Midterm Review of the African Digital Schools Initiative (ADSI) being implemented by the Global E-schools and Communities Initiative (GESCI)

Main Report

Prepared by Education Development Trust

December 2019

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List of Acronyms

ADEA	The Association for the Development of Education in Africa
ADSI	African Digital Schools Initiative
BOM	Board of Management
CDE	County Director of Education
CEMASTEA	Centre for Mathematics, Science and Technology in Africa
CPD	Continuous Professional Development
DEO	District Education Officer
DSD	Digital Schools of Distinction
EDT	Education Development Trust
EMIS	Education Management Information System
ENEA	Ecole Numérique d'Excellence Africaine"
EWG	Expert Working Group
FGDs	Focus Group Discussions
GESCI	Global E-Schools and Communities Initiative
HT	Headteacher
ICT	Information Communication Technology
INSET	In-service Training
ISE	Innovations in Secondary Education
KD	Knowledge Deepening
KIIs	Key Informants Interview
MCF	Mastercard Foundation
MOE	Ministry of Education
MoEST	Ministry of Education Science & Technology
MTR	Midterm Review
OERs	Open Education Resources
PBL	Project-Based Learning
PC	Project Coordinator
PM	Program Manager
PNR	Periodic Narrative Report
SBC	School-based Coordinators
SEQUIP	Secondary Education Quality Improvement Program
SST	School Support Team
STEM	Science Technology English Mathematics
TPACK	Technological Pedagogical Content Knowledge
TPAD	Teacher Performance Appraisal and Development
TSC	Teachers Service Commission

Executive Summary

The Innovations in Secondary Education (ISE) is an initiative of the Mastercard Foundation (MCF) that has been seeking solutions to securing and maintaining employment in an increasingly complex global job market and ensuring there is a good fit between what employers are looking for and what skills traditional academic and vocational education programs are providing. The ISE aims to improve the quality and relevance of secondary education for young people from poor and rural backgrounds by addressing teacher motivation and effectiveness, integrating technology in secondary education, and preparing students for employment and entrepreneurship. The three programs are being implemented by Education Development Center (**Project d'amélioration des performances de travail et d'entreprenariat au Sénégal - APTE - Senegal)**, Global E-Schools and Communities Initiative (**African Digital Schools Initiative - ADSI)** and Schools and Teachers Innovating for Results (**Intrinsic Motivation Programme - TIM)**. Each program represents a unique model of engagement in secondary education in five African countries (Senegal, Kenya, Tanzania, Cote d'Ivoire and Uganda).

MCF and the Education Development Trust (EDT) have worked with the three partners to ensure that these midterm reviews (MTRs) meet the following objectives: (i) they provide findings that are clear and supported by analysis and conclusions that are sound and based on the evidence gathered; (ii) they determine strengths and weaknesses that are clearly spelt out, pinpointing areas where the organization needs to improve; and (iii) apply methodology in a qualitatively sound manner. For this MTR of the ADSI program, a common methodology has been used and data has been gathered through a document review of publicly available documents, a survey of stakeholders under the ADSI and other relevant external stakeholders at HQ, capital and country level, interviews with the organization, management and technical staff and consultations with relevant stakeholders at the county/district, regional and/or country levels.

Section 1 describes the program, the purpose of the review and it concludes with a brief introduction to the methodology used supported by the provision of key details from the program field visit included in Annex 1. **Section 2** then assesses the findings by looking at each of the four outcomes through the lenses of the OECD's Development Effectiveness criteria of *relevance, effectiveness, efficiency and sustainability of the ADSI intervention/model* and on 'development effectiveness' in terms of the nature of the *impact* achieved by ADSI in the design and delivery of the program at this midpoint in July 2019. **Section 3** then considers significant factors involved in 'scaling up' and institutionalization of the program. These factors are reviewed through a Scaling framework that has fourteen core ingredients for assessing scaling across the four focus areas of design, delivery, funding and the enabling environment. The MTR has generated some questions for reflection to support ADSI to reflect internally as to where this program stands regarding scaling up across each of these focus areas and the core ingredients.

Since 2016, ADSI has impressively established the organisational architecture and financial framework to enable implementation and achievement of the expected results that are well-suited to the priorities and policies of the target groups in each of the three countries. There are structures and mechanisms in place that support the implementation of the ADSI framework for cross-cutting issues and the operating model and management of the human and financial resources support relevance and agility.

The key *relevance* **challenge** is to assess ability for 'institutionalization'. ADSI has consistently shown that its focus is on how key operational functions (e.g. human resources, resource generation and programming) and that these functions **are continuously geared to support strategic direction and deliver results**. The key *effectiveness* challenge now is ensuring that there is sufficient space to progress further and to assess as clearly as possible to what degree the current approach and

resource allocation **is aligned with the priorities of the respective country governments, both educationally and financially.**

It is difficult to determine if ADSI is being implemented in the most *efficient* **way** for a number of reasons including: (i) there are no alternatives available for comparative purposes; (ii) the aim of this MTR is not to conduct a full 'Value for Money' analysis since this program is innovative and there is comparative flexibility to change and adjust as against the previous year's program and budget allocations in response to exigencies in the program; and (iii) any measurement to review if ADSI uses the least costly resources possible to achieve the desired results is compounded by the lack of robust and quantitative external assessments of learning outcomes over time for the individual (be it school Principal, teacher or student) from the training inputs or gained at the systemic level from the Digital Skills of Distinction (DSD) component. However, across all three countries the various cycles of TPD, ICT-based professional development and DSD have exceeded targets. Further ADSI is actively supporting the achievement of its stated objectives with extensive advocacy and dissemination across the different tiers of government.

There is a need now in the final part of ADSI to move the current focus of M and E from the predominantly supply-side inputs and activities to a closer focus on the program's intended outcomes and impact. It is recommended that - from now until the end of the program – ADSI selects some indicators and monitors specific evidence that can assist the senior management team to address these three critical sustainability questions:

1. *Is the program **demonstrably** building the capacity of partners, stakeholders and the wider system, developing skills, knowledge, behaviours and cultures to support sustainable self-improvement?*
2. *Is the evidence to date indicating that the program's approaches and outcomes have a high chance of being **sustainable** beyond the life of the project? Locally, nationally or internationally?*
3. *Is the program **influencing thinking, practice and policy** through purposeful use of knowledge and learning from the diverse program activities?*

The EDT team stresses that this MTR Report is written in the context of some significant limitations, including the fact that this is MCF's first assessment using the EDT methodology and thus there is no baseline against which to compare its current performance and the ADSI MTR and the other two program MTR assessments have different purposes and mandates in terms of tracing the respective partner's performance journey. In addition, it is noted that this Report requires the application of a methodology to a specialised agency who has a dual role - both normative and engaged in the delivery of development interventions.

But the methodology used for this MTR was designed principally to provide a diagnostic snapshot of an organisation delivering an initiative at present but it is not an external audit of an organisation nor is it an institutional evaluation. Thus, even with adjustments, the assessments will not comprehensively assess all operations or all processes of an organisation in relation to ADSI nor can it provide a definitive picture of all of the performance in relation to ADSI during the time period of the assessment. Finally, ADSI has a very broad mandate and commensurately wide network across three countries and, while the reviewers were privileged to speak to many persons, they did not speak to affiliated entities in detail; and this assessment was carried out in a short period of time within the program's overall cycle, hence the Report acknowledges that the improvements are works in progress.

I. Introduction
1.1 Background

Purpose and scope. EDT conducted this Midterm review (MTR) of GESCI's "African Digital Schools Initiative" (ADSI) as part of its 2019 assessment cycle of the ISE initiative in Africa over the period May to November 2019. This MTR will provide MCF and GESCI with details and analyses that will support them to assess the performance of this program across three countries against its intended goals and objectives while identifying good practices, key lessons, and areas for improvement. The main purpose is to provide an objective and independent review of the ADSIs' achievements and challenges, the generation of critical lessons learned and identification of possible inputs for course correction. The field visit questions have been refined and agreed upon by MCF and GESCI as part of the inception/work planning phase of the evaluation while the Development Assistance Committee's (DAC) criteria of *relevance, efficiency, effectiveness, impact and sustainability* have been used for consideration when evaluating this program.[1] Box 1 below summarizes what this EDT approach in terms of the core hypothesis and framing questions.[2]

<div align="center">Box 1: MTR Approach – Core Hypothesis and Framing Questions</div>

Core hypothesis	If ADSI has effective systems, practices in place, then its interventions/activities will be more 'effectively delivered', and hence delivery will achieve relevant, inclusive and sustainable contributions to humanitarian and development results in an efficient way.
Framing questions	➢ **Relevance:** Does ADSI have sufficient understanding of the needs and demands it faces in the present, and may face in the future? ➢ **Efficiency:** Is ADSI using its assets and comparative advantages to maximum effect in the present and is it prepared for the future? ➢ **Effectiveness:** Are ADSI's systems, planning and operations fit for purpose and are they geared in terms of operations to deliver on ADSI's mandate? ➢ **Impact/Sustainability:** Is ADSI delivering and demonstrating relevant and sustainable results in a cost-efficient way?

1.2 About Global E-Schools and Communities Initiative (GESCI) and the African Digital Schools Initiative (ADSI)

The ADSI consolidated model presents a portfolio of ICT-assisted innovative elements in schools that can lead to the generation of policy coherence for whole-school ICT integration to enhance teaching and enrich the learning experience. This is accomplished through a blended-learning teacher progressive development in the pedagogical integration of ICT through four phases up to professional skills in content development and creation, the progressive transformation of schools to digital schools which is driven through concurrent actions in five key thematic areas – *school leadership development for whole-school ICT strategy development, teacher professional development in ICT integration, ICT school culture, ICT in the curriculum and ICT infrastructure.* In addition, a system of digital school awards, accreditation and certification to incentivize ICT integration and progression and to encourage

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[1] **www.oecd.org*/*dac*/*evaluation/**daccriteria***forevaluatingdevelopmentassistance.htm*. In the context of a broader debate about the future of development evaluation, a discussion has begun on re-thinking these five DAC evaluation criteria of relevance, effectiveness, efficiency, impact and sustainability, first articulated alongside evaluation principles in 1991. Throughout 2018, the Network and its partners hosted a global consultation to explore the strengths and weaknesses of the criteria, and how they might best be adapted to today's development context.

[2] A broad outline of the overarching MTR questions framework can be found in Annex 2 and in Annex 3 in the 'Terms of Reference'. The detailed question deck for the ADSI program in the three countries can be found in the Supplementary Materials Pack which is for internal use by the partner.

the acquisition of 21st century skills by students which are embedded in teacher lesson plans and facilitated through project-based learning methodologies. Table 1 summarises ADSI's six specific, interrelated program objectives with details for each.

Table 1: ADSI Program Objectives and Details

#	Objective statements	Details
1	Professionalise teachers in the educational use of specific digital technologies and internet resources in their classroom teaching	
2	*Lead teachers at each school to participate in workshops and structured online training sessions to acquire high-quality ICT-competencies and abilities for promoting 21st Century skills in their teaching*	These teachers will: ➢ be skilled in the use of technology and the internet to prepare and deliver enriched lessons in the classroom ➢ collaborate with their peers in the development and use of digital technology and internet-enriched lessons in their teaching
3	*Develop an online database of educational resources for and by teachers*	Educational materials and tools will: ➢ be placed in an online database that teachers can access.3 ➢ incorporate existing public educational resources as well as tools and materials developed by GESCI for this project ➢ be accessed by participating schools ➢ be available to other teachers and schools in East Africa and around the world.
4	*Develop a Digital Schools certification program for schools*	School leaders will: ➢ be provided a step by step guide on how to effectively integrate technology into all levels of school teaching and administration. GESCI will: ➢ create a graduated certification system to recognize a "Digital Schools of Distinction" status ➢ work to have this certification officially recognized by education ministries. ➢ empower local/county and Ministry staff in the processes of ICT integration, how to design effective quality lesson plans, criteria for classroom observation and assessment, evaluating whole school development
5	*Integrate model within teacher training colleges*	➢ work with MoEs to implement the GESCI model in three TTCs in Tanzania and to improve teacher development in Kenya
6	*Conduct a pilot project to apply the model in a Francophone context.*	➢ adapt and translate its materials into French and contextualize them for secondary schools in West Africa

Source: GESCI Project Documents

Rationale: MCF support was based on the findings from a pilot project (2013-2015)4 that showed that the program (i**)** effectively builds teacher capacity to use technology in the classroom, (ii) positively

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3 See the https://adsiteachers.gesci.org/ for the extensive ADSI websie with noticeboard, menus and details regarding the course modules.
4 The Strengthening Innovation and Practice in Secondary Education (SIPSE) Project was implemented between June 2013 and May 2015 in Kenya and Tanzania. In Kenya 10 schools from Nakuru and Machakos counties were the beneficiaries. 6 teachers were selected from each of these schools. 60 teachers were drawn from Science Technology, English and Mathematics (STEM) subjects. In Tanzania, 60 teachers were drawn from 10 schools in the Mwanza region. In total 120 teacher from Kenya and Tanzania benefitted from the two year project. The project impacted more than 10,000 students from the two countries in the two years of implementation.

impacted student attendance, participation, motivation and learning; and (iii) supports the strategy of the three host governments which are committed to the integration of information and communications technologies (ICT) in secondary schools to address issues of access, quality, relevance and teacher training. The program is expected to deepen understanding of teachers' ability to understand and use technology and to assist in determining whether greater adoption of technology within schools improves student learning outcomes.

Goal. The goal of ADSI / ENEA is to transform 140 secondary schools in three target countries into "Digital Schools of Distinction" (DSD) in collaboration with the three Ministries of Education (MoE). Attainment of this goal will lead to the refinement of pre-scaling implementation models through consolidation and a holistic expansion of the successful aspects of the pilot model as well as taking a whole school approach to ICT integration, horizontal (geographic) and Institutional outreach (vertical) impact and shared ownership.

Scope. The African Digital Schools Initiative is being implemented in Kenya and Tanzania over a period of five years while the French version of the program "Ecole Numérique d'Excellence Africaine" (ENEA) is being implemented in Cote d'Ivoire as a pilot model over a period of two years commencing 2017. Table 2 provides a summary of targeted ADSI's scope in the three countries.

Table 2: ADSI Program Targeted Scope by Country and Stakeholder

Country	Location	Numbers under the ADSI program				
		Secondary schools	Support teams	School heads	STEM teachers	STEM students
Kenya	Kiambu, Taita Taveta, Narok, Nyamira	80	20	80	800	40,000
Tanzania	Pwani and Morogoro	40	10	40	400	20,000
Cote d'Ivoire	Abidjan 1, 2 & 3 and Yamoussoukro	20	5	20	200	10,000
Total		140	35	140	1,400	70,000

Source: MCF Board Meeting document 2016

In addition, the program reaches out to 560 school boards and PTAs; 2,800 teachers of other subjects and up to 140,000 students of other subjects. As of June 2019, the reach was recorded as follows:

Table 3: ADSI Reach as of June 2019

Country	Location	Number under the ADSI			
		Secondary schools	School heads	STEM teachers	STEM students
Kenya	Kiambu, Taita Taveta, Narok, Nyamira	80	115	1,142	38,629
Tanzania	Pwani and Morogoro	40	47	466	30,939
Cote d'Ivoire	Abidjan 1, 2 & 3 and Yamoussoukro	20	20	244	64,975
Total		80	182	1,892	134,543

Source: 12th April 2019 GESCI 2nd Bimonthly Meeting

Strategy. The strategy for delivery is to work across the four following interventions in an integrated and holistic manner. Box 2 highlights the four interventions and the proposed mode of delivery for each of the different interventions.

Box 2: ADSI Interventions and Modes of Delivery

Intervention	Mode of delivery
Institutionalization	Working with the Ministries and its program implementing agencies, Program Partner Groups (PPG) & Expert Working Group (EWG) at National level and School Support Team (SST) at County level / Regional levels
Whole School Planning for ICT Integration	Working through the School Leadership, SBCs, STEM Teachers and other subject teachers in planned transformation of schools to Digital Schools of Distinction
School-based Professional Development	Supporting continuous professional development (CPD) through School-based Coordinators (SBCs) whose capacity will be developed to provide the first line of support in project activities at school level
Blended Learning Approach	Supporting STEM teachers and other teachers through the provision of face-to-face sessions, online access to content through a Learning Management System and classroom observation sessions during ICT Integration practice

ADSI Team. ADSI is implemented by the Global E-Schools and Communities Initiative. GESCI is an international non-profit organization founded on the recommendation of the United Nations Task Force on Information Communication Technology (ICT). GESCI was established in 2003 at the first World Summit on the Information Society. Table 4 shows the staff deployed by GESCI on the three ADSI country programs.

Table 4: ADSI Team Allocation by Country

Positions	Allocation by Country			
	Kenya	*Tanzania*	*Cote d'Ivoire*	**Total**
Program Manager		1		1
Project Manager	1	1	1	3
Deputy PM	-	-	1	1
Project Coordinators	4	2	-	6
Education Specialist		1		1
ADSI Technical Officer/IT Specialist		1		1
Finance and Administration Manager		1		1
Project Accountant		1		1
MERL Specialist		1		1
Communication Assistant		1		1

Program Budget. The budget for delivery of ADSI is $7.5 million over five years. Table 5 shows the budget breakdown.[5]

Table 5: ADSI Budget (2016-2021) in US Dollars

Cost per focus area	Year 1	Year 2	Year 3	Year 4	Year 5	Total (US$)
Programme preparatory work	69,994	161,151	162,434	183,854	198,777	776,211
Train teachers in ICT	489,806	304,609	492,818	580,568	347,592	2,215,393
Develop online database	82,294	239,911	151,800	147,449	131,424	752,878
Develop a Digital Schools of Distinction	46,519	268,162	319,968	291,647	207,585	1,133,882
Integrate model within TTCs	68,724	112,563	159,966	166,546	96,223	604,022
Cote d'Ivoire	5,047	166,613	292,011	333,421	31,749	828,841

[5] The MTR team have not reviewed this figure given the numerous variables involved including the many changes in the annual budget amounts and allocation.

Monitoring, Evaluation & Learning	54,603	64,661	116,048	109,631	200,683	545,626
Subtotal of Direct Costs	**816,989**	**1,317,669**	**1,695,044**	**1,813,117**	**1,214,033**	**6,856,852**
Project Delivery Fee	168,814	65,986	169,504	167,849	112,513	684,666
Total (US$)	**985,803**	**1,383,655**	**1,864,548**	**1,980,966**	**1,326,546**	**7,541,518**

The ADSI Program Details. ADSI has six program outcomes that are shown below. Further details on the breakdown per Outcome statement, indicators and data sources can be found in detail in Annex 1.

Outcome
Outcome 1: ADSI stakeholder engagement from national to school level - ownership and institutionalization
Outcome 2: Enhanced ADSI school infrastructure conditions for school-based ICT professional learning and application in STEM subjects teaching and learning
Outcome 3: ADSI blended learning model platforms for leadership development on use of ICT to promote ICT across the curriculum and innovative practice / School capacity at *e-initial, e-enabled and e-mature* levels as shown in this diagram of the ADSI Award framework and progression to the ADSI Digital Schools of Distinction.

