





DIGITAL PRINCIPLES INTO PRACTICE

OCTOBER 2017

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The **Human Development Innovation Fund (HDIF)** is a £40m United Kingdom Department for International Development (DFID) innovation programme in Tanzania managed by a Palladium-led consortium with KPMG, Newcastle University (EG West Centre), Loughborough University (WEDC), and the Institute of Development Studies (IDS).

With a focus on innovations from non-state actors and the effective utilisation of information and communication technologies for development (ICT4D), HDIF seeks to accelerate the experimentation, commercialisation, and diffusion of innovations in health, education, and water, sanitation and hygiene (WASH). Further details can be obtained at www.hdif-tz.org.

The **Commission for Science and Technology (COSTECH)** is the government partner to HDIF and a key strategic partner for the project. HDIF and COSTECH work together to realise a shared goal: to accelerate innovation and effective use of technology to increase and improve opportunities for health, education and WASH in Tanzania. Further details can be obtained at www.costech.co.tz.

UK Department for International Development (DFID) funds HDIF as part of the UK Government's investment in development in Tanzania. Through its Digital Strategy, DFID has articulated its commitment to embedding the Principles for Digital Development¹ into its programmes. All suppliers and contractors are expected to adhere to the principles.

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Front cover: Girls learning digital literacy skills at Buni Hub in Dar es Salaam.

FOREWORD

I am a true believer in the power of digital technologies to drive social impact. Digital solutions can, in part, extend basic services to new users and communities, improve service provision, and develop new and more efficient markets. However, some of the most vivid experiences I've had in international development have been seeing secondary school classrooms littered with a decade of dust-laden hardware stacked floor to ceiling – the remnants of the grand visions of technology project after project dropping in a digital training with a sprinkle of equipment, low buy-in or sense of ownership from key stakeholders, and limited sustainability planning. And I've seen hosts of unscrupulous or unaware actors looking to benefit from access to private information, or community access that offends basic development principles.

At the same time, digitally focused social networks and start-ups are popping up across Tanzania. WhatsApp groups of programmers are reaching the group membership maximums. Many young people are starting up businesses around drone technologies on the mainland and Zanzibar. Technology hubs have been coming on to the scene – and will continue to do so. And tested digital businesses like SmartCodes and Max Malipo have proven that technology businesses can succeed in Tanzania at scale.

Now, in part, I'm a funder of innovation and technology at a time when new technologies are coming on board every day and our international development community has years of learning opportunities from various information and communication technologies for development (ICT4D) projects.

At HDIF, we want to share learning from our own experience to assist players in ICT4D to ensure we are not creating



Children learning with Mwabu's interactive tablet at Silverleaf Academy, Arusha.

more stacks of unused hardware and limited viability which combine to create a larger wasteland of well-intended development projects. A broad set of donors and partners have combined to develop the Principles for Digital Development, which form a simple set of values that have helped HDIF understand our impact and establish whether we are setting partners on the best path for success.

This White Paper is HDIF's first formal publication sharing our initial insights and learning around the application of the Principles for Digital Development in Tanzania. We hope our learning will provide practice insights for the ICT4D community in Tanzania and abroad. By applying

the principles to our work, we and our partners can assess their validity through 'learning by doing' and anticipate the challenges in scaling our innovations.

We welcome your comments and feedback to help us shape our learning and approach and will continually incorporate lessons from grantees' work and the ecosystem overall. Finally, I would like to personally thank the HDIF staff, grantees, partners and technical advisers for their efforts to design and deliver these insights.

David B McGinty

Director, Social Innovation + Technology, Palladium Group

INTRODUCTION



Teachers and students can use Shule Direct's web portal to access localized digital learning resources.

In recent decades the global growth of digital technologies has transformed the lives of many people. Of the 3.2 billion people using the internet globally, two billion are from developing countries.² Among the poorest 20% of households, nearly seven out of ten have a mobile phone.³ If harnessed and used in the right way, digital innovations have the power to accelerate human development and bring improvements to the lives of poor people and the hard to reach. Digital technology is the force behind countless new frontier technologies, increasing service access, the flow of information and finances.

