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Evoke

Developing Skills in Youth to Solve the World's Most Complex Problems:

The Social Innovators' Framework

World Bank Education, Technology & Innovation:
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The *World Bank Education, Technology & Innovation: SABER-ICT Technical Paper Series* explores a variety of topics and issues related to the use of information and communication technologies (ICTs) in the education sector.

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Executive summary

Evoke is an award-winning, multi-player online educational experience, which uses storytelling, game mechanics, and social networks, to prepare young people to become social innovators who create solutions that address global 'grand challenges' (e.g., displacement, hunger, poverty, water scarcity). The Evoke project is designed to support young people as they develop an understanding of these complex challenges, acquire 21st century skills (e.g., creativity, collaboration, critical reflection), socio-emotional skills (e.g., curiosity, empathy, generosity), and gain the confidence to experiment, collaborate, and create innovative solutions. The Social Innovators' Framework (SIF) is the cornerstone of the Evoke project.

The Social Innovators' Framework is unique in that it brings together the fundamental principles and practices from the social innovation and educational development fields in order to create a multidisciplinary, structured, and active learning experience that is project based and problem posing. The SIF helps students understand the grand challenges and the lived experiences of people in the community by providing an educational model in which they can learn about the social innovation cycle through research and from first-hand experience in the field. Students then work together with their peers from different academic disciplines (e.g., IT, psychology, engineering, etc.) and with community members to develop a real world-changing idea of their own choosing. The experience culminates in the development of a team project, in which students have an opportunity to receive seed funding to help grow their solution.

The framework is designed to develop students' skills and support their acquisition of capabilities through the Evoke digital social networking platform, which brings together learners, mentors, and teachers with wide-ranging local and global expertise and knowledge. These interactions can help students make sense of their learning and field experience, as well as interpret it in light of power differentials, socioeconomic inequalities, entrenched entitlements, identity, culture, and other factors that are often inextricable from such experiences. Such interactions can also guide students in the development of their idea and help make the team's world-changing solution a reality (e.g., human-centered design, business plan, funding strategy, resources, partnerships, organizational structure, outcome measures and metrics, etc.).

The Evoke online platform provides an engaging graphic novel, a social innovation board game, and a variety of interesting structured community-based activities designed around a particular grand challenge; enables students to demonstrate their learning by submitting 'evidence' of their activities; provides incentives; facilitates social learning; and scaffolds learners' understanding of the content and the social innovation process by providing links to instructional materials and rubrics that can be used to assess and comment on other peoples' submissions.

Through this experience, youth connect to the harsh and unacceptable realities faced by people who have been marginalized and who live with injustice, and many become outraged and motivated to do something. Students learn that social innovators' skills matter because they affect *how we think* and what we are able to do and be in the world. They matter because attitudes and mindset affect *what we care about* and *how we observe and imagine the world*: our assumptions, mental models, and frames. And they matter because our beliefs affect *how we act and interact in the world*; people who believe that their voices, actions, and inventions matter are more likely to act as agents of humane change and translate their capabilities into action.

About EVOKE and the "Developing Skills in Youth to Solve the World's Most Complex Problems" papers

How can I change the world for the better? What is my life project and how can I craft it? These are questions that educators and students around the world increasingly ask themselves. Implicit in such questions is the imperative that what students learn should be relevant, empowering, and engaging. What are the types of pedagogies and curriculum that prepare students to shape their lives and make a positive impact on the world? What are the skills and knowledge that they need to develop in order to negotiate complex and ambiguous challenges and develop their world-changing ideas? These are questions that the World Bank project Evoke aims to answer.

"Developing Skills in Youth to Solve the World's Most Complex Problems" World Bank publication consists of three parts.

"The Social Innovators' Framework" is the first paper in this three-part series. In this paper, we present the Social Innovators' Framework. In the first section of this paper, we provide an overview of the SIF and the Evoke project. In the second section, we then explain the theoretical and empirical foundation that underpins the framework and connects cognitive and socio-emotional skills development to social innovation and social change. In the final section of this paper, we outline the way in which the SIF was designed, provide the detailed framework, and describe how the framework has been developed as part of the Evoke project. This includes: defining the skills, describing how these skills are operationalized in activities and measured using concrete evidence, illustrating how skills are grouped into an integrated and iterative project-based learning process, and articulating the assessment approach.

In part two of this series, "Contextualization, Implementation, and Experimental Research", we will focus on the pilot study that is currently being conducted in Colombia (August to November 2016). The project in Colombia is directed toward the grand challenge of human trafficking and displacement of people. We will share the results of the application of this framework in the context of the Evoke implementation in Colombia, including the study's methodology and findings, and its impact on the development of university students as future social innovators. We will also explain how we contextualized the skills, activities, and proposed outcomes (e.g., developing attitudes associated with imagining a more peaceful future and believing in one's ability to make a difference in creating that future) to the specific grand challenge, to the local needs of people in Soacha (a community on the outskirts of Bogotá), and to the requirements of our local university partner, Uniminuto (Corporación Universitaria Minuto de Dios).

In part three, "Applications and Sustainability", we discuss how the Social Innovators' Framework has also been applied to different grand challenges in diverse settings and with different implementation partners globally. We will also explore other potential applications and sustainability.

Acronyms and Abbreviations

CV – Creative Visionary

DC – Deep Collaborator

EA – Empathetic Activist

ECD – Evidence-Centered Assessment Design

SIF – Social Innovators' Framework

ST –Systems Thinker

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1. Enabling youth to solve grand challenges

In this section, we provide the context for the development of the Social Innovators' Framework, describing the skills and subsequent employment issues faced by young people today. We emphasize the importance of developing their social innovator skills and explain how the World Bank's Evoke project supports these skills. Finally, we provide an overview of the framework and the reasons for its development.

Educating Youth to develop Social Innovators' Skills

The world may have emerged from the depths of the 2008 financial crisis, yet, it still faces a jobs and skills crisis – particularly among youth. Youth make up 17 percent of the world's population. There are 1.2 billion youth in the world aged between 15 and 24, with 87 percent of them living in developing countries. The number of unemployed youth globally will rise by half a million in 2016 to reach 71 million and will remain at this level in 2017. Moreover, global labor force participation rates of youth are following a long-term downward trend, from 53.6 per cent in 2000 to 45.8 per cent in 2016, and 45 percent of the world's unemployed are youth (International Labour Office, World Employment Social Outlook, 2016). 225 million youth, or 20 percent of all youth in the developing world, are not in education, employment, or training (UNESCO UNDESA, 2011).

While this level of unemployment is devastating, the resultant feelings of helplessness experienced by unemployed youth are arguably worse. Combine unemployment with other complex social problems (poverty, violence, displacement, barriers that prevent children learning to read, etc.) and it is understandable why many young people believe that their voices are not heard and their actions do not matter. Traditional education is inadequate to the task in that it is failing to prepare students for a world in which new skills and ways of working (e.g., critical thinking, collaborating, innovating, etc.) are increasingly essential. Education is also failing to engage many students in ways that help them develop the complex array of socio-emotional skills (e.g., persistence, curiosity, empathy, etc.) that are relevant to their employability and life circumstances. Furthermore, many underprivileged and marginalized youth lack social capital (e.g., access to constructive social networks, a sense of empowerment and agency) and have little means for acquiring it.

The rise in importance of social entrepreneurship and social innovation to the global economy brings with it enormous opportunities to solve pressing social issues; digital technologies make it easier than ever before to be a social actor—or part of a network of social actors—who creates social products, social enterprises, and even social movements. Moreover, social innovators are drivers of job creation and are an untapped engine of inclusive economic growth in many countries. José Manuel Durão Barroso, previously the President of the European Commission, expressed the call to action this way: "social innovation has the potential to make a major difference in creating new opportunities for work. New markets can be developed from grass-root ideas. The current economic crisis makes this more important than ever. We must look to social innovation to stimulate a more dynamic, inclusive and sustainable social market economy" (European Commission, 2013).

The skills needed to be a social innovator are the same skills needed to create the job opportunities of the future. The problem, however, pertains not only to generating new jobs or finding a better way of teaching technical skills for employability, but is also about reframing the problem such that young people come to believe that they can be part of creating the solutions and the possibilities for the future. Being part of the solution can mean different things to different people at different stages of their lives, for example: working to tackle grand challenges, creating employment for themselves and others, or engaging in participative dialogue in social, economic,

political, and other realms. As such, education systems must equip students with multidimensional capabilities that broaden their personal agency and cultivate their belief in their capacity to exert influence on their environment and shape their own future (Bandura, 1989; Rao & Walton, 2004).

The capacity and skills of youth represent the single most important investment societies can make to ensure future growth and well-being. These investments nurture a sense of identity and purpose in youth – providing them with the basis to pursue their life project, and the substantive freedoms that enable them to choose and to act (Nussbaum, 2011; Sen, 1999). It is therefore also, over the long term, one of the greatest investments societies can make to counter terrorist organizations that look to recruit and poison the minds of the disenfranchised, under-educated and unemployed. What better undermines the efforts of such organizations than a constructive social network, designed for youth who are looking to find their place in the world and help them realize their own life project.

Evoke Engages Youth to Learn about Global Challenges and to Act

Evoke is an award-winning, massive multi-player online educational experience, which uses storytelling, game mechanics, and social networks, to drive collaborative social innovation and social innovators' skills development at a large scale. Evoke aims to inspire youth around the world to develop a passionate curiosity for learning and a belief that their actions can make a difference in the world. Evoke leverages technology to engage youth to better understand the complex challenges faced in their communities and to collaborate with their peers locally and globally to create innovative solutions that address these challenges. The target audience of the game is young people, defined as ages 15 to 24. This spans the upper secondary level and university populations, as well as out-of-school and working youth. Our initial focus is on university students.

Evoke was developed in 2010 in response to a request from the South African government to get young people involved in social innovation and civic engagement. The first iteration of Evoke used two game devices, a graphic novel and an alternative reality game. The novel and the game follows a secretive group of African social innovators in the year 2020 who use their talents to address global grand challenges such as renewable energy, food insecurity, access to clean water, financial inclusion, and urban resilience. Evoke has been piloted in South Africa, Brazil, Colombia, and Mexico. These pilots have shown high levels of engagement. The game was played by approximately 100,000 players in the first iteration.

Evoke leverages the media where young people spend their time – in game environments, on social networks, and reading graphic novels – to engage them in both learning and global development challenges. Evoke is designed as a project-based learning platform that inspires and supports youth to both learn about global grand challenges and to take action. Since its first iteration, Evoke has evolved to include new game mechanics such as Evocoin (the in-game currency), badges, a game board module, and the opportunity to use Evocoin to invest in other players' projects, which are known as Evokations. The Evoke team has also developed a more scalable and flexible design to include new global grand challenges and associated graphic novel stories as well as the ability for partner institutions to adapt the global grand challenge content to their local realities – creating a global network addressing these global challenges at the local and community level. The ability for students to understand global grand challenges and apply local solutions is at the heart of Evoke. *Figure 1* shows a sample screenshot from the Evoke platform used in the Human Trafficking and Displaced Persons Grand Challenge in Colombia.

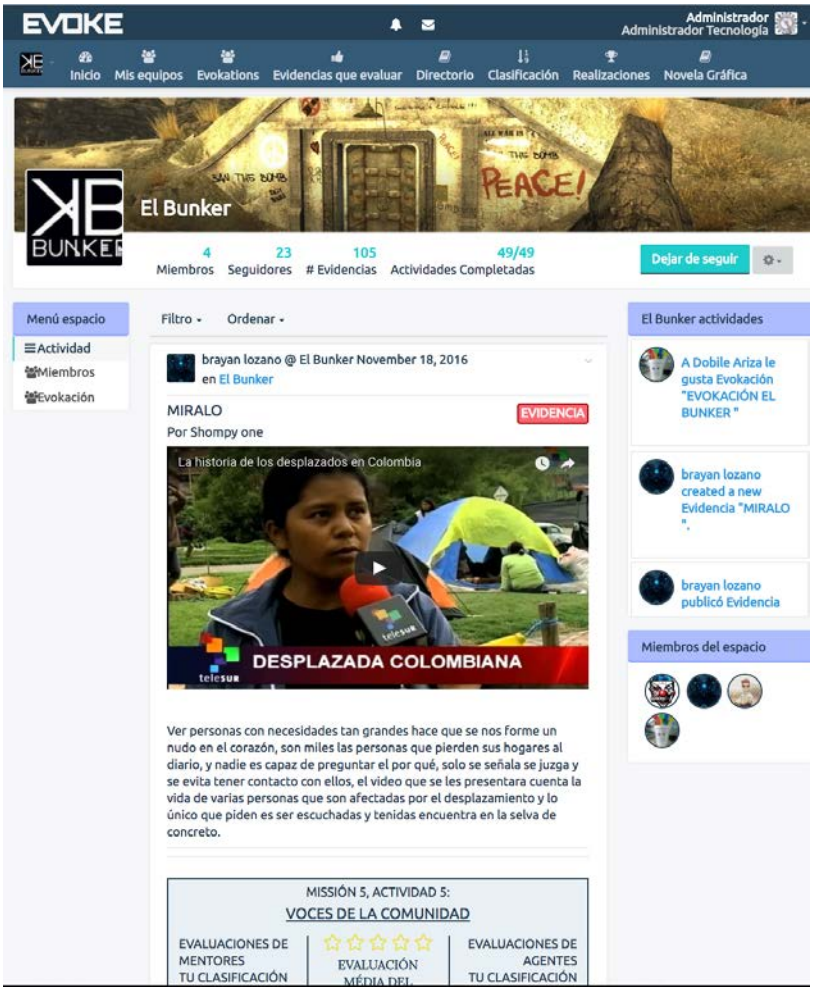

figure 1. *Evoke platform sample screenshot*

The Social Innovators' Framework (SIF) Develops Students' 21st century and Socio-emotional Skills to become Social Innovators

At the core of Evoke is the Social Innovators' Framework (SIF). SIF is grounded in the understanding that all youth have the potential to be agents of change, and that innovators succeed due to their skills, knowledge, mindset, and actions. These are qualities that can be learned and developed, as demonstrated by a robust research base (Heckman & Kautz, 2012). What are the skills necessary to cultivate in youth to help them become active, engaged, empowered contributors to society? We envision four key qualities (broad clusters of skills): Creative Visionary, Deep Collaborator, Systems Thinker, and Empathetic Activist.