Outcome 4: Phased development model of teacher capacity at technology literacy, knowledge deepening and knowledge creation levels of ICT integration in STEM & other subjects

Outcome 5: Improved 21C classroom practices and student learning with effective integration of ICT resources in STEM learning

Outcome 6: Capturing and sharing of learning – ADSI model dissemination

1.3   The Methodology

The Development Assistance Committee (DAC) Criteria of *relevance, efficiency, effectiveness, impact and sustainability*, as laid out in the DAC Principles for Evaluation of Development Assistance,[6] has been adapted for reviewing this program. Section 1.3 provides a brief summary of the criteria and

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[6] https://stats.oecd.org/glossary/about.asp. The OECD Glossary of Statistical Terms contains a comprehensive set of definitions of the main data items collected by the Organisation. The Glossary also contains definitions of key terminology and concepts and commonly used acronyms. The definitions in the OECD Glossary are primarily drawn from existing international statistical guidelines and recommendations that have been prepared over the last two or three decades by international organisations (such as the United Nations, ILO, OECD, Eurostat, IMF) working with national statistical institutes and other agencies responsible for the initial compilation and dissemination of statistical data.

details of these key areas while the broader types of questions that have been applied across the three programs can be found in Annex 2.

'Relevance' reviews the extent to which the aid activity is suited to the priorities and policies of the target group, recipient and donor. **'Effectiveness'** measures of the extent to which an aid activity attains its objectives. This criterion focuses on two key areas: (i) the extent to which ADSI has articulated a coherent and strategic vision of how and for what purpose it has organised its human activity and capital assets to deliver both long- and short-term results; while (ii) looking at the articulation and positioning within ADSI's structures and mechanisms of the cross-cutting priorities to which the organisation is committed in pursuit of its strategic objectives. The '**Efficiency'** criterion measures the outputs (qualitative and quantitative) in relation to the inputs. It is an economic term which signifies that the aid uses the least costly resources possible in order to achieve the desired results. This generally requires comparing alternative approaches to achieving the same outputs, to see whether the most efficient process has been adopted.

'Impact' is the significant dimension that considers the positive and negative changes produced by a development intervention, directly or indirectly, intended or unintended. This involves the main impacts and effects resulting from the activity on the local social, economic, environmental and other development indicators. The MTR is concerned with both intended and unintended results and it includes the positive and negative impact of external factors, such as changes in government administrations and financial conditions. Project impact is assessed against the performance indicators and targets specified in the ADSI design and monitoring framework.

'Sustainability' is concerned with measuring whether the benefits of an activity are likely to continue after donor funding has been withdrawn. Projects need to be environmentally as well as financially sustainable. Important determinants of sustainability could include the likelihood that human, institutional, and financial conditions are sufficient to support program outcomes and continued support for program outcomes from the key stakeholders.

II. Performance Assessment

At the midterm of this ADSI program, the overarching evaluation objective for this MCF ISE MTR is to assess progress/changes so far and its likelihood of achieving its stated objectives (more than two years since implementation began) on the following **four** interventions using the five DAC criterion/dimensions:

Intervention	Details to be investigated and measured per Intervention
1. *Institutionalization:*	(i) the current level of institutionalization of national strategies for the pedagogical integration of ICT use in STEM and other subject teaching as related to policy: (a) in teacher development; (b) curriculum; (c) pre- and in- service; (d) school support; and (e) management practices
2. *Digital Schools Development:*	(ii) the current level of the establishment of conditions, needs, resources and priorities of the schools in relation to ICT in STEM teaching and learning
3. *Teacher Development:*	(iii) the level of change in teacher competencies and practices for ICT use in STEM since the baseline
4. *Student Learning:*	(iv) the level of student level acquisition of 21st century skills and other learner achievements in relation to STEM subjects (v) details pertaining to student experiences and attitudes towards the use of ICT in STEM learning inside and outside of schools.

2.1 Relevance

To what extent are the activities aligned with the overall strategic priorities of the government?

Background. Across the three countries in the ADSI program, there are supply side shortcomings in the quantity, quality, and classroom practices which have been identified to be key contributors to poor learning outcomes. The shortage of teachers, particularly in schools that are located in poor, remote sub-counties/districts affected by insecurity is due primarily to an insufficiency of new teaching posts based on the allocated budget; ongoing difficulties in recruiting and retaining teachers for schools in localities with challenging accessibility and living conditions; and strong resistance from vested interests to the redeployment of teachers. The shortage of STEM teachers is particularly acute, given that the nationwide supply of such teachers in the three countries is much smaller compared with other subject teachers.

Deficiencies in teacher competencies are also identified as a major contributory factor to lagging student learning and these deficiencies can be partially attributed to the lack of a systematic approach to evaluate teachers' performance and promote professional development. Teachers that do not meet nationally prescribed teaching standards remain in the system and continue to teach ineffectively because contract renewal/career progression is not linked to performance, and there is no recourse to in-service (INSET) that is designed to remediate performance gaps. Shortages of instructional materials such as textbooks, notebooks, and ICT equipment are extremely critical since students cannot achieve the learning goals of the primary or secondary curricula without the support of textbooks, workbooks, and other supplemental learning materials. Given these sectoral challenges, there are some clear examples of where ADSI is well aligned with the respective country's strategic priorities, as referenced by the following:

- In Cote d'Ivoire, the Minister for National Education, Training and Professional Development has written to GESCI's CEO requesting that this country initiative continue into a third year in line with Kenya and Tanzania.[7] In response, ADSI has triggered two processes with the MoE's DTSI department taking notice of the online learning resources provided by ADSI and with ongoing exploration of ways to increase the collection, analysis and choice of relevant digital education contents that could be shared on a Ministry Platform for use by teachers throughout the system; and
- In Kenya, the program is aligned with the Kenya 2030 Vision and the new competency-based curriculum. There are signs of high levels of buy-in from government officials with the significant involvement of the Teachers Service Commission (TSC) and county officials in the school visits, their encouragement of teachers to embrace ICT and significantly the appointment by MoEST of a special official to work with GESCI on ADSI implementation. The Secondary Education Quality Improvement SEQIP will also support peer learning using ICT.[8]
- In Tanzania, the ADSI programme is aligned with government priorities to include ICT and the current ICT Policy for Basic Education. The TTC interventions began in 2018 are now aligned to the Ministry's Teacher Education Support Programme (TESP) on ICT While there is no department in the MoE with overarching responsibility of ICT in education the program has effectively engaged key departments, including quality assurance, secondary education, policy and planning, teacher education and technology in the EWG.

Has this model gained resonance or support from local and regional stakeholders?

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[7] 'Key Change for 2019' document (S.Adela).

[8] The Secondary Education Quality Improvement Project is projected to change the fortunes of the country in grade 7, 8 and secondary schools (form 1-4). The proposed Program Development Objective (PDO) is to improve student learning in secondary education and transition from primary to secondary education, in targeted areas.

The ADSI model has undoubtedly received high levels of buy-in from both local and national stakeholders, although this does vary between the three countries and there are areas for improvement. Interviews and focus groups in Kenya revealed unanimous support for both the model and its implementation, with county officials highlighting their high levels of involvement and how the project has been "consultative and collaborative".[9] A range of stakeholders reported that the model is not only highly aligned with government strategic priorities, but is even *"doing what the government is supposed to do but is not able to."*[10] For example, the MoE distributes desktops to schools but does not provide training to teachers on how to integrate ICT into lessons. As a result, even where schools had computer labs, they were often left locked and unused. In enabling school leaders and teachers to gain both the skills and confidence to integrate ICT into lessons and facilitate the use of ICT by students, the project has therefore added value to existing government initiatives and is supported by other stakeholders (UNESCO, UNHCR and IGAD) initiatives.

In Tanzania, stakeholders commented on how the focus on using ICT in teaching and learning reflects national and regional priorities, and how teacher training was in line with Teacher Training Colleges (TTCs) and the Ministry's Teacher Education Support Programme. An additional strength is that the regional coordinators are embedded within the government education offices in the region. However, both stakeholders and project staff gave recommendations for improvements in gaining the support of local stakeholders. For example, in Tanzania it was recommended that the existing relationship with College of ICT (CoICT), Dar Es Salaam University is further developed to gain access to CoICT's contacts in the private sector. There is also growing external interest in the ADSI model, exemplified by the growing partnership with Dignitas Kenya which is implementing a project that has similarities with ADSI but through different approaches and at different depths of implementation. Other examples of synergy among other partners include:

➢ Young Scientist Kenya (YSK) is implementing the programme to promote scientific curiosity among the students. A YSK and GESCI partnership dialogue was initiated to encourage ADSI schools to actively participate in the YSK programme and, in principle, both organizations have agreed to work together in the promotion of STEM subjects and to enable ADSI school students to actively participate in the YSK programme;
➢ Techbiz, an ICT company in Kenya, has partnered with GESCI and awarded desktop computers to the top two projects produced by the students from ADSI schools;
➢ JPIK, Portugal donated 40 laptops to the ENEA initiative and, together with the supply of 60 laptops and 40 projectors from GESCI, all the 20 schools of ENEA programme were fully equipped with ICT infrastructure during 2018;
➢ The ADSI model is regarded by both IGAD (Inter-governmental Authority on Development) and UNHCR as most promising whole school ICT integration model. An agreement outlining this a model for all IGAD members is in the process of being signed with IGAD Secretariat.
➢ The Association for the Development of Education in Africa (ADEA) is partnering with GESCI in promoting ICT integration in education administrative systems. The ADSI programme was focused on at the 2018 Digital Skills Conference on Youth in Tunisia which GESCI co-organised. GESCI is AU ICT Cluster lead and ADSI is recognized as most promising ICT integration in schooling model by IGAD.[11]
➢ ADSI is regarded as a flagship programme of the African Union Commission.
➢ GESCI chairs the ICT in Education and Training Cluster of the AU's Continental Strategy for Education in Africa (CESA),

[9] Interview with regional stakeholder.
[10] Interview with national government stakeholder.
[11] Refer to CESA Journal volume 01 (Launchof the ICT in education cluster) and CESA Journal Volume04 (page 5)

> Schools in Tanzania have benefited from private sector initiatives, particularly from Halotel who provide reduced cost internet and have supported school to develop IT labs. One school in Morogoro reported that they had received a donation of 69 tablets from the Tanzanian Tobacco Company – although this was secured separately from the ADSI project.

Box 4 provides a summary of some of the strengths and weaknesses for the *Relevance* criteria[12].

Box 4: Summary of Strengths, Issues and Challenges for *Relevance*

Strengths	Issues and Challenges
Highly aligned with national government education priorities and strategies: Kenya: SEQIP, Vision 2030, the new Competency-Based Curriculum with its focus on Digital Literacy. Highly aligned with TSC priorities. And their criteria for teacher promotion. Education Sector Plan and GPE Plan Tanzania: The focus on ICT integration is aligned with the Education Sector Development Plan (2016/17 – 2020/21), Teacher Education Support Programme and ICT for Basic Education Policy Cote D'Ivoire: Law in 2012 and the Decree in 2014 that technology should be in all schools.	Across countries > Low level of basic ICT knowledge and, in Tanzania, the ADSI lesson plan templates were significantly different from those of the Ministry and that the ADSI templates had to be repackaged and took the teachers longer to adopt have impacted adversely on the pace of the initial training program.[13] > In Tanzania, it was felt that there could have been more done to engage with other NGOs or government programmes, although it was also noted that this was in part a systemic issue which needed better levels of government coordination[14]. > Whilst ICT integration is considered important by the Tanzanian Government, the documentation is not as specifically defined as in Kenya which poses greater challenges for the institutionalisation of the program nationally. > Low levels of English amongst teachers and students may have reduced their ability to access the ICT-integrated lessons.

Brief Commentary on Program Relevance: Since 2016, ADSI has impressively established the organisational architecture and financial framework to enable implementation and achievement of the expected results that are well-suited to the priorities and policies of the target groups in each of the three countries. There are structures and mechanisms in place that support the implementation of the ADSI framework for cross-cutting issues and the operating model and management of the human and financial resources support relevance and agility. ADSI has articulated a coherent and strategic vision of how and for what purpose it has organised its activities and assets to deliver short-term results. The key relevance challenge is to assess ability for 'institutionalization' and for this internal assessment the MTR poses the following questions:[15]

   i. How do the ADSI program components fit within the respective governments' medium-term strategies and how well has ADSI managed to provide examples of how elements from their

[12] It is important to note that ADSI is operating in each country on a different cycle so the strengths and challenges will vary depending upon their respective cycle of implementation.
[13] The ADSI team report that the issue here was that the ADSI lesson plan template differed significantly from the Ministry's own lesson plan. The former was then customized solving the problem and there are now good examples of lesson planning skills.
[14] Ministry of Education provides education norms and standards but School management is implemented by a separate ministry – Presidents Office of Regional and Local Government (PORALG). This causes dissonance.
[15] ADSI has prepared a Sustainability Plan (October 2019) which addresses many of these issues.

      national programs can be incorporated and support the governments' own operational education program and budget plans?

    ii.   To what extent can the ADSI program elements be shown as readily transferable into existing or proposed national programmatic priorities through their main lines of action and expected results?

    iii.   What is the financial envelope required to ensure that the ADSI priorities are supported by a sufficient budget post-2020?

    iv.   Is there a clear operating model that effectively delineates ADSI's possible responsibilities for program results post-2020 and its contribution to the respective government's stated Education Strategy Plan?

    v.   Have discussions regarding a potential organisational structure for ADSI and the government and other partners to reflect a new mandate commenced yet?

    vi.   If financial constraints limit ADSI's ability to consistently support its cross-cutting agendas in the latter part of the program – what other methods will be employed, such as a Community of Practice?

Inclusion. This section concludes with some specific commentary regarding ADSI and issues of gender and social inclusion. The integration of ICT into learning was judged to be particularly relevant for those students with additional needs; *"it has support that a child with a disability would require: multi-sensory, video, puzzles and instructions directly from the machine."*[16] For example, benefits to students with some physical disabilities at Joytown Special School included enabling students who were unable to write to type (through foot pedestals for example), and to enter exams. However, it was also noted that, despite the ADSI project working in Joytown Special School in Kiambu, the project had not been initially designed with inclusion as a main component of the project.

While Special Needs Education was from the beginning included in the ADSI roadmap, additional opportunities to support whole school integration were gathered during the field visits including: (i) the potential to use technology to advocate for inclusion in mainstream schools by being involved in the provision of extra technical services to enable students with disabilities to stay in schools; (ii) opportunities to support with the identification of learners with special needs in mainstream schooling through utilising the Education Assessment and Resource Centres' (EARCs) staff; and (iii) the piloting of inclusion of students with disabilities in mainstream schools.[17] Box 5 highlights how the integration of ICT in Kenya raised some unexpected impacts on both girls and boys.

<div align="center">

Box 5: Difference in ICT for Staff and Students

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During the school visits in Kenya, in one school where the girls and boys were taught separately, the girls had more access to ICT-integrated lessons because of the number of ADSI teachers who taught girls. In another school, where girls and boys were taught on different sites, the computer lab was on the boys' site and so girls had little access, reporting the use of ICT just once per week compared to the boys who reported using ICT in nearly all Agriculture and Geography lessons.

2.2 Effectiveness

To what extent were the objectives achieved / are likely to be achieved?[18]

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[16] Stakeholder interview.

[17] For example, in one school visited in Narok, where there were SNE learners who had hearing impairments and low vision, it was reported that, because the school did not have a specialist SNE teacher, no adaptions were made for these students. Here there would be an opportunity for the project to utilise technology to provide additional support based upon the experience at Joytown.

[18] African Digital Schools Initiatives (ADSI– Kenya and Tanzania) and Ecole Numérique d'Excellence Africaine (ENEA) - Côte d'Ivoire – Program Statistics 2019.

Program preparatory work for implementation of the ADSI in Kenya and Tanzania in 2016 and ENEA in Côte d'Ivoire commenced in 2017. The following tables and narrative provide the details on the teachers and principals/HTs on training, transfers, replacements and catch up training.

Table 6: ADSI Teacher Training and Transfer Statistics
(January 2017 – June 2019)

Country	No. of Schools	No. of teachers planned to be trained	Total no. of Teachers trained	Total number of teachers transferred	No. of Teachers continuing the ADSI/ENEA*	Cumulative Percentage of transfers
Kenya	80	800	1,142	300	754	38%
Tanzania	40	400	466	66	400	17%
Côte d'Ivoire	20	200	244	44	200	22%
Total	**140**	**1,400**	**1,892**	**410**	**1,354**	

*includes replacement teachers

Across all three countries with various cycles of TPD, ICT-based professional development was provided to 1,764 teachers compared to the originally planned 1,400 teachers. This translates to additional training for 26% teachers as of March 2019 within the agreed / approved budget from MCF**.** Table 7 provides similar data regarding the principals/headteachers (HTs), their training and transfers.

Table 7: ADSI Principals /Headteachers Training and Transfer Statistics
(January 2017 – June 2019)

Country	No. of Schools	No. of Principals / Head of Schools planned to be trained	Total no. of Principals / Head of School trained	Total number of Principals / Head of School transferred	No. of Principals / Head of School ADSI/ENEA	Cumulative Percentage of transfers
Kenya	80	80	115	35	80	44%
Tanzania	40	40	47	7	40	18%
Côte d'Ivoire	20	20	23	3	20	15%
Total	**140**	**140**	**185**	**45**	**140**	

(includes replacements)

Across all three countries with various stages of DSD, 180 Principals/HTs have been trained compared to the originally planned total of 140 Principals/HTs. This translates to additional training for 29% Principals/HTs as of March 2019 within the agreed / approved budget from MCF. A significant reason assisting ADSI to achieve its stated objectives is due to the extensive advocacy and dissemination across the different tiers of government. Table 8 shows GESCI's reach across the national, regional, continental and global arenas.

Table 8: Examples of GESCI's Advocacy and Dissemination by Level of Engagement

Level	Details of Advocacy and Dissemination
National	➢ In Tanzania, GESCI provided TA to the finalization of the GoT's GPE fund proposal and was requested by DFID to provide a report on ADSI's implementation to secure its place in a newly established Committee on ICT in Education. ➢ In Kenya, GESCI met with the Directorate of Policy and Planning, MoE and UNHCR to discuss proposed support in Kakuma Refugee Settlements
Regional	➢ As a result of the MOU with the African Union (AU), GESCI developed a continental/regional ICT integration in Education Assessment Framework of norms

	and standards of best practice based on GESCI's African Digital Schools frameworks.
	➢ The intention in 2019 is to engage the Regional Economic Communities (RECs) to roll-out customization of the framework, assessment and peer reviews with their member state MoEs and allow a benchmarking against best practices and a road-map on ICT integration in education for individual countries.
Continental	➢ The ADSI / ENEA programme case study was presented at the session "Digital Secondary Education, 21st century skills and readiness for the world of work" at the African Forum on Youth Skills and Enterprise in the Digital Age held at Tunis
	➢ The AU's MOU was signed between GESCI and the AU's Human Resource, Science and Technology Commission that set out areas of mutual interest and put forward the agenda of the ICT in Education Cluster, of which GESCI is the lead agency
	➢ GESCI's role is to the lead agency for the implementation of the ICT Cluster in promoting the objectives of the Continental Education Strategy for Africa
	➢ GESCI developed a Memorandum of Agreement with the Pan African Virtual e-University (PAVEU) to develop post-graduate diploma for Teacher Competency in ICTs in Teaching and Learning
	➢ GESCI was an integral part of the AU Innovating Education in Africa Expo in October in Dakar – subsequently GESCI has received an invite from MoE, Botswana to explore the ADSI program model for primary, secondary school in Botswana.
	➢ MOU with IGAD on the ADSI model
	➢ Articles on ADSI implementation have been publishes in each quarterly edition of the African Union's CESA Journal (Implementing Progress of the Continental Education Strategy for Africa) since 2017
Global Engagements	➢ GESCI as the co-chair of the UNESCO International Task Force on Teachers' sub-Committee on ICT and Distance Education helped organize one of the four thematic areas of the 11th Policy Dialogue Forum of the Task Force, in Montego Bay, Jamaica, in November 2018. The ADSI model was presented here.
	➢ The ADSI model was presented at the annual Alliance meet at Washington DC, USA, in November 2018 to Alliance Steering Committee members focusing on Using Technology to Scale Support for Teachers and Community Educators in Low-Resource Environments. GESCI moderated a session on Real-Time Classroom and Community Data Collection and Monitoring.

