the Education Commission

Background Paper

The Learning Generation

Prizes for Innovation

Impact Analysis in the ICT for Education Sector

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Executive Summary

The use of prizes to stimulate innovation in education has dramatically increased in recent years, but, to date, no organization has attempted to critically examine the impact these prizes have had on education. This report attempts to fill this gap by conducting a landscape review of education prizes with a focus on technology innovation in developing countries. This report critically analyses the diversity of education prizes to gauge the extent to which these new funding mechanisms lead to innovative solutions in this sector. This is supplemented with interviews with sponsors and prize participants to gain the much-needed practitioner's perspective. We address important questions that pervade as prizes are being implemented in this sector: *What seems to be working and why? How do prizes compare to other funding mechanisms to stimulate technology innovations? How is sustainability achieved? What can be learned that can inform the design of future prizes?*

We structure our recommendations along the Doblin framework, which entails analyzing the design of prizes along the criteria of Resources (sponsorships & partnerships), Structure (types of prizes, eligibility criteria, scope, types of ICT projects, phases, & intellectual property rights), Motivators (monetary & non-monetary Incentives, Communications (marketing), and, Evaluation (measuring impact and long-term sustainability). Through this process, a number of important assumptions are re-examined, namely, that technology innovation is central to educational reform, prizes stimulate innovation, scalability is a proxy for sustainability, and prizes are the most efficient funding mechanism to stimulate innovation. We recalibrate expectations of technology innovation prizes in the educational field against empirical evidence. We reveal key trends through the deploying of prizes in this field and offer case studies as good practices for sponsors to consider when designing future prizes. The report makes recommendations along each of the given criteria to enhance the impact of prizes, drawing from interdisciplinary sources. The intent of this report is to enable sponsors to distinguish the hype surrounding these prizes and proceed to design prizes that can best serve the education sector.

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Introduction

There is no shortage of enthusiasm for prizes to foster innovation. If we go by the media, "incentive prizes do spur innovation" (The Economist, 2010). Peter Diamandis, the founder of the XPRIZE Foundation is convinced that, "focused and talented teams in pursuit of a prize and acclaim can change the world." This kind of thinking has been infectious, as witnessed in the exponential rise in the usage of prizes as a way to stimulate innovation across all sectors, including education, the focus of the report.

Prizes, given their inherently competitive, market-oriented and result-driven nature are seen as a natural choice for funding innovation and scaling solutions across global contexts. This comes at a time where technology innovation has taken centre stage in policy for sustainable practice (Blok & Lemmens, 2015). The United Nations General Assembly adopted the 2030 Agenda for Sustainable Development, namely, the 'Sustainable Development Goals' (SDGs), where they emphasize,

The spread of information and communications technology and global interconnectedness has great potential to accelerate human progress, to bridge the digital divide and to develop knowledge societies, as does scientific and technological innovation across areas as diverse as medicine and energy. (Recital 15, 2015)

When it comes to financing and implementing the development agenda, global policies have endorsed the 'multi-stakeholder approach,' which means that the public as well as the private sector and civil society should be involved for long-term impact. In recent years, this proposition has been recast as 'Responsible Innovation,' in the Horizon 2020 framework program for research and innovation in the European Union. In response to the 'grand challenges' of contemporary society, responsible innovation serves as a, "transparent, interactive process by which societal actors and innovators become mutually responsive to each other with a view to the (ethical) acceptability, sustainability and societal desirability of the innovation process and its marketable products (in order to allow a proper embedding of scientific and technological advances in our society)" (Von Schomberg, 2013, p. 19).

Given this socio-political climate, it is not surprising that there is an acceleration in the use of prizes to facilitate technology innovation within the education sector. The marketization of education has gained serious strides, as it is viewed as the most efficient path to creating systemic reform. However, these ambitions and expectations are poorly matched with research that can validate such claims. *For all this enthusiasm towards prizes, there are no studies to date that assesses the range of technology innovation prizes offered and the nature of their impact in the field of education*. Hence, this report embarks on a first of a kind critical review of prizes in the ICTs in Education sector, with a special focus on developing countries. After all, there is high expectation that technology innovation in marginalized contexts can have far more sweeping reforms given their potential to leapfrog chronic barriers to access and quality education.

It is well worth keeping in mind that this major push for technology innovation in the education sector is really about a decade old (Lepore, 2014). While there is much research on innovation and disruption, much of this stems from the business sector, with clearly

different values, objectives and degrees of accountability as compared to the public education system. So, how do we define the role of technology innovation in the educational context? To measure the impact of prizes on innovation, we need benchmarks. The Organization for Economic Cooperation and Development (OECD, 2014) defines innovation in education by framing it as new products and practices "within classrooms and educational organisations, how teachers develop and use their pedagogical resources, and to what extent change can be linked to improvements that provide a substantial increase in the international education knowledge base."

To proceed with this investigation, the report analyzes the design of prizes using the Doblin framework, which entails the following criteria: 1.) Resources (sponsorships & partnerships), 2.) Structure (types of prizes, eligibility criteria, scope, types of ICT projects, phases, & intellectual property rights) 3.) Motivators (monetary & non-monetary Incentives, 4.) Communications (marketing), and, 5.) Evaluation (measuring impact and long-term sustainability).

Through this synthesis and critique, we examine a number of important assumptions, namely: technology innovation is central to educational reform; prizes stimulate innovation; scalability is a proxy for sustainability; and prizes are the most efficient funding mechanism. In weighing these assumptions against empirical evidence, this report recalibrates the expectations around the impact of prizes on education. We propose concrete recommendations along each of the given criteria to enhance the impact of prizes, building on research from interdisciplinary sources. This report enables sponsors to distinguish the hype surrounding these prizes against consolidated evidence from the field.

'Impact' here is not autonomous, absolute or decontextualized. Impact is defined in relation to fulfilling key policy benchmarks, promoting best practices using ICTs for education, and overcoming contemporary challenges highlighted by experts in the field of education and technology innovation. Hence, studies from wide-ranging disciplines and areas concerning intellectual property rights, technology innovation, international policy, and education reform contribute to the shaping of recommendations in this report. Furthermore, interviews with sponsors and participants substantively enhance our arguments, giving the much-needed practitioner's perspective to this timely and under-examined topic. We address important questions that pervade as prizes are being implemented: *What seems to be working and why? How do prizes compare to other funding mechanisms to stimulate technology innovations? How is sustainability achieved? What can be learned that can inform the design of future prizes?* The bottom line here is to address what sponsors, policymakers and other stakeholders need to know as they design and implement prizes to foster innovation using ICTs for educational equity.

PART I

Overview of Prizes

This section provides a brief historical overview of the use of prizes for innovation followed by a critical synthesis of the current use of prizes in general and within education in particular. We analyze the contemporary ICTs in education prize landscape using a

framework by Doblin, the innovation practice of Deloitte Consulting (2014). The core elements of the 'architecture of prizes' are resources, evaluation, motivators, structure, and communications. Through this review, we reveal key trends through the deploying of prizes in this field. We offer a number of case studies as good practices for sponsors to consider when designing future prizes. Lastly, we enhance our analysis with insights from sponsors and applicants for these prizes. This critique of prizes re-examines assumptions and provides the foundation for our recommendations.

The Renaissance of Prizes

The use of prizes for innovation has been undergoing a renaissance in recent years (Adler, 2011; McKinsey & Company, 2009; Rourke, 2010). There is a need to talk about a renewed rather than new interest in prizes because their use dates back hundreds of years. Throughout the eighteenth and nineteenth centuries as well as the former half of the 20th century, the public and private sector commonly used prizes to spur innovation (Kay, 2011; Tong & Lakhani, 2012). One example is the Royal Agricultural Society of England (RASE), which for a decade (1839-1939) awarded innovation prizes at their annual show (Brunt, Lerner, & Nicholas, 2012). Successful and frequently cited case studies of historical prize-based innovations include the Longitude Prize (1714), Napoleon Bonaparte's (1800) food preservation prize, and the Orteig Prize (1927) for the first non-stop flight between New York and Paris (McKinsey & Company; Nesta & the Centre for Challenge Prizes, 2014; Rourke, 2010). These prizes commonly serve as empirical justification of their use for innovation.

Despite the popularity of innovation prizes, the public sector increasingly moved to other innovation polices such as ex ante grants and procurements in the latter half of the 20th century (Nesta & the Centre for Challenge Prizes, 2014). Prizes did not disappear, but their use became increasingly linked to the private sector. In recent years, there have been signs of renewed interest in innovation prizes from the public sector. For example, in 2009, the Obama Administration issued a government-wide strategy "The America COMPETES Reauthorization Act of 2010" that authorized and encouraged the use of prizes (Nesta & the Centre for Challenge Prizes, 2014; Tong & Lakhani, 2012). Similarly, since 2014, the European Commission has launched challenge prizes under the EU's research and innovation funding programme (IP/14/849) as part of the Horizon 2020 framework. In 2015, they launched six Horizon prizes worth $6 million in total and ten more prizes will be launched in 2016 focusing on energy, environment, health, social innovation, and technology (European Commission, 2016).

Today, the scope of prizes in terms of number, size, and variety is larger than ever, making it hard, if not impossible to provide a comprehensive view on the exact number of prizes and their total value (McKinsey & Company, 2009). Prizes are deployed in different sectors such as architecture, arts, aviation and outer space, business, climate, design, education, economics, energy, engineering, environment, governance and social innovation, health, humanitarianism, literature, mathematics, medicine, media, peace, science, and technology. Between 2000 and 2009, the use of prizes expanded seven-fold within science, engineering,

aviation, space, and environment whereas the arts and humanitarian sectors witnessed a decline from one-third to ten percent (McKinsey & Company, 2009).

One plausible reason for the proliferation of prizes in hard science sectors is due to the high-risk nature of their research and development (R&D) (Kay, 2011). Consequently, prizes are often associated with scientific and technological innovations. One frequently cited example is the Google Lunar XPRIZE, the largest international incentive prize of all time (US$30 million), awarded to the first teams to safely land a robot on the moon.

In recent years, there has been a growing interest among policymakers and philanthropists in using prizes to address the 'grand challenges' in health, environment, security, and education, the focus of our report. The promise of new technologies as a game changer in education has accelerated this momentum. Over the past decade, a variety of public and private organizations has initiated diverse prizes to stimulate innovation, using ICTs in education. Yet, *there are no studies to date that provide a critical review of these prizes. Hence, this report embarks on analyzing these prizes employing the "architecture of prizes" framework provided by Doblin* (Table 1).

Table 1: Framework of Analysis

1. Resources • Sponsorships • Partnerships
2. Structure • Types of Prizes • Eligibility Criteria • Scope • Types of ICT Projects • Phases • Intellectual Property Rights
3. Motivators • Monetary Incentives • Non-monetary Incentives
4. Communications • Marketing
5. Evaluation • Measuring Impact • Long-term Sustainability

Resources

Sponsorships

According to McKinsey & Company (2009), "corporations and new philanthropists have provided more than two-thirds of total prize capital since 2000 and are pursuing arenas closely linked to their commercial interests or individual philanthropic passions" (p. 18). In other words, most prizes are privately funded. In the education sector, most prizes are overseen by foundations/non-profit organizations with governmental, corporate or private

sponsors – or a mix of the three. For example, the foundation All Children Reading Grand Challenge for Development (ACRGCD) is jointly sponsored by the USAID (US Agency for International Development), the non-profit organization World Vision, and the Australian government. The dominance of such blended funding is driven by a win-win logic: donors subsidize social enterprises, with expectation of higher efficiency in generating social benefits while at the same time reducing the risk for the investors in this field (Bugg, Kogut & Kulatilaka, 2012). However, there is growing criticism of the disproportionate influence private actors have on public policy as they lobby their agendas and passions through such funding mechanisms (Reckhow & Snyder, 2014). Since private actors such as philanthropists are not subject to the same level of scrutiny as public sponsors, there is concern that short-term and political interests will supersede sustainable social good. Hence, *policy-makers need to scrutinize at regular intervals the correlation between prize capital and long-term educational agendas (outlined for example in SDGs, national educational policies etc.), to identify gaps in funding on marginalized projects and groups that do not fit the commercial agenda.*

Partnerships

Prize sponsors are increasingly forming non-funding partnerships that leverage the partners' resources including their knowledge, expertise, and networks. ACRGCD forms non-funding partnerships with a range of prize competitions. For example in the case of the EduApp4Syria prize, which is funded by the Norwegian Ministry of Foreign Affairs, the ACRGCD foundation provides technical expertise, input on prize design, communication coordination, outreach activities, and manages media relations. Liv Marte Nordhaug, Senior Advisor at the Norwegian Agency for Development Cooperation (NORAD) acknowledges the growing importance of technology companies as partners in prizes such as EduApp4Syria; "The commercial companies are more used to thinking about demand so their expertise is totally needed to see what the end user gets out of these ICT education products" (2016). However, attracting them is far from simple. Using the corporate social responsibility (CSR) hook only works if these companies can link these projects to their core business.