These four qualities constitute the major 21st century and socio-emotional skills that are critical for becoming a social innovator. For each quality, we developed four specific strengths (called "powers" in Evoke), which are earned through field work and used as resources in the context of the game. For example, a Deep Collaborator's strengths include: (1) Communication (listens empathetically), (2) Teamwork (works in diverse teams), (3) Networking (seeks feedback), and (4) Generosity of Spirit (shares time and resources). For each strength, we further defined three main skills that a player should exhibit to demonstrate their mastery of that power. In total, the SIF aims to cultivate 16 strengths and 48 specific skills. The 48 skills are translated into activities that capture their essence and that can be demonstrated through students' actions. Students submit 'evidence' of their activities (video, photos, text), and a rubric is provided that enables

peers, mentors, and teachers to assess and comment on other players' submissions. We also include one additional strength, persistence, which cuts across the four qualities. These skills have been validated in peer review and contextualized with partners in Colombia for the current (August-November 2016) pilot.

In addition to articulating social innovators' qualities and skills, the SIF model also combines and sequences cognitive and non-cognitive skills to support the ultimate objective of a social entrepreneur [1] – to create a world-changing idea. The project-based learning schema is organized into eight missions such that the skills build on each other and ultimately support the design of a team project that addresses a particular global grand challenge. Each mission is designed to help students understand an aspect of the social innovation cycle (community, problem, solution, communication). Youth learn that they can solve complex problems by working with the community, questioning assumptions, learning, making mistakes, and trying again (something that games, like Evoke, do especially well).

Although we identify specific skills of the social innovator, it is important to highlight that these are not prescriptive, rather they define the contours of what needs to be learned and developed to bring about solutions to global grand challenges. As with social innovation itself, context matters and specific skills will need to be modified to reflect the realities of the context in which the SIF is employed. The framework is detailed in section 3.

The Importance of a Developing a Framework

Before an issue can be addressed or a problem fixed, it must first be defined. Frameworks are critical because they provide the lens by which actions are evaluated and they set up the possibilities for future action and intervention (Schön & Rein, 1994). Thus, any framework needs to be broad enough to address and encompass the intricacies and demands of the specific domain (in this case social innovation). However, the framework needs to be flexible enough that it can adapt to the particularities of the context or circumstances in which it is used or implemented. The Social Innovators' Framework was developed with particular attention to the requirement of comprehensiveness because the intention was to ensure that the SIF was applicable to a wide variety of circumstances and local contextual realities. While the application of the framework to Evoke is discussed in this paper, the methodology can be applied to a range of diverse applications.

Those who have sought to understand the meaning and practice of entrepreneurship—as academics, as students, or as practitioners—have long had access to the burgeoning toolbox of frameworks, matrices, and other analytical methods that they can employ to navigate their study and their work. The social innovator must have all the skills of an entrepreneur, but must also have access to a raft of additional skills to manage the complexities and the demands for inclusiveness and sustainability arising from problems that have thus far proven to be intractable. As it contributes to broader social change, social innovation cannot help but touch on deeper structural issues related to the empowerment, voice, and agency of people with diverse backgrounds and wide-ranging capabilities. The Social Innovators' Framework is designed to comprehensively aggregate the multiple dimensions to which a social innovator must attend in order to secure the objective of solving global grand challenges. While these skills dovetail and encompass much entrepreneurship education, its emphasis is different because the goal of the social innovator is, first and foremost, to find new and more effective and inclusive ways to tackle urgent social issues.

[1] *We use the terms social innovator and social entrepreneur interchangeably in this paper, although there is a distinction. Social entrepreneurship is more akin to what we think of as entrepreneurship but with a social goal. Social innovation is a broader term, which encompasses social entrepreneurship. It implies a more open process in which innovators are working across traditional enterprise boundaries.*

The SIF draws on many of the principles and practices from Ashoka Fellows and Ashoka University (Ashoka U; Alden Rivers, Armellini & Nie, 2015), and The Open Book of Social Innovation (Murray, Caulier-Grice, & Mulgan, 2010). Yet, the SIF differentiates itself from these other approaches because of its primary focus on the qualities of social innovators and the essential socio-emotional and 21st century skills and abilities that need to be developed to prepare young people of diverse backgrounds to leave a positive mark on this world.

Likewise, this dynamic framework draws on many of the principles of 21st century skills frameworks, including: the P21 Partnership for 21st Century Learning (2016; Binkley et al., 2012), Four Dimensional Education (Fadel, Bialik & Trilling, 2015), and the 2016 ISTE Standards for Students (ISTE, 2016). The focus of SIF, however, is on the domain of social innovation. The SIF goes beyond the specification of skills to set out a project-based learning schema and problem-posing model of education (Freire, 2007), which is designed to help students understand global grand challenges, experience the social innovation cycle first hand, and test and enhance their social innovator qualities by developing a real world-changing idea for social innovation of their own choosing.

Since the development of socio-emotional skills is a key element of the SIF, it is important to articulate its meaning in the context of our work. Socio-emotional skills are also referred to as social-emotional, non-cognitive, soft, and character skills. Often personality traits are included under the heading socio-emotional skills. Within the SIF, we distinguish socio-emotional skills from traits, because the word 'traits' gives the impression of immutability and intransience; on the contrary, both cognitive and socio-emotional skills can be learned as people age (Duckworth & Yeager, 2015; Kautz et al., 2014). As creators of the SIF, our interest is with skills, knowledge, attitudes, perceptions, and actions that can be developed and improved through rigorous and engaging pedagogical approaches, so again the connation of immovable traits can be misleading in this sense (Tough, 2012).

In the following sections, we set out the theoretical foundation that underpins the creation of the Social Innovators' Framework, detailing the critical connections between skills development, social innovation, and social change. Having made this link, we then explain the reasons why we believe that development of social innovation skills in youth can eventually result in social change.

2. Theoretical and empirical foundations of the SIF

In this section, we provide the empirical and theoretical foundation of the Social Innovators' Framework. We explore the issue of complexity and discuss its relevance to the social innovation domain. We then discuss why youth need to develop a multidisciplinary set of skills—focusing on 21st century and socio-emotional skills—to prepare for a future in which they can both navigate complexity and become better problem solvers and leaders of change. Finally, we consider how a social innovation focus combined with these skills aggregates to social change, and discuss the broader implications for education and learning.

Complex Grand Challenges and the Social Innovation Domain

We live in an increasingly complex world. Global grand challenges represent the most demanding problems we face in this complex world. Although individual innovations are often elegant and simple, social innovation as a domain aimed at solving these grand challenges is, like the realities it seeks to prevent and eliminate, multilayered and transdisciplinary.

What makes our world increasingly complex has been the rapid emergence of networks and flows—transportation, digital telecommunication, trade, etc.—that have supercharged the exchange of ideas and, have simultaneously unleashed "the formidable productive forces of the informational revolution, and the consolidation of black holes of human misery" (Castells, 1996, p.2). According to Thomas Friedman (2016), "the three largest forces on the planet—technology, globalization and climate change—are in simultaneous nonlinear acceleration". The scope and scale of these accelerations are outpacing the capacity of governments and longstanding institutions to respond, leave alone find ways to get in front of them. And while all human beings (and non-human animals) are affected by these forces, the most marginalized and vulnerable populations experience the greatest desolation and suffering in their daily lives as a result of them.

At the same time, however, incredible entrepreneurial opportunities arise out of these same interactive networks, which afford socially-minded individuals a chance to connect with each other—regardless of geography—and to exchange ideas, to cross-fertilize perspectives, to learn, and to work together to build a more just, inclusive, and sustainable world.

Social Innovation Skills Mirror Education Skills in a Complex World

It is clear that countervailing complex forces both exacerbate global grand challenges and shape the conditions of our world; and concurrently provide the opportunities to fix the problems and re-shape humanity. It is in this context that the burgeoning domain of social innovation operates. The organic and dynamic process of social innovation in which new ideas and practices displace or destroy existing ideas and practices (Schumpeterian creative destruction) means that innovation requires constant learning and deep thinking at a transformational level. The skills required to be a social innovator are therefore not easily pigeonholed into one domain and are multidisciplinary and evolving (see *Figure 3*).

These challenges in defining the social innovation discipline are, in fact, the very same challenges that educators face when preparing youth to enter a complex world filled with ambiguous and adaptive challenges. Educators vigorously debate how best to transform the teaching and learning process to make it more relevant to contemporary demands—one that is transdisciplinary, innovative, collaborative, project-based, and focuses on real-world problems.

Social Innovation is a Response to Grand Challenges

Social innovation is a practice-led domain, in which people join together in unique ways, locally and globally, to find original, creative, and more effective ways to tackle urgent social issues (Caulier-Grice, Davies, Patrick, & Norman, 2012). Because they are addressing thus far intractable problems, social innovations are meant to disrupt—to change and improve upon—the way things currently work. A social innovation can be a new product, service, technology, or an improvement to the infrastructure or environment, such as roads, schools, street lighting, open green spaces, crops, water supply, sanitation, and so forth. It can be something unique, yet it can also involve re-thinking the way things are currently done or re-inventing a process, methodology, or practice, such as adding new features to a product or reconfiguring the supply chain of a service that already exists. An academic concept can also be a social innovation; for example, one that is purposefully designed to reframe discourse around extant power relations, or improve human capabilities, etc. (Nicholls & Ziegler, 2014).

Entrepreneurialism and inventiveness are found across all realms of life: health, education, and other social programs, consumer products and services, workplace and organizational reformation, technological and engineering breakthroughs, scientific and biotechnical discoveries, etc. Some social innovations target change at the local and operational level in civil society, others seek changes in business practices and corporate responsibility, while others focus on governmental policy (Caulier-Grice et al., 2012). The key factor is that the value from the social innovation largely benefits society and improves its ability to act (Murray et al., 2010). Social innovators' goals are purposeful and their actions are intended to make a positive difference in the quality of people's lives and the environment (Cajaiba-Santana, 2014). They are social in their means of bringing about positive change as well as in their objectives. Thus, social creations do not come about by people who do something 'to' other people, but rather they emerge by involving and working closely 'with' the people who are most affected by the problem.

A social innovation can be developed to transform the life of one person or one family or it can be designed to impact the lives of many. Since sustainable social innovations arise from relationships and partnerships between different interconnected players, sometimes a product initially designed for one individual ends up helping millions (e.g., cell phone apps for market prices, weather forecasts, health diagnostics, etc.) or a solution designed to address a specific problem ends up being applied to a different problem (e.g., social media started as a way of keeping up with friends and is now also used for political organization by social activists). Effective solutions require people from different walks of life to work collaboratively across academic disciplines, economic sectors, and geographic boundaries. This can involve cooperation amongst local players, or it could comprise smaller actors (e.g., individuals, community projects) working with businesses and larger institutions (e.g., government and intergovernmental agencies, and NGOs), or it can require the formulation of a new social enterprise.

Social Innovation Requires Collaboration

A related reality is that no one individual or discipline has the answers to these challenges. In fact, the best solutions come when disparate perspectives, ideas, and knowledge are combined. While models of the individual innovator or inventor have been largely abandoned by social innovation scholars and practitioners, the popular media still promotes romanticized images of the singular leader standing at the pinnacle of a hierarchical organization dictating prophetic visions; an individual who is somehow endowed with innate traits and rare talents that differentiate them from the rest of us. Further, the role of social entrepreneurs is often featured formulaically: follow this set of principles, and success will ensue. In so doing, the media reinforces and perpetuates the dominant mental model of the lone social entrepreneur battling injustice. This model does not reflect reality. And indeed, such messages can render apathy among those who see grand challenges as insurmountable or someone else's responsibility.

Worse still, such images make some people who work hard and do good things each day feel worthless or invisible (Gerald, 2016).

In a complex world, solutions to grand challenges require collaboration among people with harmonious interests and concerns yet a diverse set of talents. Working together on a shared cause can strengthen social bonds and lead to a sense of 'belongingness' (Baumeister & Leary, 1995). The positive acknowledgement that derives from being essential to other community members can form the basis of a virtual positive cycle. For the purpose of informing the development of the Social Innovators' Framework, social innovation is seen as a collective and open process in which social innovators and social entrepreneurs work within a broader interactive and interdependent network of influences, social structures and practices, and players (e.g., civil society, businesses, government, universities, non-profits, public, and private) and are acting to create change in their local environments.

Local Realities and Actions Matter

Context matters for social innovation because local realities matter. Another important facet of solving challenges in a complex world is the notion of action, reflection, failure, iteration, and renewed action. This action must be adapted for the local reality in which the global grand challenge is manifested. Water solutions must be applied in local contexts by social innovators who understand that particular environment. Likewise educators, social workers, environmentalists, etc., must understand the needs, resources, and barriers in their local setting to implement effective solutions. Those who are close to the problem have a great advantage in solving it. Local problems typically have global implications, so tapping into global networks as a means of information and support remains vital. Nevertheless, the greatest opportunity to sustain an innovative solution is by the people who live with it, care deeply about it, and are on the ground and can continuously improve it.