What are/were the major factors influencing the achievement or non-achievement of the objectives?

Participation and retention. In both Kenya and Tanzania, some of the EWG members did not participate in the school visits and classroom observations due to lack of capacity, lack of notice and high expectations of per diems. While in Cote d'Ivoire, the teachers initially indicated that they would be available to participate in the online tutoring during the exam / vacation period but when the online tutoring commenced there was only limited participation. In Kenya, the Government started implementing the 'delocalization' policy which resulted in 15 new Principals/HTs and 78 new teachers in ADSI schools while in Tanzania and Cote d'Ivoire, 5% of the teachers have been transferred after the training.[19] Table 9 highlights some examples of other early challenges for the ADSI program and how the internal team responded to address the challenge.[20]

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[19] Since transfers are such a key constraint to completion of the rollout, two interesting areas for further research perhaps are: (i) to what extent have the ADSI transferees carried their learning to their new postings; and (ii) what means can be implemented to enable them to complete their training even if they are transferred.
[20] PNR Y2. 2017.

Table 9: Details of Implementation Challenges by Focus Area

Focus Area	Details of the Challenges
Teacher Training:	*During the 'face to face' CPD programs:* ➤ Internet connectivity in the venues of training with hotels in the rural areas often having bandwidth constraints. ➤ Level of basic ICT skills of teachers lower than expected ➤ Level of teacher capabilities lower than expected ➤ Viruses in the laptops impacting on sharing of files using data sticks ➤ Too much content for the two days training
Online course delivery of Module 1 of TL cycle - Teacher training	*Using the Moodle Learning platform:* ➤ Incorrect teacher mail IDs and personal data took some efforts to correct and streamline on the Moodle Learning Platform. ➤ The original schedule was drawn to do online course delivery and classroom observations concurrently ➤ Considering the difficult terrain, the PCs experienced some difficulties with the concurrent tasks
Role of School Based Coordinators	➤ Many SBCs found their roles as first level of support providers at school level challenging ➤ Need for additional training and support to be planned as part of school leadership training ➤ Some tension between the roles and responsibilities of SBCs and school principals, with some principals feeling sidelined by the project
ICT Deployment	➤ Challenges procuring the total quantity of projectors from a single supplier. ➤ Due to the growing national inflation rate and growing consumer price index, it has been increasingly difficult to procure goods and services of acceptable quality for program implementation in Kenya within the approved budget allocations for these items.

Source: Periodic Narrative Report (Q2 2017)

Attrition and replacements: In Kenya, the Government started implementing the 'delocalization' policy which resulted in 20 new Principals and 106 new teachers in ADSI schools. These new entrants have been provided with an additional training program. Similarly, 45 teachers transferred in Tanzania and 27 Teachers transferred in Côte d'Ivoire. Overall, 14.30% of the School Head Teachers / Principals and 12.71% of the STEM teachers had been transferred during the year 2018 and almost 50% of head teachers and teachers from the start of the project. ADSI is making special efforts in-terms of catch up workshops, chat and forum support as well as focused support using technology tools to these teachers to complete the TPD cycles.[21] According to interviews with project staff, during the final year efforts will continue to be focused upon training both new staff, and there are ongoing considerations to train some heads of departments to mitigate the potential transfer of SBCs. In addition to turnover at the institutional level, ADSI is faced by constant change at the top which impacts on delivery at the systemic level.

Mixed progress amongst some schools. Despite some extremely impressive progress that many schools have made, there of course remain schools which are lagging behind. In interviews with Project Coordinators, in one county in Kenya out of 20 schools, around 10 were deemed to be on track. In the other 10 schools, 6 were judged to be making satisfactory progress and there were wider issues with 4 of them, and in one region in Tanzania, 8 out of 20 schools were judged to be on track. The schools visited for the MTR generally appeared to be high performing in terms of progress towards achieving DSD status, but from interviews with regional stakeholders and project staff a number of issues were raised. Project staff are clearly aware of which schools are underperforming and are planning to focus on these schools in the final year of the project in Kenya. Proposed options include

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[21] GESCI Semi-Annual Narrative Reporting – July to December 2018.

pairing high performing with underperforming head teachers and increasing school visits between schools to enable school principals to see best practice.

Different systemic contexts. The rollout in Cote d'Ivoire highlights some key delivery challenges and examples of how ADSI addressed such challenges. First there was the teachers' union that started a national level strike from November 2018 which resulted in 30% of the ADSI School teachers being unable to be fully engaged in the CPD cycle. Secondly, the academic year is approximately 165 days compared to 185 days in Kenya and Tanzania which meant that an additional two months were required to deliver the planned set of tasks which was primarily due to delays encountered in setting up the EWG, slow approval of the TPD Content Modules by the EWG lead, delays with the instructional design and packaging in the Learning Platform and the DSD and OER platforms.[22] In Cote d'Ivoire, the procurement procedures were completely different. Despite having leveraged the local staff knowledge of the environment, ADSI still encountered problems with suppliers including delay in the delivery schedule and the concomitant need to re-schedule the commencement of the online tutoring.

There was also the impression in Tanzania that the ADSI model was not as flexible as it could be and that the different context from Kenya was causing implementation issues. Staff and EWG member comments included that the ADSI had not referenced or made use of the OER content that has already been developed in Tanzania and there was feeling that the project did not want to adapt materials for one country and that adaptions that took place are not adequate - *"The resources that were there seemed to be rigid to some extent. Because we had the platform so if you were bringing in anything new if didn't fit in very well."*[23] For example, it was reported by a number of those interviewed that teachers spent a lot of time looking for resources online rather than using the OER. The reason for this was that, although topics in some subjects such as Maths were similar, the timing of the units within the curriculum differed and examples were felt to be specific to Kenya and therefore the OER was not as useful as it could be and teachers were looking for additional material. Other comments from the field in Tanzania included issues for teachers accessing materials using ICT. Comments corroborating this constraint included:

'*By using ICT you take a long time to prepare teaching and learning material but during teaching you take a short time. Because during the preparation of material you have to search, you have to go on different search engines in order to find relevant materials, even to find a picture or video that is relevant to the topic it will take a long time.*[24] And:
It takes me time, especially if I am looking for online materials including those animations and simulations. Creating animations for students takes more time[25]

In addition, the teachers interviewed felt that they were unable to adapt the available resources. Positively there was mention of sharing resources and materials from other teachers, one teacher mentioned using Whatsapp to share a video of his lesson and another that a friend had sent her materials using a mobile phone that, with the assistance of the SBC, they were able to transfer to the computer.

Amount of equipment and its ongoing maintenance. ADSI schools receive a consignment of hardware comprising of 5 laptops and 2 projectors per school. This small allocation of units does not enable many teachers or students to regularly have access to the equipment in the teaching and learning process and there are wide variations in how often teachers are able to use ICT and which students are taught by the teachers. FGDs with teachers in Kenya revealed ICT usage ranging from 1 to 8 periods per week depending upon the school. All teachers interviewed stated a desire to

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[22] 'Key Change for 2019' document (S.Adela. 2018).
[23] Interview with Project Staff.
[24] Teacher FGD, Morogoro.
[25] Teacher FGD, Pwani.

integrate ICT more into their lessons but said that they were constrained by the small number of projectors and laptops available.

An additional concern was the ongoing maintenance and failure of equipment.[26] Some issues of equipment failure were attributed to a lack of experience and knowledge amongst teachers with how to handle the equipment. Examples were given during interviews with project staff about teachers carrying the laptops in the rain and leaving project lamps on. However, there were also incidents of breakages which were difficult to explain, such as the corner of laptops being cracked. In the absence of government-funded solutions for such issues, ADSI has to date been funding the fixing and/or replacing of equipment. However, beyond project funding, whilst issues such as replacing screens will still need to be outsourced by schools, it is a cost which will likely need to be budgeted for internally under a recurrent budget item line. Due to ICT technicians being difficult to source, one solution explored during interviews with project staff was the training of SBCs or another technical person within the school.

From its interviews in the field in Cote d'Ivoire, the MTR cited poor infrastructure and the lack of equipment and resources as the number one challenge for ADSI and any ICT project in the country. The second factor was the student: teacher ratio where there could be 70:80 students per class with insufficient chairs and desks and a classroom environment where it was difficult to deploy a projector on the wall. In Tanzania schools often reported that they did not have a permanent internet connection and were reliant on Head Teachers buying bundles 'ad hoc' to access the internet. Teachers talked about establishing rotas for the use of equipment provided by ADSI, SBCs were frequently relied on to solve technical IT problems in the schools adding to their workload.

Difficulties of decentralization. Across the three target countries, ADSI understandably faces different levels of challenge due to the differing levels of decentralization. Challenges vary depending on factors such as how clear the roles are for the regional, county and/or district administrators, differing levels of budget support, the scope of their areas of oversight and the extent to which each management committee at the school level plays their roles in accountability and support. In Cote d'Ivoire, for example, strategic priorities are set by the national government, but the DREN (regional education offices) are key stakeholders when working with an individual or cluster of schools. When speaking with the DREN in Yamoussoukro, the MTR team noted that the DREN felt if engaged more proactively with the programme, they could be very useful in helping in its delivery.

Participation and engagement. Engaging teachers in the synchronous online chats is understandably difficult given their competing priorities, time and connectivity constraints. A school 'twinning' approach was adopted in Kenya where chats are scheduled to coincide with the PCs' (accompanied by SBC from a neighbouring school) presence in schools. After classroom observation, the PCs support the teachers to get into and participate in the chats. This has increased participation from an average of 54% to 80% and created opportunities for peer to peer support, collaborative learning and sharing of experiences. However, despite the improvements in attendance, teachers still identified connectivity, the timing of chats and finding the time to participate in chats as a continued challenge in focus group discussions. There is variation in the level of support from the community groups. In Cote d'Ivoire, the team noted variation in engagement across the COGES (Comités de Gestion des Établissements Scolaires publics or Public Educational Institution Management Committees).

What best practices have emerged?

Assessment. As a result of the MOU with the African Union, in August 2018 GESCI developed a continental/regional ICT integration in Education Assessment Framework of norms and standards of

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[26] January 2018 – June 2018 Report.

best practice based on GESCI's African Digital Schools frameworks. The intention in 2019 is to engage the Regional Economic Communities (RECs) to roll-out customization of the framework, assessment and peer reviews with their member state ministries of education. The AUC is exploring the possibilities of funding this initiative through their internal financial resources and through development partners. In addition, *GESCI has been requested by SADC Secretariat to develop an e-readiness tool for education sector assessments,* EMIS for post-secondary and present the same at SADC donors meet proposed to be held during the second quarter of 2019.

Monitoring and Evaluation of Learning. At ADSI inception, elaborate baseline studies were carried out across the three countries: in Kenya there was a baseline study conducted by researchers from the University of Nairobi (December 2017); in Tanzania, baseline was conducted by researchers from the University of Dar es Salaam College of Information Communication Technology – CoICT and College of Education –DUCE (December 2017) while in Côte d'Ivoire, the baseline was carried out by researchers from the National Teachers' Training College Abidjan, ROCARE/ERNWACA Côte d'Ivoire (January 2018). These reports were used internally to refine the project design and planning across the three countries. To further support the internal use of the baseline findings, the three reports were synthesized into a popular draft to provide highlights of the various contextual, operational and systemic differences and similarities across the three countries. The base line indicators were used to generate the findings of the internal Midline Report conducted earlier this year.

A fulltime position of an M&E specialist (based in Kenya but overseeing work across the three countries) was filled in mid-2018 . Existing data has been streamlined and analysed, the awareness of the M&E framework and processes has been raised amongst field staff in all three countries, tools to collect feedback from stakeholders are being reshaped to ensure that data collection is more outcome-oriented and there are increasing opportunities for staff to meet together to share learning.

A key means for measuring effectiveness is provided by the ADSI Kenya Midline Evaluation Report 2019. Table 10 shows the methods, participants and samples used to assess the ADSI program in terms of (i) its relevance, effectiveness, efficiency of project implementation and level of ownership by project beneficiaries and other actors; (ii) its effectiveness of networking with the different stakeholders for optimal leveraging of resources and sustainability benefits; (iii) documentation of lessons on the implementation of the ADSI approach and Theory of Change; and (iv) generation of practical, action-able recommendations that can be implemented by the project actors in the remaining phase of the project.

ADSI has continued to track performance of STEM subjects among the ADSI schools. A look at the average performance has produced mixed results with indications that there was some improvement in English, Physics and Biology. There was a slump in Chemistry in 2017 nationally due to a change in marking and grading criteria.

Subject	2016	2017	2018
English	3.4	3.8	4.1
Biology	2.5	3.3	3.0
Chemistry	2.9	2.3	2.9
Physics	2.7	2.8	3.0

Source: GESCI Internal Assessment (2016-2018)

Additionally, there are efforts by MERL to do an analysis of KCSE performance against County and National performance in STEM subjects and there are ongoing engagements and data collection and analysis with the schools personnel and the county education authorities. This process has remained slow because of *(i) inadequate data collection and management systems and infrastructure at the county levels; and (ii) slowness in releasing such data by government authorities such as*

the Exams Council and the national EMIS.

Table 10: ADSI Internal Midline Monitoring and Evaluation Study 2019 Details

Target group	Method/	Target sample	Sample achieved	Data collection instruments
ADSI Teachers	Survey	240	243	Structured questionnaire
	FGDs	96	114	Discussion guide
School leaders	Survey	40 Principals	40	Structured questionnaire
	Survey	40 BoM/PTA Chairs	38	Structured questionnaire
Students	Survey	1600	1600	Self-completion questionnaire
	FGDs	120	140	Discussion guide
Officials	KIIs/	12	16	KII discussions guide
		Total sample	**2,211**	

Table 11 extrapolates the following findings from the internal ADSI Midline which advance the following levels of program effectiveness in Kenya across the different interventions.

Table 11: Program Effectiveness Results from the Internal ADSI Midterm Review in Kenya

ADSI Internal MTR Findings
Institutionalization: About 90% of the schools now have either developed new ICT integration policies or improved on the existing ones. *Digital Schools Development* ➢ polices were deemed useful and effective as they had helped in building support, buy-in and corporation among members of the school community on the importance of ICT ➢ policies said to have generally motivated the school leadership to invest in the growth of ICT infrastructure and equipment ➢ helped streamline the use and sharing of ICT resources and protecting misuse of the facilities ➢ generally a very strong belief and recognition that ICT has great potential to improve teaching, learning and performance ➢ good buy-in and support by school leaders, an improved ICT integration environment, growth of ICT infrastructure and equipment, better resourcing for ICT infrastructure and improvements in the schools' ICT culture ➢ ADSI schools have developed stronger systems for acquisition and management of ICT resources and improved the use of ICT in school management and communication among the school community. *Teacher Development:* *Evidence suggests that teachers have:* ➢ improved their access to ICT both in schools and other environments, ➢ developed a deeper understanding of the potential of ICT in improving teaching, ➢ built their confidence in using ICT tools and equipment, ➢ helped the teachers acquire knowledge on the modern 21st Century teaching. ➢ adopted using ICT in lessons more regularly and have influenced their peers *The project is contributing to:* ➢ the acquisition on 21st Century skills amongst the learners ➢ greater collaboration happening among teachers ➢ building of a community of practice that allows participating teachers to share knowledge and information amongst themselves is emerging. *Student Learning Feedback from the study suggest that for the students, the project has:* ➢ greatly increased access and use of ICT among students both in and out of school, ➢ improved the skills, confidence and frequency of using computers for personal and school-related tasks

- improved their perceptions on the potential of computers to support learning.
- Through provision of ICT, given opportunities to research and find out more information beyond what the teacher covered
- Provided opportunities for lessons where ICT is integrated into conventional lessons with over a third of them saying they highly liked the lesson in which ICT is integrated.

ADSI is considered by policymakers to be:
- relevant and well aligned to national goals and initiatives with government plans
- adopting close collaboration in its implementation
- a timely and relevant project which was changing the way learning happens and improving learning outcomes
- using an approach which combines equipment support and teacher professional development and which engages different actors in implementation.

Source: ADSI Internal Midterm Review 2019

However, despite these improvements, areas for development remain. One key aspect for the ADSI staff to consider is the flexibility and adaptability of the program in response to learning and in response to the differing contexts of the three countries. The budget for M&E was split into midline and endline with a lack of dedicated budget for learning opportunities both within and across countries. It was reported during interviews that changes have been logistical rather than outcome-related. Interviewees in Kenya raised the issue of providing assistive devices to children with special needs in mainstream schools but reported that the budget was fixed and so room for flexibility was limited. It is therefore recommended that budgets for the final year are revised based upon learning to date, the varying needs of schools and the required level of effort to fully engage with national-level stakeholders.

Brief Commentary on Program Effectiveness

ADSI has consistently shown that its focus is on key operational functions (e.g. human resources, resource generation and programming) and how these functions are continuously geared towards obtaining stakeholder buy-in and support strategic direction and deliver results. The key challenge now is ensuring that there is sufficient space to progress further and to assess as clearly as possible to what degree the current approach and resource allocation is aligned with the CPD and ICT priorities of the respective country governments, both educationally and financially. To which end, the following questions are posed:

i. Has the program started yet to assess what additional work is required to strengthen the accountability and performance management of the decentralised units at the district and school levels beyond the life of the program?
ii. For effectiveness that is sustainable, does a performance assessment system need to be in place for the individual teacher or school Principal (or indeed school for the DSD certificate process) and, if so, how might such a system feed into the decision-making processes such as promotion, incentives and rewards?
iii. Is the program's current financial envelope effective and if so, how does this funding requirement change as the program looks to institutionalise its program elements?
iv. Does the program have a rough estimation of the financial breakdown of what is required to enable the respective governments to have the capacity and capability of delivering the necessary resource mobilisation strategies for a program of ADSI activities/inputs?

2.3   Efficiency

Is the program being implemented in the most efficient way?

