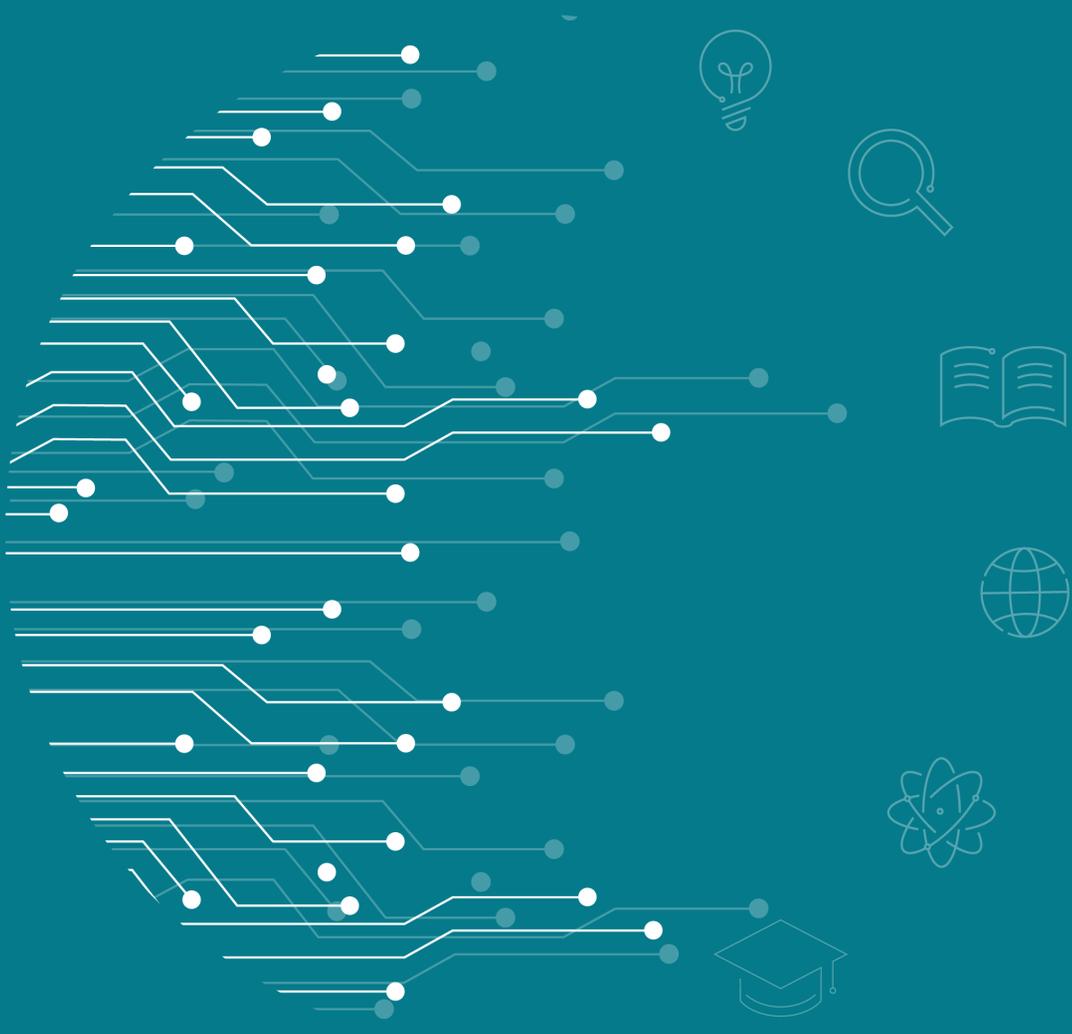


ICT IN EDUCATION MASTER PLAN 2

2021 - 2024



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MINISTRY OF EDUCATION MALDIVES
With support from UNESCO Bangkok Office

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MOOSA ADAM

Senior Policy Director

(On behalf of the ICT in Education Master Plan Team)



FOREWORD



Information and Communication Technology (ICT) has revolutionised every aspect of life and work. It has expanded access to education, allowing teachers and students opportunity for teaching and learning at any time and place. Information has become accessible, making learning more dynamic in nature. With the rapid changes in the technological developments, there is a need to change the Maldivian education system to incorporate these new developments, thus, allowing the change in learning culture. Students need to be equipped with 21st century competencies such as seeking for new knowledge, knowledge application, critical thinking, creative thinking and innovative thinking. ICT is a valuable tool which can enrich the learning environment and better engage the learners. It can also assist personalisation of education to facilitate the needs and abilities of students, thus helping to develop lifelong learners.

With the Education Act which has come into effect recently, the need to integrate ICT into education has further strengthened. Furthermore, the Strategic Action Plan (SAP) and National Resilience and Recovery Plan 2020-2022 (NRR) have emphasised the provision of ICT to improve the standard of education provided across the nation. We continue to believe that the disparity in education standards across the nation can be further eliminated through the use of ICT and by suitably conducting ICT in education as well. Adopting suitable practices to promote ICT in learning shall need to be planned well and implemented, with appropriate monitoring and evaluation mechanisms; thus, the ICT Master Plan was developed.

I extend my sincere appreciation to UNESCO for their initiative and assistance provided throughout the whole consultative process of discussion, planning, drafting and finalizing the master plan. I would also like to thank the members of the team who gave their endless support in the development of this second ICT in education Master Plan. The Ministry aims to implement this master plan to provide the necessary ICT-related skills to students as well as the entire education community.

I trust that all stakeholders would embrace and support this Master Plan and its goals to provide a better learning environment in the Maldivian schools.

DR. AISHATH ALI

Minister of Education

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LIST OF ABBREVIATIONS USED

AT	Assistive Technology
DER	Digital Educational Resources
DoIE	Department of Inclusive Education
ESQID	Educational Supervision and Quality Improvement Division
ESA	Education Sector Analysis
ESP	Education Sector Plan
FS	Foundation Stage (corresponds to 2 years of Lower and Upper Kindergarten)
GEM	Global Education Monitoring (Report)
GoM	Government of Maldives
HRD	Human Resource Development
HSE	Higher Secondary Education
ICT	Information Communication Technology
KS	Key Stage
LRB	Lead Responsible Body
LSE	Lower Secondary Education
MDG	Millennium Development Goal
MEMIS	Maldives Educational Management Information System
MGT	Multi-grade Teaching
MNQF	Maldives National Qualifications Framework
MoE	Ministry of Education
MoHE	Ministry of Higher Education
MoF	Ministry of Finance
MQA	Maldives Qualifications Authority
NALO	National Assessment of Learning Outcomes
NCF	National Curriculum Framework
NER	Net Enrolment Rate
NIE	National Institute of Education
NRRP	National Resilience and Recovery Plan
OER	Open Education Resources
PPRD	Policy Planning and Research Division
QAD	Quality Assurance Department
SA	School Administration (SA Division)
SAP	Strategic Action Plan
SDG	Sustainable Development Goal
SEN	Special Education Needs
SIQAAF	School Improvement, Quality Assurance and Accountability Framework
SMT	Senior Management Team
TRC	Teacher Resource Centre

Maldives Selected Indicators at a Glance

GEOGRAPHY			POPULATION			EMPLOYMENT		
# of Atolls: 20 Atolls,			Total: 557,426 Male: 356,149 Female: 201,277			Civil Servants: 25,652 % of Females in Civil Service: 63%		
# of islands: 1192 islands			Maldivians: 379,270 Foreigners: 178,156			# of foreign employees in civil service: 728 (3%). Mainly nurses and teachers		
# of Inhabited islands: 187						Total expatriate employment: 157,560		
# of Uninhabited islands: 841			Male: 233,854 (42%) Atolls: 323,572 (58%)			% of women out of total expatriates: 6%		
# of Tourist Resorts: 164						Unemployment Rate (ILO definition): 5.3% (for 2019)		
EDUCATION								
# of Schools (2020): 348 # of Government Schools: 213 # of Private Schools: 69 # of Community Schools: 66			Student Enrolment: (2020) K-12 Total: 87,833 Male: 44,973 Female: 42,860			% in Govt Schools: 87% % in Private Schools: 8% % in Community Schools: 5%		
NER % (2019): Pre-school: 86.4 NER Primary: 100.2 NER Lower Secondary: 100 NER Higher Secondary: 37.2			Teachers (2020): # in Govt schools: 9,596 (90.6%) # in Private schools: 693 (6.5%) # in Comm schools: 305 (2.9%)			Total Local Teachers (2020): 8,386 (80%) Total Expatriate Teachers: 2109 (20%) Total Teachers: 10,595 Total Trained Teachers 8,465 (80%) Total Untrained Teachers: 2,130 (20%)		
			Gender Parity Index (2019) Pre-Primary: 0.96 Primary: 0.93 Lower Secondary; 0.92 Higher Secondary: 1.17 Primary + L Secondary: 0.93					
ICT								
Teledensity (Sept 2020): (per 100 inhabitants) Fixed lines: 2.69 Mobile subscription: 131.90 Fixed BB:10.85 Mobile BB: 45.23 Mobile BB coverage: 100% of pop Fixed BB coverage: 75% of pop			Subscription (Sept 2020): Total Mobile: 735,249 • Post-paid: • Prepaid: Internet Fixed BB: 60,464 Internet Mobile BB: 252,679			Households with access to: (in 2019) • Smart phone: 96% • Flat screen TV: 87% • Box TV: 5% • Cable TV, Netflix etc: 81% • Tablet: 35% • Computer/laptop: 59% • Households without access to internet (2019): 7.1% Republic, Male' 1.2%, Atolls 12.6%		

Notes: All data are for either 2019 or 2020 except where stated otherwise.

Source: National Bureau of Statistics, 2019(a), 2019(b) and 2020; School Statistics, MoE, 2019b; MEMIS, MoE, 2020; and Communications Authority of Maldives, 2020; Ministry of Communication, Science, and Technology, 2021

INTRODUCTION



1.1 Background

1

Since the launch of the first systematically developed ten-year education plan in the Maldives in 1985, the education sector has always been guided by long-term or medium-term plans relevant to the respective periods. Lately, the education plans have articulated wider use of Information and Communication Technology (ICT) in varying degrees with the intention of creating an ICT-enabled learning environment for students. The first specific planning framework for ICT in education emerged in 2015 when the Ministry of Education (MoE) developed its first ICT in Education Master Plan (ICTE-MP1) for the period 2015 to 2018 (MoE, 2015). The achievements and challenges of implementing the activities of the ICTE-MP1 were reviewed by the Scoping Mission of the UNESCO Asia and Pacific Regional Bureau for Education (UNESCO Bangkok) (UNESCO Bangkok, 2018). Subsequently, a more detailed assessment of the ICTE-MP1 was undertaken in the Maldives Education Sector Analysis (ESA) (MoE, 2019). The ICTE-MP1 envisioned that schools would “become innovative in delivering quality education” through the development of ICT.

2

Based on the progress review of the ICTE-MP1, the government and UNESCO Bangkok agreed to develop the second ICT in Education Master Plan (ICTE-MP2). With technical assistance from UNESCO Bangkok, the first strategic planning workshop for developing the ICTE-MP2 was held in September 2019 after the completion of the Education Sector Plan (ESP) 2019-2023, which aligned with the policy priorities of the new government ushered on 17th November 2018 (MoE & MoHE, 2019). The ESP was built on the comprehensive ESA, both of which were made possible with support from the Global Partnership for Education (GPE) and UNICEF Maldives. Following the publication of the ESA and ESP, Maldives gained membership of GPE that enabled the country to apply for grant assistance from this multi-stakeholder partnership.

1.2 Policy context

3

The ESP, in keeping with the spirit of Sustainable Development Goal 4 (SDG 4), envisions “holistic and equitable quality education and lifelong learning for all” (MoE & MoHE, 2019, p. 14). The ESP makes a number of references in its strategies, programmes, and activities for expanded use and integration of ICT in school education, Technical Vocational Education and Training (TVET) and higher education. The sector plan emphasises the use of ICT in teaching-learning to enable inclusion and enhance quality in education. The National Curriculum Framework (NCF), introduced in 2014, also recognises the use of technology and media as one of the key competencies.

4

The Strategic Action Plan (SAP) 2019-2023 was launched in late 2019 with commitments in the education sector to increase access and completion from K to 12 and emphasising Special Education Needs (SEN) (GoM, 2019). In addition, the SAP targets to strengthen the quality of formal and non-formal education through a holistic, modern approach to service delivery.

5

After reviewing the ICTE-MP1, the Scoping Mission from UNESCO Bangkok recommended strategizing the targets for the next five years to (a) support ESP 2019-2023, (b) maximising the potential of existing ICT initiatives, (c) considering the total cost of ownership, (d) designing teacher training to targeted needs, (e) ensuring inclusiveness of ICT services, and (f) embedding monitoring and evaluation plan to the new master plan (UNESCO Bangkok, 2018). The planning workshop in September 2019 discussed in detail the implementation progress of the ICTE-MP1 and the recommendations of the Scoping Mission Report.

In alignment with equity considerations in the ESP, the MoE, with support from UNICEF, undertook in 2019 to address the most disadvantaged and underperforming 55 schools in the public sector. The Situation Assessment Report (SAR) of the 55 schools noted the existence of schools with genuine disadvantages “due to poor or inequitable allocation of resources” (QAD, 2019, p. 10). The companion strategy document that emerged for these 55 schools, in the form of the “Dhoadhi Project”, identified opportunities for “more effective and wider use of ICT” in addressing especially the capacity building needs of the underperforming schools (QAD, 2020, p.34). Enhancing the role and capacity (both human and technical) of Teacher Resource Centres (TRCs) located in each atoll was also built into this project.

The year 2020 also witnessed the historic milestone of the long-awaited passage by the parliament and ratification by the President of the first-ever Education Act in the Maldives¹. When the Act comes into effect on 10th August 2021, statutory requirements for compulsory and free education from pre-school to lower secondary (grade 10) education will be in place and those below 18 years of age would be required to be enrolled in some form of education and training.

Furthermore, the global COVID-19 pandemic brought unprecedented challenges to the education sector in 2020 resulting in a major technology pivot for teaching and learning. The Maldives’ Education Response Plan (ERP) for COVID-19 identified several strategies using ICT to enable continuity of learning. Later in 2020, with the aim to build back better, the Government of Maldives (GoM) developed its National Resilience and Recovery Plan (NRRP). In line with the national policy of decentralisation, the education sector component of the NRRP outlined new initiatives for the next three years, namely, increasing

targeted investments in 5 regions, including infrastructure, human resources, and facility developments (GoM, 2020). The NRRP also aims to integrate quality Special Education Needs (SEN), school TVET programmes in the regional schools, and introduce satellite schools in islands currently without schools due to the limited number of children to attend a formal schooling, and training school teachers to better cater for students in remote learning settings. “Institutionalisation of remote learning in school systems and improving access for students” through (a) developing teacher capacity for continuous remote learning, (b) reaching vulnerable students to ensure equal access to remote learning, and (c) implementing ICT related developments for enhancing access to remote learning are specific priorities outlined in the NRRP (GoM, 2020, p.15).

The above-mentioned policy context and the national-level policy strategies that have emerged over the last few years, along with the issues identified with respect to the implementation of the first master plan, served to inform this ICTE-MP2.

¹ The Education Act (24/2020) was passed by the parliament on 26th October and ratified on 10th November 2020.

1.3 Education system in the Maldives

10

A brief overview of the current education system is presented below to have a better understanding of the scope and issues for integration of ICT in the sector in this small national school system. The school system is characterised by its unique features that include many small schools with low enrolment in widely dispersed islands. The formal education system is provided through six Key Stages (KS) from Kindergarten to Grade 12 (K-12) that relate to ages 4 to 18 years. The KSs correspond to the more commonly known grades as follows:

- Foundation Stage (FS) – 2 years of Pre-School (Lower and Upper Kindergarten)
- KS 1 – Grades 1, 2, and 3
- KS 2 – Grades 4, 5 and 6
- KS 3 – Grades 7, and 8
- KS 4 – Grades 9 and 10, and
- KS 5 – Grades 11 and 12.

11

Three principal providers are involved in education delivery in the Maldives, namely government schools, private schools, and community schools. As shown in Table 1, there are over 92,000 students, including the Nursery level, which is not in the formal system. Excluding the Nursery schools, there are over 87,000 students in the formal school system.²

Table 1: Student Enrolment by Key Stage and Gender, 2020

Provider	Gender	SEN	Nursery	Foundation	Key	Key	Key	Key	Key	Total	Total	Total	% Total
	Schools		Total	(LKG,UKG)	Stage 1 (Gr 1,2,3)	Stage 2 (Gr 4,5)	Stage 3 (Gr 6,7,8)	Stage 4 (Gr 9,10)	Stage 5 (Gr 11,12)	(including Nursery)	(ex- cluding Nursery)	(excluding Nursery)	enrolle- ment
Government	Male	47	0	5,401	10,941	10,611	6,223	5,270	1,020	39,513	39,513	76,795	87%
	Female	36	0	5,249	9,867	10,014	5,803	4,988	1,325	37,282	37,282		
Private	Male	0	1,551	1,589	632	483	261	170	301	4,987	3,436	6,831	8%
	Female	0	1,475	1,592	563	504	240	145	351	4,870	3,395		
Community	Male	0	907	1,072	228	194	109	190	231	2,931	2,024	4,207	5%
	Female	0	870	1,012	242	181	170	241	337	3,053	2,183		
Total		83	4803	15,915	22,473	21,987	12,806	11,004	3,565	92,636	87,833	87,833	

Source: MEMIS, MoE, March 2021

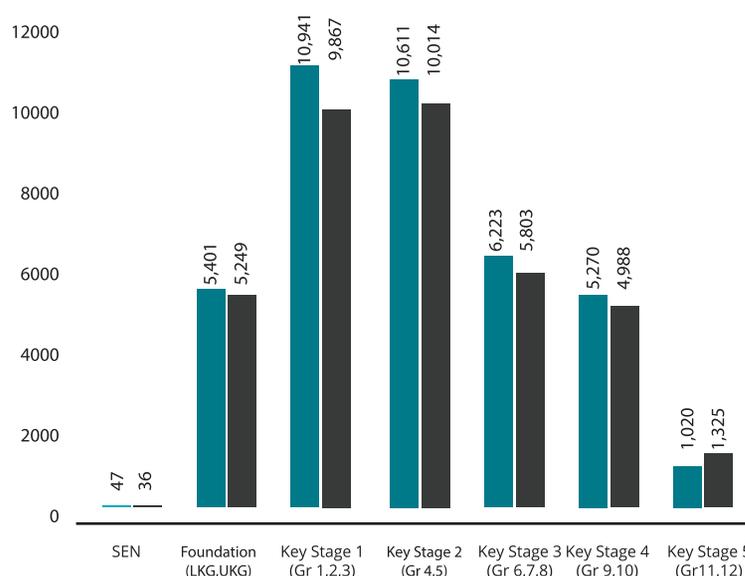
12

Eighty-seven percent of student enrolment belongs to government schools, while eight percent belongs to private schools, and the remaining five percent belongs to community schools. Figure 1 illustrates enrolment in government schools by KSs and gender.

² Data obtained from the MEMIS in March 2021 is reported as data for the academic year 2020. With the change in academic calendar in 2020 to commence the school year in August instead of January which has been the case for many years, the first half of 2021 is considered as the second term of academic year 2020.

The highest enrolment in government schools is found in KS 1 and KS 2, while the lowest enrolment in government schools is found in KS 5. As shown in Figure 1, female enrolment is lower than male enrolment in all KSs, except for KS 5. ICT devices (tablets) have been distributed to all students from grade 3 upwards in government schools.

Figure 1: Enrolment in Government Schools, by Key Stage and Gender, 2020



Source: MEMIS, MoE, March 2021

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Eight percent of student enrolment in the education sector belongs to the Private sector. There are 6,831 students enrolled in private schools. The highest enrollment in the Private sector is found in the Nursery and Foundation Stage, whereas the lowest enrollment is found in KS 3 and KS 4. It is observed that KS 2 and KS 5 had higher female participation than in the other stages of education (MEMIS, MoE, March 2021).

15

Community schools in the Maldives cater to only five percent of the student enrolment. The total number of students enrolled in community schools in 2020 were 4,207. The highest enrolment is observed in Nursery and Foundation Stage, whereas the lowest enrolment is found in KS 2 and KS 3. Higher female enrolment is observed in KS 1, KS 3, KS 4, and KS 5.

Achievements: Over the past three decades, Maldives has achieved notable success in establishing a modern public education system across the country (QAD & UNICEF, 2020). The achievements include the provision of universal access to pre-school (FS), primary and secondary education; implementation of a unified national curriculum; development of textbooks; training of pre-school, primary and secondary level teachers; building of new schools with science and computer laboratories; upgrading and refurbishment of existing schools; initiating inclusive education; provision of free textbooks, provision of free school breakfast and initiating ICT programmes including distribution of digital devices, digitalising of curricular materials and training of teachers in using ICT for teaching.

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One of the more recent achievements is the Education Act. With free and compulsory education from K-10, the Act requires the MoE to track the students until they are 18 years, regardless of grade 10 completion. The Act specifically mentions in Article 7, that students should be exposed to technology and be taught to use the internet with safety (GoM, 2020). The mandatory requirements pertaining to ICT arising from the Education Act include the following.

- Making the Maldives Education Management Information System (MEMIS) (or equivalent) as a single source of data collection of all school education sector data in the country,
- Preparation and implementation of two main policies; one on data and the other on information dissemination,
- Making necessary arrangements for equitable provision of modern technology and technical and vocational skill development in schools, and
- Regular monitoring and reporting of attendance.