Technology is seen to be essential for achieving the Sustainable Development Goals (SDGs).⁴ But while the coupling of innovation with digital technology presents

unprecedented possibilities for human development, the phenomenon also has a problematic side. The United Nations Commission on Science and Technology for Development (UNCSTD) points to the negative impact that digital technology in development can bring. Contrary to opening up the world for all, there is a risk that access to new technology and connectivity will be unequal, continuing to marginalise women and other groups. The World Bank 2016 report *Digital Dividends* warns that without a supportive enabling environment, including appropriate education and governance structures, negative consequences of new digital technologies can include the concentration of market power, greater inequality and excessive government control.

Principles for Digital Development

Recognising both the risk and the opportunity that digital technology presents for development, individuals, development organisations and donors began exploring how best to surface and spread best practice in the use of information and communication technology (ICT) tools. These discussions culminated in the Principles for Digital Development, a common set of ground rules that aim to institutionalise the many hard lessons learned in the use of information and communication technologies in development (ICT4D) projects. The nine principles can be adopted by anyone using digital as a means of delivering development outcomes and are intended to serve as guidance rather than edict. They are meant to be updated and refined over time. The nine principles are as follows:

- Design with the user
- · Understand the existing ecosystem
- Design for scale
- Build for sustainability
- Be data driven
- Use open standards, open data, open source and open innovation
- Reuse and improve
- · Address privacy and security
- Be collaborative⁷





In its 2012–2015 Digital Strategy, BFID set out its commitment to infusing digital thinking and processes into all aspects of its work. The strategy outlines DFID's plans to embed the Principles for Digital Development into its programmes and to become better equipped both to use digital technologies and also to negotiate for improved conditions which will support access to and diffusion of digital technologies worldwide. HDIF, as a project funded by DFID, is committed to bringing the principles into the programme - building capacity and understanding around the use of digital principles to support best practice in the use of ICTs in its operations and its engagement with grantees and partners.

HDIF aims to contribute to the global dialogue on the principles through the Digital Impact Alliance (DIAL), the stewards of the digital principles, who facilitate lesson-sharing around digital development and promote their adoption globally. The HDIF digital framework for learning borrows from DIAL's materials and content. For more information see https://digitalimpactalliance.org/.

The digital and innovation landscape in Tanzania

Tanzania has risen from position 123 (in 2014) to position 96 in the 2017 Global Innovation Index (GII), putting it ahead of many other sub-Saharan African countries, signalling the potential for the adoption of new technologies and associated growth opportunities. Tanzania's Development Vision 2025 recognises that ICT is central to a

competitive social and economic transformation. It states that "These technologies are a major driving force for the realization of the Vision. They should be harnessed persistently in all sectors of the economy..."

The government of Tanzania approved the renewed National ICT policy in 2016, building on the Vision 2025. Simultaneously with the ICT policy, a national science, technology and innovation policy has been in preparation, although it has not yet been passed. A national ICT Commission, responsible for ICT in both public and private sector at national level, was set up by Presidential Decree in 2015⁹ but the law on the ICT Commission has not yet been passed.

The Tanzanian ICT sector is strongly driven by mobile phones. According to the Groupe Spéciale Mobile Association (GSMA), by the end of 2015 just over 70% of Tanzania's population were connected to a mobile network, while the Tanzania Communications Regulatory Authority (TCRA) suggests that this figure may have risen to as high as 80% by 2016.10 Tanzania, and especially Dar es Salaam, has a relatively lively start-up scene, with innovation spaces, hubs and business incubators to support and catalyse it. However, there is as yet little funding available for start-ups with no visible local investor network and no longer-term local start-up fund. Many key players in the Tanzanian innovation ecosystem are included on HDIF's Innovation Ecosystem map, which currently shows 20 hubs and six incubators in Tanzania.11 The map is a live document and new entries are continuously added. It can be viewed at www.innovate.co.tz.