Prize sponsors are also increasingly partnering with crowdsourcing platforms such as InnoCentive to leverage their established global networks of millions of contributors. Everett (2011) found that the open innovation approach by InnoCentive could lead to a 48% in cost savings. This study compared the average cost of problem-solving for developing world technologies posted under the Rockefeller InnoCentive initiative (in which 10 challenges were posted via an open innovation network and 6 solved in 18 months), with the average cost of grant contracts under DFID Renewable Natural Resources Research Programme (with a typical grant being £70,000 per annum for three years). While these crowdsourcing initiatives have demonstrated financial gain over traditional forms of funding, these studies do not address issues such as digital labor exploitation. *If sponsors want to create legitimate partnerships with these new intermediaries, they need to examine labor practices closely before committing to these cost-saving mechanisms. Furthermore, we found an overarching dearth of partnerships with beneficiary countries and their governments in the prizes we analyzed. That is problematic as such partnerships can be extremely valuable to ensure sustainability of the initiatives developed during the prize.*

Structure

Types of Prizes

Prizes are classified into two overarching categories: ***incentive*** and ***recognition*** prizes (Zients, 2010). Put simply, incentive prices are designed to spur innovations that do not yet exist, are not available in the market, or that make major improvements to existing technologies, whereas recognition prizes honor past achievements. Historically, most prizes have been recognition prizes such as the Nobel Prize (McKinsey & Company, 2009). For example, before 1991, 97 per cent of the value of the 219 large prizes were recognition prizes. However, after 1991, 78 per cent of the new prizes in this database were incentive prizes. This notable shift towards incentive prizes in recent years is generally acknowledged in the literature, and a similar trend is observed in the education sector.

Out of the twenty-nine education prizes that we analyzed, seventeen (59%) are incentive prizes and twelve are recognition prizes (41%). This could be a reflection of how the whole aid industry has changed, geared towards result-based financing. The obsession with "impact" has changed the prize landscape, remarks Liv Marte Nordhaug from NORAD (2016). This is also a strategic decision to open up innovation in this sector to new actors and new ideas upfront, especially given that the technology market is beyond the core competencies of many funding agencies. Rebecca Chandler-Leege, the All Children Reading Project Director at World Vision suggests that, "it's an easier way to source what you want to source. You can always contract it out but you are not sure what you will receive in the end. And so, by doing an incentive prize, you get the product upfront, you can evaluate the product and also it's a good model to attract new problem solvers and a good way to get the message out to the public" (2016).

McKinsey & Company (2009) argues that there are at least six prize archetypes, namely *exemplar prizes, point solution prizes, exposition prizes, networking prizes, participation prizes, and market stimulation prizes.* Exemplar prizes resemble recognition prizes in the sense that they honor excellence based on achievement. Similarly, point solution prizes resemble incentive prizes albeit with a narrower focus on solving a particular, well-defined problem. While most if not all prizes can be classified as recognition or incentive prizes, the other prize types can be used to recognize certain prize features. For example, the Wise Awards, while being a recognition prize in nature, aims to build a collaborative community of laureates through the Wise Awards Network, which is a distinguishing feature of networking prizes. Another example is the Hult Prize. While being an incentive prize in nature, it may also be described as an exposition prize because it promotes not only the winner but also the other five finalists through the Clinton Global Initiative in order to facilitate further interest in, and development of, the finalist initiatives by third parties, which is a distinguishing feature of exposition prizes.

Eligibility Criteria

Prizes in the education sector tend to include typical eligibility criteria such as clear objectives for social impact, sustainability, scalability, relevance to beneficiaries, cost-effectiveness and innovativeness. Despite similar eligibility criteria, the difference between recognition and incentive prizes is that the former are based on demonstrable track records.

For example, to qualify for the Social Entrepreneur of the Year – India Award, the applicants' projects need to have been operational for at least three years and scaled to different settings. Furthermore, the applicants are required to prove financial sustainability, measurable impact, and have monitoring and evaluation plans (preferably involving third-party evaluators) in place. In contrast, prospective candidates in incentive prizes must *merely* demonstrate a potential to meet this criteria. Thus, recognition prizes are confined to existing practitioners whereas incentive prizes can also attract aspiring practitioners. The potential of incentive prizes to attract new players that would not be recipients of traditional funding mechanisms is generally considered a great advantage of incentive prizes for innovation as they come from various backgrounds and bring new perspectives. Clearly, *there is a current bias in funding aspiring entrepreneurs over experienced practitioners in the field through incentive prizes*.

Trend # 1: Prizes Engage Aspiring Social Entrepreneurs

One notable trend in prize competitions offering incentive prizes is that they aim to create the next generation of social entrepreneurs. For example, one of the stated goals of the D-Prize is to "encourage young entrepreneurs to focus their talent on the developing world, pilot new solutions to distribution problems, and launch new social ventures[1]." There are also student-focused prizes including the Hult Prize and ACRGCD's Mobiles for Reading prize. Furthermore, the Tech Awards have a special "Young Innovator Award" with less strict criteria for proven impact.

Prizes tend to be open to applications from individuals and different types of organizations (i.e. NGOs, corporates, social enterprises, government departments) with the exception of few prizes that exclude governments (e.g. the King Hamad Bin Isa Al Khalifa Prize), or only allow governments as partnering organizations (e.g. the ACRGCD Grant Competition). The India-based Mobile for Good Award has separate categories for NGOs/NPOs, for-profit organizations, and governments, with the winners in the for-profit and government categories receiving a recognition certificate instead of a monetary prize. Similarly, the India-based NASSCOM Social Innovation Forum Awards have separate "ICT led Social Innovation' prizes for different categories: 'Not for Profit' organizations, social enterprises, corporates (responsible businesses) and students as well as catalyst grants for early stage enterprises.

While diversity in applicants is appealing, it continues to be a challenge for sponsors to attract the "right type" of applicants best suited to fulfil their policy agendas. For instance, Michael Hollaender, the Director of Deutsche Gesellschaft fuer Internationale Zusammenarbeit (GIZ) states that, "the more concrete your expectations are, the potential market gets smaller and smaller and you might end up with the typical suspects at the end" (2016). On the other hand, Anthony Bloome, Senior Education Technology Specialist at USAID argues that, "if we did it too broad, then we would attract too diverse a group" (2016), many of whom would not have the ability to serve the larger goals of the agency for which the prize is designed for. Clearly, there needs to be some barriers of entry. Liv Marte

[1] www.d-prize.org

Nordhaug from NORAD states that it is important to have technical experts to screen applicants on the implementation component as, “we have to see if they are able to transfer their ideas somehow from paper to a game” (2016). Hence, for EduApp4Syria, a prototype is required as part of the application criteria. They have a professor who is part of the jury who has the theoretical knowledge and has demonstrated practical experience by designing a successful game in the past. *In short, diversity of applicants as a criterion need to come with clearly defined barriers of entry, tailored to the end goals of the prize and the organization.*

Participation in the XPRIZE team summit in Paris during the 2016 Mobile Learning Week was insightful as to the actual composition of participants that compete in incentive prizes. XPRIZE, like several prizes in this sector, are designed to attract applicants from unexpected places. Matt Keller, Senior Director of the Global Learning XPRIZE signals how open this process is as anyone can be an applicant for the XPRIZE as long as “you have a great idea and the courage to carry it through” (2016). The teams are diverse in nature, ranging from individuals working from their garage in their spare time to large established companies or NGOs with existing educational software that is being tweaked for the competition and everything in between – friends coming together to participate, coders and app or software developers using their existing skills for the greater good, and university students participating as part of their class project. Overall, there seem to be more new than existing players, i.e. organizations that established themselves for the competition. The backgrounds of the team members are also diverse, coming from various professions in order to bring different knowledge and skills to the table. Many teams also rely on volunteers for specific roles such as translating and story writing and some individual teams are merging to form larger teams.

While this clearly fulfils the criteria of diversity in applications, the more critical question is what kind of teams survive to the next stage. Karen Kaun, Founder of Makeosity and past XPRIZE applicant quit in the first stage; “I didn’t have enough money, a strong team. Anyone competing for the XPRIZE should see this as a major commitment, a full time job” (2016). Some applicants emphasized how difficult it is to get venture capital funding for their ideas due to the open source license requirements or low commercial viability. Hence, they found themselves channeling more of their energies into writing grants and chasing sponsors for their prototypes instead of focusing on their product. *This is a common challenge for incentive grants as often they come with little (if any) seed money, requiring the innovators to either be independently wealthy, or come with existing funding (sponsors/grants) or be established entities that are merely tweaking their products to fit the prize and gain the much needed media attention through their participation.*

For ICT-based prizes, functionality (both technical and usability) requirements are also included in the eligibility criteria. In analyzing the criteria and the nature of projects that stem out of these prizes, certain problems surface. If the technical requirements are too rudimentary and push innovators to design products based on existing technology and narrowly structured field-testing (more on that in the next section), we will get a basic and possibly unimaginative and redundant product by the time it reaches the market. *Several prizes produce device specifications for the innovations, already narrowing the scope of the*

innovation for this sector. We also need to recognize the political angle to device specifications. We have decades of development evidence that highlight how technology companies have used such projects to get a first mover advantage in countries in the global South, at the price of competitive markets for social good (Arora, 2010b; 2016).

Ed McNierney, Director of Technical Operations of XPRIZE Learning takes numerous questions at the 2016 Paris summit from the new applicants, including on device specifications. "I want to emphasize that these are conservative minimum requirements. We are working with Google to procure tablets for this competition and part of this reason we have not released what model we will be deploying the product on is because it has not been built yet…We are aiming for a relatively expensive device. The device we will be using for the field test will be expensive now but by 2019, it should be much cheaper. We don't want to limit you with the technology today as we recognize that it needs to be effective for the technology for tomorrow" (2016). Other features such as sunlight readability of tablets, GPS and private mesh networking is deemed as unfeasible. Interestingly, while Google is a key partner here, Google media services are proprietary and thereby, not an option for innovators as this would in itself increase the cost of the tablet and make it a non-sustainable product and project.

In short, *device specificities are important criteria in influencing the scope of innovation.* Mobile phones, while omnipresent in developing countries, are most useful for informal educational contexts, often circumventing local partnerships. On the other hand, innovations on tablets and computers are geared towards the formal context. Furthermore, the SDG agenda recognizes that to leverage on ICTs for innovation, it is important to provide "universal and affordable access to the Internet in least developed countries by 2020" (SDG 9.5c) and expand its "capacity-building mechanism for least developed countries by 2017" (SDG 17.8). Current global broadband policies and the rise of smart phones in the global South can enable applicants to innovate for the future. This would push them to create more sophisticated products that leverage on the internet, GPS and other technical affordances to enhance learning outcomes.

Scope

Education prizes are broad in scope, addressing both local and global development challenges in diverse educational settings. There are several distinguishing features in terms of scope. First, many global prizes focus on developing countries in a rather broad sense i.e. without specifying particular countries. For example, in recent years the Wise Prize for Education has awarded initiatives that have been implemented in Afghanistan, Africa (Zimbabwe, Zambia, Ghana, Tanzania, and Malawi), Latin America, and Asia (East Timor, Vietnam, India and Bangladesh). Other education prizes are not solely focused on developing countries but include them in their eligibility criteria. For example, The Library of Congress Literacy Awards rewards prizes to both education initiatives within the U.S. and abroad. While projects that focus particularly on developing countries are seldom awarded this prize, PlanetRead won in 2013 for the Same-Language-Subtitling initiative in India. *If sponsors want to fulfil the goals of SDGs, they need to be more targeted. For instance, focus on the "least developed countries, small island developing States and African countries" (SDG 4.7b) and in particular, vulnerable and marginalized groups including women and girls,*

persons with disabilities, indigenous peoples and children in vulnerable situations (SDG 5.6b) will be sidelined unless they are explicitly structured into the scope of the prizes.