18

Maldives had been ahead of some developing countries in South Asia as well as among some other Small Island Developing States (SIDS) in achieving the Millennium Development Goals (MDGs) and the subsequent Sustainable Development Goals (SDGs) (QAD & UNICEF, 2020). Maldives fully supports SDG Goal 4, Quality Education. Access to the FS and up to Lower Secondary is available in all the 187 inhabited islands.³ However, Higher Secondary is available only in 42 islands where there are larger populations.

19

Maldives has generally achieved gender parity in education (MoE, 2019). According to the ESA, Maldives has a Gender Parity Index (GPI) of 0.96% for Pre- primary level (or FS), 0.93% for Primary level, 0.92% for Lower Secondary level. A GPI of 1.17% at Higher Secondary level is indicative of the fact that the participation of girls is much higher at this level. The Primary and Lower Secondary level combined have a GPI of 0.93% (MoE, 2019).

20

As shown in Table 2 there are over 10,500 teachers to cater to over 92,500 students in the system. The teachers' population consists of 80 percent locals and 20 percent expatriates.

Table 2: Teachers in all Schools in the Maldives, 2020

Provider	Gender	Local	Expatriate	Total Local/ Expat	Trained	Untrained	Total Trained/ Untrained	Total	% Total enrolment
Government	Male	1,553	1,253	2,806	2,550	256	2,806	9,596	90.6%
	Female	6,089	701	6,790	5,174	1,616	6,790		
Private	Male	36	45	81	72	9	81	639	6.5%
	Female	540	72	612	442	170	612		
Community	Male	33	16	49	45	4	49	306	2.9%
	Female	235	22	257	182	75	257		
Total		8,486	2,109	10,595	8,465	2,130	10,595		
		80.1%	19.9%		79.9%	20.1%			

Source: MEMIS, MoE, March 2021

³ There are two islands with very small population size where a school does not exist. In one case, there are no school age children residing. And in the other case, students travel by a speed boat to a nearby island to attend school.

While 80 percent of the teaching population is trained, 20 percent is untrained. As similar to student enrolment trends, the bulk of the teaching population belongs to the government sector, which is 91 percent of the teachers in the school system. Furthermore, a disproportionately high number of teachers in the atoll schools are untrained in 2019, with 16.1% teachers untrained in the atolls compared with only 3.2% in the schools in greater Male' region (MoE, 2019).

Over the past 3-6 years, the MoE has addressed school quality improvement in at least five main areas (QAD & UNICEF, 2019).

They include:

- (a) addressing the shortages of physical facilities and resource limitations in schools,
- (b) integrating 2 years of pre-primary education into the formal education system,
- (c) accelerating further training of teachers and school heads as well as increasing incentives for teachers by raising teacher salaries
- (d) expanding learning opportunities for children with special needs and the establishment of the Department of Inclusive Education (DoIE) and Inclusive Education Support Units in schools, and
- (e) renewing efforts in monitoring and evaluation of the school system leading to the creation of a special department, in the name of Quality Assurance Department (QAD) under the MoE dedicated to quality issues.

⁴ Greater Male' region is referred to as the inhabited and industrial islands near the capital city Male'. The two other inhabited islands are Villingili and HulhuMale'.

1.4 Key challenges and opportunities for ICT in education 26

23

This section identifies major challenges and opportunities in the education sector in the Maldives based on the current policy documents, relevant reports, and discussion among members of the MoE Senior Management Team (SMT) and other key stakeholders.

24

(i) Poor learning outcomes and negative impact of learning loss:

Despite the remarkable achievements in access and participation and recent multiple efforts in quality improvement, the ESA noted that.

“while completion rates at the primary level is high, National Assessment of Learning Outcomes (NALO) results point to less than satisfactory learning achievement of many students in language and mathematics, indicating many students are completing primary level without a solid foundation in the skills of literacy (Dhivehi and English language) and numeracy (mathematics) and are pushed up to the next level, where they are likely to confront major difficulties in learning”. (MoE, 2019, p. 84).

Most recently available NALO results (of 2017) indicate that there are also clear geographical disparities in learning outcomes. Laamu Atoll in the south of Maldives performed well below all others, followed by atolls such as Raa, Alifu Dhaalu, Faafu, and Noonu. In contrast, schools in the greater Malé region, Seenu and Gnaviyani Atolls had the highest results (QAD, 2018).

25

With the aim of improving literacy and numeracy of FS and Primary grade children, the MoE with grant assistance from GPE has launched activities under the Learning Advancement and Measurement Project (LAMP) in 2020. LAMP is designed to support the achievement of ESP’s Goal 1 to improve learning for all through equitable access to quality education.

Specifically, with respect to the experiences arising from the pandemic, with intermittent closure of schools and continuation of learning under “new normal” conditions stipulated by the MoE and the Health Protection Agency (HPA) and using a condensed curriculum, the “learning loss” arising from this is likely to worsen the quality of education (anecdotal evidence). A study on assessing learning loss commenced in November 2020, just before the schools closed for the year. Data from schools in the atolls have been collected but not from any school in greater Malé region. Hence, the analysis is incomplete.

27

The establishment of a viable ICT infrastructure across the whole school system, complemented with improvements in teaching and learning using digital resources has the potential to minimise disruptions in learning due to school closure. This in turn can mitigate the learning loss to some extent and facilitate the achievement of the stated learning outcomes by all. The provision of tablets and Wi-Fi devices helps teachers to conduct classes. Education response to COVID-19 has proven that the system is now equipped to continue learning with the help of ICT. For example, during heavy rain or flooding, schools can now make necessary arrangements to continue learning instead of school closure them as was the case in the past.

28

An important strand in this challenge is improving the quality of teaching and learning, especially in the already identified disadvantaged and underperforming schools throughout the country. The Dhoadhi Project launched in early March 2020, was halted due to the health emergency following the global pandemic. Without adequate pedagogical and professional support, these schools are likely to “continue more steeply along a downward trajectory and thereby further increase disparities among schools” (MoE & UNICEF, 2020, p. 9). Opportunities exist to guide such schools via online platforms to provide support and oversight by the best performing schools and other ICT-based interventions.

29

(ii) Low enrolment compounded by a decline in enrolment at higher secondary level: The Net Enrolment Rate (NER) for Primary level has steadily increased over the last decade from 95.5% (females 95.3% and males 94.7%) in 2010 to 100.2% (females 100.2% and males 100.2%) in 2019 (MoE, 2019a). Similarly, the NER for Lower Secondary has also increased from 83.6% (females 86.5% and males 81.0%) in 2010 to 100% (females 100% and males 100%) in 2019. These are high achievements compared to most of the South Asian countries (UNESCO UIS, n.d.).

30

Likewise, though comparatively still low, the NER for Higher Secondary has steadily grown from 17.4% (females 16.4% and males 18.4%) in 2010 to 44.5% (females 50.4% and males 38.9%) in 2018. However, in 2019 there was a significant drop from 44.5% to 37.2% at this level. The NER for males dropped from 38.9% to 20.8% while NER for females increased from 50.4% to 56.0% during this period (MoE, 2019a).

31

While the overall participation rate at the Higher Secondary level of schooling is declining, the proportion of males is also going down alarmingly. Due to potential negative implications from the falling enrolment, reasons for the decline need to be carefully and urgently studied to ensure equitable access at this level. If access is the major bottleneck, ICT can be effectively utilised to enhance equity at the Higher Secondary level. There may be additional reasons for discontinuation and dropout too that hinder equitable participation and success at this level that require closer examination.

32

Furthermore, to ensure equity across all levels of education, it is important to strengthen MEMIS to identify and address equity gaps through Early Warning Signs (EWS) and implementing drop-out precautionary measures.

33

(iii) Declining student population in schools in the atolls and high cost of delivering education: While the total student enrolment in the country increased over the last decade from 87,575 in 2010 to 88,912 in 2019, there was also a trend of falling enrolment in the atolls (MoE, 2019a). In 2010 there were 62,010 students in the atolls, while in 2019 the number declined to 55,924 in 2019: a 10.9% decrease. At the same time, the enrolment in Male' schools increased from 25,565 to 32,988 in 2019: a 29% increase. This trend of falling student enrolment goes along with declining resident population sizes and lower pupil-teacher ratios which may impact the operations of schools on small islands in the atolls (UNESCO Bangkok, 2018). Student enrolment in all the 348 schools in the country varied from less than 10 to over 2,800 in 2019. Fifteen schools had enrolments of 10 or fewer students. A total of 143 schools (or 41.1%) have enrolments of 100 and less. A total of 15 schools (or 4.3%) have enrolments over 1,000. The smaller schools are known to have multiple disadvantages in terms of resources (both technical as well as human) impacting on new initiatives for ICT integration in teaching and learning.

34

The student-teacher ratio is relatively low in all levels of the system, with 10:1 at the Primary level, 6:1 at the Lower Secondary level, and 7:1 at the Higher Secondary level (UNESCO Bangkok, 2018). In 2018, an analysis of external school review reports which included nearly two-thirds of the government schools, comparing a sample of 10 schools with the smallest enrolment (less than 100 students) and a sample of 10 schools with the largest enrolment (more than 400 students), highlighted the notable variation in the student-teacher ratios (QAD, 2018). On average, the small schools had only 3 to 4 students per teacher, while the ratio for the large schools group ranged between 8 to 13 students per teacher. A disproportionate number of untrained teachers serve with little or no mentoring and professional support in the more remote and often small schools.

35

Cost of education is also factored into this analysis. The unit cost of education was noted to be high in small schools. A sample analysis of small schools and schools with larger enrolments showed that the unit cost is two to three times higher in the small schools than the larger schools (QAD, 2018).

36

The trend of migration from outer islands to the greater Male' region has continued with the multiple housing development projects in this area amounting to several thousand units. Education remains the main reason amongst four other reasons for migration to the greater Male' region (NBS, 2019). At the height of the pandemic crisis there was a temporary halt and even reversal of migration occurred when some families returned to their islands due to economic hardships and to avoid the greater risk to possible infection of COVID-19 (ERP, 2020). It is expected that this reversal is temporary, and migration to the greater Male' region will continue over time. This will in turn further decrease the student population in the outer islands in the coming years. However, it must be noted that the current government pursues a strong policy of decentralisation whereby more than 70 percent of public sector investment programmes are allocated to outer islands (MoF, 2021).

37

With the decrease in student population, it is likely to impact the ability of some small island schools for the provision of Lower and Higher Secondary classes as they may not have the minimum MoE-required number of students (5 is the minimum MoE-required to make up a Secondary class and 10 is the minimum MoE-required for Higher Secondary class) (ESA, MoE, 2019a). Therefore, as was recommended in the Scoping Mission Report, the ICTE-MP2 should consider increased utilisation of technology for the provision of more cost-effective quality education in the far-flung islands with relatively small enrolments. The potential of ICT-based multi-grade teaching and/or support through virtual classrooms from more resourceful schools (e.g., the initiative in Iskandar School in Male') could also be further explored. The educational

disadvantages that distance, isolation, and small classes bring can be overcome with effective and appropriate use of technology for learning.

38

(iv) Teacher quality and shortage of trained local teachers in the atolls: The quality and performance of teachers is a major factor that contributes to the country's weak learning outcomes (LAMP document, GPE, 2019). Although the new curriculum was rolled out seven years ago, external school reviews find that teachers need additional familiarity with the new curriculum (QAD, 2018). In addition, recent external reviews have identified a lack of detailed lesson planning in some instances, especially where there were more untrained temporary/contract teachers (QAD, 2018). This is partly related to the lack of support and supervision by the leading teachers in the schools. The role of leading teachers in supporting teachers in better preparation, checking of lesson plans, and organising coordination meetings have been highlighted in the SAR of disadvantaged and underperforming schools (QAD & UNICEF, 2020).

39

The ESA recommended that the role of TRCs be modernised to establish a proper support system to ensure sustainability of technology initiatives in schools. Additionally, the recommendation arising from the more recent assessment of the TRCs to choose a digital medium for the operations of these atoll-based centres needs to be revisited (NIE & UNICEF, 2019). ICT can be utilised for equitable and quality professional development for teachers. This can be connected to in-service programmes and/or teaching/learning resources in the region and beyond. With appropriate training and support with supportive supervision where teachers feel they can ask for help without being penalized, ICT can also help to bring the intended pedagogical shift through quality blended learning.

40

To effectively integrate ICT in learning outcomes, teachers need to have the necessary training. Shibana (2013) found that 9 percent of teachers surveyed identified them as 'not very friendly' (or novice) computer users, while 25 percent categorised them as 'advanced users'. The survey

data also showed that ICT is mainly used as a tool for classroom lesson delivery, far from being integrated and used effectively in one's teaching and lesson delivery. In 2017, only 20 percent of teachers effectively used ICT in classroom teaching in schools (MoE, 2019). The 2018 rapid assessment survey concluded that the Maldives ICT integration in education can be categorised at the emerging-applying phase as per Morel's Matrix (MoE, 2019). The MoE has undertaken steps to improve the quality of teachers in recent years. These include a programme of school-based teacher professional development and upgrading of pre-service teacher education. With the sudden shift to technology-based teaching and learning due to the school closures from COVID-19, teacher quality has come into sharper focus and attention.

41

The training of teachers for online and video-based teaching has witnessed a tremendous upsurge. The ESA, the ESP and subsequently, the ERP have recommended that it is important for all teachers to be trained in ICT literacy and ICT pedagogy-integration. The MoE achieved considerable progress in 2020 to train teachers. However, many teachers require further training for the next level of ICT integration and transformation in teaching-learning. Technology for learning should be an area with the potential for future job creation and employment. Hence, the ICTE-MP2 will emphasise the critical role of teachers and equipping them with the right skills to leverage the use of technology for learning. Technology for learning should be an area with the potential for future job creation and employment. Hence, the ICTE-MP2 will emphasise the critical role of teachers and equipping them with the right skills to leverage the use of technology for learning.

42

(v) Capacity to support inclusive education: Over the last 10 years, the MoE has been increasing its support for children with complex learning profiles (CLP). In 2019, there were 3,796 students under the category of CLP students (DoIE, 2019). Although the sector has made progress towards promoting the inclusion of children with CLP, much remains to be done in terms of having enough teachers with adequate training for CLP and strengthening DoIE's capacity for development of CLP policy and programmes. Some of the challenges to

implement inclusive education effectively in schools have been identified as: lack of adequate number of teachers for children with CLP, lack of pedagogical dimensions needed for children with CLP among the trained teachers, lack of resources and insufficient funds (QAD, 2019).

43

Supporting students with CLP and their parents have been especially challenging during COVID-19. These students are amongst the vulnerable group who were most negatively impacted. Recent attempts to train Inclusive Coaches have helped in expanding the support to this vulnerable group. Provision of appropriate technology (e.g., assistive technologies) can ensure better inclusion. Psychosocial support was also provided to the students, parents, and teachers to mitigate loss of teaching and learning.

44

Though the figures were low in comparison to the South Asian context, a notable challenge is the prevailing situation of Out-of-school children (OOSC) in the Maldives, which has been recognised by the ESA (MoE, 2019a). Based on an earlier study by UNICEF, the ESA estimated that there were over 600 OOSC at both Primary and Lower Secondary age groups. Out of this, 40% were females and 60% were males. The Maldives' ERP predicted that the COVID-19 situation could result in increasing the numbers out of school as "OOSC are predisposed to vulnerabilities such as lack of life and living skills, induction into criminal activity, and exploitation for criminal and economic purposes" (p. 9, MoE, 2020). In the absence of a new situation assessment, it is not possible to report the current figures of OOSC. It would be pertinent to explore the potential and effective utilisation of ICT in the delivery of alternative learning arrangements for OOSC.

45

(vi) Expensive and unsustainable online teaching/learning solutions: ICT is a necessary tool to access education in remote island nations like the Maldives. The Statistics from the Communications Authority of the Maldives (CAM) shows 14,983 fixed lines, 735,249 mobile subscriptions, 60,464 fixed broadband subscriptions, and 252,679 mobile

broadband subscriptions in the country (CAM, 2020). The teledensity of mobile subscription is 131.90, which is the highest in the South Asia region, while it is 45.33 for mobile broadband and 10.85 for fixed broadband, respectively. A rapid baseline assessment done in the year 2018 from 172 schools identified an internet connection speed between 2-4mbps available in outer islands. It is found that internet connectivity is generally higher in schools in the Male' region (ESA 2019). The cost of internet connectivity is very high in the Maldives, and with limited bandwidths, it is a considerable challenge to utilise internet-based platforms for teaching and learning effectively.

46

Due to the COVID-19 pandemic, there was a national budget cut-down. According to the ERP, a large part of the education sector budget was reduced especially from the capital expenditure allocation, including the purchase of information technology-related hardware, furniture and fittings, and capital equipment and machinery. The total reduction by the middle of the year amounted to US\$ 1.1 million, which directly impacted negatively on the development of IT infrastructure, including maintenance and repair (MoE, 2020).⁵ As the year proceeded, the budget cut increased. This master plan will consider high-cost, low-cost and no-cost options for integration of ICT in learning.⁶

47

Maldives has already experienced three waves of the COVID-19 pandemic. Each wave affects the schooling situation. In January 2021, all the schools in the country were permitted to reopen after the annual long break. Soon after the schools opened in 2021, the country faced the third and the most severe period so far, forcing the schools in the capital region to close for in-person

learning and shifted back to online learning. This affected 37.3% of total enrolment of students and 26.8% of all teachers in the nation. In addition, more islands with larger populations in the atolls are also being affected during the ongoing third wave, forcing the schools in those islands to close and go online for various periods as per the island monitoring regime of the Health Protection Agency (HPA). Based on the experiences of 2020, the government finds it financially difficult to sustain the free provision of data to students and teachers to ensure continuity of learning through online mode. The two internet service providers in the country, one of which is a private enterprise of a Qatar-based international company and the other has majority shares of Bahrain Telecom, have reservations to continue providing data free of charge. The Government is compelled to search for a sustainable online learning solution, not just online-only modalities for learning but also offline and more viable blended options.

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The ERP made two specific recommendations to consider in examining "a sustainable model of remote/distance learning" (p. 30). The GoM has negotiated with service providers to find cost-effective solutions. The first phase of reducing the internet costs (NetuHeyo) has lowered residential internet packages to up to 30 percent of the current subscription fees from 1st July 2021.

⁵ The Maldives is one of the few countries that does not have a Universal Service Fund scheme. It may be worthwhile to consider something along a USF scheme. See <https://www.unescap.org/sites/default/files/Universal%20Access%20and%20Service%20Funds.pdf> and <https://blogs.worldbank.org/edutech/universal-service-funds-connecting-schools-internet-around-world>

⁶ Leveraging teacher smartphones as a low/no-cost option could also be considered, since it is a way to scale up using existing devices. For example, in Bangladesh, a project is underway to develop a Tangerine mobile app for teachers to allow them to do formative assessment, so teachers can more easily track where students are, get analytics for the classroom and students, better support their learning progress, provide individualised instruction and remedial education, etc. This is an open-source app. See <https://digitalprinciples.org/resource/tangerine-mobile-assessments-made-easy/>, and <http://www.tangerinecentral.org/class>

(vii) Issues in educational data management: MEMIS is in its 6th year of operation. The database which is the first of its kind for the education sector has been extremely helpful in MoE's efforts in data collection, generation of statistics, real-time digital monitoring of attendance and risk assessment of students. Over the past 6 years many upgrades have occurred but at extremely high costs as it is owned by Community Systems Foundation (CSF), an international NGO. The attendance module was upgraded in 2020 to accommodate the modes of teaching (Online Class, Physical Class, Telikilaas). Several issues were faced during the pandemic when classes were split into two different classes, to maintain the HPA physical distancing protocols. When the change was brought in MEMIS, the students' previous attendance was not shown in the new classes as the attendance was linked to specific classes rather than to the individual student in MEMIS. This caused major confusions and difficulties in updating and monitoring the attendance. The MoE MEMIS team resolved this matter later in the year.

A long-standing concern of both the schools and the MEMIS team at MoE is that the school personnel are not adequately trained for the data collection and use of the system. The problem is compounded due to high staff turn-over without proper handover of work. MoE has started preparing video tutorials with subtitles for each module so that the schools' MEMIS focal points, principals, teachers, leading teachers, other administrative staff, and staff of MoE and departments may train themselves with the help of the videos. The videos will be uploaded to the MEMIS YouTube Channel, as well as links provided in MoE website and/or Aanu portal. These videos are to be used in the staff inductions as a self-training module.

It is to be noted that MEMIS is not only a data collection tool, but rather a learning-focused database. As such, the assessment of OOSC being conducted by UNICEF ROSA relies heavily on the MEMIS Database. The MoE also conducts separate online and phone surveys on the reach of distance learning, for which UNICEF is

supporting the analysis. The reach of the distance learning is measured from the attendance data, to ensure that the continuity of learning is taking place for all students. Furthermore, ERP monitoring is done via the MEMIS database, for reporting to donors, as well as for MoE level and national level policy decision making.