Drone technology is being tested by users and new services are being built around the possibilities they bring to Tanzania.

HDIF as a learning platform for innovation and scaling of digital technology

HDIF's Digital Approach sets out actionable steps for using the Principles for Digital Development to support cross-sector technology adoption and scaling-up for innovation-related practitioners (including HDIF and its partners) and policymakers in Tanzania. The prevalence of digital innovations in the HDIF portfolio presents an opportunity to generate learning from grantees who are putting the principles into practice in a Tanzanian context.

The Principles for Digital Development were a natural choice to be used as the learning framework through which the digital elements of HDIF grantee projects could be looked at. Of HDIF's 35 current grantees, 21

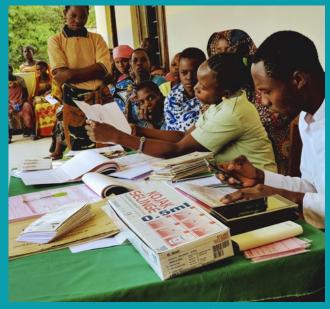


Interns from DOT's Fusion programme.

(60%) leverage ICTs, including mobile technologies, to address development challenges in Tanzania. For example, HDIF's education portfolio includes various digital solutions such as tablets and e-readers that are enriching student's learning experience in secondary schools, and testing technologies from a range of education partners including Worldreader, iSchool, Intel Learn, Google Classroom and Eneza Education. In water, sanitation and hygiene (WASH) innovative water systems are bringing clean, accessible water to communities using technology provided by Grundfos and Susteg. And in health, innovative healthcare applications are improving mother-baby pair tracking across the continuum of care and are improving maternal, newborn and child health through SMSbased health education¹² and harnessing technologies from a range of organisations including Dimagi, Vecna, Mezzanine, GE and Frontline SMS.

The Commission for Science and Technology (COSTECH) is a key strategic partner for HDIF, working to accelerate innovation and translate research into policy and practice. This partnership provides HDIF with an opportunity to expand its sphere of influence in the Tanzanian ecosystem among partners, ministers and policymakers. In addition, HDIF works directly and indirectly with key digital development partners and stakeholders across sectors, including the Development Partners Group for Innovation & Technology and the mobile health Community of Practice, and with hubs and incubators such as Buni Hub, DTBI and Anza.

HDIF's extensive network and partnerships present an opportunity to leverage learning around how the principles are being put into practice. Rather than a simple transfer of ideas, the principles will be most effective if contextualised in response to local culture



A healthcare worker records patient information using smartphone technology through Amref's mvaccination programme.

and norms, the economic and policy environment, and the digital landscape of Tanzania. Through this framework, HDIF seeks to learn what works and what does not, where are the synergies, tensions and contradictions, and what, if anything, is missing from the existing principles. From that learning, HDIF aims to develop a set of lessons and recommendations for the most effective use of, and methods for, scaling digital technology in Tanzania throughout the life of the project.

The case studies presented in this document have been written for the attention of key stakeholders in Tanzania – that is, government, donors, peer agencies and the wider development community, in particular those with an interest in implementing digital development projects.

HDIF CASE STUDIES AND THE PRINCIPLES FOR DIGITAL DEVELOPMENT

Purpose and methods

This paper focuses on the following three digital principles:

- Design with the user
- Understanding the existing ecosystem
- Be collaborative

These three principles focus on the people and partnerships that are the key components of any development project. They draw attention to the necessity of engaging with a range of clients, users and partners whose engagement and ownership are critical to the long-term success of the project. In addition, these principles emphasise the importance of not operating in silos, but instead identifying the partnerships needed to ensure success at all stages of implementation, from start-up through to close-out and at all levels of engagement.

The learning shared in this paper draws on experiences from Ubongo Kids, Camfed, Digital Opportunity Trust, Shule Direct and AMREF – education grantees capitalising on innovation to improve access and learning for young Tanzanians in primary, secondary and tertiary education. The paper aims to showcase and celebrate examples of best practice, as well as lessons, barriers and challenges drawn from the experiences of HDIF digital innovations.