Secondly, many of the ICT in education prizes tend to exclusively focus on technological solutions such as the ACRGCD grant and prize competitions, D-Prize, Japan Prize, Mobile for Good Awards, NASSCOM Social Innovation Forum, Tech Awards, UNESCO-King Hamad Bin Isa Al Khalifa Prize, and XPRIZE competitions. This is problematic as it means that the most marginalized countries are excluded because they do not have the necessary infrastructure for ICT-based initiatives. Thus, in reality, the scope of ICT in education prizes is more restricted than it seems at first glance. *For organizations like UNESCO and UNICEF that have an equity approach, ICT-based solutions can only be a subset of the educational solutions they are sourcing through their Innovations in Education prizes.*

Thirdly, some prizes focus exclusively on education whereas others address development challenges more broadly, where education is either one of the focus areas or at the minimum included in the eligibility criteria. For example, the Social Entrepreneur of the Year – India Award focuses on numerous areas including health, education, environment, access to technology, and job creation. For the 2015 awards, the majority of the submitted solutions (55%) focused on education. *Some education prizes focus on diverse challenges whereas others are narrower in focus.* For example, the Milken-Penn GSE Education Business Plan Competition welcome innovations that address issues of curriculum, instruction, educator professional development, assessment and evaluation, collaborations, learning design, technological innovations, learning/school support tools, and more. In comparison, the many ACRGCD grant and prize competitions address specifically *literacy issues, which is the most common focus of education prizes*. This is not surprising as several global educational policies such as EFA (2015) continue to emphasize, “measurable learning outcomes…especially in literacy, numeracy and essential life skills.” Hence, *basic literacy continues to be a priority among current prizes, in spite of decades of evidence on innovation using ICTs in education that emphasize new pedagogic models of learning and teaching*.

For example, the 2015 Horizon Report jointly conducted by the New Media Consortium (NMC) and the Consortium for School Networking (CoSN) reveals key factors in accelerating technological innovation for transforming teaching and learning in schools globally (Johnson et al., 2015). The panel was composed of 56 education and technology experts from 22 countries on six continents. The experts agreed on *two long-term impact trends* (p.4)

1. Rethinking how schools work in order to bolster student engagement and drive more innovation
2. Shifting to deeper learning approaches, such as project-and challenge-based learning

They also suggested *mid-term impact trends*, namely the increasing use of collaborative learning approaches and students as self-organized learners and *short-term impact trends*, namely the increasing use of blended learning and the rise of STEAM learning using new technology. Bring Your Own Device (BYOD) and makerspaces are currently being instituted across schools globally, particularly the use of mobile phones to foster these new pedagogical approaches. However, the experts admit that, “scaling these teaching

innovations are a wicked challenge — one that is impossible to define let alone solve." (p.2). It is also worth taking note that the 'global' focus alludes to economically prosperous nations. *Hence, it is clear that there is a divide in expectations structured into these prizes on what constitutes as innovation and successful impact between the global South and the global North.* In other words, basic literacy continues to be the dominant goal for learning outcomes in the global South while deeper learning approaches are encouraged in the global North.

Lastly, majority of the prizes focus on children or children and adults as the beneficiaries (see Table 2) with an emphasis on early education. The only prizes that do not focus on children are the Adult Literacy XPRIZE and the Camelback Ventures – Lumina Foundation Challenge, the latter focusing on postsecondary education. The ACRGCD grant and prize competitions put a special emphasis on early grade learners. Similarly, the theme of the 2015 Hult Prize was "Early Childhood Education" with the aim of providing quality education to 10 million children under the age of six in urban slums by 2020. According to Juan-Pablo Giraldo (2016), an Education Specialist at UNICEF, there is an implicit agreement that organizations with scarce resources focus on early-childhood learning because when educational initiatives are focused on secondary education, they tend to reproduce inequalities. In many marginalized contexts, people who have access to lower-secondary education are considered relatively privileged. Hence, while the SDGs commit, "to providing inclusive and equitable quality education at all levels – early childhood, primary, secondary, tertiary, technical and vocational training" (2015, Recital 20), the fact remains that *many of the prizes focus on early education due to scarce resources and the need to declare the maximum impact on the grounds of equity.*

Another consequence on focusing primarily on children is the neglect of teachers in the design of prizes. This is surprising as it is widely recognized that the role of teachers are fundamental for the success of innovations using ICTs in the educational system (UNESCO, 2011). According to the INEE survey on technology and education in emergencies, teacher training ranked as one of the highest listed areas of programmatic focus for technology-education solutions. Fifty-two percent of respondents identified teacher training as one of the focus areas of their initiative. Supporting teachers in particular leads to exponential benefits across the education sector through better pedagogical practices, improved curricula, and direct impact on students (GIZ Report, 2016, p. 14-15). *Hence, we advise sponsors to tailor the scope of prizes to prioritize teachers in the ICT in Education sector.*

Types of Projects

The scope, as set out in the stated objectives and eligibility criteria of a prize, can be determining as to the diversity and innovativeness of the projects. Similarly, technical requirements can also put restrictions on the nature of innovation in the projects. Broader scope might encourage greater diversity at the risk of less relevance to the prize sponsor's key objectives. While, a narrower scope focuses the efforts towards specific objectives albeit at the risk of limiting creativity (Tong & Lakhani, 2012). While the winning projects are as diverse as they are many, there are some discernible patterns in terms of the ICT-based projects. In terms of content, they tend to focus on:

- Fun and engaging **mobile learning** (edutainment, play-and-learn) applications, especially games with interactive features and reading material (e.g. GraphoGame[2], a literacy game to improve teacher-in-service training and children's basic reading skills).
- **Audio/visual content,** for example to help children with disabilities to read (e.g. Benetech[3], Tamana[4] and VideoBook for Deaf Children[5]) or to provide illiterate people with educational information (e.g. the Talking Book Project[6]).
- **Open-access educational platforms** with free content (e.g. Khan Academy[7] and OPENPediatrics[8]).
- High-quality and effective **education models** (e.g. the eSchool 360 by Impact Network International[9]).
- **Interactive voice-based and SMS messaging tools** to provide information and/or offer Q&A services or counselling (e.g. Votomobile[10] to promote health behavior in local languages and Vidya Helpline[11] for career services.)
- **Vocational trainings**, both hands-on (e.g. Al-Bairaq[12]) and through mobile technology (e.g. Skilltrain[13]).
- **Assistive technologies** such as Beeline[14], which uses color gradients so that reading text at the end of one line is the same color as the text at the beginning of the following sentence and SimplEye by Kriyate[15], which is a custom designed smartphone application with an easy-to-use interface for the visually impaired.

Case Study 1: The D-Prize

The D-Prize makes an interesting case. It is rather broad in scope because it focuses on challenges within girls' education, energy, education, governance and infrastructure, as well as global health. Yet, within each category, there are specific challenges such as the "Flip the Classroom in Resource-Limited Settings" with clearly defined requirements. First, the proposed solutions need to employ set education models with proven impact such the "flipped classroom" model by Khan Academy and the "de-skilled paper curriculum." Secondly, there are set target outputs. In the pilot phase, the candidates need to launch a new organization that reaches at least 250 students in three months. Moreover, the organization should reach 50,000 students within two years. Essentially, the innovations in this challenge are the distribution solutions, which can be diverse and creative as long as they suit the pre-defined education models. Thus, one can say that the prize has a broad scope within a narrowly defined challenge.

[2] Winner, ACRGCD Grant Competition Round 2
[3] Winner, ACRGCD Grant Competition Round 2
[4] Winner 'Catalytic Grants for Early Stage Enterprises', 2015 NASSCOM Social Innovation Forum Awards.
[5] Winner, 2015 Wise Awards.
[6] Winner, 2015 Wise Awards.
[7] Winner 'Laureate Impact Award', 2014 Tech Awards & 'Microsoft Education Award', 2009 Tech Awards.
[8] Winner, 2015 Tech Awards.
[9] Finalist, 2015 Tech Awards.
[10] Winner 'Health Crisis' category, Technology to Support Education in Crisis & Conflict Settings.
[11] Winner, 2015 Mobile for Good Awards.
[12] Winner, 2015 Wise Awards.
[13] Winner, 'Catalytic Grants for Early Stage Enterprises', 2015 NASSCOM Social Innovation Forum Awards.
[14] Winner, 2015 Tech Awards.
[15] Winner 'ICT-led Social Innovation by a Social Enterprise', 2015 NASSCOM Social Innovation Forum Awards.

A discernible pattern among these ICT-based educational solutions is that an overwhelming majority of them focus on independent learning via mobiles. A case in point are the proposed solutions for the Global Learning XPRIZE where a number of innovations build on self-directed learning through digital games and automated storytelling. Self-directed learning where children teach each other through technology is regarded as the optimistic solution to the enduring problem of teacher absenteeism and poor quality schooling. This idea gained major media traction through child-driven education projects launched by Sugata Mitra, a TED prize winner in 2013. He was awarded for his idea of the 'School in the Cloud,' where "children can explore and learn from each other using resources and mentoring from the cloud[16]" building on the past 'Hole in the Wall' initiative with similar intent. Fundamental to this approach is the circumvention of the school and the teacher. Sponsors have been inspired by such initiatives as they appear as clean, stand-alone solutions, away from the messiness of the educational system. However, compared to the hype around Mitra's projects, we find little empirical evidence to back the impact of such projects on sustainable learning outcomes (Arora, 2010a). On the contrary, it was found that such practices often perpetuated gender and caste inequalities as privileged boys served as mediators of such technologies. *Hence, while self-directed learning may seem like an appealing alternative, this is not a sustainable solution.*

ICT-based solutions should not solely aim at the end-users but also teachers in creating learning material for their students. A good example is the ACRGCD's Tracking and Tracing Books as well as Enabling Writers, focused on software that ensures that teachers receive the learning material they need to teach their students or that enable anyone to create books cost-effectively. Of course, in certain contexts such as the refugee crisis, prizes such as EduApp4Syria need to focus on self-directed learning solutions given the lack of access to formal educational systems.

In reviewing the literature and evidence from the field of technology innovation for education, a number of recommendations come to the fore (Beetham & Sharpe, 2015; Huang, Kinshuk & Spector, 2013):

- New technology solutions have to intersect with 'old' technologies to maximize impact
- Persistence of gender disparities in access and usage of ICT require explicitly targeted pro-poor gender sensitive ICT interventions and strategies
- Focusing on high-speed ICT infrastructures is just as important as the ICT innovations
- Success of ICT-based innovations should keep in mind the user's level of literacy
- Voice-based or image-based interventions can be more effective but come at a cost

Comparing the projects to the evidence from the field, prizes are failing at stimulating ICT-based solutions that mix old and new technologies as well as gender-specific solutions.

[16] 2013 TED Prize: Build a school in the cloud: https://www.ted.com/talks/sugata_mitra_build_a_school_in_the_cloud?language=en

Clearly, there is tremendous enthusiasm for mobile-based learning given the omnipresence of these technologies in marginalized contexts. However, scholars, while acknowledging their unique affordances and potential in maximizing impact, also point to certain limitations, compelling us to rethink claims on impact via these new technologies (Wu et. al., 2012; Traxler & Kukulska, 2015):

- While m-learning is promising and has demonstrated some positive results, there is no conclusive evidence that it does improve learning outcomes
- There is growing evidence that mobile-learning is more appropriate for out-of-school contexts
- While mobile learning has value, it cannot replace computer-based learning
- Mobile learning is most frequently used by higher education students, followed by elementary school students and adult learners
- In terms of content areas, mobile phone applications focus most on applied sciences
- Teacher support and teacher training have been the least explored topics in mobile learning research
- Other challenges related to mobile technology integration include lack of support, technical limitations, insufficient experience, mobile phone bans in schools, and issues in curriculum adaptations

Hence, it would be useful for sponsors to use such evidence from the field when assessing the merits and claims of the projects that compete for their prizes.

Trend # 2: Localized Content

A notable trend across prizes, including the global prizes, is the emphasis on localized rather than standardized content that is culturally and linguistically relevant to the context in which the initiatives are implemented. There are numerous examples of this trend:

- One of the focus of the many ACRGCD grant and prize competitions is to provide mother-tongue instruction and reading materials to early grade learners. For example, the aim of Enabling Writers prize is to provide software that makes it more cost efficient to translate reading materials to local languages.
- The FunDza Literacy Trust[17] gives young South Africans access to high quality, locally written literature and nonfiction via their mobile devices.
- Creative Associates International[18] mobilizes community members in Zambia to submit local stories and folktales through SMS.
- 'Donkeybook Teaching English'[19] uses audiovisual content that focuses on Columbian nature, culture, and music to help Columbian children learn English in a familiar and stress-free way. Similarly, 'My Teacher'[20] uses letters that are "hiding" in the nature to teach English to children in rural areas of Bangladesh where learning materials are not available.

[17] Finalist, 2015 Tech Awards.
[18] Winner, ACRGCD Grant Competition Round 2.
[19] Winner 'TV Proposal Division The Best Proposal', 2015 Japan Prize: International Contest for Educational Media.
[20] Winner 'TV Proposal Division Excellent Proposal', 2015 Japan Prize: International Contest for Educational Media.