Knowledge, action, and critical reflection are vital to social change and learning. Actors must understand the issues, act on the issues, and reflect on the results of their actions. Social innovation does not present correct, tested, or known answers but informs and is continually informed by the actor's own knowledge, local context, and motivation. Therefore, we do not see the individual innovator's qualities and actions as something meaningless in the face of insurmountable structural and institutional barriers. Nor do we see failure as an end. Rather, when contemplating social innovation, we are acutely aware of the concomitant roles of an individual's actions and agency and the social structure (continuous flow of real-world actions[2]) or system in which the person lives and works. Thus, what might work in one context may fail in another context. Our work on the Social Innovators' Framework is informed by Giddens' (1984) structuration theory (Cajaiba-Santana, 2014), which emphasizes that human agency and social structure are not two separate concepts or constructs, but these are together produced by social action and interaction.[3]

Social innovation requires the development of transformative capacity (Giddens) and active intent on the part of local community members to take action and to learn. This means that people need to develop both the skills and the belief in their causal powers to influence events through their actions (Bandura, 1989; Rao & Walton, 2004). As Argyris (2003) said, "Learning occurs when understanding, insight and explanation are connected with action" (p. 179). This is already happening in schools and communities across the world. For example, the students of the Manuel Agustín school in Chocó, one of the poorest regions in Colombia, designed a low-

[2] In Giddens' structuration theory, action and structure are dialectical and enmeshed in both the conditions for, and consequences of, action. This refers to the repeated patterns of interaction (rules, resources) and the continuity of interaction over time and space. Structure can be both an inhibitor and enabler of action. See Giddens (1979, 1984) for an in-depth study.

[3] This refers to the dynamic, recursive and reflexive relationship between the activities of social actors (social innovators) and the perceived stability of structures.

cost prototype to filter rainwater. They then participated in A Ciencia Cierta contest, and won $CO 80 million to develop their prototype. Before having these filters, children in the Manuel Agustín school did not have free access to drinkable water. Students from the poorest households, who could not afford to buy drinkable water, had to ask for it from other students, or did not have access to it at all. On top of solving their most immediate need of free access to drinkable water, these students concretely experienced how applying research-based thinking to develop innovations can improve their lives. We believe that this can happen in schools and communities globally and, over time, gather enough momentum to create its own disruptive force for good. Regional and global networks are available to exchange ideas and support local actions.

Still, it is important to foreshadow the next section and underscore how essential it is that youth come to believe that their actions matter, that we can all learn, and that we must all be actors to create the future. This is why it is especially urgent that youth develop critical 21st century and socio-emotional skills (e.g., creativity, problem solving, collaboration, critical reflection, empathy, etc.) at a young age and that they have access to constructive social innovator networks, like Evoke, which enable them engage with other socially-minded youth who are prepared to take action and work to change the world.

Social Innovators Require a Different Mindset to Embrace Complexity

Responses to complex adaptive challenges need to be experiential, experimental, and iterative, requiring people to acquire new skills, question old assumptions, learn, make mistakes, and re-learn (something that games, like Evoke, do particularly well). Therefore, in addition to acquiring transformative capacity, social innovation requires transformative learning (Mezirow, 2000) – a deliberate effort on the part of innovators to make sense of the world (question assumptions, re-examine attitudes, etc.) and improve their mental agility and ability to handle mental complexity. Kegan and Lahey (2009) claim that as the ability to deal with mental complexity improves, a person's mindset becomes more open and inclusive, putting him or her in a better position to negotiate complex social challenges and become better problem solvers and leaders of change.

In a complex world, the qualities of a social innovator are essential: the ability to observe (see, listen), imagine, think, care, act, and interact. Social innovators' skills matter because they affect *how we think* and what we are able to do and be in the world. They matter because attitudes and mindsets affect *what we care about* and *how we observe and imagine the world*: our assumptions, mental models, and frames. And they matter because our beliefs affect *how we act and interact* in the world; people's belief that their voices, actions, and inventions are of consequence increases the likelihood that they act as agents of positive change and actually translate their capabilities into action. It is therefore essential that each person believes that he or she can be a change agent and that their actions matter. As Bateson (1980) so wonderfully said, "the world becomes—partly comes to be—how we imagine it."

Importantly, the knowledge, skills, attitudes, and processes necessary to be a social innovator can be learned, acquired, developed (Heckman & Kautz, 2012), and acted upon. This conception of the social innovator as the result of practice and development may lack the glamor of the popularly imagined social entrepreneur—with his 'inborn traits'—but the approach does underscore social innovation as an inclusive endeavor; one that thrives on diversity, and is within the reach of all. Unfortunately, it is often those youth who are most disadvantaged by these social problems who may feel the most excluded or the most disempowered from participating in the innovation process. And thus, ironically, among the most valuable and necessary people to become social innovators. It is therefore the intention of the SIF to help reverse this experience.[4]

[4] *We are aware that not all youth start out with equal entitlements or equivalent means to achieve (Iversen, 2005), and thus, antecedent diversity and entitlements (based on class, gender, displacement) must be understood as a component of the equitable distribution of resources (e.g.,*

The Social Innovators' Framework was developed to provide the structure for all to be able to act in a complex world. The SIF was developed from an established evidence-base that shows strong positive relationships between 21st century and socio-emotional skills and a variety of outcomes. Positive relationships have been demonstrated between cognitive and socio-emotional skills and social progress (OECD, 2015), labor market and job attainment (Bassi, Busso, Urzúa, & Vargas, 2012), academic performance (Heckman, Stixrud, & Urzúa, 2006), civic participation and trust (OECD, 2010), social outcomes including health, crime, voting (OECD, 2012), and success for life (Heckman, Pinto, & Savelyev, 2013; Kautz et al., 2014).

Scholars have also shown that specific socio-emotional skills, such as 'growth mindset' (Dweck, 2008) and grit (Duckworth & Yeager, 2015), also positively impact goal-oriented endeavors, as measured on a variety of tests. For example, Blackwell, Dweck, and Trzesniewski (2007) show a positive impact of 'growth mindsets' on adolescent's math scores and Grant and Dweck (2003) demonstrated how 'growth mindsets' improved chemistry grades for pre-medical students. Duckworth and Quinn (2009) showed that 'grit' predicted higher GPA among adolescents and greater retention of West Point students. References for the specific cognitive and socio-emotional skills that form part of the SIF are provided in *Table 1*.

Cognitive and non-cognitive skills and attitudes can be cultivated and developed over the course of a person's lifetime. This is important because skills generate new skills, and cognitive and socio-emotional skills are interconnected and reciprocal, meaning that learning one set of skills can enable the acquisition of new skills (Bassi et al., 2012; Cunha, Heckman, Lochner, & Masterov, 2006). We highlight this point because it is fundamental to the ethos of Evoke and the Social Innovators' Framework. The premise of the Evoke model is that by providing interesting and engaging activities intentionally designed to facilitate the learning of particular skills¬—combined with plenty of reflection, guided practice, and mentoring—young people will be able to develop and improve their skills, knowledge and behaviors as social innovators.

In the last decade it has become clear that cognitive power is not fixed but can increase over time. According to Kautz and his colleagues (2014), the capacity to develop socio-emotional skills is greater even than the capacity to develop cognitive skills in the adolescent years. Other researchers have also reported this differential malleability (Borghans, Duckworth, Heckman, & ter Weel, 2008; Carneiro & Heckman, 2003; Cunha et al., 2006), although consensus has yet to be reached as to exactly which point in the life cycle. Heckman and colleagues (in various studies) maintain that flexibility of mind is ongoing through the teenage years. Walsh (2007) argues that malleability continues through adulthood and Borghans et al. (2008) states that socio-emotional skills can change through the later stages of life, citing responsibility as a prime example of ongoing development. This research is important because it shows that people can learn and respond to targeted interventions throughout their lives. Youth can indeed become social change agents and the authors of their own life stories.

Educating Youth to Actively Create and Transform their World

We began this section by discussing complexity and its acceleration. We return to complexity now to explore how it can lead to broader social change and also to see how the acceleration of complexity requires a fundamentally different way for students to solve problems and make their way in the world.

An aspect of all complex physical systems is that they are subject to the second law of thermodynamics: moving from order to lack of order. Dissipative structures are an interesting phenomenon that occur in the physical world. A hurricane is a notable example of a dissipative structure. It is an open system that is stable and maintains its overall structure despite a

opportunity that arises from skills development) and as a constituent part of the process of achieving well-being (Freeman, 2012). Capabilities represents the potential or freedom to achieve, which we aim to cultivate in all who participate in the social innovation process.

continuing flow and change of its components (Capra, 2002). It maintains itself in a dynamic balance far from equilibrium through repeated, self-amplifying feedback loops. This state of non-equilibrium is characterized by multiple permutations (can have more than one solution) and a low probability of any one particular arrangement occurring; the higher the degree of non-linearity exhibited by a structure, the increased number of possible pathways and the greater degree of randomness, instability, and indeterminacy. The deeper a structure delves into the chaotic regime, the greater degree of sensitivity to small changes in behavior or activity and the more difficult it is for it to maintain its organization. When a dissipative structure hits a point of instability beyond a threshold value, bifurcation may occur (Prigogine & Stengers, 1984). Bifurcation points are unpredictable; in a dynamical system it is the point of instability in which new structures of higher-order and complexity may emerge spontaneously, resulting in development and evolution (Capra, 1996). It is the patterns of interactions and relationships that is the essence of this emergent process.

We witness this phenomena in human social systems as well. Substantive changes often appear to arrive suddenly and out of nowhere (e.g., shift in attitudes toward AIDS in Africa or LGBT rights in the US). This suddenness is more apparent than real. Change is happening all the time and, in fact, the pace of change is accelerating, causing social arrangements to breakdown or revolutionize and be rebuilt at an ever faster pace.

As shown in *Figure 2*, social change emerges through communication between the extensive relationships of networked agents, countless discoveries, inventions and imitations, communities of practice, negotiated meaning, and a continuous interchange of ideas and learning[5] (4th outer ring of the spiral). Social change transcends individual innovators or innovations and arises as a result of multiple social innovations, continuous experimentation, social interaction, and learning amongst many social actors (3rd ring). Problems, however, are not solved in isolation from the context and local realities. Problem solving requires the active intent of local community members to understand the issues they face and to organize and act on those issues. It also requires that the local community critically reflects on the effects of their actions in light of the messiness of real-world implementation and the seemingly intransigent rules of interaction and routines established by entrenched systems, power structures, and institutions. In view of this tension between permanence (existing structures) and change, repeated cycles of experimentation, action, reflection, course correction and learning are needed to bring about results (ring 2). At the center of the model are the many social innovators and their teams. An individual's sense of agency and her belief that her actions and voice matter is critical to her achievements. Still, finding solutions to complex problems requires collaboration among people with diverse talents and different perspectives, knowledge, and ideas—working across academic disciplines, social and economic sectors, and geographic boundaries (1st inner ring).

[5] *See Howaldt, Butzin, Domanski, & Kaletka (2014) for a fascinating and important discussion about Tarde's theory of the dynamic process of innovation and imitation and scaling and diffusion, which follows this thread but is beyond the scope of this paper.*

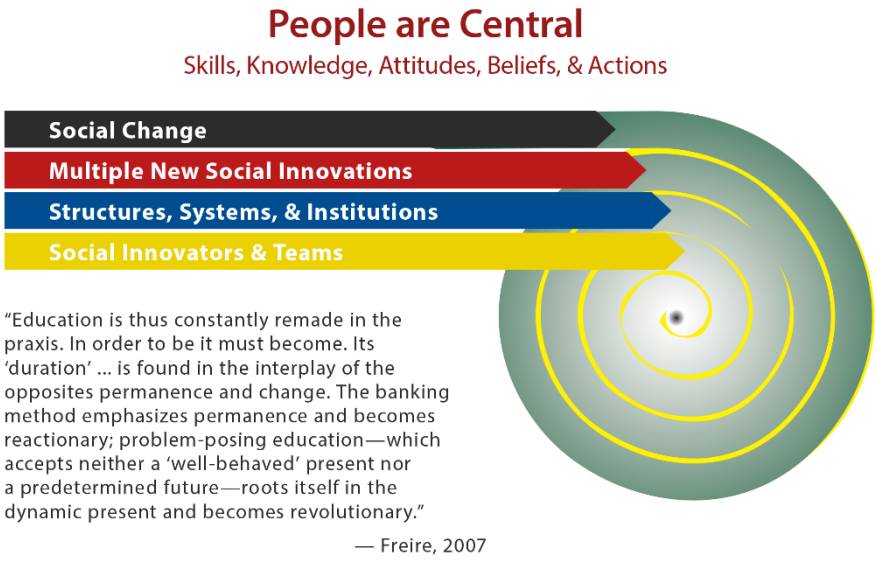

figure 2. *People are central*

In a world of intensifying complexity, all educational systems are under pressure to make learning relevant to students and to prepare them for the dynamic present while looking forward to a future in which lifelong learning and deep practice are a necessity. An education and learning environment in this context of continually adapting, changing and transforming knowledge is constructivist: a kind of learning based on critical questioning, experience, action and reflection on this action. In the case of Evoke and the SIF, the entire experience, actions, and reflections of what can be learned when youth try to solve grand challenges in the real world is constructivist at its core. In the broader context of education, it means recognizing that textbook knowledge and real-world practice are related and thus creating collaborative project-based learning experiences for students to test and think about what they are learning. It also means preparing students with the kinds of skills that will remain relevant, skills that cultivate agility of mind and improve students' ability to handle mental complexity so they can thrive in ambiguous and ever-evolving environments. We need to teach in a way that does not make students feel anxious, but encourages and equips them to jump into the void, participate, shape and rebuild their world, by working through and grasping all the variations the world has to offer. This is urgent because each student, individually and in aggregate, is central to our world and represents our only true hope for spiraling positive social change.

Multidimensional Capabilities that Change the Vectors of Future Possibilities

The Social Innovators' Framework is rooted in the belief that all youth have the potential to be social innovators, and that innovators succeed due to their knowledge, skills, mindsets, actions, and persistent energy. Moreover, the positive impact that individuals can have is deepened though collaboration, participative dialogue, experimentation, and learning with others, both within one's own team and organization and with distributed social networks, communities, or social justice movements.

Social innovators need to have multidimensional skills and knowledge, as represented in *Figure 3*. Each of these skill sets play an important role in bringing about social innovation. Although shown in neat categories, these qualities and skills interact with one another. It is at the highest stage, acquisition of transformational capabilities, that social innovators are able to bring about changes in themselves (agency, self-belief) and contribute to social change at large. Transformation encompasses the notions of transformational capacity development (Giddens,

1984) and transformational learning (Mezirow, 2000), which were discussed in this section. It is also at this stage of development that these qualities and skills can genuinely translate into capabilities and the freedom to achieve (see footnote 3).