Other challenging issues in the education sector that ICT can play an effective role in addressing and which were identified by the MoE policy officials and selected key stakeholders, include the following:

- Imbalance of teacher /workload: Teachers who perform better and have lesser workload can take classes in other schools where there is no teacher or have higher student-teacher ratios.
- Lack of student engagement in learning: E.g., Fostering more engagement through gamification of the curriculum. It can address the monotony of classroom-based didactic teaching/ learning.
- Lack of a digital platform or mechanism to conduct school self-evaluation and NALO, and generate reports automatically.
- Inadequate supervision and monitoring of schools at system level.
- Lack of a well organised curated platform to share best practices of effective teaching, remote learning, etc. (E.g., Teachers Portal in Bangladesh Teacher's Portal - a2i).
- Untapped potential of online platforms to support teaching and learning, including global free solutions such as for math (e.g., Khan Academy, Prodigy Game), literacy (oxfordowl.co.uk/ free ebooks by reading level), ICT / coding (code.org, <https://hourofcode.com/>), etc.
- Lack of teacher capacity to effectively search for relevant information and digital resources without consuming too much time. Competency in the use of Boolean operators would be effective.
- Inadequate media literacy/research skills especially in search of authenticity of the information. As a result, students are accessing any information regardless of the authenticity.
- Inadequate utilization of Google tools: Google tools especially Drive, even with the

issues associated with it, can help store and share material on the cloud easily. With a good internet connection, infrastructure investment for high-capacity storage server at each school can be reduced. This will also complement with going paperless. However, it may not necessarily be adequate to efficiently run local, school-based management system or applications.

- Not enough online /digital study material. Increasing such resources can reduce health issues arising from students having to carry heavy bags loaded with books.
- Lack of monitoring of children at risk of dropping out. MEMIS has a module developed specifically for the Maldives to automatically monitor children at risk of dropping out (low grades, overage, frequent absenteeism, etc.) but due to some technical issues, it has never been used. Leveraging this system could reduce dropout.
- Support on assessment. Assessments are increasingly being digitized: and in particular for digital formative assessments, apps such as Tangerine can be used to better monitor learning progress and provide individualised support to students.
- School/teacher resource sharing and communication system. For example, a national system to find and share teaching resources, presentations on different topics/ for different years, etc. which can be created by teachers themselves. (Bangladesh has such an online platform for teachers and Maldives can learn from this for constructing its own platform.)
- Teacher online professional development in areas of formative assessment, distance and blended learning, general ICT skills, online safety, mental health and well-being, remedial education are all very important in the COVID/post-COVID context.

1.5 State of ICT in Education

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The first part of this section provides a brief of the recent initiatives of ICT in education in the Maldives. The second part will briefly present the innovative responses to COVID-19 through ICT initiatives that aided continuity of learning. Some notable lessons learned are also presented. Recent initiatives are classified under five main categories of (a) Policy and systems development, (b) Strengthening infrastructure, (c) Teacher development, (d) Remote and distance learning, and (e) Research.

1.5.1 Policy and systems development

54

Digitalisation: A Digital School Policy was first introduced in the year 2018 to effectively utilise digital technologies and digital tools in digital pedagogy. Following this new policy initiative, the Digital Education Programme, costing MVR 154 million (USD 10.3 million), was also rolled out in 2018. All schools were to be connected via WiFi to their community. Students and teachers were to be provided with a tablet, and access to digital textbooks and study resources to be made available under the programme. However, the initiative was slow in implementation, and by the end of 2018, the tablets had only reached a few, and minimal documents were digitalised to be used as educational resources. The Digitalisation project continued throughout 2019 and 2020. The ICTE-MP2 endeavours to address the most prevalent forms of digital divides, including access divide, digital literacy divides and socio-cultural digital divide to the extent possible.

55

The MoE also teamed up with Cambridge University Press (CUP) to ensure teachers and students had access, though for a limited period, to Cambridge Elevate Platform to make learning resources readily available for the students and teachers. In addition, MoE also introduced an educational repository by the name of 'Filaa', making digital content available for teachers and students. This portal needs further upgrading and the GPE Accelerated Fund (AF) project allocated limited funding for this.

The recent Maldives Development Update by the World Bank notes that the COVID-19 crisis has demonstrated that the potential and the capacity to use digital technologies to improve access to public services including education, is significant in the Maldives. (The World Bank, 2021). The success of the introduction of online and televised classes, “prepared by teachers across the country using their smartphones and the suggested screen recording software” is also noted in the World Bank report (p. 37). The report further states that “Maldives’ digital infrastructure needs further investments to ensure equitable access to secure, affordable and reliable high-speed Internet services” (p. 40). The MoE has already invested in this area through the first master plan and looks forward to further investing in improving the infrastructure and connectivity of the school sector.

With the recent policy changes and the decisive technology pivot in 2020, the school system in the Maldives has proven that a transformation in this area is possible. The possibility for re-envisioning education is conceivable. Some of the innovative examples of practices that emerged throughout the school system within a matter of about 9-10 months are impressive and promising examples for re-imagining education in a post COVID world. These local innovations in technology-enabled learning need to be appropriately rewarded and encouraged for further refinement and utilised to build back better.

ICT systems development at MoE: Over the last 6-7 years, the MoE has started a number of ICT systems that have enabled greater integration of technology in the administration of educational services. The systems include the following.

- i Aanu portal: A portal aimed to manage large number of service request that come to the MoE and introduce a strong comprehensive platform to provide support and service for all stakeholders including schools, parents, and respective divisions of the Ministry.
- ii Edu page: A cloud-based student and school records management tool adopted by MoE

for use within the schools. Every school has its USD 99 annual license fee for EduPage paid by the Government.

- iii Edu Koshaaru: Started as a stock management interface with specific service requests like logistics and book distribution. After the start of COVID-19 crisis, this portal has been reconfigured and enabled to facilitate school admission applications and general Ministry-related service requests.
- iv HR portal: Launched to provide an efficient mechanism to speed up HR work and manage a live database system to improve services.
- v DPE website/portal: As the specialised entity of MoE to organize and conduct national and international examinations, in order to facilitate the registration, conduct and administer examinations and the provision of exam related services, the department launched a new website through which all the relevant application forms and information are made available. Since 2020, the DPE has been in the process of developing two portals to streamline and ease the administrative processes of examination services. One of these would be an Exam Centre Portal with payment gateway while the other would be an Examiners’ Portal to ease the registration services for examiners.
- vi. Filaa portal: A digital repository of education resources for students and teachers started in 2020 after the start of the COVID-19 pandemic.
- vii. MEMIS A customised education management information system. More details of this system are provided under the fourth thrust area.

These ICT systems have helped in improving the efficiency of the education system. They allow swifter communication among the divisions of the MoE, facilitate easier and faster request and approval of services, including procurement, stock keeping, and HR services. Issues observed include the overlapping of functions in the systems posing duplication of work and implementation challenges, potential for inefficiency (e.g. multiple data entry), issues with data quality and errors, and unintegrated and disjointed nature of so many systems within the sector. A systematic review of all these systems for their functionality,

utility and integration would be worth undertaking to eliminate duplication and hence reduce cost. There are merits in integrating some of the systems. It may not be necessary (and feasible) to integrate all of them.

1.5.2 Strengthening infrastructure

60

Establishing a recording studio at NIE: Responses to COVID-19 hugely amplified the potential for the use of technology. Within a matter of a few weeks of school closure, the MoE, with support from UNICEF, setup a new recording studio and activated and expanded its ICT resources to launch pre-recorded TV lessons in collaboration with the Public Service Media (PSM). Thus, it launched a relatively successful tele class initiative, locally named “Telikilass” (See Box 1). The Telikilass programmes followed the NCF.

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Laptop to Schools and dongles to vulnerable students: In the latter part of the year 2020, the GPE, through its COVID-19 Accelerated Funds (AF) project, provided 420 laptops to be used in schools throughout the Maldives. In addition to the laptops, the GPE project has supported the provision of Wi-Fi-enabled dongles for students who do not have access to the internet at home. Supplies to establish mini studios at subnational level have been provided to the MoE. Procurement of approximately 1,500 tablets for students of grades 1 and 2 is underway under the LAMP.

1.5.3 Teacher development

62

Accelerated training of Teachers: The programme, which commenced in 2018 to train and upgrade the technical capacity of all teachers, gained momentum in 2020 with financial support from UNICEF. By the end of 2020, 100 percent of teachers in all public schools have been trained for the initial level of ICT pedagogy using programmes akin to those on the Google education series. Furthermore, by the end of 2020, 43 percent of the teachers in public schools have been certified (as Google Certified Educators) to

use G Suite in teaching (MoE, 2021 and UNICEF, 2021). A programme was conducted in September 2020 with the Commonwealth Educational Media Centre for Asia (CEMCA) to orient 677 teachers to use online mediums in teaching. In February 2021, another capacity building programme for 270 teachers was also initiated by CEMCA, implemented through NIE (MoE, 2021). These training programmes have received enthusiastic support from many teachers. As a Maldivian female teacher who taught 13 and 14-year-olds recalled,

“I didn’t know the ABCs of online learning.... Before my school started online teaching, I resolved to fully equipping myself with whatever is needed to continue to be an effective teacher” (Maldivian School Teacher, 2020).

Having been certified as a Google Certified Educator, recalling the transformation from a regular classroom teacher to a virtual teacher, this teacher further elaborated that having gained the know-how she

“felt really empowered and this sense of empowerment drove me to seek out more knowledge about other teaching tools... I use quizzes quite frequently to conduct assessment in fun and engaging ways.” (Maldivian School Teacher, 2020).

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Development of ICT Competency Standards Framework for teachers: With support from UNESCO Bangkok, the MoE commenced developing the ICT competency framework for teachers in 2019. The framework has not yet been endorsed by the SMT of MoE. With the pedagogical shift to teach online due to the COVID-19 pandemic, the written competencies require further review and revision. This framework once adopted will become a useful instrument as the Maldives looks ahead to the implementation of teacher registration and licensing, which are requirements included in Article 38 of the newly ratified Education Act 2020.

7 More examples of innovative practices from Maldivian schools can be viewed from <https://www.globalteachinginsights.org/media/>

1.5.4 Remote and distance learning

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Launching dual modes of learning: To ensure continuity of learning during the pandemic, the MoE implemented dual modes of teaching; online classes and telecasted lessons locally known as Telikilaas. Several digital platforms such as Google Meet, Google Classroom, Google Drive, YouTube, TED-Ed, Edu Page, Filaa (a repository of learning materials), and Moodle were used to minimize disruption to learning.

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In addition to Telikilass lessons, Maldives was also quick in launching online teaching programmes. Due to some of the achievements of the ICTE-MP1, the system had some readiness to start internet-mediated teaching and learning. G Suite was installed in all public schools, and user accounts were created for all students and teachers in the country. According to the ERP, the choice of G Suite was selected for general administration, and as a platform for teaching and learning based on “MoE internal comparative assessments in terms of cost, simplicity, and flexibility of alternative platforms” (MoE, 2020, p. 29).

66

Virtual Classrooms: The year 2018 saw the establishment of Virtual Classrooms to connect the least populated schools to schools in the Male’ region, whereby the necessity to travel to other islands to participate in fully functional classrooms no longer posed an issue. This is an innovative ICT-based solution for the problems of small schools in relatively remote areas, with resource constraints, lack of trained teachers and subject specialists. The initiative has not been sustained. It is important to assess the need and identify ways it could be strengthened for a resilient education system for the future. The NRRP supports this initiative.

Box1: Telikilass – Innovative teaching through pre-recorded video lessons

To ensure continuity of education during the COVID-19 pandemic, the MoE partnered with three national television stations to develop prerecorded educational TV programmes. The programme, locally known as ‘Telikilaas’, were telecasted via channels of the Public Service Media. The Telikilaas lessons are complemented with daily interactive sessions for students, via Google Classroom, YouTube, EduPage, TED-Ed, Moodle, and other digital learning platform, approved by the MoE.

The lesson recordings were done by a pool of 500+ volunteer teachers from approximately 130 schools (including government, the private and, the community-run schools) inclusive of all 20 atolls and Male’. Most of these video recordings were done at the teachers’ home and out in the community using the teachers’ own personal mobile phones. Since this is a completely new and unique approach, the teachers learnt through trial and error. There was remarkable collaboration among the teachers to help each other in terms of preparing effective video lessons. Teachers preparing video lessons spent a lot of time exploring different apps and software and underwent self-motivated training on their own.

Telikilaas Project was an innovation that could be easily replicated by other countries, educational institutions, and/or stakeholder groups.

Source: Application for Wenhui Award 2020, MoE, 2020

Showcasing of innovative learning solutions: An E-conference on 'Innovation and Best Practices in Education during COVID-19' was held during November 2020. The conference aimed "to applaud and reward those most successful in creating transformational educational initiatives, enhancing student learning outcomes, and connectivity in remote learning" (Conference Concept paper, NIE, 2020). Many innovative efforts have proven beyond doubt that, given the encouragement and motivation, schools and teachers can rise up to overcome barriers to teaching and learning even in difficult circumstances in the midst of a global public health emergency. Many schools showcased their innovative practices in the E-conference; all initiatives jump started as a direct response to COVID-19 crisis and school closures. Some of the examples presented were not necessarily high tech and expensive. A special focus was on finding solutions to issues of internet connectivity and high cost of data in the Maldives. A school in a northern atoll found the solution for "equal access to education for all students" by setting up their own localised TV station (Dhuvaafaru Primary School, 2020). This school established their own studios where lessons were recorded and telecasted to children's homes through their very own TV channel. (See Box 2).

Box2: Dhuvaafaru Primary School TV Channel – A local low-tech solution

Dhuvaafaru Primary School (DPS) is one of the two schools in the island of Dhuvaafaru, in Raa Atoll, Maldives. Similar to all public schools in the country, Dhuvaafaru Primary School also began to use online learning for their students when schools were closed due to COVID-19 pandemic.

DPS management very quickly realised the problems associated with internet connectivity, high cost of data and availability of devices for students to study freely. This necessitated the school's search for an alternative solution for equal access to education for all students by setting up their own TV station, DPS Channel. The school established their own studios where lessons were recorded and telecasted to children's homes through their very own TV channel. Apart from the televised lessons, the channel is being used for multiple purposes including information dissemination, community awareness, and to connect with parents. With broadcasting license achieved, the DPS Channel has a lot of potential to further educational opportunities in an equitable manner through ICT enabled environment to build back better.

Source:https://www.globalteachinginsights.org/media/Dhuvaafaru+Primary+School+from+Maldives+on+developing+their+own+television+station++for+education+continuity/1_lzx-po8ux/186022973

One of the innovations as reported by a school from another atoll is.

"an example of innovative use of technology comprising animated videos, cartoons, funny games, interactive quizzes, songs, etc., offered as a pool of resources for teachers. The resources are student-friendly, culturally appropriate, locally relevant, and reflect local values, traditions, and customs.... the resources are multi-platform friendly and inclusive" (Lhaviyani Atoll Education Centre, 2020).

1.5.4 Research

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Assessment of remote access and data arrangements: When schools were closed at the start of the pandemic, a survey on access to local TV channels and mobile internet was conducted among the government schools (MoE, 2020). As reported in the ERP, 68.5% of the audience (students, teachers and parents) confirmed having internet / Wi-Fi access at home, while over 31% did not. With respect to access to TV, it was confirmed that 85% of respondents had access to public service media channels. Even for private TV channels over 80% had access. (Unpublished survey results, MoE, March, 2020). It must be pointed out that gaining access to and actual use of these platforms for learning are different. This survey only found out access to WiFi and/or TV channels – not about seizing the opportunity to learn from the access.

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The survey showed that TV was the only medium that reached most students. Hence, it was concluded that this would be the most viable medium to reach the largest number of students in a more equitable way. Though phone and internet services reach all islands of the archipelago, internet-based learning solutions have many drawbacks as a significantly high percentage (31%) of the audience surveyed (students, teachers, and parents) did not have access to the Internet and Wi-Fi at home. Some students did not have the relevant devices too. This meant a programme via this medium (Internet) would not benefit a significant number of children. Even if internet reach in the Maldives is wider than in some of the developing countries, data is expensive, particularly when accessed as mobile data in the absence of a home internet connection (UNICEF & UNESCO, 2021). However, smartphones would have great potential for learning purposes if leveraged in the right way, for example (a) providing Internet packages to students and/or via service provider, free access to specific websites and educational resources, (b) training of teachers on how to use smartphones for teaching and learning that minimise the need for screen time and adapted to small screens - such as home assignments shared on WhatsApp, that students can copy to their notebooks or

look up in their textbooks, then submit back in WhatsApp. This option would require minimal internet bandwidth, and if a smartphone is shared in the whole household, it is still feasible if it does not require the student to have access at all times.

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In May 2020, during the preparation of the ERP, the MoE conducted a survey to assess the impact of COVID-19 on teachers from all government schools. A sample of two teachers from every school were invited to participate and a total of 385 (276 females and 109 males) responded (Unpublished Survey Report, MoE, May 2020). Results of this survey indicate that interruption in internet is the main challenge for teachers rather than unavailability of Internet at home. These findings guided the MoE in not deciding for a programme via a medium that would not benefit a significant number of children. Data arrangements (5GB-10GB per month) for students and teachers respectively were made in consultation with local internet service providers. All students, (except those in grade 1 and 2), and teachers have been provided with Android Tablets which made the pivot to online learning easier. More support mechanisms (e.g., helpdesks to answer queries, teacher mentors to guide) to support effective use of the tablets are needed.

72

Back-to-School Campaign: As the schools re-opened in early July 2020, the MoE collaborated with UNICEF to conduct a Back-to-School (BTS) campaign based on a well-developed communications and media strategy based on ICT. Since the COVID-19 situation was fluid and on-going, the BTS campaign continued until the end of 2020. Although not necessarily focused on ICT use, the feedback collected by the campaign showed useful lessons about the dynamic situation in the Maldives. A summary of the main findings shows the following:

- A high number of students stated they preferred the online lessons to physical classroom lessons.
- Difficulties with online classes included poor internet connections, distractions during lessons, and lack of interaction.
- Students from KS 4 and 5 exhibited extreme duress about their external exams. Concern

about time left to complete the syllabus and exam preparations struggles were expressed in addition to demotivation in learning. Students also found it difficult to keep up with the amount of work (given remotely).

- Student Leaders noted that a lot of classmates were demotivated to study and had started to slack off. Several students talked about missing the interaction in the physical classroom and the difficulties in the virtual classroom.
- Parents talked about the limited internet usage provided for virtual lessons and the issues with their internet connection. Parents requested lessons be made available for students' reference. (Unpublished BTS Campaign Phase I Report by Publicity Bureau, November 2020).

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Joint case study: A joint UNICEF and UNESCO assessment of the effects of COVID-19 on education in the Maldives was undertaken in the latter part of 2020. The case study report concluded with a number of useful lessons learned (Draft Maldives Case Study Report, UNICEF & UNESCO, 2021).⁸ The lessons learned to build back better that have direct implications for ICT in education include the following:

- "Prioritise access for disadvantaged and remote learners, so they are not left behind,
- Establish and enhance the quality of Telikilaas for younger learners,
- Embed the use of Google Classroom (or alternative) as an intrinsic part of teaching and learning for older learners,
- Review and decide which national software education platforms to adopt,
- Improve integration of school EduPage (or Google Suite) records with MEMIS, and access to MEMIS data by schools.
- Utilise tablets in classroom teaching as well as remotely, and
- Address the issues of connectivity and cost". (UNICEF & UNESCO, 2021, p. 4).

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The country case study report concluded that the neediest children and the most disadvantaged risk being left out by remote learning. Examples of promising responses noted in the case study include a widespread shift to electronic rather than paper-based record keeping and assignment handling, bringing the use of tablets distributed earlier into play, and growing experience in how to create television/downloadable video lessons.

75

Ongoing Google analytics work at MoE: With the start of the online learning mode using Google Meet, the MoE was keen to understand the participation patterns among students and teachers, using freely available data through the Google site. Data in the recorded log is kept by Google for up to 6 months. A small team of ICT specialists attached to the PPRD was assigned to undertake this task. The team organised the analysis around two main points:

- (i) Analysis of 'genuine' participation of students and teachers in online classes using Google Meet as per the MoE policy guidelines, and
- (ii) Identification of scope and patterns of online log-in not specifically intended as a formal lesson from the school (malpractices in online participation in classes/sessions).

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"Genuine" participation in the online study was defined in terms of whether a student was taking part in an actual lesson organised from the school or not, where at least one teacher was present in the session. For analysis, log-in data was taken from the last week of June 2020 to December 2020. Some students/teachers are known to join through their personal Gmail accounts. Since the personal accounts cannot be identified, MoE cannot conclude whether it was only the students or both students and teachers who joined using personal accounts.

⁸ UNICEF Maldives shared a draft of the Maldives Case Study Report with MoE for comments. It is not yet published and was in the process of validation and finalisation during the final phase of preparing this master plan. MoE was given permission to use the contents of this draft report for this plan.

Although this high-level analytical work is not yet complete, results relating to attendance of students and teachers, number of periods, in disaggregate form are available at MoE. The study deduces that best practice guidelines can be formulated to improve digital pedagogy. Furthermore, use of personal email addresses, creating of unmonitored sessions by students are some of the issues that have been observed.

Based on the study and further refinement of the analysis, the MoE is eager to address the issues in terms of (a) policy guidance /instruction to halt malpractices in using Google Meet for teaching and learning, (b) sharing of guidance on emerging best practices to all schools, including addressing issues of cyber wellness. In the next phase of analysis more disaggregation could be considered in the results by gender, grade, and subject. Furthermore, mere "participation" may not necessarily be 'genuine interaction'. It is very important to track 'interaction', e.g.: questioning in class, answering in class, participating in online group work, submitting tutorial work, etc to ensure equality of outcome and quality in education.

Rapid assessment A rapid availability check survey using a Google online form was undertaken in all 212 government schools by the Information Technology (IT) section of MoE in March 2021. Due to time constraints, the survey was limited in its scope and focused on selective needs of the master plan. The results confirmed that 41% (87) of government schools did not have computer labs, while the majority of the schools needed essential network toolkit items such as screwdriver, network cable tester, wire cutter, wire stripper, pliers, punch down tool, and crimping tool for RJ45 jacks. The survey also showed that 54% (1,766) classrooms did not have smart TVs installed. It is important to note that even in the schools that have smart TVs, these are investments from private contributions of parents and well-wishers and not through state funding. The results of this survey were utilised especially in assessing and refining the needs of the infrastructure component of this master plan. A more comprehensive ICT in education landscape study is being designed by UNICEF. In collaboration with the MoE, UNICEF has decided to undertake the study through contracting a locally based private firm.

