making power.

Nonetheless, the major significance of the study lies in the potential ways in which the lessons and takeaways can deepen youth engagement and participation in community and sustainable development work. The conversations that surfaced during the Create2Solve Project will help other researchers and community workers, particularly those doing community-engaged work in the context of sustainable development, to forge youth-community-research partnerships that thrive on anti-deficit and non-tokenistic approaches of participation. The takeaways from this study also

ultimately push for a call to action among educators and practitioners to design such learning experiences in their classrooms that emphasize community, national, and global transformation. The lessons I present in this study highlight how young students can be actively engaged in the sustainability-focused curricula by designing STEAM-based learner-relevant and contextually authentic learning experiences within the classrooms. By focusing on youth-led solutions to sustainability challenges, the Project also provides a model for how sustainable development can be effectively integrated into educational programs, such that it fosters the skills and motivation necessary for young people to take action in their communities. This is only possible if professional training programs equip the educators and practitioners with the tools to facilitate youth-led initiatives that engage students in community-relevant and sustainability-focused STEAM projects — an area where valuable insights can be drawn from youth's learning experiences in the Create2Solve Project. Broadly, my study also informs the community workers and policy makers of potential ways of transforming the implementation and improvement of community and sustainable development programs, so that they lead to true empowerment of local communities (including both local youth and community members) in the planning process. By designing community-relevant development and learning programs and valuing the input of local youth, community professionals can strongly contribute to local (and thus global) sustainable development efforts. By empowering youth to take on active roles in their communities, the Project also suggests that such initiatives can have a ripple effect, inspiring further community-driven efforts and thus contributing to global development. Indeed, our young generations have the capacity, capability, and skills to change the state of the World facing a global crisis, but it is up to us to create and facilitate such opportunities for our youth. It is up to us to strongly believe and preach that youth can share and reshape the goals and outcomes of their lives; all we need to do is hear them and work with them.

DATA ACCESSIBILITY STATEMENT

The datasets generated and analyzed during the current study are not publicly available due to the protection and privacy of the participants.

ETHICS AND CONSENT

The author confirms that the required ethics approvals were obtained before conducting the study. The author confirms that consent was obtained from all participants included in the study.

COMPETING INTERESTS

The author has no competing interests to declare.

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