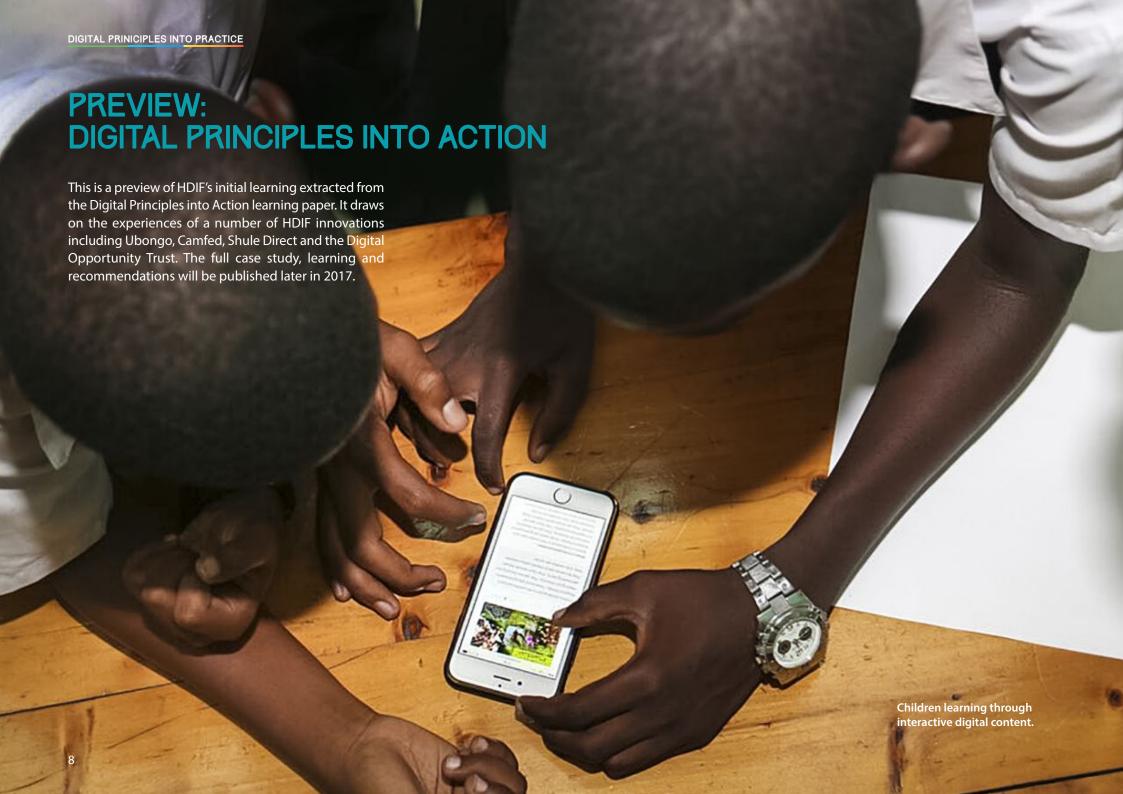
Current HDIF grantees were not asked to address the Principles for Digital Development in their grant applications, nor have those principles been used to monitor and evaluate how each project is developing. Data has therefore been gathered simultaneously with informing and educating the grantees on what the principles are and why HDIF thinks they are important. A number of methods were used to collect data including informal interviews, reviewing annual reports and

undertaking site visits as well as a survey of grantees to assess their understanding and awareness of the principles. Some text from recent unpublished case studies written by the grantees has also been used.



Camfed is partnering with Worldreader to helps girls to transition to secondary school using the latest e-reader technology.

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Design with the user

- Develop context-appropriate solutions informed by user needs.
- Include all user groups in planning, development, implementation and assessment.
- Develop projects in an incremental and iterative manner.
- Design solutions that learn from and enhance existing workflows, and plan for organisational adaptation.
- Ensure solutions are sensitive to, and useful for, the most marginalised groups: that is, women, children, people with disabilities and those affected by conflict and disaster.