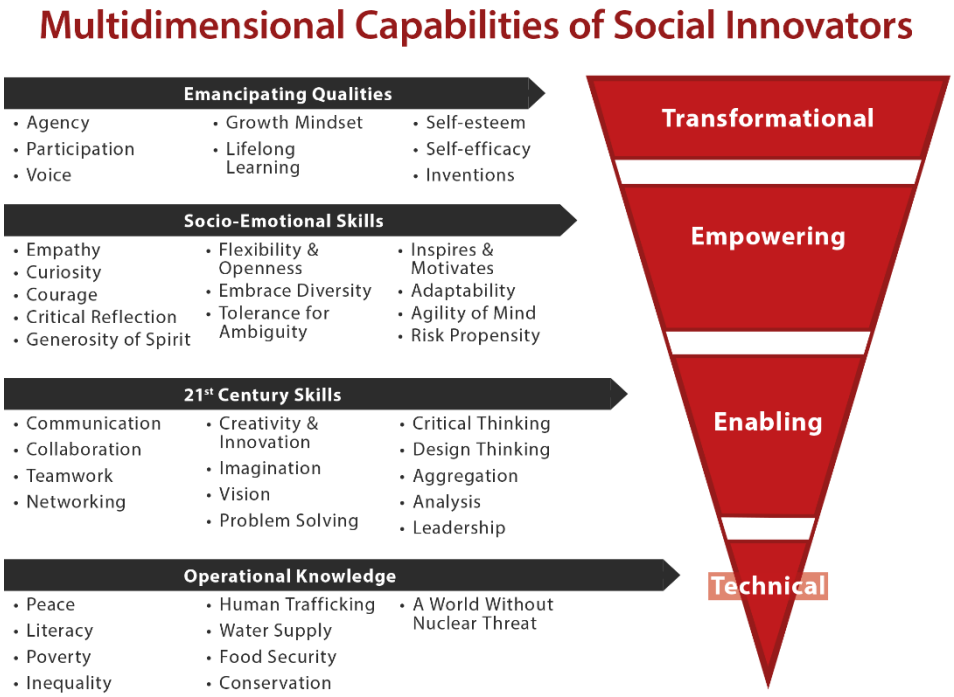

figure 3. *Multidimensional Capabilities of Social Innovators*

The skills identified in *Figure 3* are detailed in section 3. We believe that all students need to have multidimensional capabilities and that the skills identified are not limited to social innovation but are equally relevant throughout the curriculum. To be successful in today's world requires youth who have the ability to observe (see, listen), imagine, think, care, act and interact like a social innovator.

Social innovation is fundamentally about the creation of a more just, equitable, and fair world. Given that the world is in flux and the future is dependent on multiple pathways that a world in flux can take, the connection between developing the multidimensional abilities of young potential social innovators for positive social change and the bringing forth of social change itself is a vital link to establish (Mulgan, 2012). How do we define the skills and abilities that will foster a mindset to both understand and create these alternate potential positive futures? Can we say that social innovation skills and attitudes development will lead to social change and offer the potential to increase the weight of probability in favor of realizing good social outcomes? Can youth not only be prepared to engage in an uncertain future world but also actively create it? We think so. After all, one of the most important aspects of learning is that it changes the vectors of future possibilities. Young people can be the authors of their life story. As Freire (2007) said, "in order to *be*, it must *become*." (p. 84).

The overarching aim of Evoke, and the SIF that underpins it, is to increase youth's critical awareness of social issues, identify and cultivate their potential skills as agents of change, and support them in their belief in their own abilities to influence social change through their voices, actions, and creations.

In the next section, we discuss the development of the Social Innovators' Framework and present its key elements.

3. Developing the Social Innovators' Framework

This section provides the details and mechanics of the Social Innovators' Framework. In this section, we explain the development of the framework and detail each of its key elements including the skills, skills definitions, examples of activities, the project-based Evokation framework, assessment and rewards.

Methodology

What makes the Social Innovator Framework distinctive is that it is designed to concurrently facilitate the creation of early stage innovations and cultivate the essential skills and capabilities needed to achieve truly meaningful social impact. Teaching and empowerment of this sort using a massive multiplayer educational game environment (Evoke) requires a delicate balance between ensuring that learning is really taking place and engaging the learner in the process (Freeman & Higgins, in press). In order to reach an optimal balance, we must be very clear about which cognitive and socio-emotional skills we want learners to develop. It is for this reason that the Evoke assessments schema begins with the social innovators' (learners') outcomes at the center of the design (see *Figure 4*).

The SIF draws its key principles from Evidence-Centered Assessment Design (ECD; Mislevy, Steinberg, & Almond, 2003). Although ECD is most applicable to large-scale assessment design, it provides a systematic methodology to help define and map the relationships between the key elements that comprise the Social Innovators' Framework. It enables us to make inferences about learners' specific skills, knowledge, and abilities based on their actions (what they write, say, draw, create). We have adopted a modified version of the ECD. The key elements are iterative, as shown in *Figure 4*. The critical design elements include:

- Learners' outcomes: defining the key qualities of social innovators;
- Learners' skills, as well as their knowledge, attitudes, and mindset;
- Learners' activities and actions, which represent and operationalize their skills;
- Learners' responses and actions: evidence of accomplishing a task;
- Learners' performance: assessment of progress; and
- Learners' completion, with associated rewards (e.g., badges, prizes, funding).

It is important to reiterate that no social innovator works in isolation, but rather engages in the development of his or her ideas as part of both a team and a broader social network that gives them support and inspiration to develop their competencies, skills, knowledge, attitudes and ultimately their world changing idea.

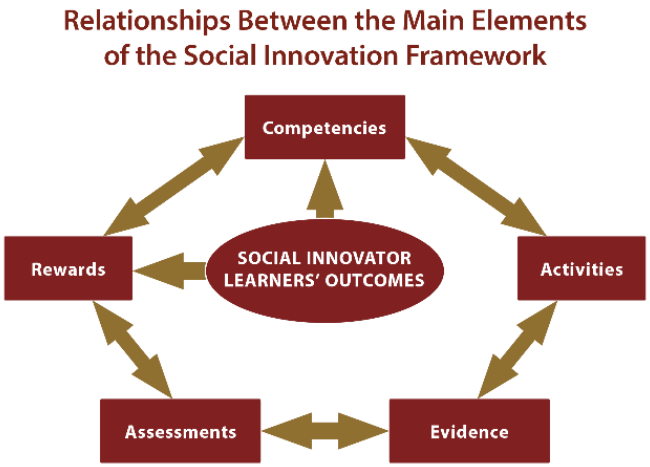

figure 4. *Relationships between the Main Elements of the Social Innovation Framework*

Key Qualities of Social Innovators

The first step in the SIF development process is to define the learning outcome, which in this case is to develop the qualities of social innovators in youth. Thus, the first question that needs to be addressed is: what are the essential qualities of social innovators? At the core of this framework are four essential qualities that successful social innovators and entrepreneurs have used with facility across multiple settings and theoretical approaches. The four key qualities of a social innovator—Creative Visionary, Deep Collaborator, Systems Thinker, and Empathetic Activist—were derived largely by combining the approaches of Stanford's Center for Innovation (2015), TEPSIE's (Theoretical, Empirical and Policy Foundations for Social Innovation in Europe) research-based working definition of social innovation (Caulier-Grice et al., 2012), and development of the World Bank Evoke project (Freeman, 2014). These qualities are shown in Figure 5 and detailed in *Table 1* and *Appendixes A-E*.

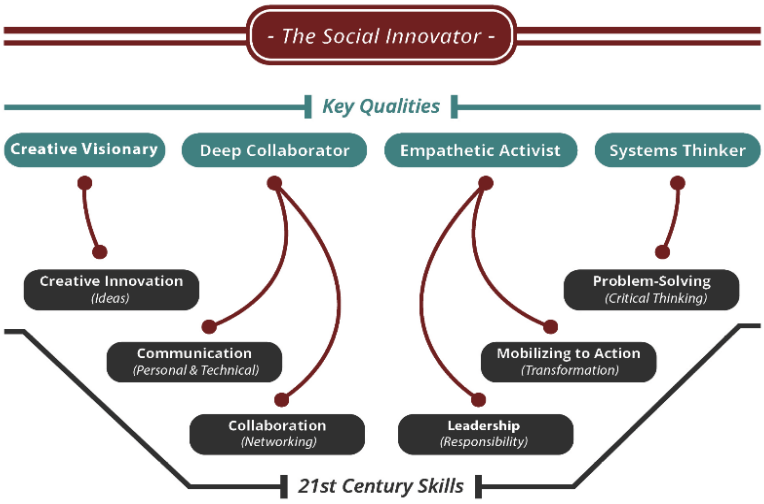

figure 5. *Key qualities of social innovators*

The four key qualities were chosen because they complement various socio-emotional skills (Fadel et al., 2015; Heckman & Kautz, 2012) and 21st Century skills models (Binkley et al., 2012; Dede, 2009; ISTE, 2016). These models focus not only on developing essential cognitive skills, but also emphasize the development of socio-emotional skills and abilities. This is important with respect to the field of social innovation because the education system is shifting from merely finding a better way of teaching technical skills for employability (although acquisition of domain-specific knowledge remains fundamental) towards preparing students for a world in which new ways of thinking, acting, and caring (e.g., problem solving, innovating, collaborating, empathizing) are increasingly essential. In other words, young people come to believe that their actions matter and they can be part of making the world a better place (e.g., working to tackle grand challenges, creating employment for themselves and others, or engaging in participative dialogue in social, economic, political, and other realms); a world in which young people could forge their own path by becoming social entrepreneurs and participate in the growing entrepreneurial economy.

Key Skills and Operationalization

Having articulated the overarching qualities of social innovators (Creative Visionary; Deep Collaborator; Systems Thinker; and Empathetic Activist), it is important to consider more specifically: What are the skills that comprise each social innovator quality and how are they defined? These two questions are at the core of the Social Innovators' Framework.

As discussed above and depicted in *Figure 3*, it is essential that social innovators have multidimensional capabilities: From the technical (operational knowledge), to the enabling (21st century skills), to the empowering (socio-emotional skills), and to the transformational (emancipating qualities). These dimensions mesh and interact with one another to develop the qualities in students that will enable them to feel confident to work through complexity and shape and reshape their world.

A fundamental objective of the Social Innovators' Framework is to develop the capacity to operationalize these skills in order to meet the learning outcome of development of social innovators' qualities. In order to operationalize these qualities, we begin by defining four specific strengths (called "powers" in Evoke) associated with each quality. To demonstrate their mastery of each strength, we further define three main skills that a student should exhibit. In total, the SIF aims to cultivate 16 strengths and 48 specific skills. The 48 skills are translated into activities, evidence, and rubrics for assessment. We also include one additional strength, persistence, which cuts across the four qualities.

The qualities and skills included in the SIF have been validated in peer review. The operationalization of these skills is described throughout this section. We begin by looking at the key strengths.

Key strengths

Although we specifically identify 16 key strengths of the social innovator, we wish to point out that these are not prescriptive. Instead, they establish the contours of what needs to be learned and developed to bring about solutions to global grand challenges. As with social innovation itself, context matters. Thus, specific skills will need to be modified to reflect the realities of the context in which it is implemented. The following are the SIF skills:

Social Innovators are Creative Visionaries

Imagination – Social innovators imagine a better future and a better world. They are willing to dream of original untried solutions and view familiar things in a different light.

Ideation – Social innovators generate lots of new and original ideas through research and work in the field. Then, they work with others to brainstorm and experiment to improve these ideas.

Vision – Social innovators see possibilities when others may see only barriers and failures. They inspire and motivate other people to see the opportunities and believe they can bring them to life.

Courage – Social innovators ask difficult questions, face up to complex realities, and are brave enough to experiment with their ideas even if it goes against the conventional view.

Social Innovators are Deep Collaborators

Communication – Social innovators listen intently, empathetically, and respectfully to people who may see the world from a different perspective. They give their total attention to the people with whom they are speaking. They also present their ideas in a thoughtful and compelling way.

Teamwork – Social innovators understand that they cannot act alone. They are appreciative of the various skills that others bring to the team, and recognize that teams are most effective when there are members who are different and who may hold opposing world views and work hard at building trust in one another.

Networking – Social innovators seek feedback not only from their team but from a broader social network. They connect with the community and engage with a broader global social network.

Generosity of Spirit – Social innovators willingly share their time and resources and are grateful for the time and support they receive from others, on their team, in the community, and in their broader social network. They support others even if it takes extra time to help someone develop their skills.

Social Innovators are Systems Thinkers

Problem Solving – Social innovators take on unfamiliar problems. They experiment with possible solutions, learn from their mistakes, and continue to explore situations, even after they reach their initial hypothesis or solution.

Analysis – Social innovators consider the problem they are addressing in light of the broader social context. They consider the interrelationship of various forces and factors within the system and use human-centered design and other structured means of visualizing the problem and making connections between cause and effect.

Aggregation – Social innovators use multiple sources of information, through research and work in the field, to gain awareness and deep understanding of the issues they are dealing with. They draw on resources and make connections from multiple domains and disciplines.

Critical Reflection – Social innovators set aside time in their busy schedules to critically reflect on what they are learning and experiencing. They question, analyze, and reconsider their ideas, both individually and with their team.

Social Innovators are Empathetic Activists

Leadership – Social innovators motivate their team through their passion and commitment. They recognize the strengths of their team members and understand that different people can lead on different parts of the problem, utilizing the whole team.

Empathy – Social innovators are respectful and sensitive to other people's lives and experiences, even if they cannot fully comprehend them. They develop a genuine understanding by listening and paying attention, recognizing that issues that led people to the situation they are in are very often ambiguous (not black and white).

Transformation – Social innovators are proactive and show their commitment. They engage the community to create change and they truly believe in the possibility of bringing about social change.

Curiosity – Social innovators are interested in other people. They seek out new knowledge and try to understand different experiences and perspectives.

