

# Activating Education for Sustainable Development Goals Through YouthMappers

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Maliha Binte Mohiuddin and Michael Jabot

## Abstract

In hopes of building inclusive and sustainable societies, SDG 4, quality education, is central to helping to build a knowledge base to tackle some of the most pressing challenges faced by society. YouthMappers around the world are applying their knowledge coupled with critical reflection tools to act on and bring others along in making changes that improve the world. As such, they can be considered among a generation of “Solutionaries,” students who extend their understanding beyond typical boundaries to include a systematic application of their learning. Youth, in general, and young women, in particular, can get aligned to the opportunity to learn through practical knowledge, by way of inclusive mapping communities, which sparks their passion for learning and supports SDG 5 gender equality in education, as well.

M. B. Mohiuddin (✉)  
Department of Geography, West Virginia University,  
Morgantown, WV, USA  
e-mail: [mb00061@mix.wvu.edu](mailto:mb00061@mix.wvu.edu)

M. Jabot  
Department of Curriculum and Instruction, State  
University of New York – Fredonia,  
Fredonia, NY, USA  
e-mail: [Michael.Jabot@fredonia.edu](mailto:Michael.Jabot@fredonia.edu)



## Keywords

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## 1 What Does Education for SDGs Mean? Setting the Stage

Among the most foundational and crosscutting of the 17 Sustainable Development Goals set forth by the 2030 Agenda for Sustainable Development is SDG 4, ensuring quality education. At its center is the tenet of ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all. In hopes of building inclusive and sustainable societies, it is a fundamental goal that is central to helping to build the knowledge base to tackle some of the most pressing challenges faced by society – and all the other SDGs. It is a key factor in reducing the inequalities that are rampant across societies, including gender inequity; and it is the foundation for helping to expand the opportunities of youth to move

into high-skill jobs that will build the resource base to allow peaceful societies to exist.

But the real challenge is how best to meet this goal with those that can lead this change, that being the educators and learners themselves.

Well before the development of the Sustainable Development Goals, teachers were recognized as a key factor in the development of understanding of global issues (the Belgrade Charter [UNESCO 1976]; the 1977 Intergovernmental Conference on Environmental Education [UNESCO 1978] specifically refers to preservice teacher education and in-service teacher education and calls for teacher education to address global issues as part of teacher preparation. These early recommendations were framed around the idea that teachers need to understand the importance of a sustainable emphasis in their teaching and that this overarching idea should be included in curricula for preservice teacher education and be part of in-service teacher professional development (UNESCO 1978: 35–36).

Likewise, the role of students as the drivers of their own educational experiences has a lengthy history, evidenced by many variations of engaged pedagogies and active learning techniques. YouthMappers recognizes and honors both roles in its student-led faculty-mentored design. This chapter explores the idea of how education for SDGs can be activated through these activities, offering our perspective as two co-authors who are student and teacher, respectively, from opposite sides of the planet.

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## 2 YouthMappers Among a Generation of “Solutionaries”

These tenets for education for the SDGs have been cast around the idea that educators have the ability to guide and empower learners to make change possible. Zoe Weil has described this as having the goal of “developing a generation of solutionaries” (Weil 2016). This term describes students specifically educated in new ways to create a more sustainable, equitable future for all. When learners participate and are empowered as

“solutionaries,” we/they have the ability to apply our/their knowledge coupled with critical reflection tools to act on and bring others along in making changes that improve the world. Mapping is one of these tools that YouthMappers promotes in many of the same ways and with the same spirit.

Like teachers, students want their work to matter. It is important to most that our work matters not only to us but to others, our friends, our families, and our community. But a larger question that exists is, “Does our work matter to those outside our realm of immediate influence?”

### 2.1 The Spirit of Solutionaries at the University of Dhaka

The students at the University of Dhaka in Bangladesh were among the very first chapters to establish within YouthMappers. Growing from chapter local leader to regional ambassador to global leadership fellow within the YouthMappers programming, one co-author has followed an empowered trajectory, which could be characterized as one that is followed by solutionaries. Following this, she participated in one of the assignments of the National NGO Program on Humanitarian Leadership (NNPHL) workshop organized by Concern Worldwide, International Medical Corps, and Harvard Humanitarian Initiative.

These experiences led to sharing this learned ability to apply skills, ethical reflection, mapping tools, and fieldwork to act on and bring other students along in making changes that create a greater gender equity. As cultivating the inspirational entitlement of young leaders, we have shared the lessons with fellow students at the University of Dhaka by organizing interactive training, which was combined with a technical session and fieldwork. The students were introduced to the YouthMappers consortium, the use of software related to mapping, and arranging fieldwork exercises involved in interviewing internally displaced women in the Moghbazar slum area about the issues behind mental stress and stress triggers in where the students have

used Kobo Toolbox and Mapillary for gathering geolocated survey data (Figs. 8.1 and 8.2).