- Eneza[21] provides engaging and learner-centered educational content relevant to the local context via basic mobile phone technology.
- ChildFund[22] transmits Pashto language stories and messages to families in Afghanistan through radio and solar charged mobile phones.

Localization reflects the priorities of agencies like UNESCO and UNICEF that seek to encourage socio-cultural and linguistic diversity in educational content. However, localization is not necessarily friendly to commercialization and scalability. According to the Caribou Digital report (2016), it is challenging for local developers to monetize their products. After all, much of the target populations are lower-income who often do not have access to even bankcards or other forms of digital payment, nor the resources to pay for such services. *Hence, localized content can enhance engagement and facilitate adoption of the innovation but often comes at the cost of scalability and commercial viability.*

Trend # 3: Using existing technical infrastructure

Besides focusing on localized content, the winning projects tend to provide innovations that fit with the existing technical infrastructure in the countries at hand. For example, they commonly employ basic mobile phones; and make use of low-cost mobile services and radio/solar-powered devices. Some prizes even make this a requirement. One example is the Technology to Support Education in Crisis & Conflict Settings prize by ACRGCD, which requires that the innovations work with the existing telecommunications infrastructure in the beneficiary countries. Another example is the EduApp4Syria prize, which requires that the footprint of the proposed applications does not exceed 100MB to ensure that those with limited mobile Internet access can download it. However, the applications should also include optional online functionalities that improve the experience of the learning resource, which the users can download on demand. The latter requirement was developed after field consultations with Syrian app developers. This shows how valuable the input from relevant stakeholders in the beneficiary countries is in informing the development of sustainable initiatives. *We need to keep in mind that designing innovations along current technological limitations versus near future possibilities can result in simplified, low-engagement and at times redundant products*.

Phases

Trend # 4: Multiple Phases in the Prize Process

An increasing trend in education prizes is the use of multiple phases in the prize process, where the participants must meet certain established criteria in order to proceed to the next phase. This has several advantages, both as an incentive for the participants and as quality assurance for the prize sponsors. For the participants, it can be an incentive because it lowers the entry barrier into the competition (Tong & Lakhani, 2012). As the participants are often expected to invest the money, time and effort into developing their ideas in order to qualify for the prize, the required investments in one-round competitions can be inhibitive. Instead, by dividing the required investments from the participants into different

[21] Winner 'Conflict zone' category, Technology to Support Education in Crisis & Conflict Settings.
[22] Winner, ACRGCD Grant Competition Round 2.

stages, the investment costs of participating are lessened at the entry level (King & Lakhani, 2013). As the winnowed solutions progress to the next phase, the further investment required from the participants are justified because their chances of winning simultaneously increase.

Incorporating R&D in the Prize Process

R&D phases are increasingly being integrated into the prize process, bringing it to the next step, from ideation to development. The length of these phases varies. While a market dialogue between the prize sponsors of EduApp4Syria and suppliers revealed that it takes six to twelve months at the minimum to develop a functioning mobile application, the EduApp4Syria and the XPRIZE competitions both integrate an eighteen months developmental phase into their prize processes. Interestingly, what distinguishes these competitions is that in the XPRIZE competitions, the participants bear the costs of the R&D phase. While the return on investment is far higher for the winners of the Adult Literacy XPRIZE ($7,000,000) and Global Learning XPRIZE ($15,000,000) compared to the winners of the EduApp4Syria prize ($1,700,000), the R&D costs and the associated risks are higher for the XPRIZE participants. On the one hand, such capital-intensive investments can be particularly inhibitive for prospective participants, especially if they have low-risk tolerance (Adler, 2011). On the other hand, the participants might consider the required investments to be justified by the size of the prize purse.

For some of the interviewed teams of the Global Learning XPRIZE, the determination to commercialize their solutions regardless of the outcome of the XPRIZE and the high visibility that comes from participating in this competition makes this a worthwhile investment, even if they do not become finalists after the 18 months R&D phase. Furthermore, philanthropic prizes benefit from altruistic motivations, meaning that the teams are often willing to go the extra mile for the greater good. Thus, returns on monetary investments are in many cases of secondary importance. Nevertheless, there are concerns from some participants regarding pursuing seed funding to survive this round. Hence, *sponsors need to carefully consider the upfront costs of participating, the size of the purse, and how this can influence the type of contestants they attract.*

Case Study 2: EduApp4Syria Incorporating Funded R&D Phases

EduApp4Syria is an incentive prize competition that aims to develop mobile learning applications for Syrian children (aged 4-10) to advance their literacy rates and psychosocial well-being.

In order to determine the most appropriate competition model, the price sponsors received input from relevant stakeholders at two dialogue conferences as well as feedback from the market (potential suppliers and users). Based on this input, the prize sponsors decided to conduct a multi-phased competition (pre-commercial procurement process), starting with an initial competition where participants are required to submit a short video pitch and a simple prototype of the main activity or the game in the proposed mobile application. The initial competition ends with a declaration of five winners who will proceed to an 18-month research and development contract with NORAD (the Norwegian Agency for Development Cooperation), which includes several separate phases:

- Phase 1: Alpha version of product
- Phase 2: Beta version of product.
- Phase 3: Comprehensive market testing & feedback for improvements.

At each phase, the best solutions are winnowed, with maximum three entering the second R&D phase and maximum two entering the third R&D phase. The entire R&D process includes close collaboration with the prize partners, including the Department of Computer and Information Science at the Norwegian University of Science and Technology, which has expertise within game technology, game-based learning, e-learning, m-learning, and software engineering. The support provided by the relevant knowledge partners throughout the entire prize process is an important incentive for participants who need assistance in developing and implementing their ideas. Minimizing the R&D investment on behalf of the participants to a short video pitch and a simple prototype in the initial competition is another important incentive for prospective participants.

This prize competition model also has advantages for the prize sponsors. Awarding the prize throughout the development, implementation and evaluation phases instead of awarding the prize to solutions that are yet to be implemented is a high quality assurance for the prize sponsors. Overall, the design of this prize model is highly promising, and it will be interesting to see how the competition unfolds in 2016. NORAD has declared that they will conduct rigorous impact studies for this project.

Incorporating Field-Testing into the Prize Process

Another addition to the prize process is field-testing. Within the education sector, the most rigorous field-testing is conducted within the XPRIZE competitions (The Adult Literacy XPRIZE and the Global Learning XPRIZE), which have the largest prize purses out of the prizes we analyzed. According to Ed McNierney, the Director of Technical Operations for the Global Learning XPRIZE, it is important to conduct rigorous field-testing in order to convince the future buyers of the technology, most notably Ministries of Education that it works; "our job is to provide that evidence", he adds (2016). The scope of the field-testing in the XPRIZE competitions is in line with their prize purses. Other prizes that employ field-testing are most notably from ACRGCD (including EduApp4Syria, Enabling Writers, and Tracking & Tracing Books). Furthermore, some prizes (e.g. the Hult Prize and the Tech Awards) encourage independent small-scale testing in the prize process. For example, the participants in the Hult Prize are required to conduct their own field-testing for one month to gather evidence that their innovations are worth the prize. As the participants are entirely responsible for this process, the rigor of it (albeit limited by the given period) is up to them. The 2015 winning team took the field-testing a step further by raising $58,000 on the crowdfunding platform Indiegogo and successfully implementing their idea in El Salvador before the finals, which might have factored into the jury's decision.

Field-testing can be tremendously useful to both the applicants and the sponsors alike. Karen Kaun, past XPRIZE applicant, emphasizes the importance of this ongoing evaluation process;

"I always had an external evaluator. We work together to develop a template and in a typical three-year grant period, I always have the chance to modify the project before the final run. Even if I find the evaluators are a pain as they make you look at yourself critically, I would still recommend them." *Worth noting here is that innovators and evaluators co-design the field testing measures, making this tailored to the innovation in question.* From the funder's perspective, field-testing is essential to create a feedback loop. As Liv Marte Nordhaug from NORAD (2016) explains, "if we don't do that [field-testing] then we are not in sync with how the technology world actually works. This is usually rather alien to the development agency world. We have to be sensitive to how the typical launching of a digital game entails certain stages that need to be assessed at certain periods."

As a result of the increased implementation of R&D phases as well as field-testing into the prize process, the length of the prize process is increasing. This trend was observed among several of the new prizes (i.e. initiated in 2014 or 2015). For example, the prize process for the EduApp4Syria spans 20 months, the Adult Literacy XPRIZE spans 42 months and the Global Learning XPRIZE spans 48 months.

Intellectual Property Rights

Open innovation (external entities with varying expertise submitting solutions to educational challenges) has potential for innovation. However, one of the main challenges is the handling of intellectual property (IP) rights. According to Doblin (2014), the prize sponsors' degree of ownership over submissions is a key design consideration. The allocation of IP rights can influence prospective candidates' decision of whether to participate in the prize competition, resulting in the pool of available solutions to prize sponsors.

On the one hand, if prize competitions require the participants to renounce the IP rights to their innovations, extrinsically motivated candidates (i.e. who are solely in it for the prize money or to profit from their innovation in the marketplace) can be discouraged from participating, especially if they believe that their innovations have high market value. If they refrain from participating due to IP rights, the prize sponsors can lose valuable innovations, potentially leading to a weaker pool of entries (King & Lakhani, 2013). On the other hand, if innovators are granted exclusive rights to the use of their innovations, the scaling of these innovations is limited to the IP rights holders.

Prizes tend to take the middle ground. Rather than requiring ownership rights, prize sponsors most commonly require that the finalist or the winning solutions[23] will be released under royalty-free copyright licenses (e.g. CC BY and CC-BY-SA), which permit the public to freely share, use, copy, and build derivative work upon them for both non-commercial and commercial use.[24] Similarly, when the solutions are ICT-based, the prize sponsors commonly require that the software be released under open source licenses (e.g. BSD, MIT and Apache 2.0). Thus, the providers of the finalist or the winning projects retain title to and can profit from their innovations, but without exclusive patent rights. This is in line with the culture of

[23] To whom the requirements of copyright and open source licenses applies to depends on the prize, but they are commonly limited to the finalist or winning solutions.
[24] Depending on the type of license.

sharing that prizes are increasingly advocating, which is based on the rationale that it maximizes the growth potential of the innovations.

Here again, philanthropic prizes benefit from altruism. For example, some of the teams participating in the Global Learning XPRIZE state that they are willing to give everything they are working on away to anyone through open-source licenses for the sake of the greater goal of the prize. Nesta (the UK's innovation foundation) and the Centre for Challenge Prizes (2014) similarly argue that *a culture of collaboration has become a strong feature of prizes.* One example is the Global Learning XPRIZE, which encourages collaboration among the competing parties during the R&D phase of the competition. Without a doubt, such collaboration can be effective as in the Netflix challenge where the only two teams to reach the set target outputs were a merger of teams (Lohr, 2009). However, *the challenge remains on how to encourage collaboration in an otherwise competitive environment and how to distinguish between collaboration and "theft" of ideas in this sharing environment, i.e. when collaboration leads to competitive advantage for one of the two collaborating parties.*

Also, *there is mounting evidence that patents can in fact deter innovation long-term*. Boldrin and Levine (2013) argue that, "there is no empirical evidence that they [patents] serve to increase innovation and productivity, unless productivity is identified with the number of patents awarded - which, as evidence shows, has no correlation with measured productivity" (p. 2). Moser (2013) drawing from extensive evidence from economic history categorically argues that countries that did not have patent laws produced just as many innovations, if not more. Mechanisms, such as secrecy and lead-time (being the first innovator to offer a new product) is seen as more effective than patents. Moser recommends knowledge-sharing, risk taking attitudes and scientific experimentation over litigious solutions if we are to spur innovation. *Sponsors need to take note here given that one of the main structured incentives for innovation in prizes is the promise of patents at the end of the competition.* Evidence points toward the fact that while innovation in a nascent sector like in our case, ICTs in education, seldom are born out of patent protection arenas, it is only when the industry matures that these patents become prominent as growth shrinks and the industry starts to consolidate. While promising a monopoly can serve as a major incentive for innovators, this comes at the social cost of growth and diversity of innovations as well as long-term sustainability.

Furthermore, the establishing and holding onto IP rights is deeply cumbersome and often expensive. This is undoubtedly a daunting process. Several questions came up during the 2016 XPRIZE summit on IP: When does code licensing apply? Should merged teams share a joint copyright license or different copyrights? Can you register a trademark? What about the licensing of software tools used for creating the innovation? Can you use open patenting systems? While going in-depth on IP issues applied to prizes in this sector is out of the scope of this report*, we highly recommend conducting a separate report to guide both applicants and sponsors in this process, especially for this given sector. All possibilities need to be explored on protecting an idea and yet allowing the process to encourage the culture of collaboration. Most importantly, the jury is still out on whether IP is a key incentive for innovators in this sector.* After all, unlike innovations in the commercial sector, technology

innovations in the education sector are more likely to not be commercially viable (see sector below on user-pay).