Lesson 1

Designing with the user is not a one-off process that only occurs during the initial design of a digital product or service. Implementers will have only a limited understanding of what users want at any particular time and place, and user needs are likely to continuously change over time in response to everchanging contexts and settings.

Case study Ubongo

Ubongo is a Tanzanian non-profit social enterprise with a mission to create interactive edutainment for children across Africa. In the design phase of their school readiness programme, Akili and Me, the producers discovered through user feedback that their original design appealed to adults but was confusing and complex for their actual users - that is, the children. Episodes were re-written and the animations adapted and then tested again. Following a more positive response from the children and parents, Ubongo went ahead with the full production of a 26-episode season of the series. It is currently reaching over two million households every week in Tanzania through TV, radio and a mobile phone app. Since its launch, Ubongo staff have constantly been seeking feedback from viewers, communicating with users via phone interviews and focus groups. Facebook has also

allowed parents to provide Ubongo with a continuous flow of feedback about how their children were responding and interacting with each new episode. An evaluation of the programme, conducted in partnership with the University of Maryland, has shown that the programme is highly effective for increasing children's school readiness, and has a significant effect on school readiness for both girls and boys aged 3–6 years old but the impact on pre-literacy was not significant.



Akili and Me is an edutainment cartoon and radio series that helps children aged 3–6 to develop pre-literacy and English language skills.

In the second series of the show, the makers are acting on these results, and are turning their attention to improving literacy skills as well as teaching socio-emotional skills and 'early mindset building'.

According to Nisha Ligon, Ubongo CEO, "While this process may seem intense, it has helped us quickly develop highly effective and engaging learning, by having our users guide us to what they need... not what we think they need."

Recommendation 1

Design with the user should be viewed as a process of continuous improvement, where user feedback is contextualised and integrated into the process at every opportunity. Project managers should experiment with user-centred design and embrace user feedback at every stage of the project. Resources are available both online and offline: books, reports, videos, online courses, step-by-step guides and case studies of best practice. New projects do not need to reinvent the wheel, they simply need to change and adapt existing approaches to suit their particular circumstances.

Understand the existing ecosystem

- Participate in networks and communities of like-minded practitioners.
- Align to existing technological, legal and regulatory policies.

Lesson 2

With digital innovations in education it is equally important to consider existing policies, regulations and ways of working in order to assess the suitability of a proposed new technology. In Tanzania, these challenges can only be addressed by developing relationships with people in local communities, schools and local, regional and national governments.

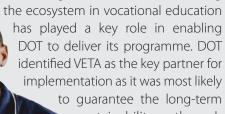
Recommendation 2

Neglecting the fundamental role of the teacher when introducing new technology is common in classrooms around the world. Tanzania is no exception and developing a more in-depth knowledge and understanding of the current role of teachers, key players in the education ecosystem in Tanzania, will be essential if this and future projects are going to have an impact and become sustainable. Teacher training should be continuous, and ongoing relevant professional development is essential if the benefits of investment in ICT are to be maximised.

Case study DOT Learning

dot

With HDIF funding, Digital Opportunity Trust Tanzania (DOT) has integrated its two acclaimed programmes into the government's Vocational Education and Training Authority (VETA) colleges that use a unique peer-topeer social learning model to embed change in schools and communities. TeachUp! brings innovative use of technology, new learning methods and digital skills content to the classroom and ReachUp! brings digital skills, workforce skills and entrepreneurial empowerment to out-of-school, out-of-work young people in the community. The project aims to build a generation of graduates with greater awareness of the opportunities around them, increased self-esteem, and the skills to plan and develop sustainable livelihoods. Their goal is to reach 600 VETA students, 120 VETA trainers, and 1,600 out-of-school young people through colleges in Dar es Salaam and Morogoro districts. Understanding



government adoption of the programme. VETA already had computer labs with some level of connectivity to the internet and 28 teaching centres across the country. Through its formal partnership



Students learn ICT skills at a VETA centre, Dar es Salaam.