The internally displaced women are moving from disaster-affected remote areas to the capital city of Dhaka in search of job opportunities and improved living conditions. This migration decision puts them under threat of living in new environmental territories and determinants of cultural changes. However, engaging in the mapping activities made internally displaced women more aware of safety through their experience, using spaces and place values, control over resources, the balance of rights, livelihood strategies, and knowledge production in terms of rapid economic and ecological transformation. Through participatory mapping activities, the internally displaced women are concerned with specific safety issues, sanitary facilities, gathering cultural and ecological information, and identifying unsafe areas such as insufficient lighting on the street and dark places. Students working with these projects learn firsthand and gain an education unlike many others.

In Bangladesh, the threats from climate change, natural disasters, and internal migration are treating women as vulnerable human beings. Expanding the participation of many women mappers and leaders in the YouthMappers chapters in Bangladesh has motivated and encouraged

gender-inclusive mapping communities to assist with women's needs. Completing a circle of education, the mapping activities on spatial data are openly available where schools and clinics have supported quality education, women's health services, economic productivity, and improved knowledge production. Mapping allows female mappers in Bangladesh to develop community livelihood, leadership experiences, empowered capacity building, and advance economic development by creating new geospatial data for development projects in places vulnerable to natural and human-made disasters. The involvement of female mappers is one of the most effective tools to assist in humanitarian services to build resilient communities, help address women's issues, make inclusive mapping communities, and promote education for the following generation.

## 2.2 The Spirit of Solutionaries at the State University of New York at Fredonia

The State University of New York (SUNY), Fredonia, is proud to have been an inaugural chapter for YouthMappers. The work at the State University of New York at Fredonia (SUNY

**Fig. 8.1** YouthMappers interview internally displaced women in the Moghbazer settlement



**Fig. 8.2** A group discusses mental stress of displacement in a community conversation convened by YouthMappers



Fredonia) and our YouthMappers chapter, Geoventurers, has revolved around the infusion of humanitarian mapping into the learning and teaching of science. SUNY Fredonia has a long history of teacher preparation, and this history has been enhanced by the inclusion of the incredible resources and support of YouthMappers. The focus of what is shared here is to cast a small glance at how the presence of the Geoventurers YouthMappers chapter has helped shape the academic work that the educator co-author oversees.

A question we could ask as an educator is, what if the work we encouraged in our students could serve to immediately change lives for the better in the real world? What would be the possibilities of such an approach to inspire students to even learn more? Again, we have a long-standing awareness of how we can focus on Education for Sustainable Development (ESD). The proceedings of the UNESCO World Conference on Education for Sustainable Development (UNESCO 2009) set forth recommendations for the integration of ESD into teacher preparation and practice. The recommendations encourage the development and extension of ESD to include all sectors (civil society,

public and private sectors, NGOs, and development partners) involved in the overall goal of sustainable development; to support ways in which sustainable development issues can be integrated in a systematic way across all education settings with particular focus given to effective pedagogical approaches, teaching practice, and curricular learning materials; and to reorient teacher preparation programs around sound pedagogical practices in introducing ESD. In the courses at SUNY Fredonia, the recommendations made for ESD are addressed in a number of ways with humanitarian mapping playing a central role. In the *Earth as a System* course, a general education course, the science content is focused on helping students understand the interconnected nature of natural systems.

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### 3 Recasting Science Education for Human Solutionaries

As our unique yet connected experiences demonstrate, education for solutionaries needs to be grounded in real-world experiences, leverage fieldwork, focus on interconnected systems, and be inclusive. While an interconnected approach is



common in science education, the content presented looks at the ways that the natural world interacts in the realities of humans around the world. The central tenet of the *Earth as a System* course is to focus on the science of “wicked problems” (Kreuter et al. 2004) and how the science and the cases studied play out differently depending on the reality of those impacted by the challenges studied. The use of humanitarian mapping around these topics (e.g., access to water) allows for the students to contribute to projects that are seeking to help others in need and does so in the temporal frame of issues that are impacting others right now.

Our connections to humanitarian and participatory mapping have ranged from addressing the call around natural crises that have occurred, like the flooding caused in Puerto Rico by Hurricane Sandy in 2012, where many of the students had close personal connections to the communities that were impacted, to using mapping technologies to look at issues around water in our local community. This opportunity has allowed students from across all majors to bring their disciplinary perspectives to the work in addition to the science content being studied. This opportunity directly addresses the recommendations made by UNESCO for ESD where students are allowed to extend their understanding beyond typical boundaries to include a systematic application of their learning.

While the *Earth as a System* course is a general education course open to all majors on the SUNY Fredonia campus, it is a required course for all students who are pursuing teacher certification. The ability to have this course and the experiences they have with humanitarian and participatory mapping as a common experience among these future teachers is an incredible opportunity to encourage the ideas experienced here to be put into practice in classrooms when these teachers enter their own classrooms.