1.6 Recommendations for the master plan

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Based on the analysis of issues presented earlier, review of the implementation of the ICTE-MP1 and reflecting on the lessons learnt from recent ICT initiatives, the following recommendations are made to consider when developing the new master plan. Some of the recommendations relate back to some of the discussions among participants of the 2019 planning workshop which were reiterated in recent working group meetings held online. The recommendations were presented to the Task Force and the SMT of MoE and have been endorsed.

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(i) Develop a comprehensive policy of ICT in education. Despite many initiatives and achievements in ICT in education, a notable gap currently is the absence of a holistic policy on ICT in education. There are a number of concept papers, project proposals and policy guidelines. For example, for the use of digital resources including tablets in schools, curriculum content digitization, capacity building for digital schools, and cyber safety. Acknowledging the recent initiatives in the area, coupled with the unprecedented pivot to technology in teaching and learning over the past year, it would be worthwhile to have a specific and comprehensive policy framework on ICT in education that would guide the transformative pedagogical evolution the Maldives is witnessing.

Along with this initiative to develop a national ICT in education policy, it would also be beneficial to assist the schools to develop their own school-level ICT in education plans. This could be done as part of the school development plans which are prepared for school quality improvement purposes and sent to the QAD annually. Such an initiative would facilitate decentralising the ICTE-MP2 and thereby make the schools active participants in implementing his master plan. These plans can consider existing and availability of resources to assist in achieving the goals of access and equity in this widely dispersed school system.⁹

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(ii) Conduct a comprehensive national ICT landscape survey of the schools. This survey should develop an inventory of existing ICT equipment in schools, available teaching and learning resources, and training received by the teachers in technology for learning. The survey could also explore what was covered in this training and if this training is adequate for teachers to change their pedagogical practices. It would also be worthy of collecting information on the frequency of the usage of this equipment.

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(iii) Conduct a capacity development programme for teachers, administrative staff and other personnel in the sector. The effectiveness of technology in the classroom depends on the teacher's ability to use it appropriately in the teaching and learning process. Therefore, training of teachers to fulfil their role in effective technology integration in learning which has already begun needs to continue. In addition, administrative and support staff in schools and other officers in the sector also need the exposure, relevant skills, and training in ICT to effectively complement the work that goes in the schools.

⁹ Having a school level continuity of learning plan and policy that can be adapted by schools would be beneficial for when schools are closed. There are many examples and templates online. Here is a good example to explore: <https://www.tbskathmandu.org/tbs-online-continuous-learning-provision/>

(iv) Accelerate the preparation of the digital educational resources. Over the last one year during the COVID-19 crisis, teachers felt the dearth of digital resources available for them that are relevant to the NCF and that are culturally appropriate. Digital content development which has already begun will need to accelerate to cover all key stages of the school system and subject areas, especially the subjects taught in the local language, i.e., Dhivehi language, Islam and Qur'an. At the same time, based on the innovations witnessed last year, it would be highly beneficial to encourage and empower teachers/schools to initiate and/or further develop digital educational resources such as videos, animations, etc. This is an area in which Maldives recently won a UNESCO award at the regional level.

(v) Developing a national education portal: The year 2020 saw the development of Filaa portal, a repository of digital educational materials. As digital resources increase, it would be necessary either to upgrade the existing portal or develop a curated national education portal where teachers and students from all over the country can easily access and contribute teaching and learning materials of quality. The current issue facing Filaa portal is in the storage of video lessons that are currently uploaded on YouTube, rather than a physical server, which creates many copyright issues. Filaa portal upgrade requires purchasing a physical server to be housed in the National Centre for Information Technology (NCIT). The other required upgrade is the software update, which will enhance the existing features. Maintaining current content is an issue with such portals. Incentivisation schemes like teacher contribution to the portal of the month as used in some countries (e.g., Bangladesh) could be considered.

(vi) Utilize technology to achieve greater inclusion: Inclusive education is an integral part of the education policy now. Specific programmes to support SEN students have expanded over the past few years. However, the crisis of the COVID-19 pandemic showed that children in the vulnerable categories including SEN students and children with disabilities were most impacted in their learning. Some support was extended to parents and caregivers of such children. Therefore, it is necessary to identify specific programmes to make technology to support inclusivity in this new master plan.

(vii) Localisation and further enhancement of MEMIS: MEMIS plays a central role in collecting and providing timely educational data and enhancing educational governance. This vital resource continues to be operated as a database operated through an international NGO. It is important that the MoE take ownership of this resource and continue its enhancement to support the educational data management and system development in this sector. Expected major changes to MEMIS are the change of ownership, hosting, and developmental rights from CSF to MoE. Discussions are underway between MoE and NCIT regarding options in the process of achieving localisation.

The next chapter will provide the methodology adopted in preparing this master plan and will present an overview of the plan.

METHODOLOGY AND OVERVIEW OF THE MASTER PLAN



Box 3: From Maldives Development Update: A Digital Dawn

"In the longer term, digital technologies can be game changers for Maldives' growth and development. The COVID-19 pandemic has accelerated the digital transition that was already underway in Maldives. As in other countries, mobility restrictions have highlighted the importance of e-payment systems, telehealth, online education, and many other digital applications. However, the digital transformation is only just beginning: given relatively high broadband and mobile internet penetration in the country, there is tremendous potential for scaling up the use of digital technologies in various sectors."

Source: The World Bank, 2021

<https://thedocs.worldbank.org/en/doc/93bdbd79b45eeb504743f4514f1095e1-0310062021/original/April-2021-Maldives-Development-Update.pdf>

2.1 Introduction

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Chapter 1 of this master plan presented the background and policy context for its development. This chapter will provide the methodology adopted in the preparation of the ICTE-MP2 together with a brief overview of the plan.

2.2 Methodology

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The MoE sought technical assistance from UNESCO Bangkok to review the ICTE-MP1 and develop the next plan in this area (UNESCO Bangkok, 2018). The Scoping Mission Report concluded with a set of "next steps", including forming a National Team to coordinate the tasks for the development of the ICTE-MP2 together with a tentative timeline, and expected outputs of responsible agencies.

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A Task Force (TF) was formed to guide and steer the development of the master plan. The TF is comprised of six members from various divisions and departments of the MoE. The TF was chaired by the Head of Policy Planning and Research Division (PPRD) of the MoE.

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As a follow-up of the Scoping Mission Report, the first planning workshop was held from 16 to 19 September 2019 in Male'. This four-day workshop was held at the NIE with 32 participants from different education sector divisions, including policy officials, professional and technical staff, school principals, leading teachers, lecturers from colleges and universities, and specialists from other sectors directly related to ICT. The latter included staff from the Ministry of Communications, Science and Technology, and the National Centre for Information Technology (NCIT).

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With technical guidance from two experts in ICT in education from UNESCO Bangkok, the workshop participants were familiarised with the master planning methodology and UNESCO's approach in this field. The participants reviewed the ICTE-MP1, and after intensive discussions and thoughtful deliberations, the visioning and strategic planning exercise culminated in producing the following outcomes:

- A vision statement for the new master plan,
- Four major thrust areas,
- Major programmes under each thrust area, and
- Relevant projects and key activities could be considered under the projects.

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Four Working Groups (WGs) were formed to develop the programmes and projects respectively for the four major thrust areas identified in the workshop. They were also charged to cost the respective project activities. The WGs were led by, in most cases, staff from the Ministry itself. The list of WG members is included.

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After the workshop, the four groups pertaining to the four thrust areas continued work through a collaborative and consultative process sharing documents via the Google drive. Several consultations and discussion meetings were held online among the group members as some of them resided in different islands of the country.

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The NIE organised a second workshop in January 2020 to complete the remaining tasks assigned to the working groups. This five-day workshop held in Male' aimed to refine and complete the development of the programmes, projects, and activities. In addition, members worked to complete the other areas in the template adopted to use, which included identifying rationales, objectives, indicators, and implementation bodies for each of the projects. Furthermore, costs were estimated for the project activities. With differing levels of achievement among the groups at the end of the workshop, all groups were requested to complete and share their proceedings with the coordinator on the Google drive folder.

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Due to the impact of COVID-19 and subsequent immediate matters, there were delays in the development of the master plan. However, this also allowed the opportunity to integrate learnings and developments that resulted from COVID-19. Subsequently, the master plan Task Force (TF) and the respective Working Groups (WG) were activated through a series of online meetings. The pandemic situation during February to May of 2021 was not necessarily any better than in the previous year. Therefore, in the final phase of the work (from February to July 2021), all meetings, consultations, and validation were accomplished online.

For the new draft of the ICTE-MP2, the following four attributes were used in confirming the projects for inclusion in the master plan.

- a. Appropriate policy foundation (policy relevance): Can the proposed project be referred back to any applicable policy document?
- b. Proper justification of need: Is the need for the proposed project justified well?
- c. Feasibility /sustainability: Is the proposed project technically and humanly feasible? Will it be sustainable?
- d. Affordability: Will the MoE have the financial capacity to implement the proposed project in the short to medium term?

The draft vision, the main thrust areas, the programmes, and the projects were re assessed and reviewed in the light of experiences from the COVID-19 crisis and new opportunities for re-imagining education for a post COVID era. New stakeholders with whom meetings were held included UNICEF Maldives, private sector participants, and NGOs active in the tech field, Senior Management Team (SMT) of MoE, Chief Technical Officer (CTO) of the President’s Office and Senior Policy, as well as technical officials of the Ministry of Communications, Science and Technology. Comments and feedback were incorporated before the online validation workshop, which was held on 5th July 2021. Most of these stakeholders participated in the validation. A total of 45 participants including the Facilitators joined for the validation. The Task Force deliberated on all the feedback from the validation workshop and decided to incorporate and address most of them. A penultimate final draft was presented to the Task Force. Additional comments received were addressed in the final version of the master plan which was then submitted to the SMT of MoE and UNESCO Bangkok for final endorsement.

2.3 Vision

The vision of the ICTE-MP2 is:

Transform learning for every child to be competent, innovative and prepared for life as a Maldivian and a global digital citizen.

Building upon the vision of the ICTE-MP1 for schools to “become innovative in delivering quality education”, and the unprecedented technology pivot due to the impacts of COVID-19, this master plan envisions to maximise the power and potential of technology to facilitate transformation in learning so that the individual needs of every girl and boy would be addressed. Technology use would be maximised to include all in the learning process and to create an opportunity to be innovative and prepared for life as a Maldivian national and as a global digital citizen in an increasingly interconnected world.

Sustainable Development Goal 4 also recognises the potential of ICT in ensuring quality lifelong learning for all. Therefore, it is essential to consider ICTs to strengthen the education system to disseminate knowledge, access information, and improve the quality of teaching and learning. Hence, this master plan focuses on improving teaching and learning along with strategic investment in ICTs through 4 main thrust areas.

2.4 Key considerations in developing the master plan

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Ensuring equity, quality, and inclusion are core principles of the ESP 2019-2023. This master plan recognises that there were already notable pre-COVID challenges in the education system. Due to the scale of the crisis, some of these challenges may have led to a magnification of already existing disparities and inequities. Adhering to the core principles of the ESP, the guiding principles of the ERP, and the review of key issues in the system, along with the wealth of lessons learned since the start of the COVID-19 pandemic, this master plan acknowledges that there is a huge potential to harness technology for learning. Therefore, and in keeping with some of the elements advocated by UNICEF ROSA in their conception of re-imagining education and many similar aspects expressed in the UNESCO Recommendations for a Regional Strategy in achieving ICT in education (UNESCO Bangkok, 2018),¹⁰ this ICTE-MP2 will adopt the following key considerations that will form the basis of focussing greater investment in technology for learning.

a)

Access and equity: ICT will be leveraged to provide equal access to learning opportunities to all K-12 students regardless of gender, disability, or location to continue learning irrespective of whether they study in school or are compelled to learn from home. Enriching the learning experience with various modalities of learning, including remote learning will equip all students with knowledge, skills, values, and an attitude to thrive in the 21st century.

b)

Inclusion: COVID-19 experiences showed that those who were most affected were marginalised children with disabilities and vulnerable populations. Technology will be utilised to enhance inclusion and address the learning needs of all girls and boys, those at risk, vulnerable children with CLP and those with disabilities and out of school children. Technology-supported personalized learning through the latest technological developments and related automation will help to improve learning outcomes.

c)

Addressing the digital divide: The ICTE-MP2 recognises significant gaps in household connectivity, availability of devices, and digital skills that need to be addressed if an equal opportunity to technology-mediated learning options is to be ensured. It is also important to note that the digital divide is not just an 'access' divide but also pertains to issues around the use of devices and addressing scepticism around the use of technology in learning. This plan will address to reduce the digital divide among learners and teachers and address the issues associated with it. While acknowledging the power of emerging high-tech solutions for learning, the master plan will consider low-tech and even no-tech solutions where appropriate and applicable.

¹⁰ https://unesdoc.unesco.org/ark:/48223/pf0000261661_eng
See <https://www.unicef.org/rosa/reports/guidance-distance-learning-modalities-reach-all-children-and-youth-during-school-closures>

d)

Empowering teachers, school leaders while involving parents and caregivers: The master plan recognises the critical role of teachers and school leaders in harnessing the potential of technology in educational delivery. Thus, teacher capacity along with an enabling school leadership are fundamental to the effective integration of ICT in the education system.¹¹ The ICTE-MP2 will ensure that teachers are equipped with the right skills for this. Additionally, enhancing leaders and support staff within the system will be ensured. Due to school closures, the role of parents and caregivers in supporting children's learning have been expanded. Many of the traditional roles taken by teachers were required to have been passed on to the parents and caregivers. The master plan recognises this and will strategise to support them appropriately to forge new partnerships in ensuring continuity of learning.

e)

Increasing efficiency and effectiveness: ICT will be maximised to increase the efficiency and effectiveness of the administration and management of the education system. ICT will be extensively used to automate and integrate all functions of the Ministry, to mechanise work processes such as management of information systems, monitoring attendance, timetabling, maintaining staff and student data, report form generation, the processing of official forms, and other relevant functions that will both increase and ensure greater efficiency and effectiveness in the system.

¹¹ See <https://www.unicef.org/rosa/reports/guidance-distance-learning-modalities-reach-all-children-and-youth-during-school-closures>

2.5 Thrust Areas

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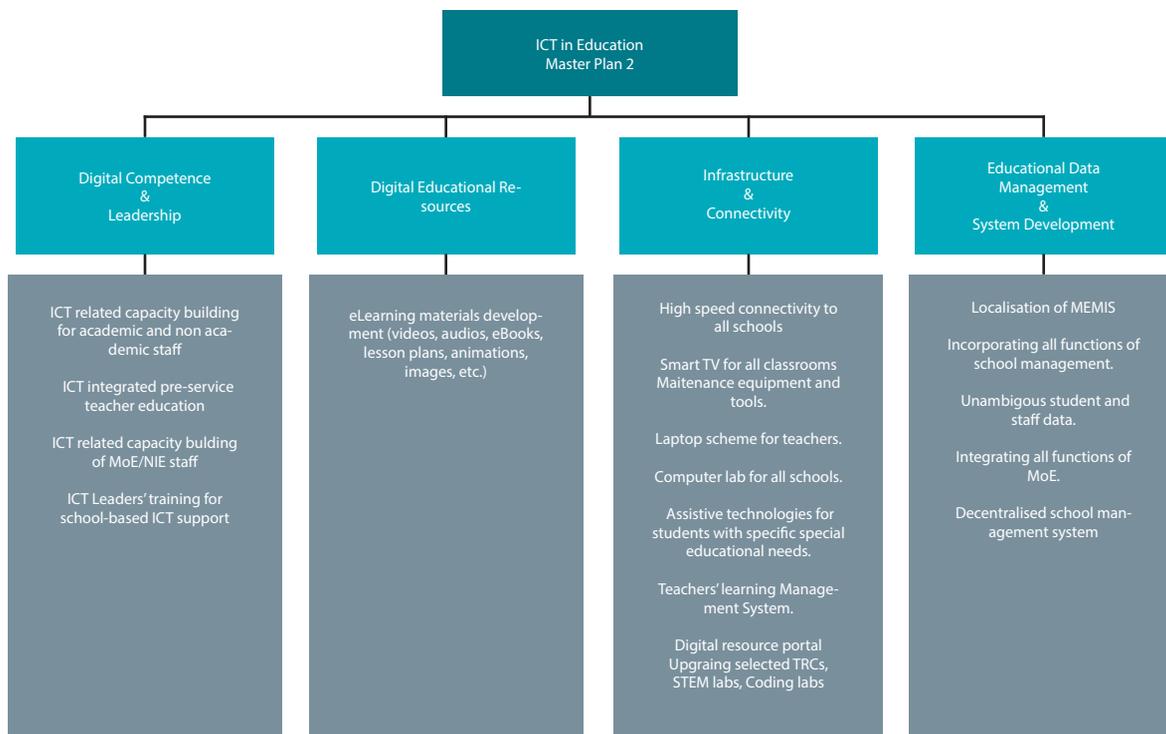
The vision of the ICTE-MP2 will be achieved through programmes and projects detailed under the four thrust areas adopted during the planning process. The four thrust areas are:

- i. Digital Competence and Leadership,
- ii. Digital Educational Resources,
- iii. Infrastructure and Connectivity, and
- iv. Educational Data Management and System Development.

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A brief of the main emphasis under each of the four areas are illustrated in Figure 2

Figure2: Master Plan Thrust Areas and Major Programmes



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The next chapter of the master plan will present the details of the programmes and projects under each of the thrust areas. The details will include goals, rationales, objectives, activities, implementation plans with key responsible agencies, estimated costs, and indicators for monitoring.

THRUST AREAS

Thrust Area 1: Digital Competence and Leadership

Goal: Build a strong system of educators, support staff, students, and parents to ensure effective and responsible use of digital technologies for learning and beyond.

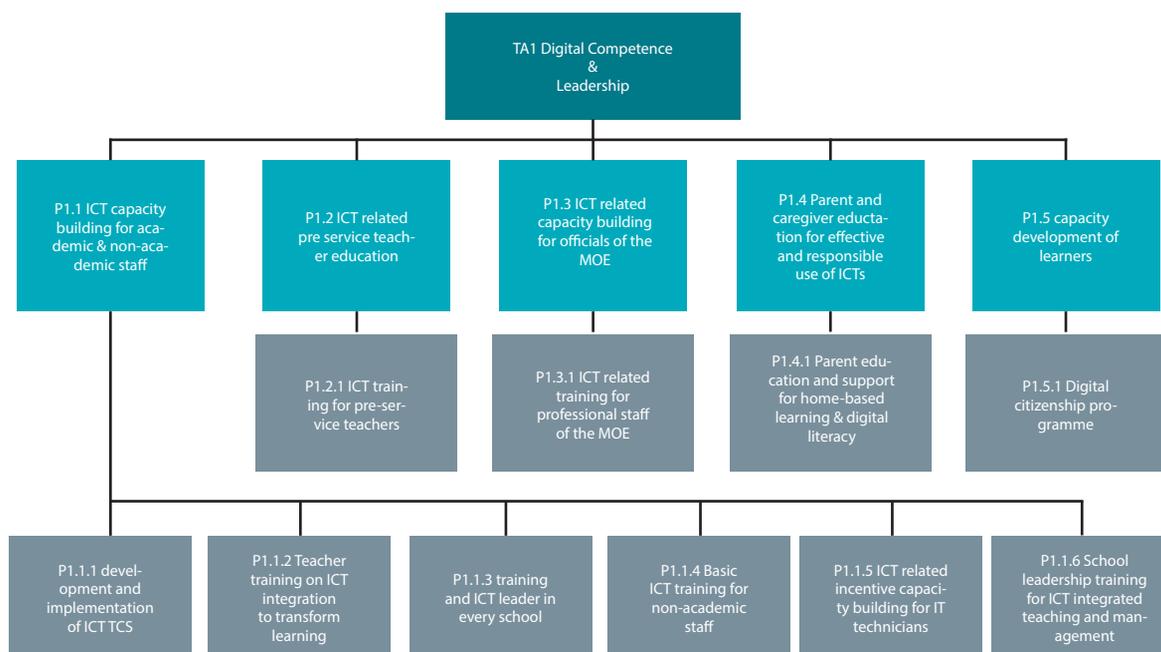
Introduction

With the rapid growth of ICT industry over the past two decades, digital technologies have transformed the world and changed the way people think, work and live. As part of this transformation, school teachers across the world are compelled to use digital technologies in their daily classroom teaching and ensure that students are prepared for life of the 21st century. The significance of ICT for classroom teaching has become more evident with the COVID-19 pandemic. In a report based on the feedback of over 900 teachers around the world about lessons learned from COVID-19 school closure, Hall (2021) states that teachers believe that implementing “technological literacy for all” policies is essential to ensure equitable access to education for all. Therefore, the main aim of the Digital Competence and Leadership thrust area is to enhance and strengthen the institutional capacity and provide professional development for all key players and ensure institutionalisation of remote learning in the school education system.