A key indicator as to whether a program is being implemented in the most efficient way involves considering how the program implementer integrates key learnings from participants into project improvements for the subsequent year. The following examples of challenges and the ADSI team's responses are drawn from the ADSI 2018 Annual Narrative Report:

i. Continuous collection of feedback from the direct beneficiaries has always been an embedded concept in the delivery of the ADSI program. Key monitoring data has been continuously gathered through self-analysing software (mainly survey monkey) and used for reflection from the teachers after each face to face training and at the end of each cycle. There have also been lesson plan reviews which have consistently shown that over 80% of the lesson plans integrate the critical components of TPACK as well as 21_{st} century skills. Then there has been the classroom observations and school visits which have provided platforms for instant feedback and support.

ii. In Kenya, the TSC issued a direction to the teachers that they have to stay at the schools during the weekdays and optimally utilize their instructional time for classroom teaching. Considering this, the TT programme for the KD cycle is planned on Saturdays. Also, instead of a two-day training program, it's been divided into two training programs without increasing the allocated budget i.e., one day workshop before commencement of Module 1 and Module 2 respectively

iii. The peer learning approach of involving SBCs in school visits has significantly enhanced the number of lessons observed as well as peer review meetings so a similar approach will be followed during 2019 and further strengthened

iv. The certification hand over and policy feedback collection is re-modelled from a Regional event to a school-based event to engage the participation of local communities to build sustainability

v. Seamless communication with the SBCs and participants (school, county and regional levels) through appropriate tools such as WhatsApp to apply learning / peer learning

vi. Considering the high percentage of teacher transfers (12.71%), catch-up training is planned for the new STEM teachers entering the schools. In addition, virtual support is planned by the SBCs at the schools' level and by PCs at the regional / county level

vii. Education officers at county level also requested for a deeper skill training as opposed only to attending meetings and visiting schools. The ADSI team is making considerations on the feasibility of enhancing the training and a decision would be made based on availability of resources and suitability of such an approach

viii. Involve the SBCs and foster interaction with neighboring schools to increase informal discussions and support. This encourages learning from each other, free advice and flow of information and sharing of strategies such as which internet suppliers are offering better services, who are the reliable service providers and what after purchase service provision is available

ix. Strategies will be developed and implemented to enable schools that lag behind to be supported to eventually achieve the required status.[27]

This list of issues and the responses highlights how the program continues to wrestle with the key challenges of transferees, maintaining momentum across all schools, accessing participants to undergo the training and advocacy/raising awareness.

Customization. Each country is understandably contextually different and this difference has been highlighted clearly from implementation experience, the baseline study reports and the comparative analysis and synthesis reports. Hence, while ADSI has a 'master footprint', there is a constant need to customize to cater for the specific needs of each country starting with modules, DSD road maps, connectivity approaches, online tutoring patterns and support and institutionalization arrangements for which ADSI has been responsive. Learning opportunities and communication between project staff in Kenya and Tanzania appear to have been limited. It was reported during the MTR visit that project

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[27] GESCI 2018 Annual Narrative Report.

staff in Tanzania received little support in terms of training, time to become familiar with the content and a lack of opportunity to see what was happening in Kenya, which made it challenging for them to fully understand the activities. Staff felt isolated in the sense of feeling responsible for the whole project e.g. *"At the regional level it's like I am the GESCI. You know coordinating, organising things, managing everyone and activities, make sure that other stakeholders know what we are doing, make sure that other stakeholders are also engaged in the process."*[28]

In Tanzania, the MTR team noted from interviews that staff in Kenya were unwilling to adapt the model itself when issues were raised. This led to some project staff feeling like their technical experience and contextual understanding were not valued. In commenting that *"sometimes when you suggest something that will support the training – it is very rigid and fixed"*[29], an example was given of budgets being fixed and negotiations representing a challenge e.g. when suggesting to provide training for additional beneficiaries or catch-up training to raise quality, the response was that there was no budget. There was a concern that lessons were not being learnt across the contexts and, instead of adapting activities to work in other contexts, staff in Kenya were just rejecting proposed activities. One further example given was the holding of a teacher forum; because it had not worked in Kenya *"they assumed even in Tanzania it should not happen... we didn't even try it, or at least they could share what happened with us to avoid that and so we can improve."*[30] On the note of sharing lessons learnt, although periodical country specific and peer country meetings are organized and all the program specific communications are commonly shared via mails and virtual collaboration, there is perhaps still need for more means for sharing of lessons learnt across the three different programs and their diverse delivery cycles.

The MERL has in recent times started the conversion of the online reports into more analytical but accessible (10 pages max) summaries called the learning notes which have created a more structured way of collective internal sharing, reflection and feedback. As some have been done retrogressively, these learning products have also supported the planning for the next phases of the project informing the team particularly on any areas where teachers may need refresher training but also areas where the project can focus on deepen learning.

In Cote d'Ivoire, the MTR team received comments regarding the need for further adaptation of the modules to the Francophone context and using the opportunity to leverage the adaptations that are being made by the teachers so that their materials can populate the site and be shared more efficaciously.

Were activities undertaken to date in the most cost-effective manner?

The ADSI Kenya midline findings and conclusions have unearthed several lessons that could go a long way in improving implementation, sharpening focus as well as improving the potential for sustainability of the ADSI project. Box 6 shows some examples.

Box 6: Lessons from the ADSI Kenya Midline study[31]

On institutionalization: Having school-level policies for integration of ICT is critical in creating awareness amongst stakeholders, supporting buy-in and assuring implementation. ADSI appeared to have gained better traction in schools where the policies were well communicated, displayed prominently and embedded in the school plans and targets

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[28] Interview with project staff.
[29] Interview with project staff.
[30] Interview with project staff.
[31] GESCI Semi-Annual Narrative Reporting – July to December 2018.

On Digital Schools of Distinction Progress: Principals buy-in is critical. Schools where the Principals had taken ownership of the ICT integration appears to have made better progress, with teachers reporting better support and most appear to have innovated and managed to marshal more resources for infrastructure and more equipment.

On teacher professional development: SBCs are the first point of help whenever there are technical challenges at schools. Empowering the SBCs to have a supervisory role and to have technical capacity to support is critical in managing delivery and participation of the teachers.

On students learning: Project based learning has generated a lot of interest among students. Learning through developing and researching has created a shift in the way students view their role in learning and made students feel empowered and confident but students with poor ICT skills are struggling. Encouraging schools to have basic ICT literacy programs for the students is critical in unlocking the students' potential to achieve more.

Engagement with policymakers: ADSI has a great reputation among the policymakers at the County level. This has been as a result of close coordination and alignment of project activities with the MoE activities. Closely collaborating and involving these policymakers in project activities such as classroom observation serves to strengthen their buy-in and support.

Source: Extrapolated from the GESCI 2018 Internal Midterm Review

Findings from the field visits further indicate that the model is cost-effective through requiring schools themselves to share the cost of ICT integration, which also has positive effects for sustainability. For example, participant schools are required to allocate part of their budget to ICT integration for areas such as the costs of connectivity. Putting issues with connectivity aside, requiring schools to fund aspects of ICT integration allows project money to be spent elsewhere whilst also enabling schools to take responsibility and ownership to fund aspects beyond the project timeframe. Supplying schools with a limited amount of technology whilst focusing efforts on training teachers is also cost-efficient because it enables teachers to use the technology. In schools which have been given desktops from the government but have not received training, they have often remained locked away with teachers unsure how to use them and wary of letting students access them.[32] In addition, once having bought into the potential of whole-school ICT integration, schools can continue to budget for more equipment or to look for external funding from other sources because they already have the ICT skills. Therefore, despite schools wanting to receive more equipment from the project, it is deemed that the project is achieving the right balance between the supply of equipment per school and the focus on training, because it has enabled more teachers to be trained which is the critical factor.

How could the partner and government work better together to further improve efficiency?

Consultation and dialogue. ADSI has evidently been proactive in holding open consultations and communication with key stakeholders in Kenya and the other countries. Across the three countries, this approach has helped in aligning activities to the school calendar, carrying out class observations and school visits at convenient times for the teachers and schools. It has also enhanced the acceptability of the project by the teachers as well as ministry officials as they no longer see the ADSI activities as intrusive or disruptive of learning and examinations in schools. In ADSI there are clear examples of collaboration with critical stakeholders including through the involvement of partners (SST, Regional District teams, EWG, PCs, ADSI team) during school visits and classroom observation raised awareness on progress and provides opportunity to advise on harmonization of project implementation to be in line with national policy and guidelines.

Consultation and Collaboration. Examples of collaboration and consultation can be extracted from the GESCI 2018 Annual Report which shows how the project learnings and outcomes for 2018 have

[32] Examples given anecdotally through interviews.

informed relevant stakeholder priorities:[33] Moving forward, in Kenya there is a need to focus on engagement with national-level policymakers, particularly with the TSC. In Tanzania, where a good relationship with the teacher training college in Morogoro has been developed, the priority should be on strengthening this relationship to be able to work more strategically to work towards institutionalisation. These examples include:

- The participation of officials from teacher employers, SST and EWG in response to the invitation to join in school visits, trainings and other activities has been very helpful in providing a deeper understanding on the cohesive set of activities and supportive tools that make up the ADSI implementation model in schools. This participation also indicates how the ADSI project goals and approaches are seen to be in line with the national educational aspirations and policies;
- The ADSI model is informing practice within government evidenced in Côte d'Ivoire where ADSI has triggered three processes: (i) the MoE's IT department took notice of the online learning resources provided by ADSI and is exploring ways to increase the collection, (ii) the analysis and choice of relevant digital education contents that could be shared on a ministry platform for use by teachers throughout the system; and (iii) held the first workshop in the MoE on the development of a strategic Vision of Innovation in STEM education;
- Opportunities for potential collaboration: In Tanzania, the College of ICT – University of Dar es Salaam (CoICT-DU) expressed an interest to partner with GESCI for an engagement with 34 teacher training colleges for capacity building of teaching faculty based on the learnings from the ADSI teacher training programme and implementation;
- Signs of buy-in from government officials: In Kenya, it was observed that since the involvement of the TSC officials in the school visits, the level of interest and participation among the teachers has increased. The TSC officials have also been encouraging teachers to embrace ICT which is significant as teachers are more likely to be dedicated when they see the education officials embrace the project.

Box 7 provides as a summary of the strengths, issues and challenges for *Efficiency*.

Box 7: Summary of Strengths, Issues and Challenges for *Efficiency*

Strengths	Issues and Challenges
- Ownership by the stakeholders is a major contributor to the successful implementation of the project. The anecdotes are very positive in-terms of the commitment and positive engagement across all tiers – central and local government, school leaders, teachers and the students - Use of Gantt charts is assisting to monitor progress at the three country and overall program level - Use of flexibility exercised to re-allocate the budget line items for overall quality delivery of the program[34] - In Cote D'Ivoire, ADSI established a Steering Committee including AfDB, Jacob Foundations, ADEA, etc. with the view to build stronger sustainability for the program	➢ The DSD platform development had to go through a multiple iterative process on the System Requirement Specification to accommodate all the DSD road map requirements with various reporting options ➢ Underestimation of the need for sustained preparation and support for SBCs before they performed their roles and responsibilities at appropriate level ➢ Monitoring of the teachers' engagement in the Moodle Learning platform requires more time and support than originally estimated

[33] GESCI 2018 Annual Narrative Report.
[34] For instance, the Instructional Design work of the Technology Literacy cycle had to be further improved to meet the quality standards so MCF was requested to permit the re-allocation of budget headings. Similarly, as implementation in Cote d'Ivoire commenced, a flexibility on travel based on specific need but within the overall approved travel budget was required.

Brief Commentary on Program Efficiency

It is difficult to determine if ADSI is being implemented in the most efficient way for a number of reasons including: (i) there are no alternatives available for comparative purposes; (ii) the aim of this MTR is not to conduct a full 'Value for Money' analysis since this program is innovative and permitted to change in the budget allocations and activities on an annual basis in response to exigencies in the program; and (iii) any measurement to review if ADSI uses the least costly resources possible to achieve the desired results is further compounded by the lack of robust and quantitative external assessments of learning outcomes for the individual (be it school Principal, teacher or student) from the training inputs or gained at the systemic level from the DSD component.[35]

2.4   Impact

The Impact Goals. Based on its Annual Plan Y4 2019, GESCI's *'Organizational; goal is to be a global thought leader and expert organization in supporting the utilization of new technologies to advise, coordinate policy dialogue, research, develop and implement models of good practice for the widespread use and integration of ICTs in formal education and other learning environments within the context of supporting the development of inclusive knowledge societies and the achievement of the SDGs.'* Attainment of this goal and the impact of ICT as a result of GESCI's work will be measured according to agreed criteria with partner countries and funding partners.

The Annual Plan states that the ADSI program goal is to transform secondary schools in the target countries into "Digital Schools of Distinction" through consolidation and development of a holistic expansion of the elements and demonstrably successful aspects of the pilot model including its innovation practice, whole school approach, horizontal (geographic) and Institutional outreach (vertical) impact and shared ownership. The impact of this ADSI goal will be measured and sourced from a range of means including phased development tools and modules, student 21$_{st}$ century skills phased development, Digital whole school maturation pathways , baseline of teacher ICT competency, pre- and post-testing, monitoring and evaluation through classroom observation and focus group discussions, and finally adoption and adaption of the ADSI model in national policy, strategy and deployment models.

What are signs of impact in terms of (a) behavior change at student, teacher, and system official level or (b) structural change in the education system?

Teachers. ADSI has gathered evidence and observed that, across the 3 countries: more teachers use technology when performing their routine classroom activities; more teachers are participating willingly or inviting peers to observe classes especially during the school visits; and there is an increasing interest and awareness on the use of technology due to close and regular support from PCs, SBCs, Principals and SSTs. While some project teachers have been transferred and new teachers have replaced them, the momentum across countries was maintained because of additional efforts from the field teams. Interestingly, it has been noted that in Kenya especially, more teachers (other than STEM and project teachers) have joined ADSI through mentorship initiatives. These findings have been corroborated by the FGDs with teachers, with the following additional effects having been reported: teachers are involving students more in their teaching as classrooms become more student-centred; they are becoming facilitators rather than the holders of knowledge; they are using ICT to improve their own subject knowledge; and teachers are collaborating more in the development of resources.

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[35] GESCI has several external groups (SST, EWG & BOMs) who participate in most of the classroom observations and lesson plan reviews to help validate internal assessents of training impact and the extent of the application of learning amongst the teachers and students.

During the fieldwork in Tanzania it was evident that teacher participation in the ADSI programme was associated with an increased sense of collaboration and peer learning within schools, teachers talked about becoming more comfortable with observing each other's lessons, and helping teachers of other subjects to use ICT in their teaching and lesson planning. When it comes to performance, the ADSI project has in place several performance monitoring mechanisms for teachers namely; lesson plan reviews, classroom observations and OER and teacher product assessments. In Kenya, 1,460 lesson reviews were carried out by both internal and external people under the TL Cycle module one and two. The teachers consistently performed above the target as follows on a scale of 0-4:

21st Century Skills	Module 1 (772 lesson plan design reviews)	Module 2 (788 lesson plan design reviews)
Critical Thinking - in Lesson Design (Teaching)	2.84	2.83
Critical Thinking - in Lesson Design (Learning)	2.72	2.72
Collaboration - in Lesson Design (Teaching)	2.75	2.80
Collaboration - in Lesson Design (learning)	2.64	2.74
Technology Use as a Learning Tool		

Source: ADSI Internal Assessments (2019)

Classroom observations done by both internal (PCs and SBCs) and external (school support teams) and done using an assessment rubric, have consistently shown that teachers were not only applying the various aspects of TPACK as covered in the modules but also applying them in their lesson design and teaching:

- In Kenya, 233 classroom observations were carried out by both internal and external people under the KD Cycle module one. The teachers performed as follows on a scale of 0-4; Communication 2.99, creativity and innovation 2.72 and technology use 2.64.
- In Tanzania, in 295 classrooms observation conducted for KD Cycle module 1, teachers scored highly in the level of incorporation of 21st C in their teaching as follows on a scale of 0-4; Communication 3.09, creativity and innovation 2.95 and problem solving 2.93. In module 2 of the same cycle, also showed that teachers were rated highly on the application of these skills.

Student learning. According to the MERL plan, outcome 5 was about Improved 21st Century classroom practices and student learning with effective integration of ICT resources in STEM learning. The ADSI team has continued to track this. There are signs that student performance in STEM subjects (except chemistry) is improving across ADSI schools in Kenya. A comparison of the KCSE performance data between 2016 and 2018 school mean scores for ADSI schools also show that the majority of the schools improved their performance (albeit marginally) as follows.

Subject	2016/2017 KCSE		2017/2018 KCSE	
	% of schools with improved mean grade from 2016 (out of 80 schools)	*Average increase*	*% of schools with improved mean grade from 2017 (out of 80 schools)*	*Average increase*
English	93%	0.65	81%	0.6
Biology	20%	0.19	94%	0.75
Mathematics	88%	0.88	55%	0.42
Chemistry	62.5%	0.45	74%	0.53

Anecdotal evidence has also suggested that overall the performance of the students in the target schools has improved significantly and that the learning experience is much better as the lessons are livelier and more participatory. However, we recognize that the Kenya Certificate of Secondary Education (KCSE) exam mean score alone is not a sufficient and reliable measure to check ADSI

impact. We believe that the improved learning environment and classroom practices could have been a contributing factor to these trends.

Another way of looking at improvements in student learning has been looking at classroom observation data to ascertain whether or not the students are applying or demonstrating application of the 21$_{st}$ Century skills in their classroom activities and learning. Data from Kenya and Tanzania has consistently shown that students scored highly in this aspect. For example, classroom observation for KD Module 1 revealed the following:

Communication	0-4
Students: Work independently to create individual products.	2.70%
Students: Communicate using a variety of techniques.	2.63%
Students: Communicate with audiences within and beyond the classroom.	2.73%
Students: Initiate communication in real and non-real time.	2.77%
Creativity and innovation	
Students: Make connections to existing knowledge. Create standard products following teacher direction.	2.72
Students: Engage in activities that have some aspects of choice or open-ended response. Question, summarize and make predictions on their existing base of knowledge.	2.57
Students: Identify trends and make predictions independently. Apply existing knowledge to create ideas and products.	2.74
Students: Apply critical thinking, research methods, and communication tools to create original work. Collaborate effectively beyond the classroom to create original work	2.65
Critical thinking	
Students: Use limited range of resources to solve routine tasks.	2.68
Students: Use resources including technology to make decisions and solve problems.	2.63
Students: Use technology to work with limited teacher help to solve problems.	2.75
Students: Use multiple resources to plan, design, and execute real-world problems. Develop and answer open-ended questions using higher order thinking skills.	2.77
Collaboration	
Students: Rely on teacher prompts to ask questions or communicate with others	2.76
Students: Work in groups to accomplish measurable tasks or products.	2.68
Students: Assume one or more roles within their team to more effectively create collaborative products	2.79
Students: Form collaborative teams to solve real world problems and create original works.	2.83

FGDs identified reasons for the impact on student learning to include: students are more motivated to attend school and to learn; the use of ICT has led to increased understanding of abstract concepts; students are more engaged and active during lessons; they are more independent and in control of their own learning; they are sometimes able to research content in their own time outside of lessons; they have gained confidence through making class presentations; and improved their group working and other 21$_{st}$ Century Skills through collaborating with other students.