Motivators

Monetary Incentives

Like with other funding mechanisms, prizes include monetary incentives. All prizes that we analyzed except The Social Entrepreneur of the Year – India Award by the Schwab Foundation[25] include monetary incentives. The total cash purses range from $10,000 to $15,000,000, the latter being an exception (see Table 3). There is substantive evidence that the size of the prize is not the prime motivating factor for applicants to participate in these competitions (McKinsey & Company, 2009). Besides, considering that participants in incentive prizes need to bear the cost and the risk of developing their innovations, the financial gains of winning prizes are often not relatively high (although the cash purse tends to increase with more extensive R&D requirements). For example, the XPRIZE foundation has shown that the participants' collective expenditure often exceeds 10-16 times the cash value of the prize itself (DFID, 2013). However, the prize itself is not the only potential monetary gain for participants. That is, prizes are intended to be catalysts for third-party investments in amounts far greater in value than the cash purse (Adler, 2011; Tong & Lakhani, 2012). For example, the cash purse in the Ansari X-PRIZE was $10 million but the teams seeking to win the prize received private investments of over $100 million (Adler, 2011). W*hile incentive prizes can serve as seed money for the development of early-stage projects while stimulating further third-party investments in general, this principle does not easily transfer to our given sector*.

There is much optimism on the commercial viability of innovations in the ICTs in Education sector and the user-pay aspect that can generate profit for innovators. Given the current state of the global app economy, this is a naïve supposition. According to Caribou Digital's report (2016) on the winners and losers in the global app economy, the current digital ecosystem is becoming a closed system and biased towards the most prosperous countries and users. For instance, 95% of the estimated industry value is being captured by just 10 countries. In the emerging digital economies of South Asia and Sub-Saharan Africa, "the app model will be the default, rather than the open publishing model of the Web" (p.4), creating further barriers of entry for local developers in marginalized contexts. As sponsors strive to support open source platforms, this trend alarmingly heads in the reverse direction.

Furthermore, as we have mentioned earlier, localized content is often not commercially viable as the target demographic often do not have the resources to pay for these innovations. This holds true in spite of the continued popularity of the "bottom of the pyramid" (BOP) business model pioneered by C. K. Prahalad. This model compelled both the public and the private sector (especially the MNEs) to shift their perception of the poor from being beneficiaries to consumers. Kolk, Rivera-Santos, and Rufin (2014) review the evidence over the decade on the implementation of this business model on social outcomes and profit, the "win-win" solution. The actual economic impact of these initiatives is weak.

[25] Sister organization of the World Economic Forum

However, evidence points to success in marketing insights (product trial, brand building, and BOP consumer information) as "better success measures than profits at the BOP" (p. 357). *This implies that in the ICTs in Education sector, incentive prizes that structure in commercial viability and the user-pay aspect as central to their strategy can be problematic*.

Non-monetary Incentives

It is well recognized in the prize literature that prize incentives other than money are important to attract participants and ultimately stimulate innovation (Doblin, 2014). In analyzing the prizes in the public sector (e.g. Challenge.gov), it was found that while recognition and monetary incentives remain the most commonly used incentives, there has been significant experimentation with different prize incentives in recent years and especially prize structures that mix multiple incentives. Other incentives include travelling, capacity building, networking opportunities, and commercial benefits through investment and advance market commitments (Doblin, 2014).

Academic research has supported the notion of the importance of non-monetary incentives. For example, Kay (2011) surveyed and interviewed contestants in the Google Lunar XPRIZE on their motivations for participating. The survey results showed that the three most important reasons (i.e. classified as "very important") were societal benefits (59% of the teams), commercialization of the technologies developed for the competition (53% of the teams), and the recognition from NASA or other government agencies for potential future contracts (47% of the teams). This was followed by the motivation of participating in a real technical and intellectual challenge (mentioned by 41% of the teams as very important and by 41% of the teams as important). Interestingly, the prize money was only considered "very important" by 24% of the teams and important by 12% of the teams. As one contestant stated: "…we are not driven by the prize" (Kay, 2011, p. 149), a sentiment that echoed through much of the interviews with Global Learning XPRIZE teams. In Kay's (2011) interviews with teams from the Google Lunar XPRIZE, a common reason given by the teams for participating in the prize versus pursuing the project on their own (i.e. without entering the competition) was the increased publicity associated with the competition. Similarly, according to Tong and Lakhani (2012), the potential for recognition and investment opportunities generated through the prize's publicity can be just as valuable as monetary rewards. Based on this, Kay (2011) concluded that monetary incentives might not be as important to participants as non-monetary incentives but that the monetary prize is nevertheless important to attract publicity around the competition, which is the foundation of the non-monetary incentives.

Trend # 5: Increased Use of Non-monetary Prize incentives

Within the education sector, there are a couple of notable trends in non-monetary incentives such as opportunities for networking and mentoring.

Networking

The large foundations that have the necessary resources tend to offer high publicity and/or important networking opportunities. For example, the Wise Awards offers their laureates global visibility through internationally renowned media partners, the opportunity to

present at their Annual Summit, and to be part of their global Wise Awards network that fosters collaboration among all of the laureates. Similarly, the Hult Prize offers the six finalists a one-year membership with the Clinton Global Initiative, a community of global leaders including heads of states, Nobel Prize laureates, CEOs, heads of foundations and NGOs, philanthropists, as well as media partners. Through this membership, the teams are supported with raising capital and identifying strategic partnerships, and media support. While large prize sponsors on a global scale offer these impressive networking incentives, smaller prize sponsors also use networking opportunities as incentives. The laureates of the NASSCOM Social Innovation Forum become part of their forum, which connects them to important industry experts, innovators, and entrepreneurs. The empowering people Award by Siemens Stiftung and the Mobile for Good Awards by the Vodafone Foundation also offer similar networking incentives in addition to monetary rewards. Interestingly, the laureates of The Social Entrepreneur of the Year – India Award, receive no monetary award. Instead, the prize consists of a membership to the Schwab Foundation Network, with benefits such as networking opportunities, services such as pro-bono consulting and legal advice, as well as waiving of registration-fees to forum meetings. *This suggests that non-monetary incentives can be used as stand-alone incentives in prize competitions.*

Mentoring

Mentoring can both be a post-award incentive (i.e. when laureates consult with networking partners) or an integral part of the prize process. Incentive prize sponsors are increasingly providing mentoring support during the development phase of the prize process. One example is the Hult Prize, which offers the six finalist teams a six-week intensive program of entrepreneurial seminars at the Hult International Business School. During this program, the finalist teams develop their ideas into investor-ready business models with concise action plans. Furthermore, they develop the proposals that they present at the finals. These mentoring opportunities are in line with the overall objective of the Hult Prize, namely to accelerate the development of young social entrepreneurs.

Communications

Within prizes, communications serve several strategic purposes at all phases of the competition. First, in the pre-prize phase, marketing plans need to be in place to attract public attention and reach prospective participants and potential sponsors/partnership organizations. Furthermore, from this phase onwards, tender documents stating all rules, eligibility and evaluation criteria and other decisions and requirements in the prize process need to be made publicly available to ensure transparency and fairness. Secondly, during and after the prize process, effective communication channels are needed to manage relations with participants and relevant stakeholders, including implementing partners. This includes using newsletters for updates, conducting review meetings to discuss issues that arise and giving feedback, and requiring reports that document the progress. In the post-award phase, besides ensuring communication coordination between all relevant stakeholders in the implementing phase for example through meetings, webinars, reunion conferences, and collaborative spaces, *it is important to ensure external communication of the prize outputs and outcomes (i.e. impact), as well as guides with lessons learned to inform future prizes.*

Marketing of the Prize

One can argue that marketing is the foundation of every prize because without it, the prize would not attract participants, sponsors and other partners. Evidently then, marketing and public relations constitute large parts of every prize website, often with special media sections that include news, blogs, press kits, and featured press articles. There is an increased focus on social media marketing such as establishing hashtags for Twitter and featuring the latest tweets on the website. A notable trend across the prizes is also the posting of promotional videos on the website and on YouTube and other video platforms. During the 2016 Paris team summit, Shannon Smith, the Director of Marketing for the Global Learning XPRIZE, guided the applicants with a number of marketing tips including branding their messaging through the prize process, capturing motivation through digital storytelling, leveraging on social media to spread the message and synchronizing diverse media attention received by the applicants with the XPRIZE portal. Professional promotional videos of each team were created for publicity purposes as well as to attract third party funding. *While the use of social media has exponentially grown to enhance visibility, there are few reports out there that capture best practices for both sponsors and applicants on leveraging this mode of communication.*

Partnerships for Publicity

Many prizes are part of large, international foundations such as UNESCO and the Wise Initiative, governmental agencies, or big corporations such as Vodafone and Siemens that all have established media networks that can be leveraged for the marketing of prizes. For less visible prize sponsors, partnerships with such organizations are vital for increased publicity. ACRGCD and XPRIZE are good examples of organizations that host a range of prizes by other prize sponsors, among other reasons, for their media networks. Endorsements by highly visible and influential people are used for similar purposes. Perhaps the best example is the Hult Prize partnership with the Clinton Global Initiative, which made Bill Clinton the face of the prize. The Global Teacher Prize also leverages endorsements by high-profile people such as Tony Blair, Kevin Spacey and Stephen Hawking.

Evaluation

Measuring Impact

While it is generally acknowledged in the prize literature that prize sponsors should invest significant resources into follow-up and evaluation of the long-term impact of their prizes (Doblin, 2014; McKinsey & Company, 2009; Zients, 2010), research shows it is seldom the case in practice. A survey conducted by McKinsey & Company (2009) showed that over 40% of prize sponsors never or very rarely evaluate the impact of their prizes and further 17% only do it every few years. Less than a quarter (23%) of prize sponsors evaluate the impact of their prizes each year. This continues to be an ongoing concern.

Within the education sector, evidence on the post-award monitoring and evaluation (M&E) of prizes and their winning initiatives is limited. Most if not all prizes, whether recognition or incentive prizes, include parameters such as scalability, replicability, and social impact in the judging criteria. However, in incentive prizes these parameters can only be estimated in terms of potential, making it crucial for prize sponsors to follow-up on the winning initiatives

to evaluate their short and long-term impact. However, *our analysis of prizes indicates that many incentive prize sponsors in the education sector are not publicly reporting M&E reports of the impact of their prizes and the winning initiatives, whether or not they have M&E systems effectively in place.*

In contrast, there seems to be a more rigorous monitoring and evaluation system in place for the Grant Competition by ACRGCD. During the application phase, the applicants are required to submit a draft monitoring and evaluation plan where they outline strategies for demonstrating the impact of their projects, including indicators and targets. After the grant has been awarded, the grant recipients are required to allocate a minimum of five per cent of their budget to conduct a baseline assessment and end line assessment using the proposed indicators as well as standardized indicators as benchmarks. The grant recipients are also subject to midterm monitoring visits and an external performance evaluation. Lastly, they must submit a final report demonstrating the results to ACRGCD and make it available to the public. This rigorous M&E system compared to that of prizes is explained, at least partially, by the fact that as opposed to prizes, grants are awarded before the R&D phase. Hence, grant sponsors rely more on M&E as a quality assurance of their investments. This does not however justify the lack of M&E in prizes.

It is acknowledged that post-award M&E can be challenging for prize sponsors for various reasons. For one, the prize recipients are most of the time responsible for their own evaluation, making it hard for prize sponsors to control the quality of assessments and to come up with standardized measures to gauge impact. Secondly, with ICT initiatives, it can be hard to isolate the impact of the technology from other factors. As Jenson (2013, p. 43) argues, "part of the reason for the claims versus evidence gap with regards to ICT and learning is because technologies are utilized as just one of the many tools for teaching and learning, and their effects on student achievement are thereby difficult to isolate and measure." Thirdly, with limited funding, external evaluation is often unfeasible, especially for early-stage pilots. As Juan-Pablo Giraldo from UNICEF (2016) stated, "external evaluation for $100,000 when the whole project itself costs $200,000 is not cost-effective."