Studies conducted in the Maldives identified lack of educators’ ICT knowledge, competencies, and skills to perform the best practices of ICT integration in the education system of the Maldives (Adam, 2015; Kinnanath, 2013; Shibana, 2013). According to the ESA, the Maldives has seen poor integration of ICT in classroom practices regardless of a number of professional development sessions conducted for teachers across atolls (MoE, 2019). Also, the ESA reports that the Maldives can be categorised as in the emerging and applying phase of ICT integration. In addition, lack of ICT competencies among teachers was noted, which can become a barrier for a successful ICT integration in the education of children. The ESP 2019-2023 recommended providing hands-on practical training for teachers, on the use of ICT, in the teaching-learning process. To ensure continuity of education during the COVID-19 related school closure, the MoE, with the support from UNICEF, provided training for all teachers across the country on how to use G Suite for Education. This training enabled all teachers to get equipped with the basics of delivering online lessons using different applications of G Suite for Education (Activity Report, NIE, 2020). Although nearly 45% of teachers got certified as Google Certified Educators, the need for providing hands-on training for teachers on how to use ICTs in classroom teaching still remains high as highlighted in ESP 2019-2023. Also as mentioned above, COVID-19 has taught us the lesson that in addition to teachers, school support staff and parents also play an equally important role in enabling students to learn through digital technologies.

A total of five programmes and ten projects are designed under this thrust area to develop the ICT capacity of students, parents, teachers, school and sector leaders and support staff in the schools. The activities built into the projects under this thrust area are designed to facilitate the transformation of learning for all children by enhancing the capabilities of all who are involved in the delivery and support of learning experiences. Also, this thrust area ensures that the human resource capacity of the education system meets the need for proper implementation or functioning of the resources and infrastructure planned in the other three thrust areas of this master plan.

Figure 3: Programmes and Projects of Thrust Area 1



Programme 1.1 ICT related capacity building for academic and non-academic staff

Goal: Improve the capacity of academic and non-academic staff to empower them for smooth integration of ICT in schools

Rationale

Effective use of technology in the education system for improved services delivery is one of the policies (Policy 4.4, p.78) of the ESP 2019-2023 (MoE & MoHE, 2020). This shows the significance given to ICTs for the development of education sector. The role of ICT has become more evident with the outbreak of COVID-19 pandemic, during the period of school closure. ICT was the only medium to reach students and continue their education. Though schools were able to reach students through various ICTs, schools faced several challenges, mainly related to the limited capacity of staff. Hence, ICT related capacity building is crucial for providing quality educational services in the digital world we live in today. Since quality educational services are a combined effort of both the academic and non-academic staff in the education system, it is essential to conduct capacity building programmes for both these groups of staff members according to their respective roles and responsibilities.

The main aim of the programme is to address the evolving trend of digital transformation in the education sector as well as to be resilient for future disruptions. Hence, the programme will focus on ensuring that academic and non-academic staff in the government schools are competent to use appropriate tools, applications, and devices necessary for the anticipated digital transformation. The projects under this programme will further help to develop teachers' confidence in using digital tools for teaching, while also enhancing their competency in designing more interactive, active, and ICT-enabled classroom learning for all children.

Project 1.1.1 Development and implementation of ICT teacher competency standards

Rationale

Both the ESA and ESP 2019-2023 have identified the lack of ICT related competencies among teachers as a challenge for successful integration of ICT in teaching and learning. Teachers need to be competent in using ICTs now more than ever, and meet the demands of the digital transformations taking place in the education systems around the world. Further, COVID-19 pandemic has been a wakeup call for teachers and schools to be equipped with ICT related knowledge and skills and be prepared to switch into remote learning whenever needed.

The ICT competency standards framework will conceptualise to structure competencies that will enhance the capacity of teachers. Hence, this project is crucial for teachers. By the end of this project, teachers' competency standards will be identified and enhanced through appropriate training. These trainings will prepare the teachers to become more competent in the use of various ICTs.

Objective: To establish competency-based ICT training programmes where teacher development is systematically guided, monitored, assessed and tracked at policy and institutional levels.

Responsible bodies

- National Institute of Education (Lead)
- Maldives Qualifications Authority
- Quality Assurance Department
- Schools

Implementation Plan

Activity	Timeline	
	Start	End
1. Develop and implement ICT competency standards for teachers (ICT-CST) with technical support from different stakeholders. 1.1 Integrate ICT competency standards to teacher professional standards. 1.2 Conduct capacity building training/workshops sessions to curriculum developers of pre-service and in-service teacher training on integrating ICT-CSTs to their curriculum. 1.3 Assess competencies using competency standards.	May 2021	June 2023

Note: ICT-CST development work began in April 2019. However, with the pedagogical shift to teach online compelled by the COVID-19 pandemic, the written competencies have to be reviewed and revised according to the government's plans for institutionalising remote learning.

Project 1.1.2 Teacher training on ICT integration to transform learning

Rationale

As modern technology is spreading rapidly around the world, the demand for utilisation of ICTs in education is also rising. Embracing social and technological changes is important to respond effectively to the needs of all students. Teachers are expected to learn and re-learn the digital world to effectively use ICT in teaching and learning. However, a study by Shihab, Ibrahim & Chaudhuri (2017) on the practices of Maldivian teachers in integrating ICTs for teaching revealed that although nearly 70% of teachers use ICTs in their teaching, the use is mostly as a visual medium for projecting information. As this is considered a very surface level of ICT integrated teaching, which is far from the intended ICT competency development specified in the national curriculum, the study recommended continuous capacity building and mentoring for teachers. According to the national curriculum, it is one of the critical roles of the teacher to facilitate the use of a variety of technological tools for learning and communication. While the Maldivian education system was planning to bridge the teacher capacity gap of technology integration, the global pandemic of COVID-19 hit the country and accelerated the existing need.

Along with the school closure of COVID-19 pandemic, the MoE took all possible measures to ensure that learning was continued for children through various means and modes of remote learning. Considering the already established G Suite for Education setup in all schools with user accounts for all students and teachers, G Suite was decided to be used as the primary learning platform for remote learning along with televised lessons. One of the first steps for getting started with online teaching was starting a nationwide training and mentoring programme for teachers on the use of G Suite for Education. The main aim of this programme was to provide a basic training for teachers to creatively utilize different applications of G Suite for Education and teach students, while they stayed at home. With over 40% of teachers now declared as Google Certified Educators, it is considered a required standard by the MoE for every teacher to be trained for the use of G Suite for Education. Although teachers are now able to deliver using Google tools, more support and training is required for them to better their craft of teaching and bring about learning transformation intended.

This project will build teacher capacity (including Foundation Stage teachers) to use pedagogical tools that will maximise learning in a more meaningful manner for innovation and digital competence.

Objective: To build teacher capacity in integrating ICTs as pedagogical tools and educational resources to facilitate and maximise student learning.

Responsible bodies

- National Institute of Education (Lead)
- Department of Inclusive Education
- Schools

Implementation Plan

Activity	Timeline	
	Start	End
1. Conduct Google for education programmes 1.1 Train and certify 50 trainers 1.2 Train and certify 4,000 teachers.	2021	2023
2. Provide professional development to school teachers on usage of different ICTs.	2021	2024
3. Conduct training for Assistive Technologies for SEN teachers.	2021	2024

Project 1.1.3 Training an ICT Leader in every school

Rationale

In most of the Maldivian schools, technical support for teachers related to ICT integration is provided mostly by the IT technicians. However, due to policy restrictions, most of the underpopulated schools do not have the position of IT technicians. On the other hand, due to the dispersed nature of the working population across the scattered islands some schools are unable to hire people sufficiently qualified for the job. Lack of technical support in the schools often leads teachers to take the responsibility of managing technical and computer network issues on their own. However, since teachers are not trained to tackle technical and network related problems, they remain unsolved. Also, since IT technicians are not trained in the area of classroom teaching pedagogy, they are often unable to provide support for teachers to integrate ICT in classroom teaching. Hence it is necessary to build school capacity in such a way that both needs are catered for, and ensure that effective teaching and learning takes place in schools with the integration of ITC.

Therefore, this project aims to train a person who is competent to assist teachers in dealing with technical issues and transform teaching and learning using ICTs. This a concept practiced in education systems across the world. A longitudinal study done in Australia by Newhouse (2010) on the role of school-based ICT leaders concluded that providing one-to-one support, role modelling, scaffolding, peer collaboration and support by the ICT leader/coordinator leads to successful ICT integrated teaching in the school.

In order to achieve the objective of establishing an ICT leader* in every school, a leading teacher, can be trained to take up the responsibility similar to the existing concept of professional development coordinators in the school system. These ICT leaders will have a crucial role in enabling the successful integration of ICT in teaching by providing support such as one-to-one guidance, scaffolding, mentoring etc. In addition, they will also be trained to help teachers to tackle technical problems and make informed decisions.

*The MoE in consultation with the Civil Service Commission will identify and adopt the most appropriate name/ title for this position of ICT leader. Some names suggested in the validation workshop include ICT Coach, ICT Ambassador, Technology Innovation Coach, ICT Specialist or Advocator and Technology Integration Specialist.

Objective: To establish an ICT leader in every school to work closely with teachers to facilitate the process of pedagogical integration of ICTs in the school.

Responsible bodies

- Ministry of Education (Lead)
- National Institute of Education
- Schools

Implementation Plan

Activity	Timeline	
	Start	End
1. Conduct a baseline study to identify the requirements of a training programme.	2020	2023
2. Design a programme for training ICT leaders (approximately 3 months in blended mode – online training and in-person training component).		
3. Train one staff member from each school as ICT leader using the designed training package.		

Project 1.1.4 Basic ICT training for administrative and support staff of schools

Rationale

The efficiency of a school is ensured by the effort and support of all staff working in that institution. Training for administrative and support staff on basic ICT skills will benefit the school in many ways and can contribute to the smooth running of school functions. This will in turn benefit teachers and students in the school. Furthermore, when school staff in administrative roles are better equipped to handle online tasks, it will help the teachers focus more on their primary role of teaching, limiting teachers' need to attend to routine administrative tasks. Training the school staff in ICT skills can lead them to be more confident and comfortable in using ICT. In addition to volunteerism and support from teachers with an interest in technology, it is also important to institutionalise technology through formal systems of maintenance and support, which requires a sustainable approach to training and retraining ICT staff.

The importance of ICT training for administrative and support staff has been made more evident during the COVID-19 pandemic situation, as many activities related to education are being conducted through online platforms. Administrative and support staff should have the necessary basic knowledge in using the required software, applications, and digital interfaces used within the education sector. These would include, among others, communication through emails, arrangement of online meetings, use of official government networks and the different portals used within the sector. Developing the technical competency of all school staff is deemed necessary to help loosen the backbone bottlenecks and foster a supportive environment. In addition, capacity building programmes for administrative and support staff in schools will facilitate sustainability of the huge shift to remote learning.

Objective: To enhance the quality of educational service delivery in the schools through increased use of ICTs.

Responsible bodies

- National Institute of Education (Lead)
- Schools
- Civil Service Training Institute

Implementation Plan

Activity	Timeline	
	Start	End
1. Conduct GCE training for all the relevant administrative and support staff in the school	2021	2024
2. Provide professional development on systems/applications/portals/software commonly used for school administration.	2021	2024

Key Indicators

Indicator	Baseline	Target group	Data source	Frequency
1. Number and percentage of Administrative /Support staff certified for GCE Level 1 training.	NA	500 staff (non-academic)	Certificate link from Google	Once
2. Number and percentage of Administrative staff completed MEMIS training.	NA	All staff (non-academic)	MEMIS	Once
3. Number and percentage of Administrative/Support staff completed Koshaaru training.	NA	All staff (non-academic)	MEMIS	Once
4. Number and percentage of Administrative /Support staff completed Civil Service e-viuga training				

Project 1.1.5 ICT related intensive capacity building for IT technicians

Rationale

IT technicians working in schools provide the technical support needed for teachers and pupils. At present, the role of IT technicians is confined to networking, hardware, and software troubleshooting. The current cadre of IT Technicians are not necessarily highly qualified staff in the area. Some of them gain on the job experience. To keep up with the advanced educational technologies and embed them in school setting, it is vital to develop the capacity of IT technicians to instil values of technical excellence which are transferred to teachers and students. Capacity building of IT technicians is an important strand of sustaining the pedagogical efforts for ICT integration in schools.

To successfully integrate ICT in teaching and learning, it is important that the traditional role of IT technicians working remotely be transformed into a more collaborative role where they assist to build a bridge between ICT usage and ICT support mechanism for non-technical users. Furthermore, technological devices, especially smart technology, upgrade rapidly, and technicians should be well-versed to service the school's devices. Information related to technology is growing continuously. Hence, to successfully integrate ICT in the schools, it is crucial to conduct a programme to upgrade the skills and knowledge of IT technicians in the schools and various divisions and agencies of the sector. Appropriate training programmes already developed by local training providers will be considered when implementing this project.

Objective: Enhance the quality of service delivery of IT technicians through intensive ICT related training.

Responsible bodies

- Ministry of Education (Lead)
- Schools

Implementation Plan

Activity	Timeline	
	Start	End
1. Conduct GCE Level 1 training	2021	2022
2. Conduct networking training	2022	2024
3. Conduct hardware repair training	2022	2024

Project 1.1.6 School leadership training for ICT integrated teaching and management

Rationale

School leadership plays a key role in the facilitation of educational change. At a time when technology integrated teaching has become the 'buzzword' of the education system, school leaders who have clear visions and commitment to develop ICTs in their schools are presumed to achieve successes in their schools. Facilitating the change of integrating ICT in both classroom teaching and school administration is part of the instructional leadership role of a principal. According to Afshari et al., (2008), principals having the understanding that, supporting and practicing the idea that ICT integration is not about the ICTs, but transforming learning for the students through ICTs. However, in a study by Hoque, Samad, Siraj, and Ziyadh (2012) on exploring the role of ICT in school management of Maldives found that despite the availability of ICT resources in some schools, ICT is not integrated effectively in the teaching and learning process but are used mostly for daily administrative purposes. This shows the significance of school principals having the right mindset about ICT related decision making, influencing others, supporting teachers and being a role model in ICT use.

The importance of building school leadership capacity for effective ICT related planning is highlighted as one of the deliverables of the ICTE-MP1 (ESA 2019). Therefore, in order to implement ICT integrated teaching in its true sense and also to sustain these efforts, it is essential for school leaders to have both the pedagogical and technical knowledge and understanding about ICT integration. This will help them to implement a holistic approach to building relationships and competencies, and guide teachers to confidently integrate ICTs in classroom teaching as well as in general administration of the school.

This project aims to provide professional development needed for school principals to function as instructional leaders in relation to ICT integrated teaching.

Objective: To build the capacity of school principals to function as instructional leaders in relation to ICT integrated teaching.

Responsible bodies

- National Institute of Education (Lead)
- School Administration Division/MoE

Implementation Plan

Activity	Timeline	
	Start	End
1. Conduct a series of capacity building programmes for school principals on ICT-based change management and instructional leadership on ICT integrated teaching.	2022	2023
2. Hold a national conference on showcasing good practices of ICT integrated teaching and school management.	2024	2024

Programme 1.2 ICT related Pre-service Teacher Education

Goal: To align pre-service teacher education curriculum with ICT Competency Standards for Teacher, in order to ensure that graduating teachers have the knowledge and skills required to implement ICT integrated teaching in the classroom.

Rationale

The NCF of Maldives envisions developing individuals who are prepared for life. To ensure this vision, students should be developed with the proper knowledge, skills, attitudes, and values in all aspects to be competent in the rapidly and continuously changing world. The revised curriculum shifts focus from subject-based learning objectives to broader cross cutting competencies, where digital literacy is embedded into all competency areas. Teachers are the key agents to ensure students are competent in ICT. For teachers to effectively meet this expectation, they must be competent in integrating ICT in their teaching and learning.

Hence, utmost importance should be given to ensure pre-service teachers are fully trained to integrate ICT in teaching and learning. To achieve this, teaching modules of pre-service programmes at the universities and colleges must be aligned with the ICT-CST. Teacher educators of faculties of education must be equipped with the necessary digital skills to facilitate the integration of ICT in the subjects they teach. In addition, ICT will provide more flexible and effective ways in the teaching and learning process, teacher professional development, and connecting teachers globally. This programme is key and deemed essential for the sustainability of many of the efforts for ICT integration built into this master plan.

Project 1.2.1 ICT related training for pre-service teachers

Rationale

In today's world, ICT literacy is a 21st century skill that will allow students to participate and contribute as a citizen in a technology centred society. The NCF of Maldives also emphasizes developing ICT competent students who will contribute to its overall vision of preparing students for life.

Teachers play a crucial role in ensuring the achievement of curriculum goals and developing ICT competent students. To facilitate students' learning, teachers need to be competent in integrating ICT in teaching and learning.

However, although a lot of government funding has already gone into providing ICT infrastructure, resources, and teacher professional development, teachers' ICT usage does not meet the expectations due to the lack of teacher capacity (Adam, 2015). Therefore, it is necessary to ensure capacity to a minimum standard, which can be achieved by aligning the training modules used in pre-service institutions with the ICT teacher competency standards. This will ensure that the training programmes mirror the standards, curriculum and realities of the classroom. It is vital for pre-service teacher training programmes to expose teachers to both high-tech and low-tech modalities of teaching and learning, so that they can transfer the skill to their students.

In addition to aligning the teaching modules with the ICT-CST, it is equally essential for teacher educators to be informed and updated with the ICT-CST framework and revised curriculum. Upgrading their knowledge and enhancing their digital pedagogy through professional development programmes will help to keep up with the best practices as technology is rapidly evolving.

Objective:

1. Equip all graduates from pre-service teacher education programmes with knowledge and skills on using ICT as a teaching-learning tool to teach the national curriculum.
2. Enhance ICT related pedagogical knowledge and skills of all teacher educators.

Responsible bodies

- Ministry of Education/NIE (Lead)
- Maldives Qualifications Authority
- Pre-service teacher training providers

Implementation Plan

Activity	Timeline	
	Start	End
1.Align ICT training programme of pre-service teachers with ICT-CST. 1.1 Review existing pre-service teacher training modules and identify needs/gaps for inclusion of ICT-CST. 1.2 Revise and /or further develop ICT training modules in alignment with ICT-CST.	2022	2024
2.Conduct professional development workshops for teacher educators on ICT integrated training of pre-service teachers. 2.1 Develop and validate training package. 2.2 Conduct training 2.3 Evaluate the effectiveness of training package and training	2021	2022

Programme 1.3 ICT related capacity building for officials of the MoE

Goal: MoE officials are competent to apply their ICT knowledge and skills to assist and monitor the ICT integration process and ICT related administrative tasks

Rationale

The new curriculum rolled out in 2015 focuses on 21st century skills where proper use of ICT is included at the heart of this major educational reform. The growing trend of increased use of ICT facilities and their integration into teaching and learning offers a wide range of new possibilities in the education sector. Implementation of ICT programmes can be difficult at times, requiring appropriate guidance to be provided to overcome the technical challenges and glitches faced by students and teachers.

In order to assist the schools and overcome these barriers, administrative and professional staff at central offices need to be trained in basic as well as specialised ICT skills. MoE officials trained can provide the professional expertise when needed and build the system towards efficient integration of ICT. Developing the skills and understanding of teachers and support staff to enable them to use a wide range of teaching strategies, and establish supportive mechanisms is key to increase learning outcomes.

Project 1.3.1 ICT related training for professional support staff of the Ministry of Education

Rationale

In addition to teachers and school staff being trained in ICT, government officials working in different departments of the MoE also require ICT integration training to achieve the objectives of the education system and the vision of this master plan. Basic ICT training will enable staff to become more productive with office software such as word processing, spreadsheets, and other commonly used applications. Basic training will also help staff to effectively use and operate different software frequently used for data management systems of civil service and the Ministry.

The technological revolutions in the past two decades have changed the way of life for everyone across the world and the education sector is no exception. Like in most other countries, in the Maldives also there is constant demand from students, parents and the society to keep up with the trends and align with the progression of the digital world. However, according to the World Bank (2021), emerging areas of technological advancements such as STEM education and artificial intelligences are lacking areas of human resource capacity in the Maldives. Therefore, it is necessary to build national capacity in these areas and survive in the digital world. In addition, human resource capacity is also limited in several other areas related to ICT in the education system such as curriculum development officers, teacher educators, data analysts, etc.

Basic trainings will provide the foundation to build further and develop ICT related skill sets. However, specialized ICT related trainings are also essential for different functions within the MoE. Education Officers and Education Development Officers working in different departments of the MoE, who are mandated to develop the national curriculum resources need training on instructional design, multimedia production, and E teaching. Also trained personnel are needed

in the areas of statistics, data science, and data analysis to effectively carry out policy analysis and policy making.

The training envisaged under this project will upgrade the skill set and increase work efficiency and job satisfaction of MoE officials working at the central level. Proper training given will strengthen staff knowledge and their competence. Ensuring the training to MoE officials involved in strengthening ICT in teaching and learning will ultimately increase the system efficiency and aid sustainability of ICT related projects in the schools.

Objectives: Enhance capacity of professional support staff of the Ministry of Education for ICT

Responsible bodies

- Ministry of Education - HR (Lead)
- National Institute of Education

Implementation Plan

Activity	Timeline	
	Start	End
1. Conduct ICT basic training. 1.1 Conduct Civil Service network usage training* 1.2 Conduct MEMIS and other MOE network trainings*	2021	2024
2. Conduct training on multimedia production for 25 staff	2022	2024
3. Train one staff on instructional design (for teacher education programme design) through an overseas scholarship opportunity.	2022	2024
4. Train 3 Network administrators (local training).	2022	2024
5. Train 5 staff of PPRD in basic statistics and data science.	2022	2022
6. Train 5 developers	2022	2024
7. Training 5 Data analysts to work at PPRD.	2022	2024
8. Training one school curriculum developer for ICT through an overseas scholarship opportunity.	2022	2024
9. Train 20 staff for E-teaching.	2021	2024

* Civil Service network training and MoE network trainings are ongoing and continuous programmes that do not require additional funds.