with VETA, the DOT programme has been rolled out to VETA's national network of colleges, capitalising on the experienced tutors and IT equipment of the VETA centres. However, the project has not been without its challenges, which mainly relate to the active participation of teachers in the project. Teachers initially lacked the motivation to engage with the programme until they could fully understand the benefits of applying ICT in their teaching. Attempts to train teachers as a single group in one location were unsuccessful, as teachers were uncomfortable with peers knowing about their lack of digital literacy. In response to this, DOT offered oneto-one coaching sessions and ensured that support was on hand for VETA teachers in the classroom from teacher facilitators. As a prerequisite to this support, seminars and ICT workshops were offered to demonstrate best practice in the use of ICT in teaching and learning. It is through extensive use of ICT that teachers are able to evaluate and select the most appropriate resources.

Louis Rumisha (26), a facilitator from DOT's TeachUp! Programme.

Case study Shule Direct

Shule Direct's Makini SMS is a mobile learning platform that provides students and teachers with access to locally designed digital learning resources. With the expanding mobile network, the intervention aims to reach the most marginalised students in the most destitute areas of Tanzania. The innovation hopes to address some of the pertinent problems of under-resourced schools by infusing e-learning and mobile-learning as a supplement to classroom teaching.

Using their extensive understanding of the ecosystem, Shule Direct recognised that many students and teachers have very limited access to the internet and consequently were excluded from online learning. Collaborating with Eneza Education, a Kenyan non-governmental organisation (NGO), Shule Direct adopted the Eneza Education platform and worked with local developers and teachers to design Makini SMS, a mobile-based learning platform contextualised for the Tanzania secondary education service.

This interface allows access via basic mobile phones to ensure the content aligns with limited multimedia and internet capabilities. In order to reach their target market, Shule Direct brought on board Tigo, a major mobile operator with a young customer base. Understanding the importance of government buy-in, Shule Direct has engaged with the Tanzania Institute of Education (TIE) on the development and approval of their mobile content

Kuanzia sasa unaweza kumpata Ticha Kidevu kwenye simu

Makini SMS Kuwa huru kujifunza

www.shuledirect.co.tz/makini

Shule Direct's Makini SMS can be accessed through a basic feature phone

> closely with the governmentapproved secondary school curriculum. The result of these collaborations is the provision of access to educational resources to 1,400 young people on mobiles and learning devices.

Learning from challenges

In contrast, another grantee, working independently, failed to gauge or understand the ecosystem when implementing their educational concept. They therefore had insufficient understanding of several key ecosystem players and how they work - including community members, landlords, and government officials at ward, district and national levels. This caused delay in school acquisition and registration.

Recommendation 3

Digital innovation projects in education should prioritise both investigating the local innovation ecosystem and the sectoral (for example education) ecosystem and creating networks of trust among key local, regional and international stakeholders very early on in the project to avoid delay and disruption in the implementation phase.



Be collaborative

- ₱ Engage diverse expertise across disciplines and industries at all stages.
- Work across sector silos to create coordinated and more holistic approaches.
- Document work, results, processes and best practice, and share them widely.
- Publish materials under a Creative Commons licence by default, with strong rationale if another licensing approach is taken.

Lesson 3

Being collaborative includes the development of partnerships that bring expertise and experience together with the aim of designing and delivering successful development programmes. Sometimes partners are international specialists or academic institutions, sometimes local private or government organisations. Implementing partners working in isolation might not only limit the success of their own programme but would certainly reduce the impact of sharing the success stories and challenges with the broader development community.



Secondary school students at Oljoro VETA centre in Arusha learning ICT skills through a programme run by World Vision.

Identifying and engaging the right partners is critical to achieving long-term sustainable change. Each level of partnership will add something unique and requires collaborating in different ways. The Partnering Initiative identifies five levels of partnering: policy, infrastructure, partnerships, organisations and individuals. HDIF grantees are collaborating with multiple partners at different levels in different ways to complement their activities, ensure their sustainability, expand their networks and their reach, and demonstrate impact.