Another reason for the lack of M&E is that prize sponsors do not allocate money to M&E specifically. One plausible reason is that they tend to focus on the initial stages, starting with the ideation phase and often ending after the pilot phase if not earlier, which is normally the stage to initiate external M&E. *Funding mechanisms that focus on scaling piloted projects are more likely to devote funding specifically to M&E*. For example, through the Humanitarian Education Accelerator, UNICEF, DFID, and UNHCR are allocating £300,000 to each of the teams to strengthen internal evaluation processes, and commissioning external evaluation of the teams as well as the accelerator approach to scaling. In a breakout session about M&E at the 2016 UNESCO Mobile Learning Week, led by Anthony Bloome from USAID, *one of the identified challenges was to increase funding for M&E of education initiatives. Another identified challenge from this session was the overall focus on quantitative data over qualitative data in M&E.* That is, focus on numbers in terms of access and coverage, especially in ICT-based education initiatives, over learning processes and outcomes as a metric of impact*;* "most of the metrics you see in ICT define a scale in terms

of access. While an educational app with 10 million users is impressive, it is not in itself transformational" (Juan-Pablo Giraldo, UNICEF, 2016).

Case study 3: Effective Evaluation of the Learning about Living Nigeria Project

The Learning about Living (LaL) Nigeria project, which involves the development and implementation of an e-learning system about sexual and reproductive health information, is an excellent case study of a rigorous monitoring and evaluation mechanism and communication of it. First, an external evaluation was undertaken after the pilot phase to evaluate initial success and recommend scaling of the project. This was followed by another independent evaluation of the scale up phase in order to assess the overall effectiveness.

The key questions of the evaluation included:

- What are the key achievements to date and how do these contribute towards the project objectives?
- What progress has been made in designing and implementing a suitable monitoring and evaluation system for the project?
- Is the project methodically learning lessons, identifying good practice and adapting project approaches in light of emerging issues and trends?
- What impact has been made at the state level in contributing to improved policy that can sustain the project's activities?
- To what extent has the project facilitated wider and deeper partnerships involving civil society and government institutions?
- What activities and/or strategies have been most cost-effective in increasing access to education?
- What were the key risks to project implementation and how were these mitigated?
- How, and to what extent has the project contributed to positive changes in young people's attitudes and behaviors?

To ensure that the evaluation was evidence-based, participatory and balanced, the evaluation team employed a mix of methods including questionnaires to compare baseline and end line data, focus group discussions, and in-depth interviews with various sources and stakeholders such as implementing partners, the beneficiaries of the project and key informants. Moreover, they reviewed secondary organizational documents. They used logical framework outputs, key project milestones and the purpose and goals as the basic benchmarks for the evaluation. Based on the gathered data, they scored each of the project outputs on a scale from one (developing process) to five (completely achieved). In the final report, they combined the aforementioned data with their reflections on the project's strengths and achievements, challenges and recommendations. The LaL evaluation team communicates their findings in the report clearly and effectively by using tables for each output that outline the performance indicators and the progress against the indicators. The tables are combined with narratives on the evidence of change and the challenges associated with each output. Lastly, the online publication of the evaluation report ensures transparency among all stakeholders including the public, and contributes to the sharing of good practices and lessons learned that can be

useful to other prize sponsors. This practice of sharing among prize sponsors is increasingly encouraged in the prize literature with a number of practical guides emerging in recent years.

Long-term Sustainability

The LaL Nigeria project is also an excellent example of a project that has ensured that local partnership structures are in place to ensure long-term sustainability. Since the pilot phase, the project has involved several local civil society organizations in the project's implementation. Interestingly, the evaluation report showed positive impact of the project on these organizations including a) enhanced programming capacities, b) improved relationships with other CSOs and government agencies, and c) increased experience in using ICTs for development. *This highlights the importance of evaluating both intended and unintended impact of the projects on the various stakeholders beyond the immediate beneficiaries.* Besides civil society organizations, the project has also built important partnership structures at the government level, including with the Nigerian Ministries of Education and Health, the Nigerian Education Research and Development Council, and the National Agency for the Control of AIDS. These government agencies are involved in the project at various levels. For example, they are part of the project steering committee. They support training of teachers and provide an enabling school environment and administrative support for implementation in addition to other resources. In short, this partnership structure ensures the long-term sustainability of the LaL project.

Analysis of the prizes in the education sector shows that the prize sponsors consider post-award partnerships vital for sustainability. As previously mentioned, the prize sponsors focus on connecting the winning projects with potential sponsors and partners through a range of networking opportunities, for example through forums, conferences, and media publicity. It is then the responsibility of the winners to establish and sustain these relationships. Additionally, *local partnerships should be embedded in the entire prize process, and not just post-award for long-term sustainability.* Juan-Pablo Giraldo from UNICEF elaborates on this matter (2016), "I am skeptical about incentive prizes because they are not a bottom-up process, but this is my personal opinion [not UNICEF's official position]. You need to start with the children, not the technology and then when you understand their needs - that is, after doing some ethnographic research - you start designing for them. Also, ideally from the start you should have the government interested and get an agreement from them that your program or software is effective. It needs to be an alternative path to get certification and curriculum so that it actually becomes an alternative in the system and not just an informal learning system. So you need to have the government and the community on your side because there is this whole political community engagement strategy where the community either agrees or rejects a program – so the success of your project is eventually up to them." The challenge for incentive prizes that target young entrepreneurs is that these applicants often come with little experience and few field contacts. Hence, *sponsors need to support these new players through facilitating grassroots partnerships so they have a better chance of success in long-term sustainability of their solutions in the field*.

Case Study 4: The Laureate Impact Awards
The Laureate Impact Award by The Tech Museum of Innovation is an award presented to former Tech Awards laureates who have demonstrated significant impact since winning the Tech Awards. This prize, sponsored in 2015 by PayPal, was initiated in 2014 and has thus awarded two prizes so far. In 2014, the laureate was Khan Academy (2009 Tech Awards laureate), a repository of over 6,500 free educational videos that are translated into multiple languages and watched by millions of people. In 2015, the laureate was Embrace (2012 Tech Awards laureate), which has implemented its innovative infant warmer technology in 11 countries (e.g. India, Uganda and Afghanistan) and recently merged with the international development non-profit Thrive Networks. The Tech Museum of Innovation is the only organization, to our knowledge, that rewards an impact award to past laureates.

To end on a disconcerting note, it is well worth questioning if long-term sustainability is compatible with technological innovation. Michael Hollaender from GIZ frames this dilemma, "innovation and long-term sustainability is contradictory in its pure essence. If you look at Silicon Valley, 17% of their innovations will become successful –so when they talk about innovation, they have already calculated that most of them will fail. If we offer prizes and also claim sustainability, then we are offering the impossible" (2016).

Clearly, we do not know what are the most effective technology innovations in the education sector. Hence, prizes serve as a way of closing the gap on market information in this context. While there are numerous agencies in this field that have the capacity to scale these innovations through long standing bilateral cooperation, on what grounds do they commit to choosing certain innovations over others? "We do not know and we will not know which of these prizes will be successful in the end and prove to be a scalable and sustainable solution. Unless the prize is to scale up" (Hollaender, 2016).

PART II

What seems to be working?

How do we define success here? In terms of generating a vast number of educational solutions with relatively low investments, incentive prizes can be considered a success. Take XPRIZE as an example. The minimum output of the competition is 137 solutions from teams originating in 40 countries with value well beyond that of the prize purse. This kind of high prize purse is however an exception among the prizes. The proliferation of incentive prizes with low prize purses show that well designed non-monetary incentives can also lead to success in generating a large number of solutions. Prize sponsors with strong reputation capital are at an advantage when it comes to offering non-monetary incentives. Besides providing resources and assistance, they can offer an endorsement, a quality stamp that comes from being affiliated with the organization, which is very valuable for the participants in generating attention to their innovations, and attracting potential partners and sponsorships. However, the ability to use endorsements as an incentive is limited to few

organizations (examples include UNESCO, UNICEF), that consequently are able to generate interest from many prospective participants despite offering small prize purses.

Juan-Pablo Giraldo from UNICEF (2016) notes that the more reputation capital an organization has, the less important the monetary prize becomes, "at some point, the XPRIZE brand is going to be so well positioned that they can decrease the prize purse because being an XPRIZE awardee will be the prize itself." In sum, one can say that *incentive prizes with low prize purses but strong non-monetary incentives are successful in generating a vast number of educational solutions, especially if the prize sponsors have strong reputational capital.* Further, given that many participants set up organizations to focus on their innovation, there is a higher likelihood that they will pursue their solutions regardless of the outcome of the competition. Since the solutions are released under open-source and Creative Commons licenses, this allows for building on the current innovation by other innovators. Hence, *prizes are a stimulus for social entrepreneurship in this sector.*

Of course, the generation of a vast number of solutions to educational problems and increased social entrepreneurship in this sector through these prizes are not sufficient grounds to declare success. Learning and teaching outcomes, sustainable schooling and policy reform and new ways of addressing chronic educational challenges are important measures that need consideration. In the following sections, we address some of the key questions, assumptions and challenges to shape our understanding on the role of prizes in education.

How do prizes compare to other funding mechanisms?

The usage of prizes in the ICT in Education sector has exponentially grown in the last decade at the expense of more traditional funding mechanisms. There is a dominant bias in thinking that prizes are more efficient in delivering innovation as compared to more conventional forms of funding such as government grants, patents and R&D tax credits. In other words, competition is seen as key to research excellence. Strong faith in the market system needs to confront evidence to validate these claims. Upfront, we find no studies to date that can conclusively support this assertion. In fact, Hemel and Ouellette (2013) in their analysis of these varied funds conclude that, "under various (stylized) assumptions, each mechanism leads to the same set of research projects being pursued at the same social cost" (p. 307).

Yet, agencies funding decisions continue to be biased towards market-oriented solutions to incentivize knowledge production. This process is influenced by three overarching questions: *First, who decides the size of the reward that innovators will receive? Second, when is the reward provided to them? Third, who will pay for this cost?* A thumb rule for sponsors is that when it is difficult to gauge the value of an innovation at the onset due to incomplete market information, they will choose patents and prizes ex post over grants. Anthony Bloome from USAID echoes this sentiment, "We started with grants but that's about two years ago. Not having a specific solution, we knew there are gaps that we needed to fill so we offered prizes to cater to this [e.g. Enabling writers and Tracking and Tracing Books competition]." The perceived advantage to this approach is the increased motivation and drive among innovators to produce new knowledge and a fair market value for their

innovation. The downside however is that “due to capital constraints and risk aversion, innovators may be less willing to pursue new projects when rewards are allocated ex post than when society provides early, certain funding” (Hemel & Ouellette, p. 309). Hence, the most likely outcome is for innovators to sell part of their equity early on to afford to embark on their innovation, introducing a moral-hazard problem of trading ownership and control for innovation.

In today’s financial aid climate, grants and prizes often resemble one another, as it is getting more common to embed patents and user-pay elements in grants while prizes are extending their competition length to about 3-4 years due to their phased approach and field-testing. Several sponsors find it helpful to market their projects as a prize. Liv Marte Nordhaug from NORAD makes the case that it is better to call some of their projects innovation competitions, “because it is more recognizable for certain groups but it is a pre-commercial procurement which means that we are asking the market to develop something for us which we believe does not exist in the market already.” However, this comes at a price. Counter intuitively, several funding agencies find the implementation of prizes far more bureaucratic than tenders and grants. Rebecca Chandler-Leege from World Vision notes that, “running a prize is far more time consuming and it’s become a major commitment.” After all, prizes are not allowed to circumvent regulations and all the legal requirements that grants are subject to. On top of this, unlike grants and tenders, prizes demand new layers in the programmatic management. For instance, Michael Hollaender from GIZ compares tenders to prizes, “the tenders are more back door where we come up with the winner. With the prizes, we do have to go public and we need to make this open, transparent and this adds to the usual regulations that are demanded from tenders.”

Besides, this increased marketization of public funding impacts the nature of innovation. In most OECD countries, there has been a significant shift in the effort to finance public R&D: from 1981 to 2013, the share of public-financed R&D to GDP reduced from 0.82 percent to 0.67 percent. By contrast, the industry-financed R&D increased from 0.96 percent of GDP in 1981 to 1.44 percent in 2013 (Archibugi & Filippetti, 2016, p. 4). The way the financing is structured can affect the kind of knowledge produced and the direction of innovation in society. For instance, if incentive prizes in the education sector have patents and user-pay built in as prime incentives, innovation would be oriented towards areas of education that are more profitable rather than those of greatest societal and scientific interest.