Programme 1.4 Parent and caregiver education for effective and responsible use of ICTs

Goal: To increase parent and caregiver awareness for supporting home-based learning and ensuring the safe and responsible use of digital technologies.

Rationale

According to UNICEF (2019), even though children are seemingly adept at using digital tools, this does not mean that they are digitally literate. Therefore, it is important to support and guide students in developing their critical evaluation skills and collaborative competencies. With the COVID-19 pandemic, interest of parents and caregivers in digital learning has heightened. It is not a simple case of replicating a school environment in the home and many changes are being made to try being responsive to learning experience as they are being implemented.

With the increase in the use of technology by children, providing the necessary support by parents for their children in their technology integrated learning has become challenging for parents and caregivers. Research shows that parental expectation of the role of ICTs in their children's future, discourses of the opportunities and risks of the internet, and the everyday practices of media engagement all shape the way in which children are socialised into using digital media at home (Mascheroni et al. 2016, p. 1). Parents have concerns with respect to finding out what their children know, how parents can ensure that the child is progressing and getting the required help.

Livingstone and Byrne (2015) emphasized that governments and other stakeholders should make greater investments to aid parents so that they can enable their children to learn and grow in the digital age. It is important to increase parents' awareness of the latest technological devices used for learning. The NIE conducted a successful webinar series in 2020 as the school system moved into 'new normal' practices. The sessions addressed key educational issues relevant to teachers, school leaders, and parents especially related to the continuation of learning during the pandemic period. Parents must also be empowered with knowledge and skills to be competent in the digital world to support their child's learning. The involvement of parents and caregivers in children's learning can lead to better performance by them.

Project 1.4.1 Parent education & support for home-based learning and digital literacy

Rationale

Due to the sudden and unprecedented school closure, the involvement of parents and caregivers in their children's learning has increased manifold. This involvement has been found to play a critical role in ensuring the continuation of learning (NIE Webinar for parents, 2020).

The familiarity and experience of parents and caregivers for using technology to support home-based learning differ widely. According to a survey conducted by NIE (2020) on teachers' expectations from parents in remote learning, many parents do not have a good sense of relatedness to technology integrated learning. This results in little to no readiness to offer a consistent digital learning experience to their children. All parents and caregivers need to understand the essential approaches to use devices that will focus on the needs of the child during their technology integrated learning. Parental guides, webinars, and media campaigns can be effective resources that would increase ICT awareness. Such activities and resources can help parents and caregivers to work with children and teachers to assist and support ICT integrated learning.

Objective: To educate parents and caregivers for supporting children to engage with digital technologies in a safe and responsible way.

Responsible bodies

- National Institute of Education (Lead)
- School Administration Section of MoE
- Schools
- Local councils and community

Implementation Plan

Activity	Timeline	
	Start	End
1. Conduct a series of parent/caregiver education sessions (physical and online) on the following areas. <ul style="list-style-type: none"> • Digital skills necessary for parent/caregiver to support students' home-based online and distance learning. • Identifying children's learning styles and appropriate interventions. • Information on moral, legal and ethical issues in online learning that parent/caregiver need to know. • How to create a conducive environment for home-based learning. • Information on online safety when learning online including taking care of the mental and social well-being. 	2021	2022
1.2 Conduct a media campaign to increase parent/caregiver awareness of students learning from home.	2021	2022

Programme 1.5 ICT capacity development of learners

Goal: Empowering students to use ICTs in their learning in a safe and responsible way.

Rationale

The knowledge and use of ICT are essential in today's world. Students are no exception to this. Accordingly, importance is being given in the school system and in the national curriculum to develop students with ICT competencies and capabilities. However, with the increase in access to a range of digital devices and the internet, children are more susceptible to cyber security risks. The Education Act 2020 of the Maldives specifically mentions in Article 7, which targets children's education, that students should be exposed to technology and be taught to use the internet safely (GoM, 2020b).

In order to fully gain the potential benefits of ICT, students will need guidance on using technology safely and appropriately. To thrive in this digital era, they will need a diverse range of skills, knowledge, and positive attitudes to use ICT responsibly. There is one project in this programme to develop ICT competencies of students.

Project 1.5.1 Digital Citizenship programme

Rationale

Even with the potential benefits of digital technology, there is always the possibility of technology being misused. Negative behaviour such as cyber bullying, accessing inappropriate content, and engaging in illegal activities can lead to enormous consequences. According to Maldives Police Service (2021) one of the most reported types of cases against children take place in the cyberspace.

With the increased use of technology in the Maldivian context, internet awareness must be promoted to avoid negative consequences and utilize the potential benefits. The MoE has in 2020 collaborated with the Maldives Police Service and UNICEF to develop a guide on cyber safety and bullying. In 2021, with support from UNICEF, the MOE launched an initiative called 'CyberSmart' on the World Internet Safety Day. CyberSmart initiative aims to increase knowledge of parents, teachers and students on protecting children from online exploitation while learning online. The initiative will start programmes with students in primary grades and their parents and eventually reach secondary students.

The Digital Citizenship programme will help the students acquire skills and competencies needed for the digital world and navigate through the internet safely and in a responsible manner. It is important to view and understand digital literacy as part of the broader skills for learning. Foundation skills, transferable skills, job-specific skills, together with digital skills combines to offer a holistic approach in education and training (UNICEF, 2019).

Objective: Empower students to participate responsibly, safely and ethically in the use of digital technologies.

Responsible bodies

- National Institute of Education (Lead)
- School Administration Section of MoE
- Educational Supervision and Quality Improvement Division (ESQID)
- Schools

Implementation Plan

Activity	Timeline	
	Start	End
1. Conduct the digital citizenship programme "Be internet awesome programme" by Google to students in grades 1 to 10.	2021	2022
2. Conduct the digital citizenship programme "Cyber Wellness Student Ambassador" for students in grades 11 to 12.	2021	2022
3. Nationwide survey to assess the level of digital citizenship practiced by school children based on UNESCO's digital citizenship standards.	2023	2023
4. Conduct continuous digital citizenship programmes for students addressing gaps identified from the survey.	2023	2024

Project 1.5.2 Coding programme for students

Rationale

In this digital era, everyday tasks can involve a variety of different computer software packages, websites and applications to be used. It is predicted that development of these resources will be in high demand in the future. In school education, computer programming is now becoming an essential skill for 21st century learners and is included in many curriculum frameworks around the world. Empowering students to keep up with the 21st century concepts is important for various reasons including meaningful learning and being prepared for the future life.

Basic coding provides the know-how on developing software, websites, applications, etc. This will also enhance the problem-solving skills of students. Teaching coding programmes in schools can provide a foundation for them to have the necessary knowledge to build on their coding skills. As students are involved in technology-integrated learning it is important to provide them with more advanced means of understanding the technology around them. This will also help to prepare students for the strong work force that they are expected to contribute to in the future.

Objective: Develop students' knowledge and skills on coding to create meaningful software applications and empowering students to be competent in 21st Century concepts.

Responsible bodies

- National Institute of Education (Lead)
- School Administration Section of MoE

Implementation Plan

Activity	Timeline	
	Start	End
1 Develop and implement a Coding Programme for students. 1.1 Develop a programme to teach Coding (with the help of a Consultant). 1.2 Train Computer Studies teachers to teach Coding with the help of a Consultant. 1.3 Implement Coding programme for students.	2023	2024

Thrust Area 2: Digital Educational Resources

Goal: Enhance digital skills among learners and teachers by providing ICT-integrated teaching and learning digital content to schools.

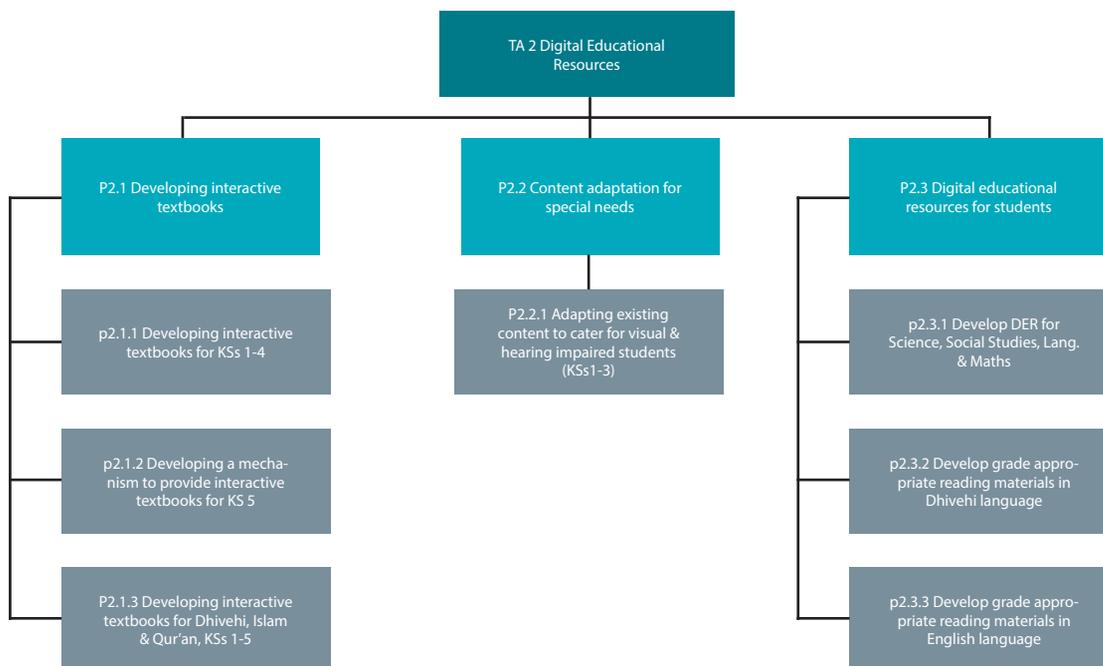
Rationale

Promoting independent learning requires a teacher who is competent and confident in using ICT in everyday teaching. Although teachers are familiar with digital devices there is a lack of digital resources to carry out ICT integrated teaching and learning in schools. The development and promotion of eLearning/digital resources would address the emerging educational needs of school children. A major step in this direction was the initiative under the ICTE-MP1 of digitisation of the curriculum which is still ongoing at the NIE. Collaboration with Cambridge University Press was sought in this endeavour. Finding relevant and high-quality digital resources is one of the most difficult and time-consuming tasks for teachers and students. Although a lot of resource development workshops have been conducted by NIE in the past, there is no systematic mechanism for collecting and disseminating these resources among the teachers.

The potential of technology in learning along with 21st century employability skills is emphasised in the national educational policies. While reaching all the children remains a priority to organisations such as UNESCO and UNICEF, there are efforts to collaborate with governments and partners to develop road maps to address the digital divide, which continues to be a significant issue in this part of the world (ROSA, 2021). In the meantime, the COVID-19 response has shown enormous potential and the importance of broadening the use of technology for learning rather than “add on” to the traditional approach of teaching and learning (UNICEF, 2021). The potential to make the schools move from classroom-based lectures to ICT mediated teaching is more realistic now than before. Well-designed ICT integrated resources and digital content can reduce the time gap in providing up-to-date information to learners and teachers.

This demands for a well-organized digital repository which gives easy access to quality teaching and learning material to students and teachers. It should consist of digital content focusing on richly diverse fields of knowledge, supporting opportunities for interaction with materials and resources. The development, dissemination and promotion of more digital content will facilitate the achievement of the vision of transformation of learning. This thrust area of Digital Educational Resources (DER) has identified three programmes and seven projects which are expected to provide ICT-integrated teaching and learning digital content to enhance ICT competency of teachers, students and educational professionals. Figure 4 shows the programmes and projects of this thrust area. One project is specifically designed to cater to students with CLP, including visual and hearing-impaired and students with learning difficulties.

Figure 4: Programmes and Projects of Thrust Area 2



Programme 2.1 Digital interactive textbooks

Goal: Ensure availability and accessibility of digital textbooks to all Key Stages.

Rationale

Today's students are growing up in a digitally connected world. The number of internet users and people accessed is expected to grow as internet penetration expands globally. The percentage of population using the internet in the Maldives is over 70%, which is the highest in the region (UNICEF ROSA, 2021). To prepare students for living and working in a quickly evolving world that centers around technology, we must provide differentiated support, teach collaboration skills, and make learning fun. Technology makes those goals possible. The ESP 2019-2023 emphasises on ensuring equitable and affordable access to lifelong learning and quality education for all. This encourages the education system to leverage emerging technologies that will prepare 21st century learners. One of the key factors impacting the quality of education and learning is the 21st century learning environment (GEM Report, UNESCO, 2018). Rather than providing a large repository of resources, which can be confusing and overwhelming, a curated and organized list of resources in relevant languages, ideally aligned to the curriculum and grade-wise educational objectives, will aid to improve student learning outcomes. Considering the importance of this, it is vital to develop a platform that gives access to electronic interactive resources to engage students in self-directed learning. This programme is expected to develop interactive textbooks to provide alternative, richer learning environments for students and teachers, provide quick updates of contents and interactivity to better engage students in learning.

Project 2.1.1 Developing interactive textbooks for Key Stages 1-4

Rationale

To develop globally competent citizens, it is important to introduce digital textbooks over traditionally printed textbooks. Digital textbooks employ multimedia content such as embedded videos, animated presentations, hyperlinks and assessments to make learning more interactive and engaging. Digitized contents provide a new way of learning, makes learning more exciting, motivates learners and increases their attention towards instruction. It is important to develop the interest of youth in digital skills through a gamified approach. As it is also vital to ensure digital safety, it is also equally important to develop digital participation and increase awareness on how digital technologies shapes our societies.

All textbooks except Dhivehi and Islam have been digitized. The MoE is required to pay subscription for three years to use these books to Cambridge Elevate which is a digital learning subscription service of Cambridge University. [<https://cambridgegosupport.zendesk.com/hc/en-gb/articles/360014839358-Welcome-to-Cambridge-Elevate>].

In 2020, a subscription fee of MVR 8 million (approximately USD 518, 807) was paid. The Cambridge Elevate has promised the senior management of the NIE that when the subscription for 2021 is paid, the subscription for the third year will be waived. After three years of using the digital books on subscription basis, this resource will change ownership to the MoE.

MoE has decided not to print books for KS 3 and KS 4.

Objective: Complete the digitalization of textbooks for all subjects from Key Stages 1-4

Responsible bodies

- National Institute of Education (Lead)
- Cambridge University Press

Implementation Plan

Activity	Timeline	
	Start	End
1. Pilot the digital textbooks [all except for Dhivehi and Islam for grades 1-6] in 90 selected schools 1.1 Select 90 schools to pilot the project. 1.2 Orient teachers from the pilot schools. 1.3 Monitor and provide onsite support to the pilot schools. 1.4 Refine digital textbooks.	April 2022	Nov 2022
2. Review and refine digital textbooks. 2.1 Review and refine digital textbooks for KSs 1-4 prepared through Cambridge University Press, with curriculum developers from NIE.	2022	2024
3. Implement digital textbooks through in-service programmes (mostly online sessions). 3.1 Orient teachers for digital textbooks for KS 1-4. 3.2 Orient students for digital textbooks. 3.3 Conduct awareness programmes for parents of respective KSs	2022	2024
4. Conduct monitoring and review (includes classroom observations)	2023	2024

Project 2.1.2 Develop a mechanism to provide interactive textbooks for KS 5 (A level subjects)

Rationale

It has been the policy of the government to provide textbooks to all students in government schools free of charge. This policy will now become mandatory with the Education Act 2020. With the introduction of smart tablets to students in 2018, digital textbooks became a considerable issue among the educators in Maldives. This raised the demand for digital textbooks for international syllabuses. It was expected to reduce the burden of carrying heavy textbooks and students looked forward to an enjoyable learning experience. However, schools found it difficult to cater to the needs of students because of lack of digital textbooks and resources. Individual schools faced many financial challenges in purchasing these books. Thus, it is important to have a central mechanism to share books among schools.

This project is designed to continue the supply of digital textbooks to students in grades 11 and 12 of all government schools. The MoE receives funds for purchase of textbooks from its regular recurrent costs every year.

Objective: Develop a mechanism to identify and provide digital textbooks for teachers and students of KS 5.

Responsible bodies

- Policy, Planning and Research Division/ MoE (Lead)
- National Institute of Education
- Department of Public Examination

Implementation Plan

Activity	Timeline	
	Start	End
1. Develop a mechanism to share and use digital textbooks and content for KS 5 through [Edexcel curriculum, for 26 textbooks, 2,300 students, 300 teachers]. 1.1 Identify global publishers to negotiate in getting corporate license to provide A level digital textbooks. 1.2 Develop a mechanism to give annual subscription to teachers and students for their textbooks.	2021	2023

Project 2.1.3 Developing interactive textbooks for Dhivehi, Islam and Qur'an used in KSs 1 - 5

Rationale

One of the main challenges faced by teachers teaching the subjects of Dhivehi, Islam and Qur'an is obtaining resources for these subjects. There is always a comparison between students' interest in these subjects taught in the vernacular and subjects taught in English language (NALO, 2018). Therefore, it is important to provide digital textbooks over traditionally printed textbooks for these three subjects. The digital textbooks for these subjects should include multimedia content such as embedded videos, animated presentations, hyperlinks and assessments to make learning more interactive and engaging. Digitized content provides a new way of learning and makes learning more exciting, motivates learners and increases their attention towards instruction. It is important to develop lessons to deepen children's understanding of the concepts taught through applying knowledge, problem solving and being creative.

Objective: Develop interactive textbooks for the subjects of Dhivehi, Islam and Qur'an.

Responsible bodies

- National Institute of Education (Lead)
- Local teachers

Implementation Plan

Activity	Timeline	
	Start	End
1. Develop digital textbooks for subjects taught in the vernacular through writer's workshops. 1.1 Develop digital textbooks for Dhivehi language KSs 1-5. 1.2 Develop digital textbooks for Islam KSs 1-5. 1.3 Develop digital textbooks for Qur'an KSs 1-5	2022	2023
2. Implement digital textbooks through in-service programmes. 2.1 Orient teachers for digital textbooks prepared for Dhivehi language, Islam and Qur'an for KSs 1-5. 2.2 Conduct awareness programmes for parents of respective KSs.	2022	2024
3. Conduct monitoring and review.	2023	2024

Programme 2.2 Content adaptation for students with CLP

Goal: Ensure availability and accessibility of appropriate learning materials for students with visual and hearing impairment.

Rationale

One of the goals of the ESP 2019-2023 is to improve learning for all through equitable access to quality education. Hence, one of the main activities in the sector plan is to establish a mechanism to provide assistive technology for children with CLP. Content adapted for students with CLP with assistive technology will promote learning. ICT can help to improve accessibility to learning resources for visually impaired students with text-to-speech software, high contrast displays, and font resizing. Similarly, ICT can help learners with hearing impairment through visual mediums such as videos and pictures. This programme aims to develop appropriate learning materials for KSs 1-5 with visual and hearing impairment and create a digital learning resource bank. This will enable students and teachers to access information instantly and adapt to their own specific needs. There will be scope for inclusion of many features in the project that will cater to children with other learning difficulties as well. Additional adaptation will come through adaptation that teachers can bring into the classrooms.

Project 2.2.1 Adapting existing content to cater for students with visual and hearing impairment (KSs 1-3)

Rationale

Adapting digital learning resources for appropriate needs is important for promoting inclusivity. One of the main challenges faced by teachers in promoting inclusivity in a mainstream classroom is lack of resources that are specially designed for diverse needs of students. Hence, developing materials for students with visual and hearing impairment has become an essential requirement. The teacher digital learning community as well as the online learning platforms possess accessibility features allowing teachers and children with hearing or visual impairment to participate fully in the training and learning programmes which increases accessibility and inclusion (UNICEF, 2020). As materials are adapted, teachers will be oriented to them.

This is a project that is in direct alignment with the vision of this master plan, the ESP 2019-2023 and the NRRP.

Objective: Develop appropriate learning materials for students of KSs 1-5 with visual and hearing impairment and thereby create a digital learning resource bank.

Responsible bodies

- National Institute of Education (Lead)
- Department of Inclusive Education
- Cambridge University Press
- Local Higher Education Institutions

Implementation Plan

Activity	Timeline	
	Start	End
1. Adapt existing digital textbooks to cater to the needs of students with visual impairment for KSs 1-3. 1.1 Conduct workshops with DoIE, HEIs and other related NGOs and technical experts. 1.2 Review existing learning content and identify topics for adaptation. 1.3 Develop and create learning materials. 1.4 Provide online and offline access to learning materials. 1.5 Orientation of teachers to adapted materials	2022	2023
2. Adapt existing digital textbooks to cater to the needs of students with hearing impairment for KSs 1-3. 2.1 Conduct workshops with DoIE, HEIs and other related NGOs and technical experts. 2.2 Review existing learning content and identify topics for adaptation. 2.3 Develop and create learning materials. 2.4 Provide online and offline access to learning materials. 2.5 Orientation of teachers to adapted materials	2022	2023

Programme 2.3 Digital educational resources for students

Goal: Build a digital educational resource hub for students.