School management and administration. An unintended benefit of the project for those schools which have embraced ICT integration has been how the project has been a springboard for these schools to go beyond the project requirements and integrate ICT in ways which support wider school management and administration. Examples given during interviews which reflect a real appreciation of the potential of technology included the installation of biometric recognition for registration (parents can also get sent a text verifying their child's arrival at school which has improved attendance), CCTV around school, the uploading of materials onto a school portal which means that children who are ill and unable to attend school can learn from home, and the generation and payment of bills online.

There are indications that there is marginal increase in enrolment in the ADSI schools in Kenya. Anecdote evidence has revealed that there are some schools where enrolment has grown

tremendously (including transfers from neighbouring schools) as a result of growing status of schools within the community. This is an indicator that MERL is analysing and particularly looking to come up with case studies of individual schools that have experienced the rise.

County	Average enrollment 2016	Average enrollment 2017	Average enrollment 2018
Kiambu	175.1	175.8	175.6
Narok	82.9	88.3	99.0
Nyamira	72.1	70.8	92.8
Taita Taveta	83.7	85.1	88.8

In Cote d'Ivoire, the MTR team visited three schools which were embracing the program: in Lycee Moderne Cocody-Angre (Abidjan, 9.26) the COGES created a 2019-2020 plan and has budgeted to put Wi-Fi in the schools as well as purchase additional laptops; the COGES at Lycee Moderne Autoroute (Abijdan, 9.27) has a plan to combine efforts with 10 other schools in South Abidjan and put money in a pot from which they will decide what needs to be purchased for technology to be in the schools and then approach vendors to ask for reduced rates while at Mamie Adjoua (Yamoussoukro. 9.24) they said that they would maintain the upkeep of the IT room and buy more computers.

In Tanzania examples were given of Head Teachers sourcing additional computers, projectors and printers for their schools – in some cases through reworking the school budget, and in some cases taking advantage of donations from alumni. In most cases head teacher actively encouraged teachers to use ICT and actively engaged in increasing the use of ICT for school administration for example for record keeping and recording exam results to enable easier communication with parents.

Officials. In Côte d'Ivoire the deeper engagement from the national MoE and the involvement of the General Inspectors of each subject discipline to include ADSI/ENEA in their priority and scheduled visits to schools greatly facilitated project activities and generated a spirit of cooperation among other departments as well. The IT Department provided on-going support for the successful deployment of equipment to schools and to get them user–ready for training sessions including the provision of two staff from the Ministry to work with the program. They also provided technical support during training sessions. In Kenya, stakeholder interviews revealed that the Centre for Mathematics, Science and Technology in Africa (CEMASTEA) has developed an online module as a direct result of seeing the positive impact that the online sessions had with ADSI teachers. As a result of being part of the EWG, CEMASTEA has also realised the importance of adapting materials for those with additional needs and so will be involving KISE in material development moving forward. Other examples of learning from the project in Kenya include the EWG members developing their own ICT skills, such as the use of infographics.

Box 8 provides a brief summary of the main strengths, issues and challenges to program Impact, some of which - most critically, the transferrals and change of status for teachers who have the DSD certification – are beyond the control of ADSI.[36]

[36] COGES: the level of support from COGES/PTA in all the schools is not the same. The COGES in Yamoussoukro reported less motivation around the schools but this could be because these schools were poorer/more rural so there would be access to less resources.

Box 8: Summary of Strengths, Issues and Challenges for *Impact*

Strengths	Issues and Challenges
- Creation and facilitation of peer learning opportunities - Use of OERs and simulations to assist in understanding of abstract topics and hard to teach concepts - Improved support with internet by the school administrations in Kenya emanating from the attainment of E-enabled status - A training program for different levels of staffing from central to institutional levels - A defined and integrated three-phased Digital School Certification framework that can monitor impact and an incremental path for progression	- Lack of national or regional means for assessing ADSI's impact on improved student achievement - Ability to assess the impact of transferees once they go to non ADSI schools - High student population ratio to the ICT equipment - Capacity and budget for facilitators training struggles to meet set targets often due to unknown number of transferees and the need to train their replacements - Any proposed wage increase for ADSI trained staff is unlikely to be implemented but this is related to the status of these teachers/school principals and their career development - Low level of access to bandwidth and hardware undermines relevance of the other 'soft' inputs - Low level of basic ICT knowledge impacts adversely on the relevance of the initial training program - Low level of English amongst students impacts adversely on their ability to use ICT

Brief Commentary on Impact

As expected of a 'lean' team managing deliverables across three countries simultaneously, the ADSI SMT provides and maintains a very comprehensive set of Project/ Program Activities per year and the 2019 Plan is no exception with its detailed breakdown of the Work Package, the Objectives, the Outputs/Deliverables, the Milestones and Deliverables timeline and the Human Resources needed. The MTR however makes a recommendation regarding the need to refer to and use the Risk Matrix on a regular basis. There have been no identifiable changes in the risk plans and assumptions from 2017 to 2019 for Risks 1, 3, 4 (in which only the level of likelihood was raised to high), 5 and 6 across the Periodic Narrative Reports.

Using the risk matrix. Management sets the standard by building a risk matrix for the organization and the program, it needs to train the staff to use the matrix and set limits. The matrix can be used to generate more consistent and effective results since it enables the team to understand the levels of risk and thus be more decisive and make more their decisions quickly. ADSI identified six significant risks which have been ranked according to likelihood and impact, overarching assumptions as to how the risk will play out and how the team intends addressing these risks. Each identified risk is reviewed and questions posed to determine if the project might have generated unintended outcomes, positive or negative, during its implementation to date.

Risk #1: ADSI is too ambitious a program (Likelihood: *Low* / Risk Impact: *High*)

Assumption	Proposed Risk Mitigation Plan
There will be no major interruptions beyond our 'circle of control' during the implementation of project activities.	- The project design is modular and similar in all countries Going by the experience from implementing planned activities in Kenya, ADSI will be improving on and adjusting approaches based on lessons, tools and frameworks used. - The processes will not be beginning on a clean slate in the other countries but build on and contextualize what has been done in Kenya. - Systematic monitoring and evaluation of activities at project and program level will reduce and minimize delays in the implementation of activities.

i. ADSI has been uniquely delivering across three very different country settings, what lessons have been learned regarding the tracking of improvements and adjustments based on the ADSI lessons, tools and frameworks?

ii. 'Circle of control' is an interesting notion – from the perspective of replication, this is a significant use of terminology, but has ADSI been able to determine what comprises such a 'circle' and what the variants are across the very different systems (including an Anglo versus Francophone education system)?

Risk #2: Stakeholders at the school level will not have the motivation to mobilize resources to support the implementation of School DSD plans/roadmaps towards transformation.
(Likelihood: *Medium* / Risk Impact: *High*)

Year	Assumption	Proposed Risk Mitigation Plan
2017/2018	Regional governments will not only provide resources but value attached to education towards a knowledge driven economy and society will be key to the success of ADSI in the target areas	➢ Stakeholder mobilization and awareness creation on the need for partnerships for the success of ADSI prior to the County launch of ADSI and the roll out of the intervention in schools was key to mitigating this risk. ➢ Going forward, the PCs and the SSTs will keep nurturing the relationships with local governments, commercial banks operational in the regions, other companies with interests in the target areas, professionals in the locale, BoMs, PTAs, parents, and community as whole. ➢ These will be critical to ensuring schools are supported to implement the plans.
2018/2019	County / Regional governments will continue to show their engagement in program towards integration of STEM subjects through ICTs in Teaching & Learning and education towards a knowledge driven economy and society	➢ Ongoing communication with the stakeholders and their engagement as part of DSD workshops and self-assessment for DSD levels. ➢ The synergy building among PCs, SSTs, PTA Representative, School Leaders and SBCs will keep nurturing the additional resource mobilization to the schools and ensuring the successful implementation and sustainability of ADSI/ENEA

The significance of this risk is evidenced by the fact that there is an addition for 2019 to the original 2017 assumption and proposed risk mitigation. Again, however, there are questions firstly regarding the ambitious assumption that governments attach value and how such value can be measured; and, secondly, understanding what lessons have been learnt from the stakeholder mobilization and awareness creation in Kenya that could then be utilised in Tanzania and Cote d'Ivoire. Further, to what extent are the data sets that are being collected specifically assisting in generating data that enables analysis and monitoring of this particular risk?

As ADSI enters the last stage of the program, the MERL has laid down a strategy (beginning with training the project team) to scale-up the use of Outcome Mapping (OM) to track changes in behaviour and practices among the county/regional-level officials (SST) and the Expert Working Groups (EWG). Particularly the focus will be in tracking their level of engagement and advocacy efforts as outlined in the ADSI outcome mapping framework which envisage the following: (i) the project would like to see school support teams attending the ADSI launch project together with attendance at the training of the school management and the school based coordinators training; and (ii) they are taking ownership for the development of the ADSI model and advocating the quality of the model and materials in national institutions.

Risk #3: Teachers will not have motivation to complete the course. (Likelihood: *Medium* / Risk Impact: *High*)

Assumption	Proposed Risk Mitigation Plan
▪ Support and institutionalization of the project will greatly motivate the teachers. ▪ The accreditation and certification that is being worked out with the University of Mauritius before being cascaded to local universities will give the intervention traction with teachers.	➢ With e-learning initiatives taking root in the primary school level in the target countries, secondary schools teachers have no choice but to take up ICT integration in time to prepare for taking in such graduates. ➢ Consequently, coupled with the looming change in teaching and learning that is on the horizon accessing such a practical training program as offered by ADSI that has immediate applications should increase the motivation of the targeted teachers. ➢ The course is linked to CFICT-FT standards and avenues have been explored for accreditation and certification at the regional level with the University of Mauritius to begin with and cascading to local universities as a process of building up credits for post graduate certification. ➢ This process is also being negotiated in the target countries with the ministries and teacher's employer like TSC in Kenya.

This third risk again identifies motivation as a key issue – in this instance for the teaching cadre. Accreditation and certification are important means for initially motivating the teachers but this Risk Matrix item needs to be updated to reflect what lessons have been learnt to date for establishing such certification and what other activities are there with SMART indicators that can be used by ADSI to show how this motivational tool, and possibly other financial and nonfinancial means, can be deployed as a vital component either for developing new ICT in education programs or for ensuring sustainability in the three existing ADSI national programs. There are several ways in which the manifestation of this risk has been tracked at the project management level:

- The percentage of teachers who perceive the TPD program to be useful, relevant and adding value to their work (mainly from teacher feedback survey at the end of every cycle);
- Teachers who demonstrate interest in engaging with and receiving feedback from assessors during school visits and classroom observation (during school visits and through the stories they tell when engaged during the face to face trainings);
- The percentage of teachers completing and qualifying for the various levels (cycles);
- The number of teachers who participate in online chats and discussion forums; and
- Number of outputs, module resources and portfolio resources submitted by teachers.

Risk #4: High turnover of teachers in implementing schools. (Likelihood: *Medium* / Risk Impact: *High* raises to Likelihood *High* in 2018/2019)

Assumption	Proposed Risk Mitigation Plan
A significant number of ICT literate teachers can be found in the selected schools and these teachers are willing to enroll and stay in the training program.	➢ The project will aim to train larger numbers of teachers from the target schools to ensure sufficient numbers of such teachers will be available over the span of programme implementation. ➢ New cohorts of ADSI inducted teachers will be brought in to replace those who may be transferred or leave the profession for whichever reason.
MoEST and TSC will agree to the request to keep the trained teachers in the school to the end of the programme or that if they	➢ Further, in discussions and negotiations with the ministries and the teachers' employer, ADSI is seeking to ensure two options for dealing with target teachers in the program: ➢ if a trained teacher has to be transferred, they should be taken to another project target school;

have to be transferred, it is to another project school.	➢ hold the trained teachers in the target schools for the duration of the project implementation.

Table 12 highlights the significance of this risk and queries the reliability of this risk analysis. In summary, it shows how 1,892 Teachers were trained both 'Face to face' and 'online' against originally planned target of 1,400 Teachers. This number translates to 35% more teachers trained within the agreed financial resources with MCF which is laudable but, when scaled up nationally, this requirement to train the additional teaching cadre will be onerous plus the move to an on-line platform as an alternative delivery option also appears to have its limitations.[37]

Table 12: ADSI / ENEA Teacher Training Program (2016-2019)

	ADSI Teacher Training program – 'Face to face' delivery					
	Technology Literacy Cycle (Mod 1 &2)		*Knowledge Deepening Cycle (Mod 1 & 2)*		*Knowledge Creation Cycle (Mod 1 & 2)*	
Country	*# units*	*% of total*	*# units*	*% of total*	*# units*	*% of total*
Kenya	802	100	756	95	754	94
Tanzania	400	100	393	98		
Cote d'Ivoire	200	100	172	86		
Total	1,402	100	1,321	94.5		
	ADSI Teacher Training program – 'On-line' delivery					
	Technology Literacy Cycle (Mod 1 &2)		*Knowledge Deepening Cycle ** (Mod 1 & 2)*		*Knowledge Creation Cycle* (Mod 1 & 2)*	
Country	*# units*	*% of total*	*# units*	*% of total*	*# units*	*% of Total*
Kenya	747	94	739	92		
Tanzania	344	86				
Cote d'Ivoire	165	83				
Total	1,256	90				

Source: GESCI MERL team data July 2019

Risk #5: Teachers and School Based Coordinators will not have time to get involved in the training program. (Likelihood: *High* / Risk Impact: *High*)

Assumption	Proposed Risk Mitigation Plan
The school community will be enthusiastic and supportive of the project Teachers and School-based Coordinators will prioritize ADSI activities Ministries of Education and the teacher employers in the target countries will agree to recognize the roles of SBCs and make it a consideration for possible promotion	➢ Activities requiring face to face will be few and organized during school holidays when the teachers and teacher educators are freer. This will curtail time wastage during the school term. ➢ Further, an honorarium and contribution towards required airtime and internet connectivity will be provided to the SBCs as a critical incentive. ➢ The school administration will also be requested to give some time consideration to the SBCs to enable them to execute their coordination effectively and reduce work overload. ➢ Finally, in the negotiations with the MoEs and the teacher employers like TSC in Kenya, we will flag out the need to recognize the roles of the SBCs and make it a consideration for possible promotion particularly for those who are effective in supporting their peer teachers to learn and professionally grow.

[37] If Kenya has about 93,000 secondary school teachers (https://www.businessdailyafrica.com/datahub/High-death-rate-Kenya-teachers/3815418-5007152-dvmgl6/index.html) and 522 Teachers have gone through the 3 Cycles of training, then every trained ADSI teacher would need to train 153 teachers.

Table 13 provides data regarding the gender and social inclusion within the community. Regarding gender inclusion, this is an issue since females comprise less than 50% of the teachers, 37% of the Principals/HTs and 31% of the SBCs. While the data does not disaggregate the wider community by gender, it does show how the total number of persons impacted within the community seems low and very skewed in comparison to total students impacted. Finally, there is an oddity caused by overcrowding classrooms where we have the 20 schools in Cote d'Ivoire supporting 49% and 47% of the total student cohorts across the three countries.

Table 13: School Leaders, School Board of Management, School Based Coordinators, School Support Team and Expert Working Groups (2016-2019)[38]

Country	No. of Schools	No. of Students		Principals / Heads of Schools*		Teachers (includes SBCs)*		Officials (EWG/SST)	PTA Rep/ School Board Chair
		Boys	Girls	Male	Fem	Male	Fem		
Kenya	80	19,235	19,394	68	47	720	422	39	320
Tanzania	40	14,563	16,376	36	11	370	136	1	160
Côte d'Ivoire	20	33,181	31,794	10	10	212	32	12	80
Total	**140**	**66,979**	**67,564**	**114**	**68**	**1302**	**590**	**69**	**560**

Note: *The number of Principals/Heads of Schools and Teachers engaged (including transfers) through the ADSI/NEA program across Kenya, Tanzania and Cote d'Ivoire – June 2019

Risk #6: Lost or damaged ICT equipment (Likelihood: *High* / Risk Impact: *High*)

Assumption	*Proposed Risk Mitigation Plan*
Selected schools/institutions will accept responsibility of provided ICT equipment.	➢ The equipment will be insured by GESCI during the project period and will be signed for by the schools. ➢ In effect, H/Ts will commit to protecting them and ensuring they are secured according to security measures that will be spelt out. ➢ Thus, while the project will provide target schools with instructions on safety measures, the schools will also contribute ideas on contextual specific safety measures to be adopted.

At the end of June 2019, all three countries have completed the e-enabled stage of DSD while Tanzania and Côte d'Ivoire are at the beginning stage of e-confident stage of DSD and Kenya has migrated to doing the evaluation for the e-confident stage. Table 14 provides an analysis of DSD progression in July 2019. It would be useful to have an indication of targets for December 2020 as to achievement across the three levels of distinction and an assessment as to whether the assumption was overly optimistic and if the risk plans are sufficiently realistic to address what is a key risk to the institutionalisation of the program.

Table 14: Digital Schools of Distinction Progress per Country (June 2019)

Country	Digital Schools of Distinction					
	e- Enabled		e- Confident[39]		e- Mature	
	# units	% of total	# units	% of total	# units	% of total
Kenya	78	98				
Tanzania	40	100				

[38] Y4 2019 Annual Work Plan, GESCI.

[39] The e-confident graduation conducted only in Sep/Oct'19 hence, it is not appropriate to fill in the details now as per the cutoff date of June 2019.

Cote d'Ivoire	20	100			
Total	138	99			

There are two additional risks specific to the Cote d'Ivoire program in the Annual Workplan for 2019 which are both rated high for likelihood and high risk of impact. The risk mitigation plan correctly identifies the issues and indicates their severity but it does not outline specific activities with SMART indicators that are going to show how this risk will be addressed.

Risk	Risk Mitigation Plan	Assumptions
OER for Ecole Numérique d'Excellence Africaine program	The OER is very limited in the French version hence this may result in paucity of learning resources for the teachers to use it in the teaching & leaning of ENEA program.	The MOE and other partners are keen to share their learning resources in French for the ENEA program
Accelerated program delivery in Côte d'Ivoire	Two cycles of TPD and DSD planned for 2019 spreading across two academic terms. This is very ambitious target which may lead to overwhelming teacher, SBCs and Head teachers' engagement into the program	The online tutoring and modules delivery needs to be optimized keeping the overall objectives of the learning outcome

2.5   Sustainability

What are the factors that promote or impede institutionalization?

Promoting institutionalization

Principal buy-in. Principals are pivotal in the institutionalization of ICT integration. Regular refreshers for old program participants and mandatory induction for new ones is important in ensuring continuity, institutionalization and sustainability of the ADSI lessons and activities. In Kenya, a refresher training was carried out for all the Principals of ADSI schools who were still in the same school but were not showing signs of a good understanding of the project aims. The newly posted teachers were also incorporated. ADSI PCs continue to engage closely with the Principals, keeping them updated on progress and encouraging them to provide support on these types of resources which can be catered for within their budgets.