Research Basis for Skill Selection

In *Table 1*, we list the 16 strengths, showing the key skill to be developed and providing references to the research upon which the skill was selected. A key strength was only included in the SIF if it fit in all three of the following categories:

(1) Cited in social innovation or social entrepreneurship literature as a key skill or competence;

(2) Cited in 21st century skill or socio-emotional literature as a key skill or competence; and

(3) Has an established research basis in at least two academic disciplines (e.g., education and economics, sociology and science, etc.).

Table 1. *Key Skills of the SIF with References*

Social Innovator Quality	Key Social Innovator Skill (Strength)	Key Skill to be Developed	References
Creative Visionary (CV)	Imagination	Presents a unique and new view of the world and imagine a new and better world.	Binkley et al., 2012; Bronowski, 1979; Tough, 2012; Vygotsky, [1967], 2004
	Ideation	Commands the World of Ideas: Sparks lots of new ideas and reshapes existing ideas.	Binkley et al., 2012; Dewey, 1997; Grant, 2016; Sherman, 2011
	Vision	Envisions the future and is driven to do the difficult work to move a concept to reality.	Drucker, 2009; Fadel et al., 2015; Lewin, 1951; Millett, 2011; Senge et al., 1990; Stanford Center for Social Innovation, 2015
	Courage	Ventures into the unknown, showing strength in face of challenges and willing to work through the fears and uncertainties of bringing about change.	Brown, B., 2012; Fadel et al., 2015; Peterson & Seligman, 2004; Rate & Sternberg, 2007
Deep Collaborator (DC)	Communication	Listens, seeks understanding, embraces diverse perspectives, and presents ideas in a compelling way: shows adeptness in relationships.	Binkley et al., 2012; Castells et al., 2007 Fadel et al., 2015; Goleman, 1998; P21 Partnership for 21st Century Learning, 2016; Scardamalia & Bereiter, 1994; Terenzini & Pascarella, 1991
	Teamwork	Gets things done through collaboration with diverse agents, and by building trust and creating effective teams.	Binkley et al., 2012; Dede, 2009; Laurillard 2009; Mezirow, 2000; P21 Partnership for 21st Century Learning, 2016
	Networking	Leverages the power of diverse network resources, making connections by engaging actively and respectfully.	Castells et al., 2007; Gee, 2007; Murray et al., 2010; P21 Partnership for 21st Century Learning, 2016; Scardamalia & Bereiter, 1994
	Generosity of Spirit	Collaborates, gives, and shares one's time, ideas and expertise with others.	Brown, 2012; Cajaiba-Santana, 2014; Erikson, 1968; Peterson & Seligman, 2004; Thelwell & Bowcombe, 2016; Tough, 2012
Systems Thinker (ST)	Problem Solving	Takes on unfamiliar problems; questions, analyzes, and experiments with ideas and potential solutions.	Binkley et al., 2012; Gee, 2007; Caulier-Grice et al., 2012; Laurillard 2009; National Research Council, 2011; Scardamalia & Bereiter, 1994
	Analysis	Uses design thinking to reveal systems and illuminate the interconnectedness of problems and solutions.	Alden Rivers et al., 2015; Bateson, 1980; Bertallanfy, 1972; Brown, T., 2012; Capra, 1996; Caulier-Grice et al., 2012; National Research Council, 2011
	Aggregation	Connects to multiple sources of information and multiple perspectives of people to understand a challenge.	Binkley et al., 2012; Dede, 2009; Murray et al., 2010; National Research Council, 2011
	Critical Reflection	Questions, analyzes and considers and reconsiders ideas in light of evidence and feedback.	Alden Rivers et al., 2015; Binkley et al., 2012 Cajaiba-Santana, 2014; Freire, 2007; Flavell, 1979 (metacognition); Kolb, 1984
Empathetic Activist (EA)	Leadership	Leads the team to accomplish goals by being responsible, flexible yet showing commitment and consistency.	AshokaU, 2014; Bass, 1981; Burns, 1978, 2006; Fadel et al., 2015; Heifetz, Grashow, & Linsky, 2009; Ospina & Sorenson, 2006
	Empathy	Walks in others' shoes. Passionate about making a positive difference.	Alden Rivers et al., 2015; Bernhardt & Singer, 2012; Davis, 1983; ISTE, 2016; Kopec, Hazenberg, & Seddon, 2015; Sherman, 2011
	Transformation	Inspires and motivates, has a growth mindset, and builds inclusive, diverse, and collaborative teams and networks to create positive and sustainable change in a community.	Binkley et al., 2012; Cajaiba-Santana, 2014; Dweck, 2008; Freire, 2007 Giddens, 1984; Goleman, 1998; Mezirow, 2000; Peterson & Seligman, 2004
	Curiosity	Shows intense curiosity as to how the world works and asks good questions and listens to answers without judgement.	Berlyne, 1960; Fadel et al., 2015; Heckman & Kautz, 2012; Lowenstein, 1994; Tough, 2012; Peterson & Seligman, 2004

Clarifying Constructs

At first glance, the skills listed and shown above are recognizable and appear to be obvious. On closer examination, however, the underlying constructs reveal themselves as difficult to pin down. There is in fact very little clarity about what many of the terms mean in practice and so attempts to use these constructs consistently in the real world, or to teach them in an academic setting, prove difficult to put into effect.

Therefore, in addition to the 16 identified strengths, we have provided 48 skills definitions, three particular skills definitions for each of the overarching strengths to be developed. In order to make these 48 skills concrete, we provide 144 examples of what these skills may look like in action, three for each of the 48 particular skills. We then provide examples of concrete activities that are designed to develop or demonstrate these skills in learners—activities that relate specifically to what players in Evoke would do. Some of these examples show how the quality could be represented in the real world, and others provide examples of actions that can be taken that would develop this skill. We also created three skill definitions and three examples for persistence, but this has yet to be operationalized in the activities.

In *Table 2*, we show two examples from the Creative Visionary quality (one of the four social innovator qualities) in order to provide an example of how a 21st century skill (Imagination) and a socio-emotional skill (Courage) are defined and made concrete. The comprehensive skills table, which details all four social innovator key qualities (Creative Visionary, Systems Thinker, Empathetic Activist, and Deep Collaborator) plus persistence, is provided separately in Appendixes A-E.

Table 2: *Example of 21st Century and Socio-emotional Skills Definitions for a Creative Visionary*

Key Social Innovator Skill (Strength)	**Key Skill to be Developed**	**Skills Definition**	**Examples Ways to Make Concrete**
Imagination	Applies the Imagination (Imagines a new and better world)	1. Produces original and novel ideas through the willingness to take risks and try something different	• Engages in thought experiments to imaginatively speculate (plays with ideas) • Tinkers and makes things • Employs lateral thinking to explore taken for granted assumptions
		2. Views familiar things in a different light	• Challenges ingrained assumptions • Reframes old problems, considering people's feeling and reactions • Conceives of different purposes for existing tools
		3. Dreams of creative ways to resolve a conflict or problem and initiates forward-looking solutions	• Tells stories • Learns experientially through small games or scenarios (e.g., Prisoner's Dilemma) • Talks with people from different cultures, backgrounds, etc.
Courage	Engages to Create Change (Ventures into the unknown)	1. Has the courage to build consensus that challenges the status quo to address social causes	• Just begins even if the path looks long, scary, or obscured – and finds other like-minded people to share in the journey • Presents ideas for others to build on, even if they are not perfect • Asks for help to achieve goals, knowing it is a collective effort
		2. Tolerance for ambiguity and uncertainty	• Not afraid to dig beneath the surface to explore problems and possible solutions: not too quick to put things in neat boxes • Stretches beyond what one already knows: more important to learn than to prove you are smart all the time (documents/shares this learning) • Recognizes negative emotions and doubts but confronts them when faced with the unexpected
		3. Engages in respectful dialogue with people who may view and understand the world in a different way and who may be resistant to change	• Stands up for what is right and just, even if is unpopular • Speaks one's mind assertively but without being rude or aggressive • Exhibits patience in oneself and patience with others

Rendering the Skills Transparent

Once the skills are defined, they need to be rendered transparent, as many skills are unobservable (latent variables). To illustrate the process employed in the SIF, the Deep Collaborator quality is unpacked in Figure 6. As an example, while it is generally understood that communication is a necessity, the complexity and nuances of communication are invisible until they are named and described. Once the attributes and skills that represent communication are identified, they become observable and therefore measurable. For example, Active Listening is a measurable activity that can be observed by checking whether a person is paraphrasing or summarizing another person's ideas to check for understanding or asking for further explanation.

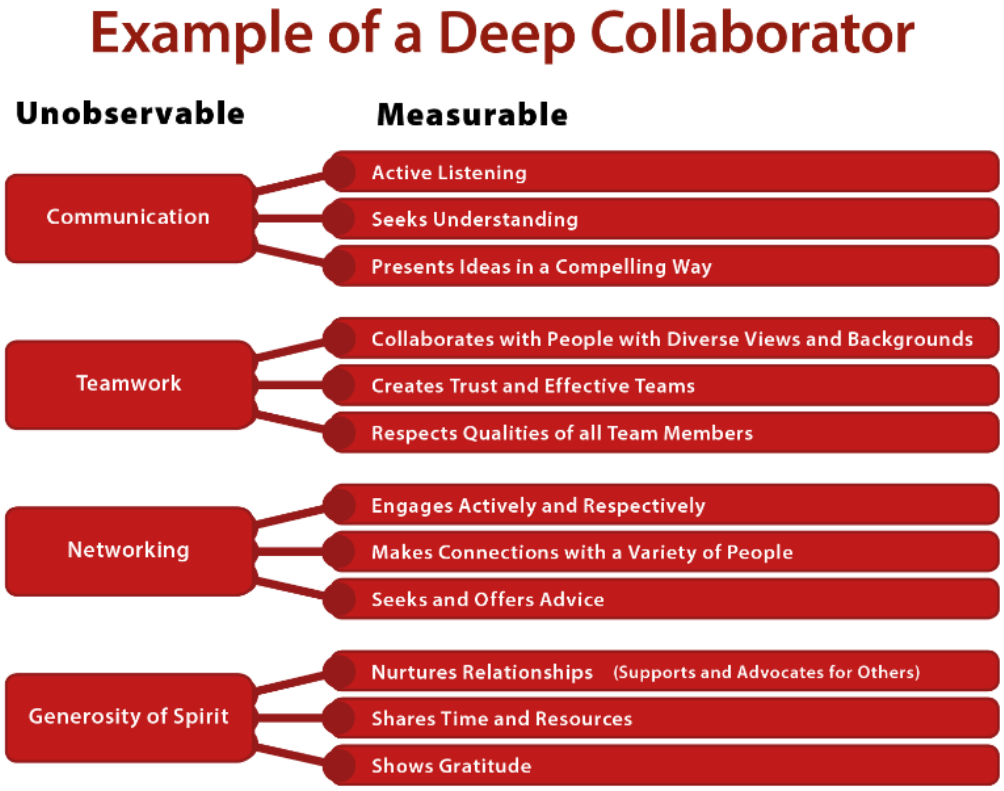

figure 6. *Example of a Deep Collaborator*

Missions, Activities, and Combining Skills for Project-Based Learning

After defining the various skills, we then specify means of measuring these skills by translating the examples provided in column 4 of *Table 3* into engaging and interesting activities that capture the essence of the skills and that can be demonstrated by students through their actions. In the Evoke project, a specific activity is designed to represent (actualize) a specific skill or competency, though many activities require a mix of multiple skills to complete. The activities vary in nature; some are intended to be conducted in the real-world through field work, others can be conducted offline and through research.

Tables 3 and *4* provide examples of the types of activities developed for the Human Trafficking and Displaced Persons Grand Challenge in Colombia for the skills of imagination and courage. The specific activity to which the student must respond is provided as well as the basic evaluation rubric on which that activity submission will be assessed.

Table 3: *Imagination skill*

Skill definition and ways to make concrete	**Activity**	**Basic Rubric**
Produces original and novel ideas through the willingness to take risks and try something different. • Engages in thought experiments to imaginatively speculate (plays with ideas) • Tinkers and makes things • **Employs lateral thinking to explore taken for granted assumptions**	**Imagine the Future:** *My friend Cipher thinks a lot about the future. He is always drawing diagrams of devices that don't yet exist and telling stories about how they would be used. I often would ask him the value of always thinking about what could be instead of focusing on the present and what is. His response: "Everything begins with an idea born from imagination and eventually made real. The telephone, Internet, virtual reality...all began as only ideas.* Agent: brainstorm with your team to come up with potential positive alternative realities for the future of your community. Share these ideas or tell a story about the future to the Evoke network	Does this evidence presents an original and novel idea?
Views familiar things in a different light. • Challenges ingrained assumptions • Reframes old problems, considering people's feeling and reactions • **Conceives of different purposes for existing tools**	**Reshape your reality**: *Remember Mikaela's mother? The moment she suspected her husband's betrayal was when she noticed his new and expensive new purchase. To see these boots from a new perspective, the horrible reality of what her husband did crashed her world.* Agent: look around your community. Take a picture of an object, a place, or a person and conceive how it could be transformed to improve the community.	Does this evidence views a familiar thing in a different light?
Dreams of creative ways to resolve a conflict or problem and initiates forward-looking solutions. • **Tells stories** • Learns experientially through small games or scenarios (e.g., Prisoner's Dilemma) • Talks with people from different cultures, backgrounds, etc.	**Dream**: *Almost all of the stories Cipher writes are utopias. While most sci-fi stories imagine pessimistic future worlds, Cipher writes about what is possible with descriptions full of details of new technologies that will eradicate corruption and injustice. I love his stories. They helped me to never relinquish my dream.* Agent: what is your dream? What do you imagine for your country? Tell a compelling story through text, images, or video of what a post-conflict Colombia will look like.	Does this evidence tell a captivating or persuasive story?