Rationale

The ESP 2019-2023 has identified the integration of technology for quality holistic learning as one of the key activities (MoE & MoHE, 2019). Under this programme it aims to equip all schools with educational technology related materials by the end of 2020. Part of this distribution of electronic tablets to all students commenced in 2018. Due to the COVID-19 pandemic the schools were closed for many months and the education system was forced to find alternative ways to continue the teaching and learning process. MoE initiated a television-based programme called Telikilaas where lessons prerecorded by the schools are aired through national TV channels. In recording lessons teachers all over the country faced difficulty in finding resources to use in the lessons. As well, adequate relevant digital resources are not available for the students. Therefore, building a resource hub will make education more accessible and engaging for learners to foster a culture of lifelong learning. Thus, this programme will focus on building an appropriate digital learning hub for the students.

Project 2.3.1 Develop digital educational resources for Science, Social Studies, Language and Mathematics

Rationale

To achieve the targets of ESP, an effectively managed learning resource hub is necessary. Therefore, building video tutorials, audio, animations, educational games, and other digital learning supplementary materials would provide the students an opportunity for self-directed learning. This project aims to develop digital educational supplementary resources for Science, Social Studies, Language and Mathematics. Developing and providing a menu of technologies and educational resources is important, so that there is flexibility to select the most suitable solution for a given context and ensure maximizing the learning experience for all students.

Objective: Develop digital education supplementary resources for Science, Social Studies, Language and Mathematics.

Responsible bodies

- National Institute of Education (Lead)
- Local Higher Education Institutions

Implementation Plan

Activity	Timeline	
	Start	End
1. Develop digital educational resources for Science, Social Studies, Language and Mathematics. 1.1 Conduct needs analysis for respective KSs, including FS. 1.2 Consult and identify contents and format 1.3 Conduct digitization workshops 1.4 Host student resource hub	April 2022	Nov 2022
2. Orient stakeholders to use the digital resource hub for students. 2.1 Conduct awareness on digital resource hub to students. 2.2 Conduct awareness on digital resources hub to parents	2022	2023
3. Monitor the progress.	2023	2024

Project 2.3.2 Develop grade appropriate reading materials in Dhivehi language

Rationale

Traditional educational environment does not prepare learners to function or be productive in the workplace for the 21st century. To be a citizen of a knowledge-based world, it is important to inculcate reading habits in students. Well-designed reading resources in local language can improve students' engagement and knowledge and encourage individual learning. Building flexibility and interaction in learning is important to ensure that there are mechanisms to connect, interact, provide feedback, increase engagement and improve learning outcomes in a self-paced basis, with each student according to their needs and requirements.

Objective: Build grade appropriate Dhivehi scripted reading materials.

Responsible bodies

- National Institute of Education (Lead)
- Local Higher Education Institutions

Implementation Plan

Activity	Timeline	
	Start	End
1. Identify contents/ topics for developing grade appropriate reading materials to be written in Dhivehi. 1.1 Identify content required for supplementary reading materials for Dhivehi language and Islam. 1.2 Develop a guideline/manual for supplementary reading materials.	April 2022	Nov 2022
2. Develop grade appropriate reading materials written in Dhivehi through workshops. 2.1 Develop supplementary materials based on the manual.	2022	2023
3. Monitor the progress.	2023	2024

Project 2.3.3 Develop grade appropriate reading materials in English language

Rationale

A child's reading skills are important to their success in school as they will allow them to access the breadth of the curriculum and improve their communication and language skills. English language, being the medium of instruction in the Maldives, students are provided and are encouraged to read materials in English language. School children are provided with various interactive and non-interactive digital reading platforms in English and some more platforms are under way of provision as part of the GPE-funded LAMP project. However, since these materials are produced in other countries for children of different cultures, it is considered important to have reading materials in the local context and culture. Therefore, this project aims to produce reading materials in English language that are aligned with the local culture.

Objective: Develop grade and locally appropriate digital reading materials in English language.

Responsible bodies

- National Institute of Education (Lead)
- Local Higher Education Institutions

Implementation Plan

Activity	Timeline	
	Start	End
1. Identify contents/ topics for developing grade appropriate English language reading materials. 1.1 Identify content required for supplementary reading materials for social studies and science. 1.2 Develop a guideline/manual for supplementary reading materials.	April 2022	Nov 2022
2. Develop grade appropriate reading materials through workshops. 2.1 Develop supplementary materials based on the manual.	2022	2023
3. Outsource development of supplementary reading material for social studies and science.	2023	2024
4. Monitor the progress.	2023	2024

Thrust Area 3: Infrastructure and Connectivity

Goal: Develop an effective nationwide ICT infrastructure to enhance education through ICT in government schools.

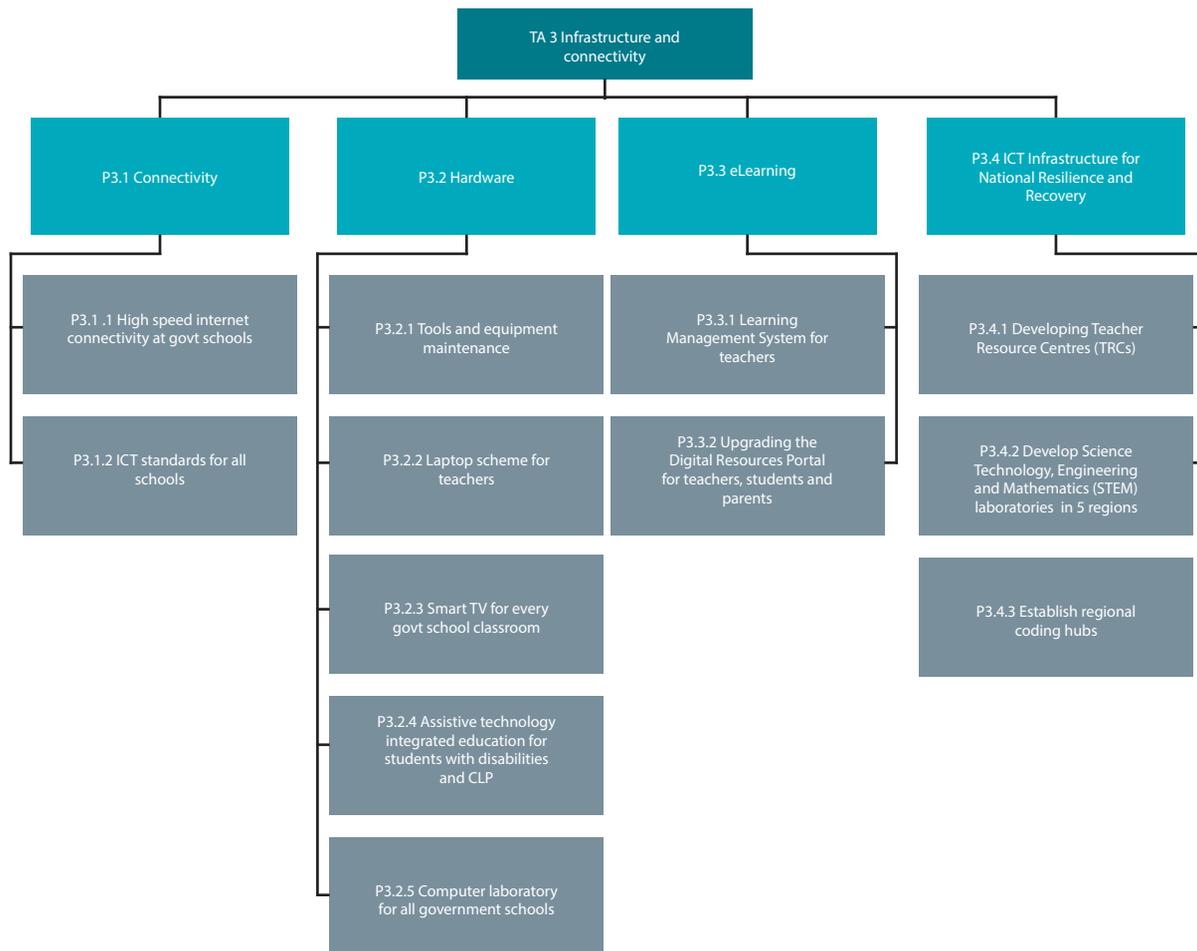
Introduction

Infrastructure development is a fundamental requirement for establishing an effective education system. Recently there has been a high demand for ICT transformation in schools in the Maldives. A strong and well-established ICT infrastructure is needed in all government schools to cater for this demand, especially in a post-COVID era where most of the learning has moved online. Several initiatives have been made by local and international communities in the Maldives to enhance education through ICT. There is a huge need for further development of ICT

infrastructure to enhance the education system to address the challenges of the 21st century.

In this regard, the third thrust area of the master plan includes improving connectivity, hardware enhancements and strengthening the eLearning platforms. With the population geographically distributed to small communities on small islands, separated by sea, a decentralized education system through use of ICT will help bring these communities together and function as one. Figure 5 shows the proposed four programmes and 12 projects of the Infrastructure and Connectivity thrust area.

Figure 5: Programmes and Projects of Thrust Area 3



Programme 3.1 Connectivity

Goal: Providing a feasible bandwidth to schools, expand the existing Wi-Fi coverage area in schools and develop ICT standards required for the schools.

Rationale

The Internet has become a very important learning tool for education and the effects of the COVID-19 pandemic has increased its significance. Digital learning has transformed education to an unprecedented level where internet connectivity has become compulsory. Needless to say, limited and insufficient internet connectivity in schools hugely impacts teaching, learning and administrative functions, which are mostly done online nowadays.

The MoE uses digital resources in all government schools for teaching and learning purposes with internet connectivity provided to all government schools in 2018. The existing bandwidth ranges from 4 Mbps to 36 Mbps based on student population. Slow and limited internet connectivity in the island schools is greatly impacting teachers and students from using ICT in the classrooms. This challenge was escalated when schools had to switch to online teaching due to the sudden school closure due to COVID-19 and the entire school population was compelled to concurrently connect to the internet. The situation worsened with the shift of administrative workload too to online mode. Therefore, the need for sufficient internet connectivity, especially in the island schools has become a major priority.

Developing effective ICT standards for the government schools and revising the existing policies also have become a necessity. ICT needs to be unified across the schools so that all teachers, students and other staff can be provided in a similar manner across the nation and shall adhere to the same practices.

Project 3.1.1: High speed internet connectivity at all government schools

Rationale

To cater for the needs of all the government schools, the MoE has provided Internet through a closed network for all public schools in the year 2018. A total of 2 Gigabits of bandwidth is currently shared among the 212 government schools with security firewall. The current bandwidth ranges from 4 Mbps to 36 Mbps based on student population.

The Scoping Mission Report 2018 by UNESCO Bangkok stated that one of the difficulties, as highlighted by the teachers in island schools included limited internet speeds that prevented them from using ICT in the classrooms. The ESP 2019-2023 also stated that for effective curriculum implementation good internet connectivity is required in the schools (MoE & MoHE, 2019).

According to the recent publication on Maldives Development Update, there are many factors that influence the use of digital technologies such as high cost of broadband services, relatively slow speed of internet in some areas and lack of digital literacy as some of the potential challenges in Maldives (World Bank, 2021). Furthermore, the publication noted that the COVID-19 pandemic has increased internet usage to a point where ISPs have responded to the President's call to offer discounts on Internet packages. Thus, in mid-March 2020 the local ISPs offered discount on their select business broadband packages. They provided 5GB data for free to students and teachers for

a month and provided discount on connection fees to new fibre broadband customers. The local ISPs have offered a 50 percent discount on connection fees to new fibre broadband customers and would likely not be able to sustain lower prices for a prolonged period as COVID-19 pandemic has impacted its revenue. Therefore, bringing the prices down permanently would require more structural solutions that not only involve ISPs, but also regulatory and other policymaking authorities (World Bank, 2021).

At present, Wi-Fi coverage areas in government schools are limited to classrooms. However, the need for providing Wi-Fi access coverage to staff room, hall, library, laboratories and other common areas have become necessary due to the extensive use of mobile devices by teachers and students for teaching/learning purposes. This project aims to upgrade Internet bandwidth and Wi-Fi coverage area in government schools over a 4-year period.

Objective: Upgrade the existing internet bandwidth allocated to schools to cater for an effective bandwidth allocation to schools and expand Wi-Fi coverage area in schools.

Responsible bodies

- Policy, Planning and Research Division/ MoE (lead)
- Finance Division/ MoE
- Procurement section/ MoE
- Digital School Programme/ Information Technology Services Section/ MoE
- Administrative Services Section/ MoE

Implementation Plan

Activity	Timeline	
	Start	End
Upgrade existing internet bandwidth in government schools.	2021	2024
Expansion of Wi-Fi coverage to staff room, hall area, libraries, laboratories and other common areas in the government schools	2021	2024

3.1.2: ICT standards for all schools

Rationale

The MoE needs to update its existing standards and policies authored for few different aspects of ICT in the education, which are currently outdated. It needs to bring in to place key standards and policies that are missing so that everyone in the sector is aware and shall follow the same unified practices at all schools across the nation, irrespective of the location. Transfers of staff and students throughout the year are frequent. Continuation of similar practices will save time and effort. Adherence to common standards, procedures and protocols will save everyone a great deal and will lead to a common understanding. With the use of new devices and potentially high-speed internet at all schools together with frequent and fast updates and upgrades coming up in the ICT field, standards will need frequent revision and upgrading.

This project will update current policies and introduce new policies and relevant guidelines related to ICT along with ICT standards for all schools in the country.

Objective: To streamline ICT related practices across all government schools so that they are applicable to all teachers, students and staff irrespective of school.

Responsible bodies

- Policy, Planning and Research Division/MoE (Lead)
- School Administration Division/MoE
- Digital School Programme/Information Technology Services Section/MoE
- National Institute of Education

Implementation Plan

Activity	Timeline	
	Start	End
1. Update all existing standards and policies that are outdated	2021	2021
2. Draft, approve and implement new set of ICT standards applicable to all schools.	2021	2021

* No additional funding will be required for these activities and will be done by staff within the lead responsible department.

Programme 3.2 Hardware

Goal: Providing ICT equipment to cater for the needs of all government schools.

Rationale

ICT for education requires appropriate hardware, software, maintenance tools, plans and policies to be established in schools. Today the needs for adopting educational technologies have become important due to the digital transformation in the education sector.

The achievements of the ICTE-MP1, under the Digital School Project, included internet connectivity and the provision of tablets to students and teachers (MoE, 2019). Furthermore, the NIE has completed the development of digital books for KS 1 to 3 and is in the initial stage of implementing them in government schools. The success of these initiatives depends on high-speed internet connectivity, provision of appropriate devices for teachers and students, and effective display devices in classrooms.

Project 3.2.1 Tools and equipment maintenance

Rationale

As part of the ICTE-MP1, all the government schools have been given access to a digital network connection that is centrally managed by MoE. As a result, schools have been equipped with computer systems, network devices and some schools have computer laboratories. Additionally, all the teachers and students (except grade 1) are provided with tablets with access to Wi-Fi for teaching and learning purposes. This necessitated schools to self-manage and sustain their network devices and connections.

Given the geographical dispersion and resource limitations, it is almost impossible to get the required network equipment and tools from retail shops in the islands for maintenance and repair. The available options in most cases have been to get the required tools and accessories from Male', the capital island located geographically around the centre of Maldives. Alternatively, the policy is to outsource within the islands, which is time consuming and costly.

This project aims to provide necessary network tools and accessories for all the government schools in the Maldives in order to overcome the difficulties faced by the schools in a cost effective and timely manner. The replacement plan of network tools and accessories is estimated for a period of three years, and it is important to continue with the replacement plans even after this period

Objective: Provide basic network tools and accessories for computer and network maintenance to enable all government schools to maintain their ICT tools and devices cost-effectively in a timely manner.

Responsible bodies

- Policy, Planning and Research Division/ MoE (Lead)
- Finance Division/ MoE
- Procurement Section/ MoE
- Information Technology Services Section/ MoE
- Administrative Services Section/ MoE

Implementation Plan

Activity	Timeline	
	Start	End
Equip schools with network toolkits.	2022	2022
Replacement plan of network toolkits.	2023	2024
Equip schools with network cables and accessories.	2022	2023
Replacement plan of network cables and accessories.	2022	2024
Distribution of network toolkits, network cables and accessories.	2022	2022

No additional funding will be required for these activities and will be done by staff within the responsible lead department.

Project 3.2.2 Laptop scheme for teachers

Rationale

The use of laptops, tablets, Chromebooks and mobile devices for teaching in classrooms have become one of the fastest-growing trends in education. The use of laptops in classrooms have made lesson preparation, student assessments, and many such tasks simple (Barros, 2018). Under the digitisation project of ICTE-MP1, all teachers were provided with tablets in 2018. Additionally, the ESP 2019-2023 also stated the relevance of the usage of appropriate teaching/learning materials for improved teaching to achieve quality in education (MoE & MoHE, 2019).

However, participants of the September 2019 planning workshop proposed to replace the tablets with laptops citing the difficulties faced by teachers. Some of these difficulties include difficulty in typing, lesson preparation, exam preparations and data management.

This project aims to provide laptops/Chromebooks to all government school teachers through a viable scheme and enable them to use ICT to transform learning for the students. Under this scheme, each teacher is entitled to a laptop/Chromebook in every 2 years, starting from 2022. However, requests for replacement upon completion of 2 years will be determined after assessing the condition of the existing laptops. A maximum amount of Maldivian Rufiya 18,500 (approximately USD 1200) per teacher will be allocated, which may be reviewed as required by the MoE. The MoE will provide minimum specifications for the laptops/Chromebooks. Teachers will have the option to purchase laptops/Chromebooks of a higher specification provided they bear the additional cost. The teachers will own the purchased devices as specified in the laptop/Chromebook scheme policy. A voluntary insurance scheme will be developed for the maintenance and replacement of laptops procured under the laptop scheme. The MoE will undertake further discussions with insurance providers, the GoM focal points for technology and Ministry of Finance officials in order to develop a sustainable scheme that will reduce the burden on the state over the long term. Possible public-private/corporate-partnership opportunities may also be explored. Those who do not wish to join the insurance scheme shall bear the maintenance and replacement cost of the laptop they purchased under this scheme.

The specifications for laptops and Chromebooks have been developed in 2021. Additionally, policies on laptop/Chromebook device usage by teachers in government schools, purchase and maintenance policy of the devices will be completed in 2022. Purchasing of the laptops/Chromebooks is estimated to be phased over a 3-year period and to be completed before 2023. For the success of the project, it is important to continue the laptop/Chromebook scheme under an insurance scheme even after the duration of this plan.

Objective: Equip all government school teachers with laptops/Chromebooks to be used in their daily teaching and learning practices at schools to enable them to create a more effective ICT-enabled learning environment.

Responsible bodies

- Policy, Planning and Research Division/ MoE (Lead)
- Finance Division/ MoE
- Procurement Section/ MoE
- Information Technology Services Section/ MoE
- Administrative Services Section/ MoE

Implementation Plan

Activity	Timeline	
	Start	End
Develop a policy for the laptop/Chromebook scheme for teachers in government schools.	2021	2022
Develop and execute an insurance scheme policy for the maintenance of the laptops/Chromebook procured under the laptop scheme for teachers in government schools	2021	2022
Develop a policy on using laptops/Chromebooks in schools for teachers	2021	2022
Provide laptops/Chromebooks to all government school teachers	2022	2024

* No additional funding will be required for these activities and will be done by staff within the responsible lead department.

Project 3.2.3 Smart TV for every government school classroom

Rationale

Digital technology has necessitated the traditional classrooms to become smart and has transformed the teaching methods. Textbooks have been digitised, Power Point presentations have replaced flashcards and posters, printed worksheets have transformed to interactive worksheets, and one-way audio and video lessons have become two-way communications. Moreover, students are able to surf through the web to collect information and do their class works (Richardson, 2019).

The ESP 2019-2023 highlighted the significance of strengthening teaching competencies using media and technology to strengthen student learning (MoE & MoHE 2019). The participants of September 2019 workshop to develop this master plan vigorously debated the issue. It was proposed to replace existing projectors in classrooms of all government schools with 65 Smart TVs for content delivery due the challenges of using projectors. The cited challenges include visibility due to brightness, issues with the lens and the frequent need for servicing. Given the resource limitations along with careful consideration on the pros and cons of projectors, smart boards and TVs, it was decided at the workshop in September 2019 that TVs are the best option.

The MoE has not yet spent on installing TVs in school classrooms. Parents and community contributions provided the existing 46% TVs in government school classrooms. The need for TVs has become important due to its reliability, higher resolution images and the online accessibility necessary for today's teaching and learning. It is more cost effective and lasts longer than projectors and projector screen which had been used in limited numbers before. The cost of maintenance of projectors are very high, because of the lamp replacements at its end-of life.

Moreover, out of the existing TVs in the school classrooms, it is estimated that TV sets in 50% classrooms would require replacement. The reason for replacement is that the existing TV sizes vary and lacks important features of a smart TV. Additionally, the TVs may be damaged since these have been installed for a long time. Thus, the need for replacement is important and maintaining same standard for each laboratory is also necessary.

Hence, this project aims to provide TVs for all government school classrooms in the country. Specifications of TVs, the distribution plan and maintenance plan was developed in 2021. Procurement and installation will be done according to the distribution plan and will be phased over a 3-year period. The maintenance and replacement plan of the TVs were also estimated for the 3-year period, and it is important to continue with the replacement plans even after this period.

Objective: Equip 65 TVs in every government school classroom for effective content delivery.