Buy in from parents and students. Both parents and students have responded well to the integration of ICT in lessons and students now question teachers when they do not come equipped with a projector or laptop as planned. It is therefore likely that expectations from both students and parents will make it difficult for schools to cease using ICT in lessons.

Impeding institutionalisation

Complexity of government structures in Tanzania. In Tanzania, it was reported that the complexity of the current (government) structures hampered alignment with what ADSI is trying to do – for example within the MoE there is a curriculum department but not an ICT department. Although there is a tripartite partnership between GESCI, MOEST and PORALG, the alignment between the project model and existing government structures could limit the extent to which the model could be institutionalised and therefore scaled up.

Access to adequate infrastructure, facilities and equipment. Inadequate computers/laptops and projectors and poor and inconsistent internet connectivity was reported to be making it difficult for teachers and students to integrate ICT as much as they might wish. For example, during the DSD e-

enabled graduation in Kenya, the schools that were yet to graduate experienced challenges to fulfil criteria related to connectivity at the schools and websites.

Training program. One of the major concerns among the teachers across the three program country sites was the fact that most of the trainings were often short and hurried and with too much to cover within a short time. Teachers are also concerned about scheduling of the training - in Kenya the teachers complained about training taking place during the school holidays whilst in Tanzania some complained about it taking place during term time and suggested it take place during the school holiday. Teachers across both countries also highlighted difficulties relating to the online chats, which often clashed with other school commitments. In some schools the issue of Principal transfers had slowed down activities and, in isolated cases, it was reported that the Principals were not fully supportive of the initiative thus making it difficult to roll out activities specifically those that needed financial resources. Some teachers who had been in the service for longer were said to be struggling with ICT integration and while there were individual cases of schools that had managed to shift these attitudes, there were reportedly cases where this had not happened.

Two further issues connected to the training programs include (i) *Quality and contextualized translation* - the quality of translation and contextualization into French continues to consume more additional efforts and resources than were originally visualized while (ii) *barriers to participation* - in the peer review chats it is important to ensure that the new strategy does not result in over-dependency on the project team.

ADSI program findings and conclusions have unearthed several lessons that could go a long way in improving implementation, sharpening focus as well as improving the potential for sustainability of the ADSI project. Table 15 provides a summary of some of the key lessons and responses by intervention extrapolated from internal documents showing responses that are underway or completed.

Table 15: Summary of Lessons Learnt and Implications for *Sustainability* by Intervention

Lessons learnt	Responses
Institutionalization:	
▪ Although there is an ADSI master plan, it is not feasible to have a single approach for institutionalisation and sustainability of the ADSI model across the 3 countries because of the differences in the education systems and structures. ▪ Institutionalisation and sustainability should be focused at county and regional levels respectively while in Côte d'Ivoire it might be better to target the relevant departments at the national level. ▪ Having school-level policies for integration of ICT is critical in creating awareness amongst stakeholders, supporting buy-in and assuring implementation.	➤ Be prepared to customize modules, DSD road maps, connectivity approaches, online tutoring patterns and support and institutionalization arrangements ➤ Minimize equipment maintenance and repairs, continuously mentor schools to safeguard supplied equipment ➤ Display policies prominently and embed them in the school plans and targets ➤ Conduct regular refreshers for programme participants and mandatory induction for new ones.
Digital Schools of Distinction Progress:	
▪ Principals buy-in is critical and schools where the Principals had taken ownership of the ICT integration appears make better progress ▪ Regularly review the DSD road map based on the feedback from the counties/ regions ▪ Context specific flexibility needs to be extended to schools for evaluating on DSD progress	➤ Focus the DSD certification event at the school level to engage the participation of local communities

Teacher Professional Development:	
- SBCs are the first point of help whenever there are technical challenges at schools - Empowering the SBCs to have a supervisory role and to have technical capacity to support is critical in managing delivery and participation of the teachers	- Contract experienced online tutors to provide additional support to do the online tutoring of teachers - Employ virtual support for the SBCs at the schools' level and by PCs at the regional / county level 40 - Plan for catch-up training for the new STEM teachers entering the schools - Use the peer learning approach to involve SBCs in school visits
Students learning:	
- Project based learning has generated a lot of interest among students - Students with poor ICT skills continue to struggle.	- Use a learning approach that supports developing and researching projects - Encourage schools to have basic ICT literacy programmes for their students
Engagement with policymakers:	
ADSI has a commendable reputation among the policymakers resulting from a close coordination and alignment of ADSI and MoE activities.	- Leverage the respective country experiences for peer country learning - Continuously share and discuss ADSI project implementation experiences, lessons and records with the Ministries

Brief Commentary on Sustainability

ADSI has shown that its solutions are informed by evidence about the key drivers of rapid educational improvement and they have been tailored to offer innovative approaches across very different local contexts. Further these solutions are based on system analysis and local diagnostics and they are explicitly building on local strengths although to what degree these solutions are embedded and will endure is less clear. The work under the program is being delivered effectively through high quality leadership and management. The program is deploying and developing a high quality, multi-disciplinary team with each member possessing the appropriate skills and mindsets to deliver the program objectives. The data and evidence demonstrate that the program is achieving some impact. Assessing to what extent these outcomes are having the intended impact at the system, policy, provider, practitioner, or learner level is still hard to determine though since there is no learning outcome measurement available nor any value resulting from the intervention that can be compared to other similar interventions.

While the program's MERL processes now enable systematic tracking of impact and delivery and lead to action as the interventions are adapted in response to data and insights, there is a need now in the final part of ADSI to move the current focus of M and E from the predominantly supply-side inputs and activities to a closer focus on the program's intended outcomes and impact. Further, where possible, measuring how ADSI is achieving broader impacts on children, the education systems and wider society, building partner and system capacity and influencing the broader debate, practice and policy.

It is recommended that - from now until the end of the program – ADSI selects some indicators and monitors specific evidence that can assist the ADSI SMT to address these three critical sustainability questions: *(i) Is the program demonstrably building the capacity of partners, stakeholders and the wider system, developing skills, knowledge, behaviours and cultures to support sustainable self-improvement?(ii) Is the evidence to date indicating that the program's approaches and outcomes have a high chance of being technically and financially sustainable beyond the life of the project? And (iii)*

40 ADSI are building a Job description for SBCs (informal, as the role is not a recognized or renumerated role in schools) and providing training for them. Their status in the school requires some anknowledgement which will be supported with the provision of training and certification.

Is the program influencing thinking, practice and policy through purposeful use of knowledge and learning from the diverse program activities?

Based on joint field mission report and MTR external evaluation field data collection, several key findings are appearing that are related to the transition to a larger rollout of the ADSI program components:

(a) Teacher motivation and morale

Types of motivation. ADSI needs to continue its reviews of these areas to better understood how it can (a) strengthen school/teacher ICT support services; and (b) to inform strategies for wider engagement of the community. Several motivational supports are needed to address the classroom challenges and demands placed on teachers be they external motivation supports (e.g., remuneration and incentives; teacher accountability; unclear and constantly changing policies as well as poor management; and few or poor learning materials and facilities) or other types of intrinsic' motivational support (e.g., recognition and prestige within the community; career development opportunities; and 'voice' as teachers may not have an opportunity for input into school management and ministry policy).[41]

In Cote d'Ivoire, in all the focus group discussions, the teachers reported that the pedagogy is very different but they enjoy learning this different style of teaching. Further, they sacrifice a lot of time to prepare lessons but they see that their students are more engaged in learning and that motivates them. The teachers also reported that they like the collaboration they are having with other teachers in other schools on chat/discussion forums as well as across subject areas in their own school.

Teacher competence and professional development. Teachers are expected to use a competency-based curriculum (CBC) but they are not trained to teach the CBC or they struggle to deliver it (e.g., since 2005, the schools in Tanzania have been using a CBC prepared by the Tanzania Institute of Education (TIE) for all secondary schools).[42] ADSI's rapid appraisal for the program in the different countries showed the need to focus on the same INSET areas including learner-centered/CBC pedagogy, school-based formative assessment, laboratory management and maintenance skills, and ICT basic skills acquisition.

Current formative assessment practices. These tests are mainly content-based and not competency-based and this formative assessment is usually conducted through weekly written tests, using marking schemes based on what was taught in class rather than to measure acquisition of non-cognitive skills.

(b) Teaching and learning environment

Equipment and infrastructure. While ADSI has a budget for maintenance and a policy whereby any non-functional laptops and projectors are always sent back to the warranty centre for repair, schools across the program understandably vary widely in terms of the numbers and quality of infrastructure and equipment. Many schools have an inadequate number of classrooms, requiring double-shifts for teaching. Many schools lack a functioning library, science room, or computer room. Schools use lists prepared by MoE for their science and ICT equipment packages but purchases are often made from contributions from a poor community and the parents.

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[41] ADSI has extensive experience of the value of the graduated cettification ae provide to teachers which addresses several of these motivational aspects.

[42] It was not possible to review the ADSI's in-service training materials but given that harmonization of project approaches is a key feature of the current project design, such a review or content analysis is necessary, to guide project managers in making strategic choices.

Teacher Training Colleges. While TCs will host INSET for STEM teachers, the TTCs face a number of challenges. Including a shortage of subject advisors particularly for Science subjects, and the absence of lab technicians. Digitized INSET may help to address the shortage of qualified subject advisers but a digitized training program may also be a cost-effective way of supplementing the cascade model for INSET, as long as the digitized training - which usually focuses on curriculum knowledge-based content - is complemented by hands-on, 'face-to-face' training for the competency-based curriculum.

(c) Community engagement[43]

While there have been some attempts to decentralize management and governance to secondary schools in SSA, in line with international trends, it has often been done grudgingly and with reservations. In most countries the process is driven by donors, with limited SSA government commitment and buy-in. This helps explain why even after a myriad of projects have had SBM and decentralization at the core of their theory of change, in much of SSA secondary schools are still lacking real autonomy. Both push and pull factors account for this. Governments are wary of losing control over important and often profitable functions like appointing school staff and setting the curriculum. While schools in Kenya have greater control over their budgets, have functioning boards of management and active PTAs where parents and local business community provide strong support to their schools, many schools across the three countries do understandably still struggle to get their communities to engage and take responsibility and are also wary of the intentions of government when it offloads financial responsibilities onto schools.[44]

Recommendations for Sustainability

In light of the above key findings, ADSI has certainly made impressive efforts to improve the quality of ICT and STEM provision at the ordinary-level secondary education by generally addressing the systemic or school-based (supply-side) and decentralized education service constraints. But now going forward, it is recommended that ADSI consider more synergies between these and related demand-side measures. For sustainability, ADSI needs to plan how it can support its clients to address these three common systemic challenges which are beyond their control:

i. Teaching and learning in schools is driven by high-stakes exams, with little attention given to teacher's abilities to teach the competency-based curriculum (CBC) using ICT-enabled content and pedagogy, learner-focused formative student assessment, school support services related to the CBC, and community engagement in school-based quality assurance.
ii. The public sector infrastructure and equipment for STEM and ICT teaching is often inadequate and, when made available, the provision is skewed and/or poorly managed and maintained.
iii. Although there were some positive examples of schools supporting their communities through opening up access to ICT facilities, and parents were reportedly happy with the use of ICT, there was still need for a more consistent strategy for engaging parents and the local community.[45]

Section 3.5 concludes with some examples of possible actions.

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[43] The context analysis for 'community engagement' included interviews with Regional and District level education offices and SMCs, as well as with parents, teachers and national level stakeholders.
[44] Mastercard/reports/School-Based-Managment-in-Secondary-Education.pdf.
[45] Further complication regarding community engagement involves the different in participation across the urban and rural c ontexts and the fact that students are often attending boarding schools at the secondarfy level.

Revisit the Risk Matrix. Initially ADSI designed its model with emphasis on ownership and collaboration amongst stakeholders in Kenya which was then delivered as a pilot and then scaled up in Kenya. This model was then exported to Tanzania and later Cote d'Ivoire. Ensuring successful rollout of the model into different country contexts requires monitoring and adaptation, hence ADSI needs specifically to review assumptions from inputs to outputs, outputs to immediate outcomes and intermediate outcomes to final outcomes. For these assumptions to be valid and current requires ADSI regularly reviewing:

i. Identification of implementation partners and seeking means for harmonisation and the avoidance of duplication of activities within and across the different national contexts;
ii. Partnerships between the MoEs, decentralized bodies and the communities – especially the students and how their voice is being heard;
iii. There are operational synergies between and across the three ADSI country projects and other related projects within the overall framework of the respective country's Education Strategy;
iv. Leverage of project contribution to results that contribute to the achievement of common and specific policy objectives across the different education contexts; and
v. M&E learning and feedback continues to be undertaken at all stages of implementation.

Consider Innovations. The MTR Report offers some innovative options for ADSI to consider in addressing some of the outlined challenges:

➢ *Equipment and maintenance.* As an alternative to MOE or ADSI-supported direct procurement and disbursement of equipment, could ADSI trial a scheme whereby the TCs are given 'improvement grants' based on number of teachers serviced by the centers? A possible proposal might involve training teachers as lab technicians who might be remunerated through the use of the School Improvement Grants (SIGs).
➢ *Teacher supply.* It is important to precisely determine the shortage of TC staff and to identify a strategy of recruiting additional subject advisers in ICT and STEM so that there will be no reduction in the number of available subject teachers in school. Although addressing this supply gap is out of ADSI's control, d*oes ADSI have an overview of the extent of this teaching supply gap per country for subject advisers in ICT and STEM?*
➢ *CPD delivery.* In Tanzania, the national media center under MoEVT and the Centre for Digital Learning (CDL) based in SUZA collaborates in providing support for digitized INSET. *Does ADSI have technical and budgetary lessons it can share regarding the use of face to face and online delivery modes? A combination of face-to-face workshops, online curse delivery and classroom observations provided a very strong model of TPD as opposed to either being used as a standalone. The combination of the 3 modes gave opportunities for teachers to continuously build their confidence in experimenting with technology and increased the space for creativity without fear of failing as they were always sure of the support structures.*
➢ *Community engagement*. *Could ADSI find a partner to assist in the development and delivery of a 'foundation' training program for SMCs capacities* that provides (a) clarification of the roles and responsibilities with regard to committee members mandated roles (b) clarification of the responsibilities for school supervision in relation to quality assurance; and (c) the provision of basic skills training in the use of ICT tools for school-based monitoring and greater accountability.
➢ *Student clubs.* Clubs and school competitions enable and encourage greater parental involvement. Graduation ceremonies are also opportunities for parental engagement, as well as for disseminating IEC messages related to education quality. *What lessons can ADSI share regarding the use of such means to increase community engagement?*
➢ *Competitions during the project period provided a definite time and milestone within which a task was to be completed with clear targets that had to be attained and reached in order to move to the next* level.

➢ ***Development of an ADSI handbook and information booklet.*** This was recommended by an TSC interviewee on the following basis: an information booklet (containing an overview of the project, objectives and achievements) will allow incoming officials to gain an understanding of the project. As a recently-transferred official, this interviewee did not have a clear overview of the project (e.g. did not know about teachers being given certificates) and said that it would have been helpful to have a "black and white" hard copy to read rather than having been "*left in the dark".[46]* A technical handbook should also be developed to support officials with their understanding of what to check for when visiting schools. See below for more information. For continued monitoring of ICT integration, officials need to be trained in ICT integration so that they are able to monitor progress and provide support. Three quotes below exemplify this CPD requirement:

"We need to know the ICT bit, what we expect when a teacher is using the gadgets, what we expect when he is interacting with the learners, what are we expecting to see so we know is this project taking root".
"The idea is that when we go to school, we have teachers who look at us as superiors… so we would like to be taken away so that we are alone (so we are not embarrassed) so that when I go to schools now I am also confident, so that even when I go alone I will be able to ask a teacher what are you doing and be able to correct or support the teacher."
"We can't give support to something we don't have mastery of."

The Education Management Information System. The ADSI's outcome, results, and activity progress have been measured rigorously, credibly, and on time. There is an inherent yet understandable difficulty to be faced when disaggregating findings and making attributions of impact across multiple programs, funding agencies and target sites etc. and there is still some way to go in ensuring that the considerable amount of required school data is sufficiently collected and utilized by the different tiers of stakeholders, from the policymakers to the school level staff.

To help ensure robust mechanisms of collection and use, *could ADSI support a needs assessment as to what degree the governments are prioritizing the following five key areas*: (i) ensuring sufficient financing of EMIS systems; (ii) upgrading the EMIS hardware and software, (with a recommended focus on cloud-based tools and services to help save costs); (iii) recruiting and retaining quality staff; (iv) institutionalizing EMIS with all education stakeholders including schools and districts, the Ministry and parents as well as non-governmental organizations; and (v) ensuring the analysis and utilization of this data. Further, given the difficulty for governments and partners to assess progress made towards the attainment of SDG 4 Quality, it is recommended that GESCI review how its targets and indicators could be better aligned and coordinated with the EMIS of the MOES to track key SDG 4 indicators.[47]

Teacher Management and Professional Development. Several key issues can be identified regarding teachers' management and deployment that are affecting the quality of the ADSI teaching learning process. As can be seen in the PNRs and other project documentation, teacher qualification, professional development and deployment constitute a key component to achieve the final objectives, at all levels of the education system. ADSI's approach is twofold - an input on teachers' qualification and professional development to increase the quality of the teaching learning process and a stronger accountability mechanism, including rationalization of teacher position and performance scheme. CPD plays an important role in teacher's promotion, which might explain (along with existing training capacity) the difficulty for locally appointed or temporary teachers to benefit from TPD packages.

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[46] TSC interview.
[47] The global indicator framework was developed by the Inter-Agency and Expert Group on SDG Indicators (IAEG-SDGs) and agreed to, as a practical starting point at the 47th session of the UN Statistical Commission held in March 2016. The report of the Commission, which included the global indicator framework, was then taken note of by ECOSOC at its 70th session in June 2016.

Furthermore, based on reporting from interviews run at the different administrative tiers, it clearly appears that the existing training capacity will struggle both to meet any future targets set but also to respond to the existing demand. The CPD processes need to improve in terms of transparency and in terms of adequate planning. *Is ADSI in a position to advise on the development of the model school as "resource center" that could serve as an entry for a cluster follow-up mechanism to ensure a real transfer of the ICT training received and the continued provision of close support?*

Incentive and teacher promotion. ADSI's three cycled Professional Development cycles can only be sustainable in schools where an adequate number of teaching staff is available. It also requires a sufficient number of fulltime Principal positions to efficiently reinforce school management and teacher performance monitoring. Although it is appreciated that this is difficult given that, in Kenya for instance where CPD is independently decided upon by the TSC, is *ADSI in a position to advise on: (a) planned national education budget estimates of what is required to meet the CPD targets set by the respective governments for teacher and Principal supply across the primary and secondary education cycles; (b) advocate this issue to ensure the education sector budgets can cover this need; and (c) outline how the ADSI teachers' and Principals' ICT development scheme could also be utilized by enabling the most dedicated and experienced ADSI teachers to hold positions of mentorship for newly appointed teachers, participate in action research, and act as key members of a pool of "expert teachers" consulted in ICT and STEM curriculum and related matters, including CPD and the development of materials that support a CBC secondary curriculum*?