Collaboration examples

Distribution partners: Ubongo Learning collaborates with several partners to distribute its educational content through partner programmes in order to achieve its aim of bringing edutainment to children across Tanzania. Partner programmes include fellow grantee Silverleaf, Camara Education, Avanti Satellites, Mobisol and EquipT.

Partnerships on many levels: Camfed is an international education NGO that supports the empowerment of young women. Through the HDIF-funded e-reader

literacy programme it has collaborated with other players in the field at different levels. Camfed is partnering with Worldreader to develop suitable materials for marginalised rural students, with national and district education structures to embed e-readers into the government English orientation programme, and with young women graduates to work as Learner Guides to support the students. The Camfed approach has been especially successful in supporting marginalised girls who have diverse needs and unequal access to resources and influence.

Complementary products: Two HDIF education programmes – Camfed and Fundación Paraguaya – operate together in several secondary schools. Despite having very different objectives, the two programmes complement each other. The improved English oral and written skills from the Camfed programme are transferred and reinforced in the business club activities of Fundación Paraguaya. The result is improved confidence with communication, a better understanding of ICT, and group learning skills that enable students to acquire and put into practice the knowledge, skills and competencies necessary for employment.

Research: A number of grantees have collaborated with research organisations to help deliver rigorous and reliable evidence of what does and what does not work. Ubongo collaborated with the University of Maryland, which carried out comprehensive research on the impact of *Akili and Me*. Fundación Paraguaya is partnering with the University of Minnesota to evaluate the impact of their innovative business club programme in secondary schools in Iringa region. Other projects that are nearing completion have requested similar partnerships, knowing that collaboration with a reputable external organisation with academic research experience will give credibility



Students learning digital skills at the VETA Kipawa Centre in Dar es Salaam through DOT's ReachUp! programme.

to data used in their reports, especially in the education sector. Projects should also consider collaborating with research organisations to help deliver rigorous and reliable evidence of what works.

Learning from challenges

Looking across the HDIF portfolio, the projects making the least progress are those that operate in silos and fail to develop the necessary partnerships with government, local stakeholders and other partners. There are instances of different grantees implementing projects with very similar objectives, and failing to realise that they are planning to work in the same institutions; if allowed to implement, there would have been duplication in IT resources, teacher training and teaching programmes. Lack of collaboration and communication can reduce impact and also waste resources.

Recommendation 4

Collaboration should be seen as an issue that is wider than simply finding the right project partners. Collaboration can be local or global depending on the issue, and it can be used for different purposes in both the short and the long term – from very practical implementation issues to more conceptual learning and its dissemination.

NEXT STEPS FOR HDIF

The full version of this paper will be made available online and shared with stakeholders at upcoming events later in 2017. HDIF will continue to gather learning around the other principles and across the health and WASH sectors. The results will be disseminated to stakeholders in Tanzania and globally, through platforms such as DIAL and through HDIF events, website and social media

HDIF has identified another priority issue for further exploration through the digital learning agenda. Insights gathered so far suggest that 'inclusion' as a wider concept has been largely missing from the Principles but is increasingly starting to appear in discussions related to the Principles for Digital Development. The impact of digital innovations on women, girls and other marginalised groups is also being explored through HDIF's second learning agenda, which aims to better understand whether innovations are bringing positive impact to women and girls. The first HDIF White Paper on gender (Making innovation work for girls and women in Tanzania) can be found at www.hdif.org/gender. HDIF will continue pursuing learning on this topic.

In January 2018, HDIF will award a third cohort of education and WASH innovations. It is HDIF's intention to develop a monitoring and evaluation framework based around the nine Principles that will track and measure how HDIF grantees use and work to the Principles over the project life cycle. HDIF will share this learning with practitioners, policymakers and funders of innovation to deepen our collective understanding of how best to improve the use, scaling and adoption of digital technology in development in Tanzania.



The office at Shule Direct, a social enterprise that provides digital study tools for Tanzanian secondary school students.

ENDNOTES

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- 12 For more details on HDIF's portfolio, see www.hdif-tz.org/portfolio
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- (All links accessed 5 October 2017)



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