While traditional grants aim for the largest social impact of the research through the public disclosure of knowledge and the diffusion of innovation, incentive prizes may not share the same societal priorities, especially when partnered with the private sector. For instance, Lemmens (2015) criticizes ‘responsible innovation,’ which necessitates that public-private partnerships find common ground as a means to sustainable innovation as naïve. Take information asymmetries for instance: from the perspective of the state or non-profit, closing this gap through transparency and the culture of collaboration is desirable as it provides alternative solutions to existing or anticipated problems. However, from the perspective of a company, “information asymmetries have to be seen as a source of competitive advantage” (p. 26). Hence, we need to reconsider the notion of mutual

responsiveness among stakeholders, in this case information asymmetries as a natural outcome given divergent agendas, interests and approaches between these actors. In other words, public private partnerships are good in theory but challenging in execution. While there are, of course some overlap in the interests and goals of the stakeholders, the 'common ground' should not be viewed as equivalent to the contemporary needs of society, in this case, the educational sector in developing countries. *Hence, it is worth asking: How do you prevent private sector priorities from taking over public sector research for societal benefit? How can innovators be free of private interests and yet sustain themselves while building on their innovation through these prizes?*

Michael Hollaender from GIZ succinctly summarizes these concerns; "I just want to challenge the hype around these prizes. They consume a lot of energy, they absorb a lot of resources so we need to carefully think of why we use these prizes and why in comparison to conventional funding approaches. One major concern is that innovation on one hand, which opens up the risk for failure, does not necessarily fit well with long-term solutions for sustainability. Just to add to this paradigm and this is more specific to the tech sector, the development cooperation became more political and economical and many donors are not just concerned with development goals but also private sector development. These prizes can combine this so they can claim they have an overarching development goal but also without putting it on the agenda, they also do private-sector support." Hence, sponsors need to be mindful of having their prizes transform into mechanisms that subsidize and serve the private sector industry over the public good.

What are the assumptions here?

This report moves away from the hype surrounding these prizes and examines closely the underlying assumptions and evidence that support commonly held propositions on prizes, paving the way for key recommendations for policy-makers, academics and practitioners.

Assumption # 1 Technological innovation is central, urgent and positive for education reform

There is an implicit belief structured into prizes that technological innovation is a positive social force. Firstly, these innovations are inherently unpredictable and disruptive. True to the nature of all innovation, they guarantee more failure than success. If we look at the implementation of technology solutions in the last decades in the education sector, we find plenty of evidence where these projects have failed, stalled or have not precipitated intended changes. As per the classic Collingridge dilemma, "the social consequences of a technology cannot be predicted early in the life of the technology. By the time undesirable consequences are discovered, however, the technology is often so much part of the whole economic and social fabric that its control is extremely difficult." (Collingridge 1981, p. 11).

Secondly, this is only one type of innovation for education, the others being systems and attitudinal innovation which is sidelined as it is not as easily monetized. Thirdly, in some contexts, especially in developing countries, there may not be an urgent need for innovation as much as there is an urgent need for other interventions. Some examples include increased educational spending, political reforms within this sector, teacher training, and socio-cultural shifts in attitudes towards education. Fourthly, for technological innovations

to be adopted, adapted and integrated to enhance learning and teaching outcomes, they are often incremental improvements to proven educational interventions and not radical transformations. Fifthly, such innovations can actually accelerate educational inequalities; for instance, by being piloted among select groups over others. Lastly, we argue that it is impossible to disassociate technological innovation from the larger educational structure it aims to reform. For these innovations to take root, there needs to be an acknowledgement in the design of these prizes that they are not self-contained solutions (e.g. self-directed learning systems). Several factors influence innovation including the schooling process, teachers, learner's abilities, and cultural attitudes, all often neglected when assessing impact of these prizes on technological innovation.

Assumption # 2 Prizes stimulate innovation

Historical and empirical data point towards the positive impact incentive prizes have on innovation in general. However, most of this evidence uses patents as proxies for innovation. In which case, there is mounting evidence that there is little correlation between patents and innovation and in fact, there is a compelling case on patent's negative impact on innovation. Hence, prizes that use patents as central to its design are less likely to attract innovation. *There is no one proxy for innovation*, especially in the education sector. The messy realities of the field of education make measuring technological innovation a tremendous challenge. What we have instead are design incentives to best guide funding agencies to maximize the use of prizes to fulfil their objectives and goals.

Assumption # 3 Prizes are most efficient compared to other funding mechanisms

Contrary to popular belief, prizes are far from efficient. Competition is inherently wasteful and failure is the norm. The "common pool" problem of redundancy through duplicate research among innovators need to be recognized. While this is normative in the technology industry, the development sector is accountable to taxpayers and is often cash strapped. Furthermore, funding agencies face more bureaucracy and invest far more time and resources in this process, more than traditional grants. However, this trade-off can be worth it if sponsors use prizes strategically to garner public attention to a social cause, send a market signal to channel research in a targeted direction, close the gap on market information regarding a nascent area of educational innovation, and open up this process to applicants beyond the usual suspects.

Assumption # 4 Scalability is a good proxy for sustainability

This report reveals that most prizes in this area are structured with sustainability in mind. Sustainability is embedded in the selection criteria and design of the impact testing. Scalability of the innovation is often explicitly highlighted in the prize design process as a measure of sustainability. In many ways, this is a good proxy. *Diffusion of innovation is just as critical as the innovation itself.* Prizes that enforce open source, creative commons licensing and open patent systems are in alignment with sustainability of the technological innovation. These incentives enable other innovators to build on prototypes to create alternative products or/and improve the existing product. In other words, *sustainability in this context is the ongoing building of the technological innovation* (for instance, by adding

multiple languages, tailoring content to suit different cultural contexts, catering to diverse learners and subjects, and modifying the product to increase engagement and thereby expand the user base).

There is much evidence that prizes are successful at piloting programs and products but few studies demonstrate how these projects achieve public outreach. This is partly due to the structural constraints of prizes having short-term funding cycles. Few prizes offer any post-structural support to extend the life of the winning innovations after the competition is over. *This report recommends that prizes should combine with traditional grants or the private sector via seed investments to foster the continuation of this effort, with eligibility criteria being that applicants need to be finalists of the competition*. A good example is the Carbon Trust's Accelerator programme, which begins with a prize and ends with seed investment into the winning enterprise from Carbon Trust, matched by other private investors. *Alternatively, the prize can be structured as a pre-commercial procurement to bring the product to market such as Norad's innovation competition.* Generally, however, technological innovations in this sector rarely reach market success due to its target demographic, emphasis on localization, and the current closed state of the global app economy with a bias towards the English language. Hence, *success in this arena cannot be dictated solely by commercial indicators but rather on long-term policy goals and user impact and outreach.*

We can increase the odds of success of these prizes through partnerships with the technology industry, whose core expertise is to develop and scale innovation. It is important to make transparent the nature of public-private partnerships lest these prizes start to serve the interests of the private sector over the welfare of the society. However, to date, we do not have a clear set of incentives to stimulate the ongoing involvement of the technology industry within this sector for sustainability. We are aware that their collaborating with established funding agencies is driven by public relations, reputation management and branding and to a lesser degree, insight into a potentially vast and largely untapped consumer base at the bottom of the pyramid. However, *user-pay as a strategy to scale the innovation is less likely to work given the dearth of evidence on BOP models generating major profit.* Thereby, sponsors need to be vary of user-pay as a scalable factor to ensure sustainability.

Another way of increasing the chance of success in scalability of the innovation is through meaningful local partnerships that will embed these innovations in the current educational system. However, few prizes structure in local partnerships as part of their sustainability criteria. Partly, this is due to the design of prizes that implicitly position the local system as the problem for which the innovation needs to circumvent. Partly, this is due to low or non-existing incentives for the local actors to embed these innovations in their system or/and be innovators themselves. Partly, this is due to pressure on innovators to demonstrate high impact, leading them to supplant rather than support the existing educational system. Hence, it is not surprising that many innovations are designed for the informal educational context. However, sponsors need to note that non-formal programs and products undergo

tremendous challenges in gaining accreditation and certification in the local context, deterring sustainability.

As we see above, at times, scalability and sustainability is complementary. However, given that development agencies focus on the most marginalized demographics (least developing countries, women and children, refugees, persons of disability etc.), valuing sustainability of an innovation based on scalability may be problematic. For example, a well-developed innovation to preserve a dying tribal language is not scalable but can have long-term sustainable impact. Thereby, in the designing of the prizes, sponsors need to ask themselves what their criteria are for measuring sustainability and if scalability fits as a measure of their core goals. *We recommend engagement as a better proxy for sustainability as it signals a bottom-up demand and puts the learner and the local context at the center of this process.*

What are some key recommendations in the design of prizes?

We suggest a series of recommendations following the framework we have deployed in this report, namely:

Resources

Sponsorships and partnerships

In this marketization climate, it is not surprising that the bulk of the prize capital comes from corporations and philanthropy organizations, driven by their commercial interests, individual passions, and often short-term political gain. This situation is exacerbated by serious budget cuts in public financing in this sector. There are gains in the privatization of funding such as providing expertise in bringing innovations to the market. However, long-term sustainability remains a concern. Hence, *this report recommends ongoing and transparent evaluation of correlating prize capital to long-term education development goals to identify gaps in funding for projects and demographics that do not fit the commercial agenda*. Using new intermediaries such as InnoCentive have proven to be effective in cost-saving and in generating novel ideas. However, for public sector actors, whose overarching mission is societal benefit, they need to *scrutinize digital labor rights and copyright agreements prior to the formalizing of these partnerships*. Lastly, *this report recommends building partnerships with beneficiary countries and their governments in the prize process for long-term sustainability.*

Structure

Type of prizes and eligibility criteria

Clearly, incentive prizes dominate this sector and appear to be growing exponentially. To some degree, this is understandable given the technology innovation focus, compelling sponsors to stimulate diversity in innovators and innovations at the onset through such prizes. However, this report has pointed out the “goldilocks” dilemma on diversity, recommending sponsors to tailor the barriers of entry based on how targeted their intervention needs to be. While the pot of gold at the end of the tunnel may be a good motivator for innovators seeking these prizes, it still leaves them cash-strapped in the process of bringing their innovation to the market. *The most effective incentive prizes are those that provide staged financial support to the pre-screened candidates. This allows them*

to focus on their ideas instead of channeling energies to attract sponsorships and grants during this process.

The question for sponsors however is if recognition prizes are still relevant in today's "impact" oriented and result-driven funding market. The answer is yes. While incentive prizes are biased towards supporting young entrepreneurs, there is still a case to be made for expertise and experience. *Recognition prizes should be targeted towards innovative projects and products existing in the beneficiary countries and contexts.* Local municipalities' exemplifying best practices in their usage of new technology in the educational sector and being recognized for these efforts can send a strong market signal to other local entities to perform better. This will contribute to the long-term sustainability of the innovation. Lastly, *device specifications have a disproportionate influence on the nature of innovation, thereby needing special attention*. *Sponsors need to push for devices that are cost-effective, contextually relevant and commonplace and have the potential to scale in the near future.* Given the global commitments to mitigating the digital divide through new broadband policies for instance, sponsors need to push for innovations tailored for near future access rather than the current state of access among beneficiaries.

Scope & Type of projects

In reviewing the prizes in this sector, certain priorities have emerged, namely the focus on early education, basic literacy, children and adults, and technology-centric solutions. While sponsors are generally in agreement with global policies and their emphasis on the least developed countries and most vulnerable populations, in reality, few prizes reflect this concern. Budget constraints and current ICT infrastructures in least developed contexts are cited as key reasons for these choices. We recommend that sponsors offer prizes targeted to the most marginalized groups by expanding the scope to project-based innovations, where technology is a component but not central to these innovations.

Regarding basic literacy, it is understandable why this is appealing as it allows these innovations to scale in the global South. For instance, math-centric apps are popular for scaling, as they do not require cultural and linguistic adaptation and can be deployed on non-smart mobile phones accessible to most of the target users. However, if sponsors want to bridge the divide between the way ICTs in education are employed in the global North to foster 21st century skills of critical and creative thinking versus the global South with an emphasis on basic literacy, they need to involve the teachers on the ground. Recognition prizes should be targeted at promising teachers in the local context. This will also address the current neglect of teachers in the scope of most prizes. ICT-based educational innovations that are designed to replace teachers and foster self-directed learning are common among the winning projects analyzed. While this is understandable, as we do not want a lost generation due to systemic failures, sponsors should recognize that self-directed learning innovations are not sustainable, as they do not target the roots of the system's failure.

Interestingly, the review of prizes demonstrate strong success in producing localized innovations that are culturally and linguistically appropriate to the beneficiaries. The jury is still out on how these localized successes scale, if at all. However, as we have pointed out

earlier, scalability should not be viewed as a sacrosanct measure of sustainability. Another clear pattern has emerged from the analysis, namely, that these innovations are based on existing technical infrastructures. As we have remarked earlier, incentive prizes involve a process that can take a few years for the product to reach the market. We recommend that innovations should target near future technical infrastructural aspirations versus the current state to avoid creating products that become quickly redundant, resulting in low-engagement and thereby low impact. This demands fostering key partnerships with the technology industry and providing strong incentives for the private sector to get involved to tackle formidable challenges in digital access, especially among marginalized groups. For instance, while Facebook's internet.org initiative has caused much controversy in India and Egypt due to its net neutrality violations, this initiative has pressured local governments to accelerate internet access among their poor.