III. Concluding Remarks

3.1 Findings and Recommendations

Relevance Since 2016, ADSI has impressively established the organisational architecture and financial framework to enable mandate implementation and achievement of the expected results that are well-suited to the priorities and policies of the target groups in each of the three countries. There are structures and mechanisms in place that support the implementation of the ADSI framework for cross-cutting issues and the operating model and management of the human and financial resources support relevance and agility. The key relevance challenge is to assess ability for 'institutionalization' and for this internal assessment the MTR poses the following questions:

i.   How do the ADSI program components fit within the respective governments' medium-term strategies?
ii. Has ADSI managed to provide examples of how elements from their national programs can be incorporated to support relevant elements of the host governments' own operational education programs and budget plans?
iii. To what extent can the ADSI program elements be shown as readily transferable into existing or proposed national programmatic priorities through their main lines of action and expected results?
iv. What is the financial envelope required to ensure that the ADSI priorities are supported by a sufficient budget post-2020?
v.   Is there a clear operating model that effectively delineates ADSI's possible responsibilities for program results post-2020 and its contribution to the respective government's stated Education Strategy Plan?

Effectiveness. ADSI has consistently shown that its focus is on how key operational functions (e.g. human resources, resource generation and programming) and that these functions are continuously geared to support strategic direction and deliver results. The key challenge now is ensuring that there is sufficient space to progress further and to assess as clearly as possible to what degree the current

approach and resource allocation is aligned with the CPD and ICT priorities of the respective country governments, both educationally and financially. To which end, the following questions are posed:

i. Has the program started yet to assess what additional work is required to strengthen the accountability and performance management of the decentralised units at the district and school levels beyond the life of the program?
ii. For effectiveness that is sustainable, does a performance assessment system need to be in place for the individual teacher or school Principal (or indeed school for the DSD certificate process) and, if so, how might such a system feed into the decision-making processes such as promotion, incentives and rewards?
iii. Is the program's current financial envelope effective and if so, how does this funding requirement change as the program looks to institutionalise its program elements?
iv. Does the program have a rough estimation of the financial breakdown of what is required to enable the respective governments to have the capacity and capability of delivering the necessary resource mobilisation strategies for a program of ADSI activities/inputs?

Program Efficiency. It is difficult to determine if ADSI is being implemented in the most efficient way for a number of reasons including: (i) there are no alternatives available for comparative purposes; (ii) the aim of this MTR is not to conduct a full 'Value for Money' analysis since this program is innovative and permitted to change in the budget allocations and activities on an annual basis in response to exigencies in the program; and (iii) any measurement to review if ADSI uses the least costly resources possible to achieve the desired results is further compounded by the lack of external assessment of learning outcomes for the individual (be it school Principal, teacher or student) from the training inputs or gained at the systemic level from the DSD component.

Impact. Across all three countries with various cycles of TPD, ICT-based professional development was delivered to 1,764 teachers compared to the originally planned 1,400 teachers - additional training for 26% teachers as of March 2019. Similarly, across all three countries with various stages of DSD, 180 Principals/HTs have been trained compared to originally planned total of 140 Principals/HTs. A significant reason assisting ADSI to achieve its stated objectives is due to the extensive advocacy and dissemination across the different tiers of government. As expected of a 'lean' team managing deliverables across three countries simultaneously, the ADSI SMT provides and maintains a very comprehensive management structure with proven work processes.

Each country though is contextually different and this difference has been highlighted clearly from implementation experience, the baseline study reports and the comparative analysis and synthesis reports. Hence, while there is an ADSI 'master footprint', there is a constant need to customize to cater for the specific needs of each country starting with modules, DSD road maps, connectivity approaches, online tutoring patterns and support and institutionalization arrangements. The following two key recommendations are made to further enhance impact:

i. ADSI could undertake an internal review to assess how responsive it is in providing learning opportunities and communication between the project staff in Kenya who have been working on the program longer and in more schools than in the other countries; and
ii. ADSI could conduct an external research study into the lessons learnt on designing and delivering its program of innovative interventions across three different educational systems and country contexts

Sustainability. ADSI has shown that its solutions are informed by evidence about the key drivers of rapid educational improvement and they have been tailored to offer innovative approaches across very different local contexts. Further these solutions are based on system analysis and local diagnostics and they are explicitly building on local strengths although to what degree these solutions are embedded and will endure is less clear. The work under the program is being delivered effectively

through high quality leadership and management. The program is deploying and developing a high quality, multi-disciplinary team with each member possessing the appropriate skills and mindsets to deliver the program objectives.

The data and evidence demonstrate that the program is achieving some impact. Assessing to what extent these outcomes are having the intended impact at the system, policy, provider, practitioner, or learner level is still hard to determine though since there is no learning outcome measurement available nor any value resulting from the intervention that can be compared favourably to other similar interventions led by other organisations against which it is possible to benchmark levels of impact. There is a need now in the final part of ADSI to move the current focus of M&E from the predominantly supply-side inputs and activities to a closer focus on the program's intended outcomes and impact. It is recommended that - from now until the end of the program – ADSI selects some indicators and monitors specific evidence that can assist the ADSI SMT to address these three critical sustainability questions:

(i)   Is the program demonstrably building the capacity of partners, stakeholders and the wider system, developing skills, knowledge, behaviours and cultures to support sustainable self-improvement?
(ii) Is the evidence to date indicating that the program's approaches and outcomes have a high chance of being sustainable beyond the life of the project? And
(iii) Is the program influencing thinking, practice and policy through purposeful use of knowledge and learning from the diverse program activities?

3.2   Further Reflections

Using the fourteen core ingredients and four particular stages *(design - delivery - finance-enabling environment)* identified by Robinson and Winthrop (2016)[48], a series of questions have been posed to support ADSI to reflect across these ingredients and stages (see Annex 4 for details on the framework). ADSI is now past its midpoint so it is time for internal reflection on the relevance of their endgame vision (the overarching impact statement) especially across these the four core **design** ingredients – *local education needs, cost effective learning, flexible adaptation and elevating teachers.*

Success initially and then subsequent scaling up and sustainability also depend upon the **delivery and implementation** factors such as:

➢   the extent of resources and skills of the various partners,
➢   the cultivation of leaders and champions both within and outside of the government and classroom;
➢   opportunism and luck in seizing those moments when there is a greater openness to the adoption of new ideas to improve learning that include the utilization of appropriate technologies to drive efficiencies and overcome context-specific barriers to learning;
➢   and better use of the diverse range of data to continuously drive improvements in programs and policies as well as to motivate and sustain action in support of scaling quality learning.

For this delivery stage, focus is required on these five core ingredients - *education alliances, learning champions and leaders, technological advances, having data play a central role by motivating informed action at the policy and practice levels, and reviewing how the ADSI approach is aligned with the three country priorities.*

Designing and delivering the programs at scale require resources and, to complicate matters, case studies demonstrate the notion that stability and flexibility of financing are necessary for scale to occur in ways that contribute to lasting change. Regardless of the source, financing for scale needs to take

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[48] Perlman Robinson, J. and Winthrop, R. (2016) *Millions Learning: Scaling up Quality Education in Developing Countries.* Washington, DC: Brookings Institute.

a long-term approach, invest in core organizational capacity, and activate middle-phase funding. For this critical **funding** stage, the focus needs to be made as to whether *the financing is sufficiently flexible to build core operational capacity, whether there is "middle phase" financing to bridge the critical stage between ADSI concluding and possible broader and then ideally if there is long-term education financing available that is stable and predictable.*

Successful scaling efforts are more often about creating an **enabling environment** for innovation to flourish and for new supportive policies to be enacted rather than for any specific action required for a particular program to scale up or replicate. Political, institutional, economic, cultural, and other factors comprise this environment which makes it harder to reflect upon and assess the extent to which the environment has been enabled. Reflections might include how well the program was performing currently in (i) finding ways to generate widespread and locally rooted demand for the initiative; (ii) providing support to an informed and inclusive locally-based deliberation over the content and form of the initiative; (iii) finding ways to make political space for the interventions and ensure the larger bureaucracy does not constrain change; (iv) understanding the initiative and its interventions as a continuing process rather than a specific outcome; and (v) structuring any replication so that it has learning at its core.

Annexes

Annex 1: Summary of ADSI Outcomes, Indicators and Data Sources

Outcome 1: ADSI stakeholder engagement from national to school level - ownership and institutionalization	
Outcome indicators	*Data sources*
No. of stakeholder (MoE, curriculum, teacher training) engagement meetings for design and integration of ADSI in teacher education and whole school development.	➤ Project records and documents from stakeholder meetings and forums
No of stakeholder partner MoU and commitments from national to county/ district to schools to project scale-up implementation activities	➤ MOUs, TORs and EoIs

Outcome 2: Enhanced ADSI school infrastructure conditions for school-based ICT professional learning and application in STEM subjects teaching and learning	
Outcome indicators – Schools in ADSI	*Data sources*
In the DSD cycle year 1: schools score a mean of 2.0 on 0-4 on DSD evaluation scale (at least 40% of ADSI project schools achieve between *e-initial* and *e-enabled* digital school status) In the DSD cycle year 2: schools score a mean of 2.5 on 0-4 on DSD evaluation scale (at least 50% of ADSI project schools achieve *e-enabled* and *e-confident* digital school status) In the DSD cycle year 3: schools score a mean of 2.75 on 0-4 on DSD evaluation scale (at least 80% in ADSI project schools achieve between *e-enabled* and *e-mature* digital school status)	➤ School Self-evaluation in criteria of Digital Schools ➤ School review validation reports

Outcome 3: ADSI blended learning model platforms for leadership development on use of ICT to promote ICT across the curriculum and innovative practice / School capacity at e-enabled, e-mature and e-transform levels	
Outcome indicators – Schools in ADSI	*Data sources*
Number of School Support teams (20 in all countries) Number of school-based teacher support leads and head teachers trained (target is 1 teacher lead/ 1 head teacher trained in every project school – 80 leads/ heads in Kenya, 40 leads/ heads in Tanzania, 20 leads/ heads in Cote d'Ivoire) Number of teachers trained (target is 800 in Kenya/ 400 teachers in Tanzania/ 100 teachers in Cote d'Ivoire) completing the training in ICT- STEM competencies At least 3 modules developed for each annual cycle of blended learning training (9 modules for Kenya and Tanzania and 6 modules for Cote D'Ivoire) E-learning and m-learning platforms developed for online course deployment OERs resources for ICT in STEM; teacher produced lesson plans and resources compiled & disseminated on teacher resource portal Percentage of time teachers are using ICTs for teaching Percentage of time students are using ICTs for learning Percentage of learning resources on the online portal selected, evaluated, translated, modified, employed usefully and efficiently by teachers in STEM subject teaching and learning.	Attendance lists of face to face workshops Online Learning Management Statistics Module sets developed E-learning, m-learning and teacher portal platforms

Outcome 4: Phased development model of teacher capacity at technology literacy, knowledge deepening and knowledge creation levels of ICT integration in STEM & other subjects	
Outcome indicators – Teachers in ADSI	*Data sources*
Teachers in ADSI: In the teacher training cycle year 1: teachers score a mean of 2.0 on 0-4 Technology, Pedagogy and Content Knowledge (TPACK) scale (at least 80% of teachers achieve 'technology literacy' level certification) In the teacher training cycle year 2: teachers score a mean of 2.5 on 0-4 TPACK scale (at least 70% of teachers achieve ICT-CFT 'knowledge deepening' level certification) in the teacher training cycle year 3: teachers score a mean of 3.0 on 0-4 TPACK) scale (at least 60% of teachers achieve ICT-CFT 'knowledge creation' level certification)	➤ Database of course assessment documents on teacher use of ICT use to support didactic and constructivist learning in STEM and other subjects ➤ Teacher lesson design plans & resources ➤ Teacher lesson Observation - monitoring, sharing and improving lesson artefacts ➤ Teacher portfolios

Outcome 5: Improved 21C classroom practices and student learning with effective integration of ICT resources in STEM learning.	
Outcome indicators – Students in ADSI	**Data sources**
in the project cycle year 1: students score a mean of 2.0 on 5.0 scale on 21st Century Skills (21CS) application in STEM subjects (at least 10% of students show 21CS & GCSE improvement on baseline) in the project year 2: students score a mean of 2.5 on 5.0 scale on 21CS application in STEM subjects (at least 15% of students show 21CS and GCSE improvement on baseline survey) In the project year 3: students score a mean of 3.0 on 5.0 on 21CS application in STEM subjects on cognitive domains (at least 20% of students show GCSE and 21CS improvement on baseline)	➢ Baseline, midline and end line ➢ National examination student STEM performance trends before, during and after ADSI interventions ➢ Lesson observations using - 21CS rubrics ➢ Teacher Designed Student assessment rubrics

Outcome 6: Capturing and sharing of learning through an ADSI model for dissemination.	
Outcome indicators – Students in ADSI	**Data sources**
Lessons from the ADSI are learned, documented and disseminated via publications and policy forums ADSI innovation through ICT model integrated in education policy forums to inform strategy for ICT use in teacher development	➢ Policy forums have been convened and policy brief shared with different policymakers and government officials. ➢ Publications via newsletters/conference and position papers, case studies ➢ Mid-term formative evaluation at the end of 2 ½ years – December 2017 ➢ Summative evaluation at the end of 5 years – March 2020

Annex 2: Criteria of relevance, efficiency, effectiveness, impact and sustainability

Relevance reviews the extent to which the aid activity is suited to the priorities and policies of the target group, recipient and donor. Key questions explored under the MTR include:

1. To what extent are the objectives of the program still valid?
2. Are ADSI's activities/outputs of the program consistent with the overall goal and attainment of its objectives?
3. Are the activities and outputs of the program consistent with the intended impacts and effects?
4. Are the activities to date and the outputs achieved consistent with the overall ADSI objectives?
5. To what extent are the activities aligned with the overall strategic priorities of the government?
6. How have these priorities been influenced by the partner?
7. How has the relevance of the program changed as it started moving to scaling the intervention?
8. Has this model gained resonance or support from local stakeholders?
9. How does program implementation consider issues of gender and social inclusion?
10. How does social and economic vulnerability intersect with program implementation?

Effectiveness measures of the extent to which an aid activity attains its objectives. This criterion focuses on two key areas: (i) the extent to which ADSI has articulated a coherent and strategic vision of how and for what purpose it has organised its human activity and capital assets to deliver both long- and short-term results; while (ii) looking at the articulation and positioning within ADSI's structures and mechanisms of the cross-cutting priorities to which the organisation is committed, in pursuit of its strategic objectives. Key questions explored under the Effectiveness criterion include:

(i) To what extent were the objectives achieved / are likely to be achieved?
(ii) What are/were the major factors influencing the achievement or non-achievement?
(iii) How are each of the key program components being operationalized, implemented, monitored and targets met?
(iv) To what extent are the stated objectives likely to be achieved?
(v) How effectively is the program managed, both by partner staff and its implementing partners?
(vi) How adequate are the partner's M&E mechanisms – are they serving to keep the project on track and how has the learning strategy changed over time?
(vii) What are the strengths of the project and some of the best practices that have emerged?
(viii) What challenges have been encountered in implementing the program as planned?
(ix) In what ways has the program adapted to address them and what major challenges remain?

The '**Efficiency**' criterion measures the outputs (qualitative and quantitative) in relation to the inputs. It is an economic term which signifies that the aid uses the least costly resources possible in order to achieve the desired results. This generally requires comparing alternative approaches to achieving the same outputs, to see whether the most efficient process has been adopted. Key questions to explore include:

(i) Were activities cost-efficient?
(ii) Were objectives achieved on time?
(iii) Is the program being implemented in the most efficient way (if so, what alternatives are available for comparative purposes?)
(iv) Were activities undertaken to date in the most cost-effective manner? Are there any recommendations to improve cost-effectiveness?
(v) How well has the program used its resources to realize the target outputs?
(vi) How could partner and government work better together to further improve efficiency

'**Impact**' is the significant dimension that considers the positive and negative changes produced by a development intervention, directly or indirectly, intended or unintended. This involves the main impacts

and effects resulting from the activity on the local social, economic, environmental and other development indicators. The MTR is concerned with both intended and unintended results and it includes the positive and negative impact of external factors, such as changes in government administrations and financial conditions. Key questions to be addressed include:

(i)	*What has happened so far as a result of the program?*
(ii)	*What real difference has the activity made to the beneficiaries?*
(iii)	*How many people have been affected?*
(iv)	*What are the early signs of impact in terms of (a) behavior change at student, teacher, and system official level (b) structural change in the education system?*
(v)	*How satisfied are teachers and students with the services, mentorship, and training they are receiving?*
(vi)	*Has the project generated any unintended outcomes, positive or negative?*

Project impact is assessed against the performance indicators and targets specified in the design and monitoring framework. As this is likely to be a forward-looking consideration, evaluators will need to make judgments based on achievements (including sustainability considerations) up to the time of the evaluation.

Sustainability is concerned with measuring whether the benefits of an activity are likely to continue after donor funding has been withdrawn. Projects need to be environmentally as well as financially sustainable.

(i)	*To what extent has the partner received support, ownership and leadership from the government to realize the sustained success of the program?*
(ii)	*Have any policy changes been observed?*
(iii)	*How effective has the program been meeting its stated target of sustainability?*
(iv)	*What systems, if any, have been put into place to ensure the long-term viability of the program?*
(v)	*To what extent is the program able to scale up?*
(vi)	*What are the implications (both positive and negative) and pathways for achieving further scale?*
(vii)	*What are the factors that promote or impede scale-up?*
(viii)	*Beyond current interventions, are there other viable options that the program could implement*?

Important determinants of sustainability could include the following:

(i) Likelihood that human, institutional, and financial conditions are sufficient to support program outcomes	➢ Political will on the part of government to maintain support of key stakeholders ➢ Institutional capacity to take appropriate follow-up actions ➢ Degree that the outcome of policy reforms is resilient to changing financial, social, economic and political conditions
(ii) Continued support for program outcomes from key stakeholders	➢ Distribution of benefits and continued sociopolitical support from adversely affected groups ➢ Resilience to changes in government and institutional arrangements

Annex 3: Terms of Reference: Midterm Evaluation of Mastercard Foundation

Innovations in Secondary Education Initiative Programs

Mastercard Foundation is seeking evaluators to lead a midterm review of three programs within the Innovations in Secondary Education Initiative that are being implemented by Education Development Center, Global e-Schools and Communities Initiative and Schools and Teachers Innovating for Results. Each program represents a unique model of engagement in secondary education in five African countries.

1. Scope of Work

Mastercard Foundation. Mastercard Foundation envisions a world where there is opportunity for all to learn and prosper. The Foundation's mission is to advance learning and promote financial inclusion in order to create an inclusive and equitable world. Core to this mission is the belief that a person's starting point in life should not determine his or her future. Rather, the Foundation believes in the agency of individuals to change their own lives. Change happens when people are equipped with the right skills and tools and believe a better future is possible. The Foundation, based in Toronto, Canada, is one of the largest private foundations in the world. Through work with partner organizations, the Foundation provides access to education, skills training and financial services for people living in poverty, primarily in Sub-Saharan Africa. The Foundation's Young Africa Works strategy sets out an ambitious goal for the next decade: by 2030, our work will enable 30 million young people in Africa, especially young women, to secure employment they see as dignified and fulfilling. Using youth employment as a key measure of socio-economic progress, we aim to help millions of people to find a pathway out of poverty.