The transition from the *Earth as a System* course to science methods course offerings has been shaped around the recommendations and findings around ESD discussed previously but most importantly a shift to the idea of “teaching

with and not just about ESD” (Zamora-Polo and Sánchez-Martín 2019). The idea of teaching with and not just about the SDGs allows for the development of the recommended pedagogical approaches in the context of near-real-time data and occurrences.

The work in the science methods course is typically shaped by attempting to address the incredible challenge of how best to help our students reflect on the way that they have learned science across their lives and to reflect on how their mode of learning may, in fact, need to be modified as they think about teaching science to others. The benefit of having the shared experience of the *Earth as a System* course is that the process of this transformation has begun based on their own learning, and we can continue in the science methods course.

The pedagogical strategies shared in this course have as their legacy the incredible work developed in the TeachOSM curriculum (Cowan and Hinton 2014). The inclusion of TeachOSM strategies and the Tasking Manager designed by TeachOSM allow future educators to see ways that collaborative mapping with a humanitarian focus can be seamlessly integrated into their work.

The use of these strategies is then centered broadly around the Geo-Inquiry Process (National Geographic Society 2017) where the future teachers design instructional modules that introduce their students to ways in which they can look at significant issues of interest at varying scales from local communities to the larger global perspectives. The Geo-Inquiry Process shapes students’ thinking by asking questions that shape their thinking and understanding through the collection of data that helps answer these questions. It is in this data collection and visualization that humanitarian and participatory mapping come most into play.

If we return to the question of access to water, a module shaped by this process would look at how access to water on the shores of the Great Lakes is quite different than if we look at access to water in other regions of the world. What is critically important to this is the idea that through

the use of participatory mapping, students can investigate if what they believe to be a “non-issue,” access to clean water along the Great Lakes, is in fact a much more complicated issue. Students in this module could, in fact, map points of access to water around the community and investigate if, in fact, we should not be worried about this access. In light of the understanding of the importance of the human right of access to clean water, the students can also investigate ways that they can use humanitarian mapping tools to help others around the world have the same information to help inform their communities. It is in the focus on this type of learning that can foster their understanding that their work plays in global collaborative community.

#### 4 Tying It All Together

Young people are considered the “solutionaries” in terms of humanitarian mapping because they are crossing the trans-boundary borders of continents to mark the meaning of their existence on the world map by creating sustainability around us. Mapping is a way of knowledge of the production of lived experience, which is preparing the youth to be solutionaries. Young people as “solutionaries” are bringing knowledge and skills to solve the development challenges through

humanitarian mapping to bring positive changes in communities.

Some of us educators have been taught that science is the foremost objective and that this objectivity is what, in fact, gives science its “power.” But as we think about a shift in science education away from the process of science being driven by the scientific method to science being driven by inquiry and a greater focus on the practices and process of science, there is an increased need for welcoming a level of subjectivity that comes from investigating how science plays a role in people’s lives and that this role is often different because of the variables that shape people’s lives. It is in this that the application of humanitarian and participatory mapping in both the structure of the content that future teachers will develop and the use of these technologies as a pedagogical tool that empowers students to contribute to their communities, both locally and globally. It is through humanitarian and participatory mapping that future learners will develop real-world experiences that empower profound change, both locally and globally (Fig. 8.3).

Speaking as an educator, for most of my formal education, I didn’t much think about who actually was responsible for the scientific advances I was learning about nor what was going on in the world at the time those advances were happening. It wasn’t until later that I began

**Fig. 8.3** Mapping quantitative and qualitative data reveals significant learning opportunities for university students



to truly appreciate what science as a human endeavor means. Fortunately, because of the role that YouthMappers has played on our campus, the students I work with have opportunities to explore the interactions between science and society in ways that I did not, and in the case of our future teachers, take this learning into their own classrooms to help shape this understanding in their students.

From the perspective of learners, we can share the idea that as we start to raise the awareness of the challenges faced in the real world, we begin to grow in understanding of the way that what we have learned about social issues in humanities courses interacts with what we have learned in other areas, like the sciences (Solís and DeLucia 2019). Often, we as students react passionately when we encounter information about injustices that occur around the world, especially when we see these injustices as being couched as “wicked problems” where solutions to lessen inequity are known but not applied. The debate and fervor for discussing these inequalities often end as the class comes to an end. But what if we could find ways to link the passion of teaching and learning with the opportunity to take action. This is where YouthMappers has had the greatest impact on our work.

Students don’t just learn about problems faced by real people in the real world; educators don’t just teach about them; both actually can contribute to do something about them. Our work with humanitarian mapping offers deep inspiration about the impact that education for the SDGs has to offer and removes the all too frequent question of “why am I learning this?” This work can serve as the inspiration to focus on innovation and

entrepreneurship and to engage in creative thinking well beyond the academic classroom. It acts to empower a generation of mappers as “solutionaries,” bringing together the interdisciplinarity of the social sciences and natural sciences to broaden understanding and purpose.

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