Table 4: *Courage Skill*

Skill definition and ways to make concrete	**Activity**	**Rubric**
Engages in respectful dialogue with people who may view and understand the world in a different way and who may be resistant to change. • **Stands up for what is right and just, even if is unpopular** • Speaks one's mind assertively but without being rude or aggressive • Exhibits patience in oneself and patience with others	**Show your Courage:** *Cipher's work is risky. Many think that exposing corruption in the world through a team of hacker journalists called Citizen X has generated positive change but many others don't believe their methods are appropriate. He often has to act when others do not believe in his methods.* Agent: what is one thing that you believe to be true in your community that others may not be able to see or imagine? Post this to the network to start a respectful dialogue.	Does the evidence show a willingness to articulate what is right even if it is unpopular?
Not afraid to dig beneath the surface to explore problems and possible solutions: more important to learn than to prove you are smart all the time. • **Embraces ambiguity and uncertainty; not too quick to put things in neat boxes** • Stretches beyond what one already knows (documents/shares this learning) • Immerses oneself in learning more about an idea being considered.	**The Unknown**: *As secret agents we often obsess about the cases we are working on. Our job is to dig deeper, to go beneath the surface. To find the hidden truths.* Agent: what concerns you most about this problem? What are the aspects that you least understand? Write those out and share them with the network.	Does this evidence demonstrate that the agent is stretching beyond what she currently knows?
Has the courage to build consensus that challenges the status quo to address social causes. • Just begins even if the path looks long, scary, or obscured – and finds other like-minded people to share in the journey • Presents ideas for others to build on, even if they are not perfect • **Asks for help to achieve goals, knowing it is a collective effort**	**Build your Network:** *I don't have to remind you again what happened when I tried to stop Orlando on my own. That was stupid, I know. Agents like James Bond, lone agents with exceptional skills that exist only in the world of fiction are what most of us imagine. But this is real life, and secret agents need other people to help us solve our cases.* Agent: think about those partners who might be able to help you make your idea a reality. Reach out to one person who you think can help you and present your idea. Post both your presentation and the feedback you got. Pay close attention to both how they can help you and how your work can help them.	Does this evidence illustrates courage to reach out to potential partners for feedback and support?

Mission Structure and the Social Innovation Cycle

Activities are designed to help a social innovator work with a team to create a world-changing idea. The SIF is designed in a way that it can be applied to a specific program or project, which addresses one specific global challenge: human trafficking, literacy, water, energy, etc. The activity examples provided above applied the SIF in the Evoke campaign to address issues of human trafficking and displacement of people in Colombia. The activities, however, are presented at different stages of the implementation of the Project and are embedded in a Mission structure that supports project-based learning. The project-based learning schema is organized into eight segments or eight missions in Evoke parlance. Each mission is designed to help students understand and uncover a specific aspect of the social innovation cycle. The eight segments or missions are defined as follows:

Mission 1: Understanding the particular global grand challenge for which the activities are designed and for which the player is focused on creating a solution.

Mission 2: Working with the community and people who will be impacted by the project to understand their concerns and involve them in the design, using human-centered design methodologies.

Mission 3: Defining the problem.

Mission 4: Creating the solution.

Mission 5: Communicating the idea.

Mission 6: Revisiting how the problem affects the community.

Mission 7: Understanding the interdependencies of problem and solution.

Mission 8: Engaging the community through effective communication.

Activities Reflect the Skills

Each mission is composed of six activities which reflect one of the 48 skills (the three skills related to persistence are reflected through all of the other skills and other actions in Evoke) for a total of 48 activities that the students undertake. During the course of the eight missions (designed to take place over either 8 to 16 weeks, a full semester), a social innovator as part of a team will create unique content that corresponds to each of the 48 activities. Each of these outputs will then be aggregated into the design of a team project or business plan (called an 'Evokation'), which organizes each of the outputs under the headings of community, problem, solution, and communication. Each activity therefore creates unique content that is used to build a team's project.

Consequently, the activities in the SIF are not designed to work in isolation, but rather are scaffolded to build on one another, to combine with other activities (representing different skills), and to explicitly support the four key aspects of project development emphasized in the Evokation. *Table 5* shows the structure for how the 48 skills combine in the 8 missions (EA = Empathetic Activist; ST = Systems Thinker; DC = Deep Collaborator; and CV = Creative Visionary).

Table 5: Project-based structure

Mission 1 – Understanding the global grand challenge for which the activities are designed and for which the player is focused on creating a solution. 1. Curiosity (EA): 4.4.1 Asks questions that seek to understand other people's perspectives 2. Curiosity (EA): 4.4.2 Open to different or surprising answers: observing without judgment and without believing that you already know the right answer 3. Curiosity (EA): 4.4.3 Confronts one's emotions and doubts when faced with the unexpected 4. Aggregation (ST): 3.3.1 Uses many sources of information and research to gain awareness and knowledge about the technical issues 5. Aggregation (ST): 3.3.2 Makes connections between multiple sources 6. Aggregation (ST): 3.3.3 Models a system
Mission 2 – Understanding the community and individuals who will be impacted by the project employing human-centered design methodologies. 1. Analysis (ST): 3.2.1 Uses structured analysis 2. Teamwork (DC): 2.2.2 Creates an effective team 3. Empathy (EA): 4.2.1 Treats other people with respect 4. Courage (CV): 1.4.2 Engages in respectful dialogue with people who may view and understand the world in a different way and who may be resistant to change 5. Leadership (EA): 4.1.1 Responsibility 6. Leadership (EA): 4.1.2 Leader-Follower relationship
Mission 3 – This is our problem! Your team's mission is to identify the main problem that you want to solve in your community. 1. Problem Solving (ST): 3.1.1 Takes on unfamiliar problems 2. Teamwork (DC): 2.2.1 Collaborates and works on teams with a diversity of views to resolve conflict and solve problems 3. Communication (DC): 2.1.1 Listens actively and empathetically to other people; not only to be attentive but to truly understand what they are expressing 4. Critical Reflection (ST): 3.4.1 Critical reflection 5. Courage (CV): 1.4.3 Not afraid to dig beneath the surface to explore problems and possible solutions: more important to learn than to prove you are smart all the time 6. Leadership (EA): 4.1.3 Handles challenges for which there is currently no solution
Mission 4 – Imagine! Creativity is thinking up new things. Innovation is doing new things. Get out and imagine a new world! 1. Vision (CV): 1.3.2 Sees opportunity where others see failure and inspires others to do likewise 2. Imagination (CV): 1.1.1 Produces original and novel ideas through the willingness to take risks and try something different 3. Imagination (CV): 1.1.2 Views familiar things in a different light 4. Imagination (CV): 1.1.3 Dreams of creative ways to resolve a conflict or problem and initiates forward-looking solutions 5. Networking (DC): 2.3.2 Makes new contacts and connections with a variety of people 6. Networking (DC): 2.3.3 Seeks and offers advice as needed

Table 5: Project-based structure (continued)

Mission 5 – Communicate. We must realize we are all different in the way we see the world, craft your message with this in mind. 1. Communication (DC): 2.1.2 Seeks understanding by presenting ideas in a thoughtful and assertive way 2. Communication (DC): 2.1.3 Reasons persuasively by clearly expressing and supporting a position so that other people can understand 3. Transformation (EA): 4.3.2 Proactive in the local community 4. Problem Solving (ST): 3.1.2 Analyzes the system 5. Generosity of Spirit (DC): 2.4.1 Nurtures relationships and considers the intentions and purpose of other people's comments and actions 6. Generosity of Spirit (DC): 2.4.2 Shares resources and information freely
Mission 6 – Revisiting how the problem affects the community. 1. Ideation (CV): 1.2.1 Generates lots of new ideas and a variety of innovative alternatives 2. Analysis (ST): 3.2.2 Ensures that the people affected are central to understanding the problem and solution 3. Ideation (CV): 1.2.2 Shows flexibility of mind by exploring ideas in a diversity of ways 4. Ideation (CV): 1.2.3 Deals well with complex and nuanced ideas as an integrative thinker 5. Generosity of Spirit (DC): 2.4.3 Advocates for and actively collaborates with other agents 6. Transformation (EA): 4.3.3 Inhabits a growth mindset
Mission 7 – Understanding the interdependencies of problem and solution. 1. Problem Solving (ST): 3.1.3 Experiments with potential solutions 2. Vision (CV): 1.3.1 Sees the bigger picture and is oriented to a "true north"– even if everyone else does not see it 3. Vision (CV): 1.3.3 Motivated to move a concept to reality; goal oriented, not enough to come up with an idea but is compelled to bring it to life 4. Critical Reflection (ST): 3.4.2 Task-oriented reflection 5. Critical Reflection (ST): 3.4.3 Means of reflection 6. Analysis (ST): 3.2.3 Tackles the problem and considers possible consequences of alternative plans and actions
Mission 8 – Engaging the community through effective communication. 1. Courage (CV): 1.4.1 Has the courage to build consensus that challenges the status quo to address social causes 2. Teamwork (DC): 2.2.3 Gets things done by working with others 3. Empathy (EA): 4.2.3 Nurtures a sense of inclusiveness and belonging to a shared cause 4. Transformation (EA): 4.3.1 Inspires and motivates other people to take action 5. Empathy (EA): 4.2.2 Is passionate about making a difference 6. Networking (DC): 2.3.1 Assesses other people's ideas constructively

Evidence of Activity Accomplishment

The activities were designed to both illustrate the specific skill with which they are associated and to reflect the mission in which they occur, such that the activity not only captures the objective of the mission in relation to building the final project or Evokation, but also builds on prior activities and associated skills. Thus, the SIF is intentionally designed so that the output, or content produced, during the activity (called 'evidence' in Evoke) demonstrates the accomplishment of the activity (action) that represents a particular skill. The evidence itself can take on various forms including text, photos, videos, and audio files.

Once evidence is submitted, it is immediately shared with the entire network. Both peer agents and expert mentors are incentivized through game mechanics (see Evocoin below) to review each evidence based on the rubric and also provide additional comments to support and strengthen the evidence provided. Evocoin are provided to both peers and mentors based on both the rubric assessment (1 Evocoin) and a unique comment provided to the player (4 Evocoin). Evocoin is then used during the course of the game to purchase real-world rewards to support the development of Evokations—such as travel vouchers to visit communities or cell phone minutes to engage over a mobile device. Evocoin are then also used at the end of the 8 missions to vote or "invest" in the best Evokations.

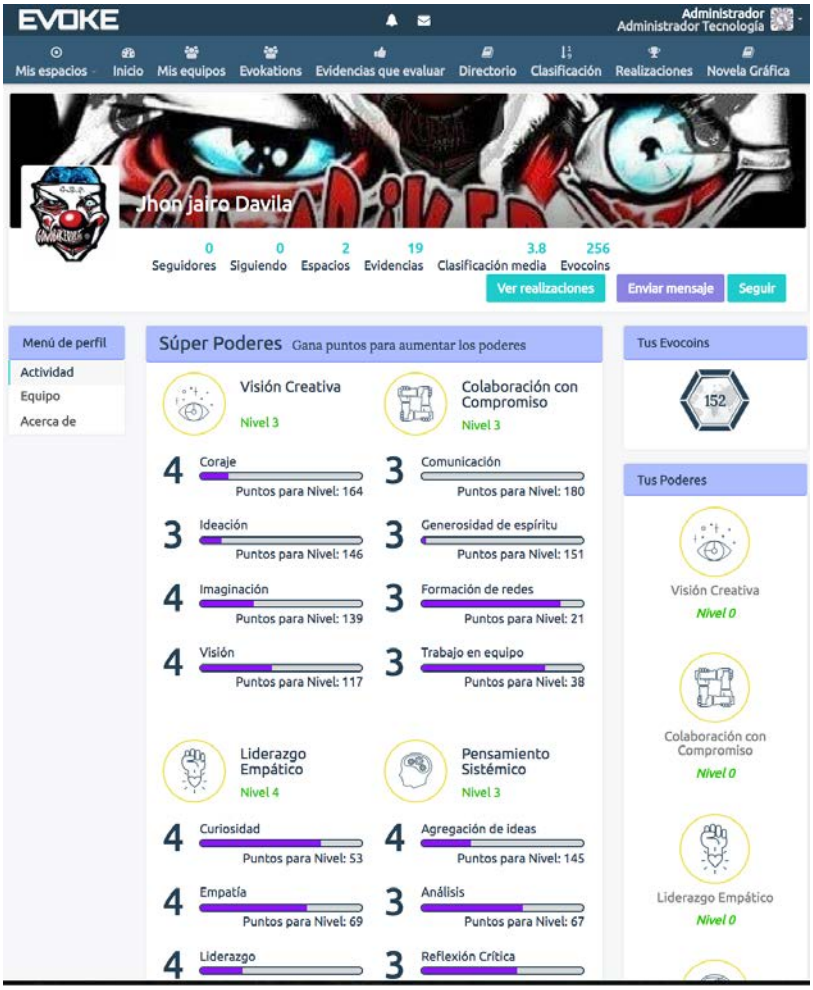

figure 7. *Example of Rubric and evidence Review*

In Appendix F, we provide an example of evidence that was submitted in Evoke.

The Final Project

The output of each of the above activities is then aggregated into the final project or Evokation design. Each unique evidence is associated with one of the key areas of the final Evokation: Understanding the Community; Defining the Problem; Your World Changing Idea (the solution); and Communicating your Vision. An additional section relates to activities involving the entire team. Each activity therefore creates unique content which is used to build a team project. So along with having a skill orientation, each of the 48 activities organized within the 8 missions also has an orientation to the final Evokation. Therefore, for each mission, the team will review all of the evidence submitted, review how it fits into their Evokation, and progressively develop their world-changing idea during the course of the 8 missions.

In Appendix G, we provide the Evokation Template.

Assessment and Rewards

The final challenge in developing a framework is to determine whether students have acquired the various skills and competencies that are deemed important. This is accomplished largely by drawing inferences from students' actions. Therefore, the subsequent step is to decide what constitutes quality evidence and to establish criteria that demonstrates when quality evidence has been attained through assessment. That assessment could be an academic test, evaluation of interaction with an educational game or other learning material, and/or through feedback from real-world actions.