Mastercard Foundation, Innovations in Secondary Education Initiative (ISE)

Mastercard Foundation Innovations in Secondary Education Initiative aims to improve the quality and relevance of secondary education for young people from poor and rural backgrounds by addressing teacher motivation and effectiveness, integrating technology in secondary education, and preparing students for employment and entrepreneurship. The Partnership to Strengthen Innovation and Practice in Secondary Education (PSIPSE), a component of ISE, supports achievement of the initiative's objectives. PSIPSE is a donor collaboration, established in 2012-2018, to spur innovation in secondary education in developing countries in the areas of access, quality, and relevance of education. It also aims to influence change at the systems level by increasing the visibility of secondary education and sharing promising practices and solutions to challenges.

2. Innovations in Secondary Education Initiative Projects

About Education Development Center (EDC), Projet d'amélioration des performances de travail et d'entreprenariat au Sénégal (APTE Senegal). APTE-Senegal is a five-year project implemented by EDC, with its consortium of partners. Operating in seven geographic areas in Senegal—Ziguinchor, Kolda, Sedhiou (in the Casamance region); Kedougou; Djourbel; Tambacounda; and Thies—the project works at the school and community level as well as the regional administrative level to provide end-beneficiaries (students) and their families' first-hand experiences with transferable skills and relevant work readiness training. APTE-Senegal seeks to institutionalize youth employability programming within Senegal's secondary education system, civil society, and the private sector. The APTE-Senegal project has four specific, interrelated project objectives:

i. *Develop and implement a sustainable transferable skills and entrepreneurship curriculum*. To be implemented in 200 lower secondary schools (CEM) (23,000 pupils) across the national departments of the Ministry of national education (DESMG, DPRE and DFC) and 6 Inspection Académique (IA), with a regional coordination carried out by the regional partners (local NGO).

ii. *Adapt and implement a work readiness curriculum and school to work transition programming in TVET schools.* Working closely with the Inspection Académique (IAs), local NGOs and technical and vocational schools (TVETs), the project will target students at the TVET level, to ensure that youth not only have better work readiness skills but also access to 'transition to work' services that can guide graduates toward employment or self-employment.

iii. *Build the capacity of key local partners – public, private, and civil society institutions – to offer and support sustainable employability and school to work transition programming.* Parallel to the work at the regional level, the project will work closely with the national departments of the Ministry of Education (MEN) in order to institutionalize the curricula of the work readiness and transferable skills training to enable all secondary, technical, and vocational training institutions to run these programs in the future.

iv. *Document, learn from and replicate the employability initiative.* This project will document efforts within the secondary and technical education systems, thus helping to generate lessons for governments, foundations, donors, and the private sector actors seeking to support the employability of young people on a large scale.

EDC is a global nonprofit that advances lasting solutions to improve education, promote health, and expand economic opportunity. Since 1958, EDC has been a leader in designing, implementing, and evaluating powerful and innovative programs in more than 80 countries around the world.

About Global e-Schools and Communities Initiative (GESCI), African Digital Schools Initiative (ADSI). The ADSI consolidated model presents a portfolio of ICT-assisted innovative elements in schools that can lead to the generation of policy coherence for whole-school ICT integration to enhance teaching and enrich the learning experience. This is accomplished through a blended-learning teacher progressive development in the pedagogical integration of ICT through 4 phases up to professional skills in content development and creation, the progressive transformation of schools to digital schools which is driven through concurrent actions in five key thematic areas – school leadership development for whole-school ICT strategy development, teacher professional development in ICT integration, ICT school culture, ICT in the curriculum and ICT infrastructure. In addition, a system of digital school awards, accreditation and certification to incentivize ICT integration and progression and to encourage the acquisition of 21st century skills by students which are embedded in teacher lesson plans and facilitated through project-based learning methodologies. ADSIs five specific, interrelated project objectives include:

i. *Professionalise teachers in the educational use of specific digital technologies and internet resources in their classroom teaching.* Lead teachers at each school to participate in workshops and structured online training sessions to acquire high-quality ICT-competencies. These teachers will be skilled in the use of technology and the internet to prepare and deliver enriched lessons in the classroom and who, in turn, will collaborate with their peers in the development and use of digital technology and internet- enriched lessons in their teaching as well as to share experiences.

ii. *Develop an online database of educational resources for teachers.* Educational materials and tools will be placed in an online database that teachers can access. These teaching materials and ICT-based model lesson plans will incorporate existing public educational resources as well as tools and materials developed by GESCI for this project. The online database of materials will be accessed by participating schools and will be available to other teachers and schools in East Africa and around the world.

iii. *Develop a Digital Schools certification program for schools.* School leaders will be provided a step by step guide on how to effectively integrate technology into all levels of school teaching and administration. GESCI will create a certification system to recognize a "Digital Schools of Distinction" status based on schools' success in making technology a key resource in the delivery of quality teaching and learning experiences in the classrooms on a school -wide basis. GESCI will work to have this certification officially recognized by education ministries.

iv. *Integrate model within teacher training colleges*. GESCI will work with education ministries to implement the GESCI model in three teacher training colleges in Tanzania and to improve teacher development in Kenya.

v. *Conduct a pilot project to apply the model in a Francophone context*. GESCI will work closely with the national Ministry of Education to test its model in Côte d'Ivoire. It will adapt and translate its materials into French and contextualize them for secondary schools in West Africa.

ADSI is implemented by GESCI. It is an international non-profit organization founded on the recommendation of the United Nations Task Force on Information Communication Technology (ICT). GESCI was established in 2003 at the first World Summit on the Information Society.

About Schools and Teachers Innovating for Results (STiR), Intrinsic Motivation Programme.
The Intrinsic Motivation Programme is supporting the Ugandan education system to reignite intrinsic motivation in teachers and officials through teacher networks. After five years of successful growth and demonstrable impact on teachers and pupils, in 2018 the Ministry of Education and Sports committed to fully embedding the STiR model into the education system in Uganda. In response to this, STiR currently operates in 27 districts and 8 municipal councils at both the primary and secondary education levels, working directly through the public education system by building capacity among district and national officials. The Foundation support is focused on secondary education in Uganda. STiR has three critical objectives for different levels of the education systems:

i. *Develop the intrinsic motivation for Ugandan teachers to continuously improve*. Every teacher within STiR's districts will attend monthly network meetings and participate in classroom observations, putting principles into action in their own specific classroom contexts.

ii. *Motivate and support district officials*. Officials within each district will take part in a training and coaching programme which motivates and supports them to effectively prioritize, run and monitor teacher networks.

iii. *Develop a system learning partnership at the national level.* STiR will support national officials to align and optimize the intrinsic motivation approach within their priorities, structures and systems, with a focus on long-term adoption and sustainability.

STiR is an international NGO that is addressing the moral and economic imperative for every child to cultivate the joy of lifelong learning. Practically, STiR supports governments to reignite intrinsic motivation in teachers and local officials, through teacher networks. STiR's vision is a world where teachers love teaching and children love learning.

3. Purpose of Evaluation

This midterm evaluation should provide Mastercard Foundation and the three partners with details and analyses that will allow for them to assess the performance of the program against its intended goals and objectives while identifying good practices, key lessons, and areas for improvement. The main purpose of the evaluation is therefore to provide an objective and independent review of the program achievements and challenges, generate critical lessons learned and foster input for course correction. These programs are from the outset considered innovations and are expected to adapt and improve during the implementation period so that they deliver a tested model that can be implemented at scale.

4. Key Questions to Consider

It is expected that the questions will be refined and agreed upon by Mastercard Foundation, each partner, and the evaluator(s) as part of the inception/work planning phase of the evaluation.

The Development Assistance Committee (DAC) Criteria of relevance, efficiency, effectiveness, impact and sustainability, as laid out in the DAC Principles for Evaluation of Development Assistance, should be considered when evaluating this program by addressing the following key areas and questions:

Relevance	▪ Are the activities to date and the outputs achieved consistent with the overall objectives of the program? ▪ To what extent are the activities aligned with the overall strategic priorities of the government? How have these priorities been influenced by the partner? ▪ How has the relevance of the program changed as the partner started moving from scaling its intervention? ▪ Has this model gained resonance or support from local stakeholders (government, schools, teachers, students, youth, families, and communities)? ▪ How does Program implementation consider issues of gender and social inclusion within the community? ▪ How does social and economic vulnerability intersect with Program implementation?
Effectiveness	▪ How are each of the key program components being operationalized, implemented, monitored and targets met? ▪ To what extent are the stated objectives likely to be achieved? ▪ How effectively is the program managed, both by partner staff and its implementing partners? ▪ How adequate are the partner's M&E mechanisms, do they serve to keep the project on track and how has the learning strategy changed over time? ▪ What are the strengths of the project? ▪ What best practices have emerged? ▪ What challenges have been encountered in implementing the program as planned? In what ways has the program adapted to address them? ▪ What challenges remain?
Efficiency	▪ Were activities undertaken to date in the most cost-effective manner? ▪ Are there any recommendations to improve cost-effectiveness? ▪ How well has the programme used its resources to realize the target outputs? ▪ How could partner and government work better together to further improve efficiency?
Impact	▪ In terms of: Behaviour change at student, teacher, and system official level, structural change in the education system? ▪ How satisfied are teachers and students with the services, mentorship, and training they are receiving? ▪ Has the project generated any unintended outcomes, positive or negative? ▪ Has the project been able to affect a result beyond the scope such as employment for youth after going through project training?
Sustainability	▪ To what extent has the partner received support, ownership and leadership from the government to realize the sustained success of the program? ▪ Have any policy changes been observed? ▪ How effective has the program been meeting its stated target of sustainability? ▪ What systems, if any, have been put into place to ensure the long-term viability of the program, post-funding? ▪ To what extent is the program able to scale up? What are the implications (both positive and negative) and pathways for achieving further scale? What are the factors that promote or impede scale-up?

	▪ Beyond current interventions, what are the other viable options that the program could implement to enhance sustainability?

5. Background Documentation

Relevant documents will be made available to the Evaluators to complete the mid-term-review, including planning documents, contracts, annual workplans, monitoring/progress reports, the evaluation reports, pilot project evaluations, communications materials, M&E plan, Theory of Change, etc.

6. Evaluation Methods

Mastercard Foundation seeks the most robust mixed-methods approach appropriate for this varied initiative. Evidence gathered will be from both primary (interviews, focus groups, etc.) and secondary sources (project documents, monitoring data, research reports, etc.) using a mixture of qualitative and quantitative data. While the evaluators will be expected to incorporate a subset of common indicators of success, we are strongly supportive of the use of participatory and innovative approaches that will surface rich, credible data while elevating the voices of the beneficiaries themselves. Finally, the proposal should provide a clear description of how it will deal with ethical requirements including; addressing cultural sensitivity, treating participants with respect and dignity, informed consent and conflict of interest, etc.

7. Interviews

The consultant may wish to interview key informants, including:
- Managers from EDC, GESCI & STIR;
- Implementing partners and NGOs;
- Active members or contributors of the program including principals, (head) teachers, students, government, community members etc.;
- Mastercard Foundation staff (program and finance);
- Partner Donors;
- Key actors in the Kenyan, Ugandan & Senegalese education ecosystem (Tanzania and Cote d'Ivoire as appropriate);
- Policymakers and policy advisers.

Annex 4: The Scaling Up Framework

a. Design Stage

Going to scale must be designed for from the start. This does not imply limitless scale, but rather, a clear vision of what the endgame is. Table 1 provides thirteen questions to support reflection on the four core design ingredients – local education needs, cost effective learning, flexible adaptation and elevating teachers.

Table 1: Core ingredients and MTR reflective questions – The Design Stage

#	Core ingredient	Indicative MTR Reflective Questions
1	**Local education needs:** *Interventions should be designed in response to local demand and should ensure the participation of end-users.*	(i) **How do we know that the programs and policies are what students, parents, or teachers actually want rather than just what the governments, implementers, or donors think they need?** (ii) What means are being used to ensure the participation of the local community? (iii) How is the program strengthening accountability to respond to local education needs? (iv) How is the information needed to demonstrate and persuade communities of the educational benefits of the program being delivered and acted upon?
2	**Cost-effective learning:** *Cost structures affordable at scale should be incorporated in the design.*	(v) In hindsight, were the interventions designed at the outset for effectiveness and efficiencies to be delivered for scale? (vi) **Going forward, can the program provide estimates yet as to what the** approximate **costs might be for taking up the program interventions post 2020?** (vii) To what extent can the program show it is leveraging technology to assist in reaching a scalable cost by generating efficiencies, by automating work and/or optimizing the use of resources? (viii) To what extent could the program more creatively use government infrastructure and human resources?
3	**Flexible adaptation:** *Core elements should be identified and replicated while adapting the rest to local circumstances.*	(ix) **How is the program addressing the challenge of striking the right balance between local adaptation and fidelity to the original model?** (x) Does the program have an assessment as to the essential aspects of the model that must be maintained as it scales?
4	**Elevating teachers:** *Community expertise should be leveraged to support and unburden teachers.*	(xi) To what extent has the role of the teacher been elevated by the program through raising respect for the profession or providing other support? (xii) How is the program leveraging expertise that resides within the community? (xiii) To what extent is the program providing diverse pathways to bringing motivated people into the teaching profession?

b. Delivery Stage

Success initially and then subsequent scaling up and sustainability also depend upon the delivery and implementation factors such as the extent of resources and skills of the various partners, the cultivation of leaders and champions both within and outside of the government and classroom; opportunism and luck in seizing those moments when there is a greater openness to the adoption of new ideas to improve learning that include the utilization of appropriate technologies to drive efficiencies and

overcome context-specific barriers to learning; and better use of the diverse range of data to continuously drive improvements in programs and policies as well as to motivate and sustain action in support of scaling quality learning. Table 2 provides seventeen questions to support reflection on these five core design ingredients.

Table 2: Core ingredients and MTR reflective questions – The Delivery Stage

#	Core ingredient	Indicative MTR Reflective Questions
5	**Education alliances:** *All actors need to work together to achieve a common goal.*	(i) **Is the program still exhibiting a clear and shared goal?** (ii) **Are the programs' incentives still properly aligned toward meeting this goal?** (iii) **How** well **is the program ensuring accountability to the clients (the government and community) and to its learners (the beneficiaries)?** (iv) Has the program got a clear sight as to the key actors that are required to leverage diverse resources, capacities, and skills— particularly related to financing, service delivery, and knowledge generation?
6	**Learning champions and leaders:** *As scaling quality learning is a political and technical exercise, champions within and outside government and the classroom are crucial.*	(v) Has the program identified and started working with any visionary leaders who can assist in growing the initiative? (vi) Has the program identified and started working with champions who have the political will and capital to scale and sustain the initiative – from the government leader to the teacher motivator? (vii) **What clear evidence of impact can the program point to which will resonate with stakeholders and thus become more difficult to reverse?** (viii) **Does the program have a good understanding as to those who stand to lose as a result of this initiative scaling up?** (ix) What opportunities have been put in place to identify, select and support change agents to share their good practice?
7	**Technological advances:** *Context-appropriate technologies can accelerate education progress.*	(x) **Can the program provide SMART data to substantiate cost savings and efficiency-generating processes enabled by technology used in the program?** (xi) **Where technology is/was used, can the program identify what context-specific barrier (eg., poor infrastructure or a lack of materials or trained teachers) was overcome or lessened?**
8	**Windows of opportunity:** *Effective education approaches are more likely to take root and spread when they align with country priorities.*	(xii) Are there core offerings which can be identified to align more readily with the existing system and other offerings which will require a larger more long-term system reform? (xiii) **To date, has the program been able to identify and leverage any windows of opportunity that support scaling?** (xiv) Going forward, can the program identify any possible opportunities where there will be supportive, positive attitudes toward change?
9	**Better data:** *Data on learning and scaling play a central role by motivating informed action at the policy and practice levels.*	(xv) How is the program using data to assist in motivating action to address the key identified program problem? (xvi) How is the program using data to shape the design and implement a flexible yet consistent response? (xvii) How is the program using data to ensure the initiative can be sustained post 2020?

c. Funding Stage

Designing and delivering the programs at scale require resources and, to complicate matters, case studies demonstrate the notion that stability and flexibility of financing are necessary for scale to occur in ways that contribute to lasting change. Regardless of the source, financing for scale needs to take a long-term approach, invest in core organizational capacity, and activate middle-phase funding. Table 3 provides six significant questions to support reflection on these three core design ingredients.

Table 3: Core ingredients and MTR reflective questions – the Funding Stage

#	Core ingredient	Indicative MTR Reflective Questions
10	**Flexible education financing:** *Financing should be flexible, including to build core operational capacity.*	(i) **Does the program have knowledge regarding how any future financing might be structured and allocated?** (ii) **Does the program have some knowledge as to what the total financing needed for scaling up might be per intervention?** (iii) **Does the program have a financial estimate as to what the costs of longer term financial and technical support might be?**
11	**Long-term education financing:** *Stable and predictable support is essential.*	(iv) Does the program have a plan for demonstrating relevant intermediate results to leverage support from potential public or private funders?
12	**"Middle phase" financing:** *Financing is required to bridge the critical stage between pilot and broad uptake.*	(v) Is the program's system-level theory of change enabling identification of collective accountabilities for shared outcomes? (vi) **Has the program got robust coordination and collaboration processes in place among government agencies and donors?** (vii) **Going forward, does the program have a clear segmentation and transparency around who might fund what at which stage of any potential scaling up between now and post 2020?**

d. Enabling Environment

Successful scaling efforts are more often about creating an enabling environment for innovation to flourish and for new supportive policies to be enacted rather than for any specific action required for a particular program to scale up or replicate. Political, institutional, economic, cultural, and other factors comprise this environment which makes it harder to reflect upon and assess the extent to which the environment has been enabled. Reflections might include how well the program was performing currently in (i) finding ways to generate widespread and locally rooted demand for the initiative; (ii) providing support to an informed and inclusive locally-based deliberation over the content and form of the initiative; (iii) finding ways to make political space for the interventions and ensure the larger bureaucracy does not constrain change; (iv) understanding the initiative and its interventions as a continuing process rather than a specific outcome; and (v) structuring any replication so that it has learning at its core. Table 3 provides six questions to support reflection on these more nebulous core design ingredients.

Table 4: Core ingredients and MTR reflective questions – the Enabling Environment Stage

#	Core ingredient	Indicative MTR Reflective Questions
13	**Supportive policy environment:** *Government policy must safeguard every child's right to a quality education while remaining open to a diversity of ideas and actors to contribute to this common aim.*	(i) **How open is the government policy space to the program's innovative interventions?** (ii) How open is the system to enabling regulation of education quality and standards being shared with a multiplicity of actors? (iii) What is the role of civil society in monitoring the program's educational developments?
14	**A culture of R&D:** *Ensuring that more children learn requires a strong ethos of experimentation, collecting learning data, and using it for continuous improvement.*	(iv) **How impactful are the program's R&D processes that are occurring at the local level?** (v) **Are the program's R and D processes being undertaken on a systematic basis and used to devise new applications?** (vi) How is the program collectively celebrating achievements against outcomes, so that all parties are recognised for their contributions?