Phases, R&D process and Field-testing

It is evident that a phased approach is beneficial to both the participants and the sponsors in the design of incentive prizes. Participants can invest incrementally in this process based on their progress, and as they advance, they will be more likely to gain additional sponsorship from external sources as well as be motivated to complete their project. Simultaneously, sponsors can weed out applicants and target their funding and energies on a few key applicants through the application of multiple barriers of entry to reach the finals. Few organizations such as XPRIZE have such generous prize purses, which allow them to not offer financial support through the process and yet attract applicants. Hence, given this is an anomaly in prizes, we recommend that sponsors look at incentive prizes as an R&D process of phased funding instead. *It is also clear that field-testing within the prize process is beneficial to both sponsors and applicants as it provides an invaluable feedback-loop for the ongoing improvement of the innovation over the course of the prize period*. However, we recommend that field-testing templates should not be indiscriminately applied to all innovation, as that could compel applicants to fit their innovation to the field-testing model, compromising the novelty component. The best templates are co-designed with the innovator and the evaluator with the end goals in mind.

Intellectual Property Rights

Most prizes have adopted the mid-way approach, where the winning solutions need to be released under royalty free copyright licenses and the software released under open source licenses while innovators are free to pursue the commercializing of their products by building on these prototypes to fit demand. However, especially in this sector, the reality of most of these innovations reaching commercial viability is low for a number of reasons (users can't or won't pay, scaling is problematic, marketing expertise is missing etc.). More importantly, there is much evidence that patents can have a negative impact on innovation. While the culture of collaboration is embedded in most prizes, it is difficult to balance this with protection against idea-theft. Hence, *we recommend that prizes should not structure commercial viability through patenting as the key strategy for innovators*. More importantly, we recommend a special report to assess the IP choices that sponsors and applicants have that can best maximize these innovations for social good and personal gain, including trademarks, copyleft, and open patenting systems.

Motivators

Monetary vs. Non-monetary Incentives

Most evidence points to applicants more motivated by non-monetary incentives such as publicity for their innovation, networking with key agencies and mentorship than monetary incentives such as the size of the purse. While commercial viability as an incentive applies to prizes in general, in the ICT in Education sector, there is little evidence to validate this proposition. User-pay is unlikely to be a key strategy given the evidence on BOP models that attempt to convert low-income beneficiaries into paying customers with little proven impact. Hence, we recommend that sponsors need to focus more on the networking, mentoring and publicity aspect over the commercialization of the innovation.

Communications

Marketing

Given that majority of applicants are motivated by the publicity that these prizes generate for their innovation, it is critical for sponsors to solidify and leverage on all forms of communication to get the message out. While it is clear that social media is the new and important frontier, there are no studies to our knowledge, which synthesizes sponsors and applicants practices with these new tools. Further, there is little research on how crowdfunding and crowdsourcing can be maximized for external investments and field-testing respectively while generating public attention. Lastly, there is little guidance on how data mining tools can be used effectively to gain insight into user behavior with these prototypes during and after the prize process. Hence, *we recommend that a best practices report be undertaken to capture the spectrum of social media and big data tools out there to serve prizes in the ICT in Education sector.*

Lastly, sponsors need to take note that most publicity is geared towards other funding agencies and innovators. However, what is neglected is social marketing targeted at the user itself, most of whom reside in marginalized contexts in the global South. We cannot follow the mantra of "if you build it they will come" in this highly competitive digital environment. Thereby, we recommend that given that user engagement and adoption of the innovation is a key ingredient to success, prizes need to structure in user-targeted marketing at the core of their communication strategy, using both old and new mass communication technologies at their disposal. Facebook can serve as an important partner in social marketing to the end user given their enormous popularity among this vast low-income group.

Evaluation

Measuring Impact

Our analysis shows that most sponsors do not conduct or at least do not disclose monitoring and evaluation (M&E) of the long-term impact of their prizes. A number of reasons influence this decision – it is cost-intensive, it is hard to standardize given that often evaluation is self-reported and executed by the applicants themselves, and it is hard to isolate the impact of technology from other factors (such as institutional support, quality of teachers etc.). In spite of these reasons, this is still an important effort to improve the prize process. Future

prizes can thoughtfully incorporate lessons learnt and thereby heighten their efficacy, as they will be armed with better market information to select innovations that are more likely to generate the best results. Further, there is clearly a significant bias towards quantified over qualified measures in gauging impact, which can lead to misleading and incomplete assessments of these innovations. Hence, *we recommend that sponsors seriously consider expanding and targeting their budget towards post M&E of their prizes as well as adopt a mixed methods approach to these impact studies*.

Long-term Sustainability

It is evident that without local partnerships in the implementing process of the prizes, innovations cannot reach fruition, however promising they may appear to be. Sustainability here should be framed along a) technological lines (for instance, are prototypes being built upon, supported and updated to remain relevant?), b) institutional lines (for instance, will local institutions embed these innovations in their systems? Is there both local and global political commitment to supporting ICT and educational infrastructures?) and c) financial lines (for instance, along with prizes, what kind of post prize funding is available for innovations to be scaled or improved?).

We should also not underestimate the impact of volunteerism as a means to sustainability (e.g. the Wikipedia model) and studies should be conducted on how best to design incentives to attract, sustain and support volunteers in this process. Lastly, given that innovation comes at the cost of a high failure rate, we recommend that sponsors need to embed failure as an essential and not necessarily negative ingredient in their framing of long-term sustainability. This would indeed be cost intensive for sponsors as the funding cycle needs to support ongoing experimentation until failure turns to success. Alternatively, sponsors need to disassociate innovation from sustainability in their criteria for prizes.

Concluding thoughts

Prizes have captured the imagination of the sponsors and the public alike. It is common knowledge that new technology stimulates new hope to address chronic social inequalities, in this case, in access and quality education to most of the world's population who reside in developing countries. The marketization of funding is seen as a necessary response to technological innovation in this sector. The report addresses a major gap in research on prizes used to spur innovation in the ICT in Education sector, particularly in the global South. *The report is the first of its kind to provide a critical synthesis of prizes in this arena.* By no means is this a comprehensive review of all the prizes in this sector. However, this should serve as a launching pad to think deeply about the assumptions and the range of criteria that contributes to understanding "impact" when designing the prize. This report guides sponsors in the weighing of the issues at hand, including comparing prizes to more traditional forms of funding.

Despite the promise that incentive prizes hold in terms of the increased number of generated solutions and social entrepreneurship, there is no proof of impact on learning outcomes. Incentive prizes focus primarily on piloting as part of the prize process, and this is limited to the finalists. There is little empirical evidence on the building of these innovations

into sustainable solutions for intractable problems in the education sector. One particular cause of concern is that new players might have limited knowledge or experience in implementing their solutions in the field. They might be able to create the right ICT solution to a targeted problem but lack the experience in implementation, knowledge of working with local governments and don't come with essential local and global networks to ensure support and adoption of their solutions. Clearly, incentive prizes alone are not enough to generate sustainable solutions. We need the right cocktail of funding mechanisms and partnerships to create genuine educational reform. This requires going beyond the pilot phase and viewing the role of technology innovation in education as supplemental but not integral to the success of the reform.

Innovation in education is not necessarily about coming up with the next big thing. Rather, it is about building on efforts that have proven to work before, replicating them and in most contexts, scaling up their impact. It seems, however, that prize sponsors are moving away from limiting innovation in education as supplemental to something unprecedented and revolutionary. While this makes for good media, it comes at the price of genuine reform. After all, as Juan-Pablo Giraldo from UNICEF argues (2016), "the goal of prizes, competitions or challenges is not to spur innovation in education per se. The goal of prizes, from our perspective as sponsors, is to source what is already happening out there."

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Appendix

Table 2: Focus of Prizes

Explanation of symbols:
✓= Yes
X = No
– = Possible but not sole focus
–* = One of the main focus areas

Prize	Focus on ICT-based innovations	Focus on education	Focus on developing countries	Target Beneficiaries
ACRGCD Grant Competition	✓	✓	✓	Children (grade 1-3)
Barbara Bush Foundation Adult Literacy XPRIZE	✓	✓	**X**	Adults
Camelback Ventures – Lumina Foundation Challenge	–	✓	–	Post-secondary level
D-Prize	✓	–	✓	Children & adults
Enabling Writers	✓	✓	✓	Children (grade 1-3)
EduApp4Syria	✓	✓	✓	Children (Syrian 4-10)
Empowering people. Award	✓	–*	✓	Children & adults
Global Learning XPRIZE	✓	✓	✓	Children
Global Teacher Prize	–	✓	–	Children (5-18)
Hult Prize	–	–	–	Children & adults
Japan Prize: International Contest for Educational Media	✓	✓	–	Children & adults
Library of Congress Literacy Awards	–	✓	–	Children & adults

Milken-Educator Awards	–	✓	X	Children (K-12)
Milken-Penn GSE Education Business Plan Competition	–	✓	–	Children & adults
Mobile for Good Awards	✓	✓	✓	Children (up to higher education)
Mobiles for Reading	✓	✓	✓	Children (grade 1-3)
NASSCOM Social Innovation Forum	✓	–*	✓	Children (up to secondary education)
Social Entrepreneur of the Year – India Award	–	–*	✓	Children & adults
TED Prize	–	–*	–	Children & adults
Tech Awards and the Laureate Impact Award	✓	–*	–	Children & adults
Technology to Support Education in Crisis & Conflict Settings	✓	✓	✓	Children
Tracking & Tracing Books	✓	✓	✓	Children (grade 1-3)
UNESCO-Hamdan bin Rashid Al-Maktoum Prize for Outstanding Practice and Performance in Enhancing the Effectiveness of Teachers	–	✓	✓	Children
UNESCO-Japan Prize on Education for Sustainable Development (ESD)	–	✓	✓	Children
UNESCO-King Hamad Bin Isa Al Khalifa Prize	✓	✓	✓	Children & adults
Wise Awards	–	✓	✓	Children & adults
Wise Prize for Education	–	✓	✓	Children & adults

Table 3: Cash Purses

Prize	Cash Purse (USD)	Type of Prize
Global Learning XPRIZE	$15,000,000	Incentive
The Barbara Bush Foundation Adult Literacy XPRIZE	$7,000,000	Incentive
ACRGCD Grant competition	$2,700,000	Grant
EduApp4Syria	$1,700,000	Incentive
The Global Teacher Prize	$1,000,000	Recognition

The Hult Prize	$1,000,000	Incentive
TED Prize	$1,000,000	Incentive
Milken Educator Awards	$900,000	Recognition
Tech Awards	$500,000	Recognition
WISE Prize for Education	$500,000	Recognition
D-Prize	$300,000	Incentive
UNESCO-Hamdan bin Rashid Al-Maktoum Prize	$300,000	Recognition
Library of Congress Literacy Awards	$250,000	Recognition
empowering people. Award	$225,000	Incentive
UNESCO-Japan Prize on Education for Sustainable Development	$150,000	Recognition
The Milken-Penn GSE Education Business Plan Competition	$138,000	Incentive
Enabling Writers	$136,000	Incentive
Tracking & Tracing Books	$120,000	Incentive
Wise Awards	$120,000	Recognition
Mobile for Good Awards	$88,000	Incentive
NASSCOM Social Innovation Forum	$88,000	Incentive
Technology to Support Education in Crisis & Conflict Settings	$50,000	Incentive
King Hamad Bin Isa Al Khalifa Prize	$50,000	Recognition
Mobiles for Reading	$28,000	Incentive
The Japan Prize: International Contest for Educational Media	$19,000	Recognition
Camelback Ventures – Lumina Foundation Challenge: Shaping the Next Frontier in Postsecondary Education	$10,000	Incentive
The Social Entrepreneur of the Year – India Award	$0	Recognition
The Laureate Impact Award (Tech Awards)	Not specified	Recognition

Table 4: Interviewees, Positions, and their Organizations

Interviewee	Position	Organization
Liv Marte Nordhaug	Senior Advisor	Norwegian Agency for Development Cooperation
Rebecca Chandler-Leege	Project Director	World Vision
Michael Hollaender	Director	Deutsche Gesellschaft fuer Internationale Zusammenarbeit (GIZ)
Anthony Bloome	Senior Education Technology Specialist	USAID
Matt Keller	Senior Director	Global Learning XPRIZE
Karen Kaun	Founder & Executive Director & XPRIZE past applicant	Makeosity

Ed McNierney	Director of Technical Operations	Global Learning XPRIZE
Juan-Pablo Giraldo	Education Specialist	UNICEF
Shannon Smith for	Director of Marketing	Global Learning XPRIZE

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