Assessment is context dependent. Gee maintained that people never just read or think in general (Gee, 2007). These are social accomplishments linked to social groups and therefore reading or sense-making in any content domain is always situated within specific contexts, that have specific progressions of skills, patterns of representation and error, and ways to measure growth. In the Evoke context, players are given points as they realize actions in the game platform.

This framework is designed based on the fact that high-quality assessments are multidimensional and data driven, as shown in *Table 6*. Good evaluations provide a "360 degree" view and include different types of assessments: expert assessment (rubrics for mentors and teachers), computer-based scoring (technical artifacts, data collection, and instrumentation), self-assessment (written, video, or oral), psychometric testing (using validated and reliable instruments), and algorithmic (combining and weighing all of the other assessments). Different types of assessments lend themselves to measuring different dimensions of competency. It is also important to structure the assessment (and rewards) so that it recognizes both individual and collaborative team achievements. The precise method is determined by the specific context.

Table 6: *Assessment Types*

	Skills	**Knowledge Domain Specific**	**Attitudes & Perceptions**	**Actions**
Assessment Types	Peer Teacher (Expert) Mentor Computer Algorithmic Paper-Pencil or Digital Test	Peer Teacher (Expert) Mentor Computer Algorithmic Paper-Pencil or Digital Test	Self-Reflection Psychometrics Situational Judgement (Scenario-Based) Game-Based Paper-Pencil or Digital Test	Self-Reflection on Community (Field) Work Final Project Game-Based

In Evoke, the assessment is a combination of peer review of evidence, mentor review of evidence, expert (teacher) review of evidence, submission of an initial psychometric questionnaire, and computer measures. A unique rubric is provided to reviewers for each skill associated with the specific activity designed for that skill (*Figure 4* shows an example of a basic rubric). The initial psychometric survey is intended to be short and fun. It was tested in Colombia for use in the current pilot. Its purpose is to reveal specific tendencies and to identify strengths

of the students (e.g., creative, empathetic, collaborative, etc.) in order that all students who embark on the Evoke journey feel good about themselves and understand that they already have specials powers to draw upon at the start, which are meaningful and respected. Together, these measures provide players with their overall skill progression across the 4 qualities of Creative Visionary, Deep Collaborator, Systems Thinker, and Empathetic Activist. Badges (and recognition on the leaderboard) are provided to those players who demonstrate the cluster of skills associated with the four main social innovator qualities. A team assessment is then also done for the final project or Evokation in which the entire community evaluates and votes on all Evokations to determine the top 10, which then move to an expert review phase to award and recognize the top three Evokations.

The final step in the process is to ensure that the reward structure is consistent with the elements in the Social Innovators' Framework and the assessment process outlined above. Since we started with a clear vision of learning outcomes (developing social innovator qualities), we were able to design a system that incentivizes and rewards students both during the game or learning experience (e.g., game points [XP], Evocoin, seed funding) and provides opportunities that can endure beyond the particular learning experiences (e.g., badges, credentials, support for growth of social innovation idea and plan developed within the game). Again, these are context dependent. In the Evoke context, points for each skill are given to players as they realize actions on the platform and receive peer, mentor, and expert assessment. When a point threshold is reached in a cluster of skills, the player is awarded a badge for the associated. Moreover, the final team project or Evokation is assessed and provided recognition at the end of the 8 missions.

Table 7: *Rewards and Assessment Types*

	'In-Game' XP & Evocoin, Leaderboards	**Seed Funding**
Assessment Types	Peer Teacher/Expert Mentor Computer	Peer Teacher/Expert Mentor Project-specific criteria

In addition to in-game measurement and assessment, we are currently evaluating the Evoke project in a university in Colombia in order to test the impact that Evoke has on developing students' social innovator skills and competencies, as described above. Also, in the Colombian pilot, we are looking at changes in students' attitudes related to how they feel about their role in bringing about more peaceful future. We are conducting a quasi-experimental study with a treatment and control group, using pre-post tests and a host of additional measures including the final project or Evokation evaluation and computer-generated statistics. We will share the results of this experiment in Part Two of this series.

4. Conclusion

The Social Innovators' Framework stems from our belief that all youth have the potential to be social innovators, and that innovators succeed due to their knowledge, skills, attitudes, perceptions, actions, and persistent energy. Moreover, the positive impact that individuals can have is deepened though collaboration, dialogue, experimentation, reflection, and learning with others, both within one's own team and organization, and with distributed social networks, communities, or social justice movements. In a world of increasing complexity, this cycle of critical questioning, experimenting, action, and reflection must be continuous and requires deep practice and learning throughout one's life.

The SIF is a unique tool designed for young people who are asking themselves: How can I change the world for the better? What is my life project and how can I craft it? Inherent in these questions is the imperative that what students learn is relevant, empowering, and engaging. What are the skills and knowledge that they need to develop their world-changing ideas? What are the types of pedagogies and curriculum that enable youth to deal with a dynamic present while preparing for an unknown future in which they can shape their lives and make a positive impact on the world? These are the questions that the World Bank project Evoke has tried to answer.

In this paper, we established the theoretical foundation and critical connections between developing the 21st century and socio-emotional skills of young potential social innovators: the creation of social innovations, the bringing forth of social change, and the associated implications on educational content and pedagogy. This link is imperative because the aim of the SIF—a framework central to the World Bank Evoke project—is to equip young people with the skills and mindset necessary to make an impact on the world and a belief that, as agents of change, they can help find solutions to the world's most complex grand challenges.

Through a comprehensive curriculum and rigorous pedagogy, the Social Innovator Framework prepares students to become Creative Visionaries, Deep Collaborators, Systems Thinkers, and Empathetic Activists and to look at the world with an open mind and an open heart. It is our hope that it empowers youth to innovate, collaborate, experiment, and create solutions to our world's most intractable problems, to find their passions, and create their own life story.

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Appendix A:
Social Innovator Badge: Creative Visionary (Quality #1)

Powers	Skills	Skills Definitions	Examples & Ways to Make Concrete
Power #1 ***Imagination***	Applies the Imagination [1.1] *(Imagines a new and better world)*	Produces original and novel ideas through the willingness to take risks and try something different [1.1.1]	• Engages in thought experiments to imaginatively speculate (plays with ideas) • Tinkers and makes things • Employs lateral thinking to explore taken for granted assumptions
		Views familiar things in a different light [1.1.2]	• Challenges ingrained assumptions • Reframes old problems, considering people's feeling and reactions • Conceives of different purposes for existing tools
		Dreams of creative ways to resolve a conflict or problem and initiates forward-looking solutions [1.1.3]	• Tells stories • Learns experientially through small games or scenarios (e.g., Prisoner's Dilemma) • Talks with people from different cultures, backgrounds, etc.
Power #2 ***Ideation***	Commands the World of Ideas [1.2] *(Sparks lots of new ideas and reshapes existing ideas)*	Generates lots of new and original ideas and a variety of innovative alternatives [1.2.1]	• Brainstorms ideas • Uses mind maps • Visits somewhere different or new (documents/shares lessons learned)
		Shows flexibility of mind by exploring ideas in a diversity of ways [1.2.2]	• Investigates different aspects or layers of issues • Draws ideas from multiple domains • Explores ideas through research, field visits, conversation
		Deals well with complex and nuanced ideas, showing fluency as an integrative thinker [1.2.3]	• Simplifies complex or abstract ideas • Synthesizes a range of ideas • Elaborates or develops existing ideas

Powers	Skills	Skills Definitions	Examples & Ways to Make Concrete
Power #3 ***Vision***	Displays Clarity of Vision [1.3] *(Envisions the future and is driven to move a concept to reality)*	Sees the bigger picture and is oriented to a "true north" – even if everyone else does not see it too [1.3.1]	• Finds/marshals resources to move forward • Outlines or writes a business plan or canvass • Seeks evidence of a right path
		Sees opportunity where others see failure and inspires others to do so too [1.3.2]	• Keeps trying if it doesn't work • Identifies potential in every person • Identifies potential in every situation
		Motivated to move a concept to reality; goal oriented, not enough to come up with an idea but is compelled to bring it to life [1.3.3]	• Begins exploring and working toward a solution – one problem at a time • Creates concrete artifacts (visualizations, hands on models, narrative use cases) • Develops a prototype or mock-up
Power #4 ***Courage***	Engages to Create Change [1.4] *(Ventures into the unknown)*	Has the courage to build consensus that challenges the status quo to address social causes [1.4.1]	• Just begins even if the path looks long, scary, or obscured – and finds other like-minded people to share in the journey • Presents ideas for others to build on, even if they are not perfect • Asks for help to achieve goals, knowing it is a collective effort
		Tolerance for ambiguity and uncertainty [1.4.2]	• Not afraid to dig beneath the surface to explore problems and possible solutions; not too quick to put things in neat boxes • Stretches beyond what one already knows: more important to learn than to prove you are smart all the time (documents/shares this learning) • Recognizes negative emotions and doubts but confronts them when faced with the unexpected
		Engages in respectful dialogue with people who may view and understand the world in a different way and who may be resistant to change [1.4.3]	• Stands up for what is right and just, even if is unpopular • Speaks one's mind assertively but without being rude or aggressive • Exhibits patience in oneself and patience with others

Appendix B:
Social Innovator Badge: Deep Collaborator (Quality #2)

Powers	Skills	Skills Definitions	Examples & Ways to Make Concrete
Power 5 ***Communication***	Communicates clearly [2.1] *(Presents ideas in a compelling way)*	Listens actively and empathetically to other people; not only to be attentive but to truly understand what they are expressing [2.1.1]	• Paraphrases to check for understanding • Summarizes to show understanding of another person's perspective, but not prematurely • Asks why: asks about a particular aspect of an idea that may need further explanation or the person's reasoning or emotion
		Seeks understanding by presenting ideas in a thoughtful and assertive way [2.1.2]	• Prepares and tests ideas to see what message resonates • Shows assertiveness—expresses interests, etc. in a clear and empathetic way—respecting cultural differences • Uses aids or scaffolds (pictures, graphic maps, video, blogs)
		Reasons persuasively by clearly expressing and supporting a position so that other people can understand [2.1.3]	• Formulates an argument (key points, structure, level of detail) • Contextualizes an idea to the audience and the situation (local vs. global) • Responds thoughtfully to questions posed (explaining, justifying, re-assessing)
Power 6 ***Teamwork***	Participates actively in diverse teams [2.2] *(Gets things done by collaborating with people with diverse views and backgrounds)*	Collaborates and works on teams with a diversity of views to resolve conflict and solve problems [2.2.1]	• Responds to posts and questions from a variety of people (different gender, ethnicity, academic discipline, age) • Works on projects with people locally (same class) and remotely • Works with people with differential power (engages with community members, government officials, etc.)
		Creates trust as part of an effective team [2.2.2]	• Builds trust in one another's commitment to a shared goal (follows through with one's commitment) • Agrees roles, maximizing the strength of team members, and drawing out the relationships and chemistry that makes them effective • Formulates processes, expectations, leadership and decision-making structures that enable open communication and trust
		2.2.3 Gets things done by actively working with others	• Respects participation of all team members and recognizes that each person is essential (no single member dominates and no member expects a 'free ride') • Co-constructs meaning and creates artifacts (scrapbook or canvas to share photos, resources, ideas) • Creates workable real-world solutions, as evidenced

Powers	Skills	Skills Definitions	Examples & Ways to Make Concrete
Power 7 ***Networking***	Leverages the power of network resources to access new ideas and information and learn from others [2.3] *(Engages actively and respectfully)*	Makes new contacts and connections with a variety of people [2.3.1]	• Asks questions to seek a connection to another person's interests, ideas, etc. • Focuses on quality of relationships (vs. quantity) by really looking for synergy or commonality • Uses other social networks to access to ideas and information: Facebook, Twitter, etc.
		Assesses other people's ideas constructively [2.3.2]	• Thoughtfully votes on other people's posts • Provides respectful comments and feedback to other people • Reads/evaluates other people's posts/emails/blogs/logs with a view toward understanding
		Seeks and offers advice as needed [2.3.3]	• Raises thought-provoking issues and asks the network for help solving problems • Responds to other people's requests for help • Follows through on offers of help
Power 8 ***Generosity of Spirit***	Displays a Generosity of Spirit [2.4] *(Shares, collaborates, gives of oneself and one's time)*	Nurtures relationships and considers the intentions and purpose of other people's comments and actions [2.4.1]	• Shows interest in other people by asking about, and listening to, their story, their passions, etc. • Displays sensitivity for the well- being of others and takes time to think about their feelings (sending little notes of congratulations, etc.) • Uses "we" rather than "I" when talking about team projects
		Shares time, resources and information freely [2.4.2]	• Posts links, relevant articles, YouTube videos, pictures, etc. • Makes an introduction to other people • Shares one's expertise on a particular topic
		Show gratitude and support [2.4.3]	• Shows gratitude for other people's efforts, time, and actions • Takes times to work with, support and encourage even the weakest team member • Advocates for and actively collaborates with other agents

Appendix C:
Social Innovator Badge: Systems Thinker (Quality #3)

Powers	Skills	Skills Definitions	Examples & Ways to Make Concrete
Power #9 *Problem Solving*	Solves Problems [3.1] *(Questions and takes on unfamiliar problems)*	Takes on unfamiliar problems [3.1.1]	• Gains awareness of the extent of the problem and clearly defines the issue (global vs. local differences) • Clearly specifies the human dimension of the problem • Investigates the root cause of the problem (e.g., it takes multiple, varied questions [5 not 1] to get at genuine answers)
		Analyzes the system [3.1.2]	• Articulates a hypothesis about a system • Poses probing questions about parts as well as the whole of a problem • Draws out patterns in data and information
		Experiments with potential solutions [3.1.3]	• Develops criteria to know if the solution is working (metrics, outcome measures) • Experiments through trial and error and iteration • Learns from mistakes and identifies workable parameters and constraints
Power #10 *Analysis*	Understands complex problems through analysis [3.2] *(Human Centered Design and Systems Thinking)*	Uses structured analysis [3.2.1]	• Illuminates the interconnectedness of issues, actions, and solutions in the particular context by using structured analysis (e.g., Human Centered Design, Design Thinking, Systems Thinking, one's own formal process) • Explains causal reason by drawing concept maps, timelines, etc. • Describes dynamic flows and dependencies: interactions
		Ensures that the people affected are central to understanding the problem and solution [3.2.2]	• Seeks to understand the motivation and needs of a range of people affected by an issue • Speaks with people affected and listens to their input throughout the process • Takes into account partnerships and stakeholders, who can help implement the solution in the community
		Tackles the problem and considers possible consequences of alternative plans and actions [3.2.3]	• Considers the effects holistically, not only on people but also on the environment, future generations, etc. • Effects change by breaking down problems into small, manageable bite-size chunks • Performs cost-benefit analysis

Powers	Skills	Skills Definitions	Examples & Ways to Make Concrete
Power #11 *Aggregation*	Connects to multiple sources [3.3] *(Connects multiple sources of information and to multiple perspectives of people)*	Uses many sources of information and research to gain awareness and knowledge about the technical issues [3.3.1]	• Uses third-party research (publicly-available data, web search, classwork, etc.) and first-hand research (conversations, surveys) • Learns from experts and mentors in the field • Investigates the accuracy of sources
		Makes connections between multiple sources [3.3.2]	• Connects the dots between different academic disciplines and cross- pollination of ideas (e.g., music and text, engineering and education) • Makes connections between research (knowledge) and experience • Remixes (mash-up) ideas, media (multimodal), etc.
		Models a system [3.3.3]	• Visualizes the system (visualization via concept maps, causal maps) • Draws feedback loops • Evaluates prototypes through cycles of abstraction (generating ideas, reflecting) and concrete (hands on)
Power #12 *Critical Reflection*	Reflects critically to build self-awareness [3.4] *(Questions, analyzes, and reconsiders ideas)*	Critical reflection [3.4.1]	• Sets aside time to reflect honestly on one's own actions, priorities, biases, decisions, and emotions • Sets aside time to reflect on how others perceive one's actions, etc. • Reassesses ideas and views in light of new evidence
		Task-oriented reflection [3.4.2]	• Reflects individually on experience and lessons learned • Debriefs as a group, reflection on what went well and what can be improved • Reflects on decisions: considers how the individual or team could have acted differently if they can redo their work
		Means of reflection [3.4.3]	• Writes in private journal • Posts reflective thoughts (blog, shared spaces, through art, etc. • Peer or expert review

Appendix D:
Social Innovator Badge: Empathetic Activist (Quality #4)

Powers	Skills	Skills Definitions	Examples & Ways to Make Concrete
Power #13 ***Leadership***	Brings about positive social change as leader of an interactive and interdependent team [4.1] *(Leads the team to accomplish goals)*	Responsibility [4.1.1]	• Binds the team together, exuding competence, inspiring trust and infused with concerns for the morality of their goals and what they do and hope to achieve • Orients the team toward a common purpose through shared understanding (e.g., shares updates regularly, organizes meeting, post new links, articles, videos) • Sustains the commitment to reach the project goals through leading by example
		Leader-Follower relationship [4.1.2]	• Leadership assumes a group/team and the team is willing to engage and work together (power "with" not "over" the team) • Provides engaging "identity stories" or narratives (frames the situation, provides a roadmap) to unite the team and push past the complexity • Recognizes that leadership is situational and needs to be contextualized
		Handles challenges for which there are currently no solutions [4.1.3]	• Adapts to deal with complex challenges through experimentation and iteration • Takes into account the human dimension of problems and solutions • Provides consistency despite disruption or unexpected challenges or changes
Power #14 ***Empathy***	Empathy [4.2] *(Walks in others' shoes)*	Treats other people with respect [4.2.1]	• Is interested in other people; looking for commonalities and shared values; sets aside preconceptions – even among those who may be viewed as "adversaries" • Puts one's self in another's place through experience (e.g., attends a meeting or event that one wouldn't ordinarily attend or be exposed to) • Creates an empathetic bond by opening up and sharing one's own vulnerabilities to another person (e.g., being the first to share emotions or personal stories)
		Tries to understand other people's perspectives [4.2.2]	• Listens closely without judgement • Recognizes what others are feeling • Works with others to deal with what they are feeling
		Nurtures a sense of inclusiveness and belonging to a shared cause through shared understanding [4.2.3]	• Asks a thoughtful and thought- provoking question to open deeper conversation and sharing • Creates a safe environment in which the team trusts one another and can communicate openly • Engages with others and helps them feel good about what they are doing (e.g., notices something different and compliments a person, sends happy emoticons)

Powers	Skills	Skills Definitions	Examples & Ways to Make Concrete
Power #15 ***Transformation***	Engages to create change in the community [4.3] (Builds inclusive, collaborative networks to address social issues)	Inspires and motivates other people to take action [4.3.1]	• Displays one's own aspirations and shows a visible commitment to making them happen – and it matters that the problem is solved • Is an active member of the team/network, makes contributions, asks questions, gives and receives support from other team members • Tells compelling stories, painting a picture of what things could be like
		Proactive in the local community [4.3.2]	• Makes connections between global/national and local issues • Builds consensus among people in the community to support change • Helps build a supportive and non- coercive network to address community issues
		4.3.3 Inhabits a growth mindset [4.3.3]	• Embraces challenges: tries something new – even just a small first step • Learns from feedback and criticism • Assists others to take small steps and move forward even if they believe their own character or events are fixed or immutable
Power #16 ***Curiosity***	Shows intense curiosity and motivated to seek new knowledge and experience and embrace the novel and uncertain [4.4] *(Curious as to how the world works)*	Embraces different experiences and able to cope with novel situations that are different than expected [4.4.1]	• Seeks out new information and ideas (documents/shares this learning), without believing that you already know the right answer • Puts oneself in another's place (shadows a person for a while) and observes without judgement • Continues exploration despite anxiety, discomfort, or distress
		Asks questions that seek to understand other people's perspectives and context [4.4.2]	• Is intrigued and asks open-ended questions: what, where, when, how • Speaks with different people and comfortable not knowing where the conversation may lead • Receptive to new experiences, in different contexts, without predetermining the outcome
		4.4.3 Stretches beyond one's current capabilities [4.4.3]	• Immerses one's self in the idea, context, etc. • Sets goals to push one's self toward further understanding • Seeks personal growth

Appendix E:
Social Innovator Badge: Cross-cutting qualities

Powers	Skills	Skills Definitions	Examples & Ways to Make Concrete
Power #17 ***Grit***	Persistence and relentless spirit [CC] *(Never gives up. Stays with an issue, a team, or a mission to the very end)*	Shows persistence and works relentlessly to stay with an issue and meets project goals (individual) [CC1]	• Sustains an effort and focus in the project over time (effort stamina) • Sustains an interest and follows through with actions even if they don't seem to be leading in a straight line (interest stamina) • Sticks with the meaningful challenges that one begins, while showing flexibility to respond to developments
		Commits to deep practice [CC2]	• Sees setbacks as a motivator to dig in deeper, work harder, and try again, working through cycles of practice and challenge • Seeks feedback and uses it constructively • Has self-efficacy and believes that by working hard will find a way to achieve goals
		Never gives up and works with other people to reimagine a better world (collaborative) [CC3]	• Energetically and passionately works with other agents to surpass the uncertainty and difficult stages of a project and show how positive change can happen (e.g., shares updates regularly, organizes meeting, post new links, articles, videos) • Stays optimistic and works with others to sustain effort and interest, keeping an eye on the future and end goals • Remains passionate about how these sustained and consistent efforts can change the world for the better

Appendix F:
Example of a student submission of Evoke evidence

Explore your World: Global or Local

When Evokes on forced displacement in Colombia increased, we convened a meeting in which we asked how from one day to the next, against their will, people are forced from their homes and communities by individuals or armed groups. It is a global problem, as we continue to get a large number of Evokes from countries such as Honduras, Syria and Nigeria.

Agent, help us understand this global challenge. What do you know about forced displacement or human trafficking? Why do people voluntarily or forcibly move from their homes, their communities? Find articles or websites that talk about global challenges, think about how these challenges might be related to your own community, town or country. Then, share with the network.

Example of a Student's Evidence for this Activity:

21 million living in Slavery

- Living in Washington DC, I do not see slavery. I had assumed it had been eradicated more than 150 years ago with the emancipation proclamation. But I was wrong. Slavery exists. It exists in my own back yard
    - https://www.washingtonpost.com/opinions/sex-slavery-isnt-just-a-problem-overseas/2016/01/15/bc3acb04-badd-11e5-829c-26ffb874a18d_story.html?utm_term=.2ff7c61ef527
- The face of evil that Marta saw is real. As quoted in this article "Victims, particularly child victims, can be kidnapped into slavery, and extremely poor families may sell their children to labor or sex exploiters to make ends meet. This is called "survival sex."
    - http://www.heatwatch.org/human_trafficking/how_human_trafficking_happens.
- Washington DC is not the only place this occurs. Atlanta and Miami are hotbeds for human trafficking and human trafficking is the fastest growing criminal enterprise
    - https://oag.ca.gov/human-trafficking
- Slavery not only exits in this world, it is worse. "In the Asia-Pacific region where most of the world's forced laborers come from at 56%, an estimated 11.7 million people, followed by Africa at 18% or 3.7 million people live in bondage. Considering that at the peak of America's slavery prior to the Civil War that ultimately declared it illegal, the total was four million people, fathoming that over five times that number are currently suffering in slavery here in the twenty-first century, casts some serious doubts on whether us humans are evolving as a species at all."
    - http://www.globalresearch.ca/global-human-trafficking-a-modern-form-of-slavery/5377853.

What can we as agents do? This will be our objective to learn about actions we can take to ensure that the emancipation proclamation is as relevant today as during the civil war!

Appendix G:
Example of an Evokation template

<The Evokation Name>
<Evokation Symbol, Logo, or Slogan>

The Team
Roles and Responsibilities: <describe the key role and responsibility of each team member>

The Community
Global Connections: <Describe how the global problem is connected to your community>
Community Challenges: <Describe the particular challenges faced by the community you wish to impact>
Community Profile: <Describe the person or persons you most want to help>

The Problem
Problem Statement: <a clear statement of the problem that the team plans to address including constraints and possibilities>
Global Connections: <describe how the problem connects to the global grand challenge>
Community Challenge Link: <describe how the problem addresses community challenges>

Your World Changing Idea
Vision: <describe your vision of a better world>
Solution: <describe the solution>
Your Prototype: <share a prototype of your idea -- this could include a drawing of your idea, a mock up, a graphic, or a picture of what you have imagined**>**
Overcoming Constraints: <identify challenges or risks and how you will overcome them>
Solution Metrics: <describe how you will measure success. Don't forget the human dimensions such as inclusion and voice>
Solution Execution: <describe the first three steps you need to take to put your idea into action>
Resource Needs and Funding Strategies: <describe the top 5 areas where you need resources and resources needed to execute 6 months of your Evokation>

Communicate your vision
Your one sentence idea: <your idea in one sentence>
Elevator Pitch: <link to video containing the problem, your solution, who you will impact and how you will measure that impact>
Your Network: <list of those key partners and mentors who will help you with your idea>
References: <all of the relevant sites and references that you found including any photos you wish to include>

Appendix H:
Example of an EVOKE graphic novel:
Human Trafficking and Displaced Person Grand Challenge

World Bank Education, Technology & Innovation: SABER-ICT Technical Paper Series

[1] *SABER-ICT Framework Paper for Policy Analysis: Documenting national educational technology policies around the world and their evolution over ti*me (Michael Trucano)

[2] *Building and sustaining national ICT/education agencies: Lessons from international* experiences (Michael Trucano & Gavin Dykes)

[3] *Building and sustaining national ICT/education agencies: Lessons from Korea (KERIS)* (Youngsun Kwon & Sanghyun Jang)

[4] *Building and sustaining national ICT/education agencies: Lessons from Malaysia (Smart Schools*) (Molly N.N. Lee & Soon Seng Thah)

[5] *The Role and Status of National Research and Education Networks (NRENs) in* Africa (Michael Foley)

[6] *Building and sustaining national ICT/education agencies: Lessons from England (Becta)* (Gavin Dykes)

[7] *Building and sustaining national ICT/education agencies: Lessons from Chile (Enlaces)* (Eugenio Severin)

[8] *Building and sustaining national ICT/education agencies: Lessons from Armenia (NaCET)* (Edmund Gaible and Anush Shahverdyan)

[9] *Building and sustaining national ICT/education agencies: Lessons from Uruguay (Plan Ceibal)* (Eugenio Severin)

[10] *Building and sustaining national ICT/education agencies: Lessons from Indonesia (PUSTEKKOM)* (Neil Butcher & Petra Bodrogini)

[11] *Evoke -- Developing Skills in Youth to Solve the World's Most Complex Problems: The Social Innovators' Framework* (Barbara Freeman & Robert Hawkins)

[12] *Technologies in education across the Americas: The promise and the peril – and some potential ways forward* (Michael Trucano)

[13] Building and sustaining national ICT/education agencies: Lessons from Costa Rica (The Omar Dengo Foundation) (Carla Jimenez)

[14] Building and sustaining national ICT/education agencies: Lessons from Thailand (NECTEC/Schoolnet Thailand) (Saowaruj Rattanakhamfu)

[15] Building and sustaining national ICT/education agencies: Lessons from the Philippines (Benjamin Vergel De Dios)

[16] Building and sustaining national ICT/education agencies: Lessons from Australia (EdNA) (Gerald White & Lesley Parker)

[17] ICT and the Education of Refugees: A Stocktaking of Innovative Approaches in the MENA Region. Lessons of Experience and Guiding Principles (Kent Lewis with Simon Thacker)

[18] Digital teaching and learning materials: Opportunities, options and issues (Michael Trucano)

[19] Developing Skills in Youth to Solve the World's Most Complex Problems: Contextualization, Implementation, and Experimental Research. Lessons from Evoke (Barbara Freeman & Robert Hawkins)

[20] Developing Skills in Youth to Solve the World's Most Complex Problems: Applications and Sustainability. Lessons from Evoke (Barbara Freeman & Robert Hawkins)

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