Responsible bodies

- Policy, Planning and Research Division/ MoE (Lead)
- Finance Division/ MoE
- Procurement Section/ MoE
- Information Technology Services Section/ MoE
- Administrative Services Section/ MoE

Implementation Plan

Activity	Timeline	
	Start	End
Equip schools with Smart TVs.	2022	2024
Distribution of Smart TVs to schools.		
Maintenance and replacement plan for Smart TVs.	2022	2024

Project 3.2.4 Assistive technology-integrated education for students with disabilities and complex learning profiles

Rationale

Assistive technology (AT) includes software, tools and equipment that are used to increase, maintain, or improve functional capabilities of children with disabilities and CLP. AT is utilized in a variety of performances ranging from skills including reading, writing, information processing, mobility, communication and sensory process. The Scoping Mission Report 2018 by UNESCO highlighted that ICT can potentially widen the knowledge divide unless the ICTs provided are inclusive and considers geographic difficulties, gender, income levels, and disabilities. The importance of creating accessible digital learning platforms for students with disabilities and complex learning profiles was realized more than ever when the COVID-19 pandemic forced to keep students out of schools for over a year.

Despite the government's efforts and how well equity and inclusion are represented in the national curriculum framework and inclusive education policy, one of the major hurdles is to provide accessible learning environment and resources to students with disabilities and CLP. Therefore, for an effective reform in the teaching pedagogy, AT integration into special educational services needs to be considered as a priority in this plan. Furthermore, this would also align with the proposed initiative in the NRRP of integrated development of quality SEN components for schools in the five targeted regional hubs (GoM, 2020).

This project aims to provide AT devices to schools and develop Dhivehi text-to-speech software for the blind and visually impaired community to easily access Dhivehi literature and curriculum. The project also proposes the capacity development of professionals and teachers in using AT in effective teaching and learning. Since there are text-to-speech software available in the market for English and other languages, it would be a great achievement to have local language text-to-speech software available. Also, the software can help a majority of students who have reading and processing difficulties and provoke interest among all students to Dhivehi literature in general.

Providing assistive devices, resources and technology to schools can support teachers and students to identify and promote positive learning environments. By using AT equipment including technological devices, software, adaptive furniture, visuals and other devices would significantly promote positive education, independence, self-esteem, and overall quality of life, which can lead to an increase in motivation and enthusiasm for learning. This would enable students with disabilities and CLP to participate at a similar level as their peers.

Despite recognition of the benefits of AT in education, the resources provided cannot be sustained without a capable workforce. Hence, the third activity proposed in this project includes training of trainers (TOTs) on capacity development of teachers and professionals working in the field. The TOT can be a sustainable strategy to utilize the resources provided to their full potential. The capacity need analysis carried out by the DoIE in 2019, found out that many special education teachers in schools, lack proper knowledge and skills to use AT and ICT in teaching, which leads to hurdles in reaching specific learning goals of individual students.

Objective: Provide every student with disabilities and complex learning profiles, the needful AT integration in education

Responsible bodies

- Department of Inclusive Education (Lead)
- National Institute of Education
- Schools

Implementation Plan

Activity	Timeline	
	Start	End
1. Development of a Dhivehi text-to-speech software.	2021	2022
2. Development of a Dhivehi speech-to-text software	2022	2023
3. Equip assistive technology (high-tech and low-tech) based on student needs in all government schools	2022	2024
4. Develop a standard list of AT resources.	2021	2021
5. Distribution of AT resources to schools	2022	2024
6. Maintenance of the resources.	2022	2024
7. Train AT coaches in 7 regional schools (Shaamilu veshi schools) to be developed by DoIE under NRRP	2022	2024

Project 3.2.5 Computer laboratory for all government schools

Rationale

Computer laboratories in all government schools will pave the way for students to learn, think, create, explore and enhance their learning and research capabilities (Sharma, 2019). Given the fact that computing is included as a separate subject in the national curriculum necessitates the establishment of computer laboratories in all government schools. Furthermore, the ESP also promotes digitization of teaching and learning material, use of web portals (such as the Google Classroom) in teaching and learning.

At present, 41% of the government schools lack a computer laboratory (MoE rapid assessment survey, March, 2021). This project aims to provide 29% of the mentioned schools with computer laboratories with a capacity of 31 computer systems. Furthermore, the remaining 12% of schools lacking a computer laboratory are to be provided with multipurpose rooms with not more than 15 computer systems. Since these schools have relatively small student populations ranging from 50 to 100, these rooms will be equipped with other resources such as library books and audio-visual facilities.

Among the 59% of schools with computer laboratories, 91% of the laboratories lack a smart TV. Therefore, purchasing smart TVs for the existing computer laboratories is also included in this project and will be phased over a 3-year period.

Objective: Enable all government school students to become ICT literate and innovative

Responsible bodies

- Policy, Planning and Research Division/ MoE (lead)
- Finance Division/ MoE
- Procurement Section/ MoE
- Physical Facilities Development Section/ MoE
- Information Technology Services Section/ MoE
- Administrative Services Section/ MoE

Implementation Plan and Costing

Activity	Timeline		Estimated cost (USD)
	Start	End	
1. Build a computer laboratory or multi-purpose room in the government schools that do not have a computer laboratory (includes building, safety setup, electrical setup, network setup, furniture and hardware).	2022	2024	14,735,004
2. Provide a Smart TV for the existing computer laboratory in each school.			177,432
3. Distribution of required computer laboratory and multi-purpose room items.			175,381
4. Maintenance and replacement plans for computer systems	2023	2024	2,105,242
5. Maintenance and replacement plans for Smart TVs.	2023	2024	27,782
Subtotal			17,220,841

Programme 3.3 eLearning

Goal: Provide access to eLearning for teachers and students in government schools

Rationale

Technological development and the internet have greatly changed teaching and learning methods in the education system. The web has become one of the channels of learning that enables access to free educational resources and participate in online training and courses for free or at a lower cost. Therefore, it is important for teachers and students to have access to additional learning materials that will contribute towards improvement in quality of education.

The NIE's existing open-source Learning Management System (LMS) for conducting online training and courses for teachers have many limitations, including non-user friendliness and need for extensive customisation. Hence there is genuine need to develop a new LMS at NIE to overcome the current issues.

Furthermore, having a Digital Resource Portal can greatly benefit teachers and students to access additional teaching and learning materials from anywhere at any time, broadening the knowledge base and improving quality of education in the Maldives. Use of a variety of digital resources such as presentations, lesson plans, worksheets, assessment tools, audios, and videos help to increase student engagement in learning. This was demonstrated by some of the innovations showcased by some schools in the November 2020 e-Conference on 'Innovation and Best Practices in Education during COVID-19' organised by the NIE. However, it was also illustrated that finding digital resources and developing them is time-consuming and requires a lot of effort, which burdens the already stressful life of teachers.

This programme aims to encourage and motivate teachers to use a variety of digital resources to promote meaningful learning and avoid duplication of work. Building a repository of carefully vetted digital resources for schools is seen as a way to ease the pressure on teachers while integrating ICT in their teaching process.

Project 3.3.1 Learning Management System for teachers

Rationale

The ESP 2019-2023 highlights the importance of effective teacher training for achieving learning outcomes and instilling skills among students. Given the geographical dispersion of the government schools and the huge cost involved with bringing teachers to Male' for trainings, the NIE depends heavily on the existing LMS for delivering and managing teacher trainings. Some of the main features of the existing LMS include course management, learner enrolment and online activity tracking.

At present, NIE faces a lot of challenges in using the exiting LMS as it is an open-source software that lacks some of the key features needed for workplace learning. These include troubleshooting and other support services being forum-based coupled with complex interface design and lack of user-friendliness that requires extensive customisation.

This project aims to develop a more appropriate LMS for teachers where different training programmes and courses can be conducted effectively and efficiently by the NIE. Hence, system requirements are to be drawn up using an open-source software, course and user manuals to be developed and the system is to be piloted and rolled out within the 4-year period.

Objective: Facilitate professional development of all government school teachers via a LMS.

Responsible bodies

- National Institute of Education

Implementation Plan

Activity		Timeline	
		Start	End
1.	Develop a LMS for teachers: <ul style="list-style-type: none">• Requirement analysis• Design and develop the system• Testing and implementation• LMS trainings for NIE and teachers	2021	2024

¹² Different open source tools can be identified from platforms such as https://database.edtechhub.org/tool_focus/learning-management-systems/?open_source=yes&post_types=tools

Project 3.3.2 Upgrading the Digital Resource Portal (Filaa Portal) for teachers, students and parents

Rationale

Use of Open Education Resources (OER) is a very new concept for Maldivian teachers. Sharing resources is not a popular among schools. However, it is important for a country like Maldives where schools are geographically isolated to share learning materials to overcome duplication of work, save time and money. Digital Resource portals enable teachers to share and access relevant teaching materials and for students to access the resources they need for learning purposes (Mark, 2019). One of the few studies which investigated ICT use and integration into teaching and learning outcomes in the Maldives was undertaken seven years ago in 2013 (Shibana, 2013, quoted in MoE, 2019). This study showed that when teachers get access to technology, they are willing to use OER and use them in their teaching and learning. Though the study was limited to 5 schools, it showed the positive impact of ICT on teaching and learning and that it can provide quality materials to use with students. The ESP 2019-2023 states that one of the key factors that affect the quality of education is the quality of teaching/learning resource inputs. A well-developed digital portal for teachers to share resources was one of the main aspirations of the participants of the 2019 planning workshop.

The need for a Digital Resource Portal became a necessity due to the COVID-19 pandemic and the analysis of requirements was completed in 2020. A resource portal in the name of 'Filaa Portal' was developed and launched subsequently in 2020 with assistance from a private company as part of their contribution to the education sector. Currently, the portal is in use by teachers and students. At present, most of the resources uploaded in the Filaa portal are pre-recorded and telecasted video lessons of Telikilaas. However, Filaa portal is intended as a one-stop destination to obtain notes, worksheets, assignments, digital lessons and other teaching and learning resources catering to all grades and subjects.

The main challenges encountered regarding the Filaa portal include the following:

- High consumption of data for users as the portal is currently not hosted locally and the internet bandwidth is limited.
- Copyright issues in uploading videos as the videos uploaded to the portal are currently hosted by YouTube.
- Lack of adequate familiarity among teachers in uploading materials to the portal indicating the need for training/orientation.

Further developments to the Filaa portal including upgrading of server capacity, improving user experience, and changing the portal to a local hosting are required to ensure effective continuity of education. This project aims to upgrade the Filaa portal, locally host and upgrade the server by the end of 2021. It will be re designed as a robust platform with scope for features such as visual lab for teachers with live sessions, simulations, teacher self-development, teacher portfolio, etc. In addition to students and teachers, parents' will also have access to relevant content in the portal. Additionally, the project will undertake to create greater awareness among teachers on the importance of sharing learning resources and build a mechanism for this through the portal. The MoE will undertake a detailed requirement analysis as one of the first activities of this project.

Objective: Promote eLearning within government schools to increase the knowledge base of teachers and students to enhance the quality of teaching and improve student performance.

Responsible bodies

- Policy, Planning and Research Division/MoE (Lead)
- Finance Division/MoE
- Procurement Section/MoE
- Information Technology Services Section/MoE
- National Institute of Education (NIE)

Implementation Plan

Activity	Timeline	
	Start	End
1.Design and develop the Digital Resource Portal* <ul style="list-style-type: none"> • Requirement analysis • Design and develop the Digital Resource portal • Testing and implementation of the Digital Resource Portal • Develop digital content • Digital Resource Portal training for NIE, teachers and students 	2020	2020
2. Review and update the existing guidelines to share digital content among teachers [the Filaa portal guidelines]. <ul style="list-style-type: none"> 2.1 Conduct review and research. 2.2 Consult stakeholders. 2.3 Publish the revised guideline. 	July 2021	Dec 2021
3. Identify and collect existing resources. <ul style="list-style-type: none"> 3.1 Conduct awareness on guidelines on sharing digital learning resources. 3.2 Collect and host resources on digital resource portal. 	July 2021	2024
4. Local hosting and server upgrading	2021	2021
5. Upgrade the Filaa portal	2021	2021
6. Conduct Filaa portal training for NIE, teachers and students	2021	2022

Note: This activity started in 2020.

Programme 3.4 ICT Infrastructure for National Resilience and Recovery

Goal: To ensure the continuity of quality education for all children using Information and Communication Technologies by decentralising education.

Rationale

In order to recover from the negative impact of COVID-19 pandemic and to increase the national resiliency for the future, the Maldivian government has reprioritised the SAP and formulated a NRRP 2020-2022 (GoM, 2020). One of the most significant components of the NRRP includes strategies for the improvement of educational facilities in 5 regions of the country. According to the Ministry of Finance (MoF, 2021), MVR 50.0 million has been allocated from the budget to improve the quality of education in these 5 regions, where Information Technology equipment will be procured to enable remote learning and to set-up satellite schools along with the introduction of quality STEM education and coding in school education. The NRRP also emphasizes on the importance of strengthening the TRCs which are established in all the atolls.

Project 3.4.1 Developing Teacher Resource Centres

Rationale

Over a 2-year period (2006-2007) and as part of the tsunami recovery efforts, Teacher Resource Centres (TRCs) were established in each of the 20 atolls by the MoE with support from UNICEF and Dhiraagu (the National Telecom Provider). Each TRC consisted of a training room and a computer laboratory equipped with modern technology such as “smart board” which served as a replacement for the traditional white board used in schools (NIE & UNICEF, 2019). The TRCs were equipped with virtual classrooms and 10Mbps internet connectivity. Availability of technology, equipment and other resources understandably differed in the TRCs. Teachers in the respective school where TRCs were located were able to use the internet facility to browse and download material for their lessons.

However, there has not been any significant upgrading of TRCs and their facilities since the initial establishment. A recent assessment of TRCs by an independent consultant noted that the resources in the TRCs have started to diminish and that some of the usable furniture and equipment have been shifted to various other locations in the schools in some of the centres (NIE & UNICEF, 2019). The assessment report recommends the need to re-establish or re-structure the TRCs to suit the current realities of the system. Greater shift to using ICT resources is also recommended. Hence, due to excessive use and the rapidly evolving technology around the world, most of the equipment has been either outdated or out of order with no significant upgrading during the past 14 years.

Along with the technological transformations that have taken place over the past decade and half, the needs of the education sector as well as the way people work has changed significantly. An outcome based modern curriculum has been rolled out and teachers' need for continued support and guidance has increased more than ever. Social media and all sorts of online activities have taken over most of the in-person meetings, trainings and work. Therefore, it is essential that the functions of TRCs are transformed and aligned with the needs of the current environment.

Objective: To upgrade the TRCs with the necessary equipment to function as atoll level hubs for teacher training and digital resource development.

Responsible bodies

- National Institute of Education (Lead)
- Ministry of Education

Implementation Plan

Activity	Timeline	
	Start	End
1. Establishing mini production studios in all TRCs	2021	2024
2. Upgrading TRC Training Rooms.	2021	2024

Project 3.4.2 Developing STEM labs in five regions of the country

Rationale

STEM education aims to incorporate four specific disciplines, namely Science, Technology, Engineering and Mathematics as an interdisciplinary and applied approach in students learning and development. Instead of teaching the four subject areas separately STEM aims for a cohesive learning paradigm based on a modern, practical and a real-world application approach.

Successful STEM integration into education in schools has the potential to significantly transform students learning process, providing a variety of new challenging opportunities to improve their educational standards and raise academic achievements and skills levels (Unpublished Concept Paper on STEM education, MoE, 2021). In addition, it provides teachers with opportunities to upgrade themselves and to explore new styles of teaching and learning to enhance their teaching profession and bring innovation to it. This development is fully in alignment with the policies pursued in response to COVID-19 to build national resilience and recovery under the NRRP (GoM, 2020).

STEM education which is also an essential aspect of the NCF of Maldives, helps to foster ingenuity and creativity in students, by building resilience, collaboration & adaptation skills. STEM education also develops students' problem-solving skills, develops tech skills in students and prepare them for future job markets and meet the demands of the dynamic and evolving workforce of the nation.

Some learning institutions in the capital Male' and few islands already offer some components related to STEM education. However, a more organised and well-planned approach is needed to spread STEM education across the Maldives to the entire student population, reducing digital divide and gender imbalance in access to STEM education.

In this regard, establishment of STEM labs in five different locations of Maldives can play a vital role in providing access to STEM education to all students. These STEM labs will be fully functional with a pre-developed STEM syllabus and equipped with modern STEM equipment to teach knowledge and skills required by the students to achieve the goals of STEM Education. The STEM labs will act as hubs in the region, connecting all island schools in those specific regions and providing opportunity for all the students to receive a quality education in relation to STEM Education.

Objective: To establish infrastructure needed to teach high quality STEM education in 5 targeted regional schools.

Responsible bodies

- National Institute of Education (Lead)
- Ministry of Education

Implementation Plan

Activity	Timeline	
	Start	End
1.Establishing full-fledged STEM labs in 5 different schools.	2021	2023

Project 3.4.3 Establishing Regional Hubs for coding

Rationale

Coding is considered as basic literacy in the digital age and it is vital for children to understand and be able to work with and understand the technology around them. Having children learn coding at a young age prepares them for the future. Coding helps children to be able to visualize abstract concepts, lets them apply math to real-world situations, and makes math fun and creative.

Coding, which is an integral part of STEM Education is also an essential aspect of the NCF of Maldives. Recent studies carried out across the world shows that coding helps to foster ingenuity and creativity in students, while developing an entrepreneurial mindset that meets the demands of the dynamic and evolving workforce of the 21st century.

Some schools and learning institutions in the capital Male' and few outer islands, already offer coding classes and activities to their students in different forms. Different institutions use different computer applications and programmes to teach coding. However, a nationwide, well-planned and organized coding education programme can ensure uniformity and equal opportunities to access quality coding education for students.

In this regard, establishment of coding hubs in 5 different regions in the Maldives can play a vital role in providing access to computer coding education to all students. These hubs will be established with fully functional computer lab and other relevant equipment needed for coding classes and activities. These centres will act as hubs in the region, connecting all island schools in those specific regions and providing opportunity for all the students to receive a quality education in relation to coding education.

Apart from teaching coding in the centres, they will also operate as regional coordination centres who work alongside with the TRCs in the region to facilitate coding education by resource sharing and dissemination.

Objective: To establish regional coding facilities to enable students to embrace computational skills such as problem solving, abstract thinking, logic and critical reasoning.

Responsible bodies

- National Institute of Education (Lead)
- Ministry of Education

Implementation Plan

Activity	Timeline	
	Start	End
1. Establish Coding Labs in 5 different regions in the country.	2021	2024

Thrust Area 4: Educational Data Management and System Development

Goal: Establish the Education Management and Information System (EMIS) of the MOE as a one-stop solution for administration, dissemination, and utilisation of educational data to enhance transformation of learning.

Introduction

A national level Education Management Information System (EMIS) was always in demand in the Maldives. Work towards such a system began decades earlier. In this process of establishing an EMIS, the project Maldivian Education Management Information System (MEMIS) was initiated in December 2015. The setup of MEMIS was established and configured by January 2016 and within the same year, in July 2016, data entry and transfer were enabled along with the basic training programmes to operate the database. From January 2017 onwards, schools across the country have been uploading data to MEMIS and it became an integral policy and planning tool for the MoE as well as to the schools.

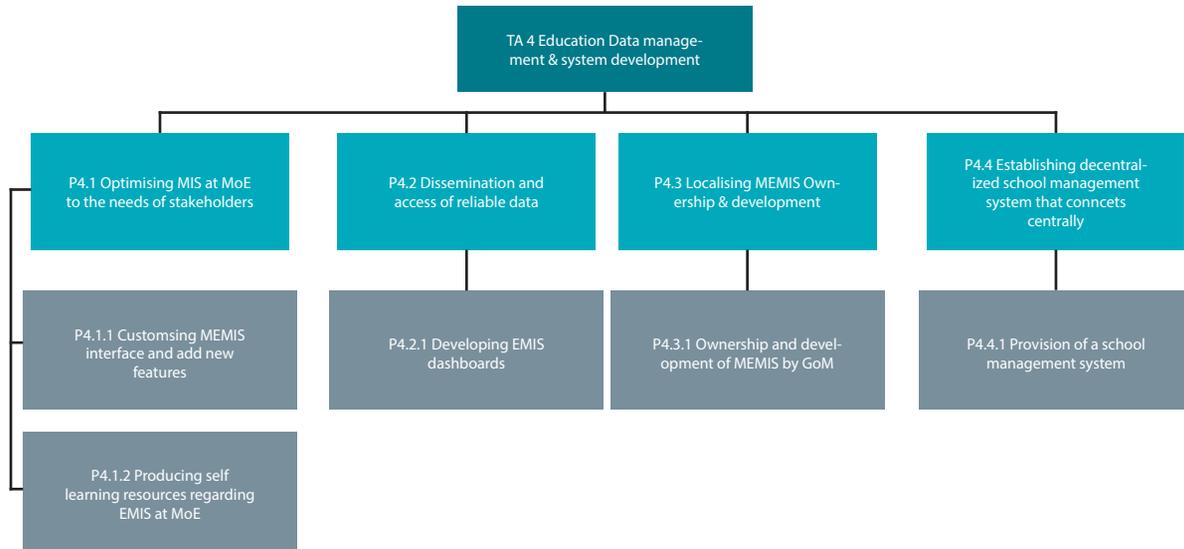
Since then, MEMIS has had an integral role in enhancing educational governance, improving quality and providing up-to-date data for decision making and monitoring tasks of the sector. However, during this short period of using MEMIS, lots of recommendations have come to enhance some of its features to make it more accessible and user friendly. For this reason, strengthening of MEMIS was highlighted as an essential component in the ESP 2019-2023.

MEMIS is a database operated through an international NGO known as Community System Foundation (CSF). Since CSF is an external host, for the development and alteration work of the system, the MOE must consult with the support provider. This is found to be a very costly and time-consuming process. Hence, it is vital to take the ownership of MEMIS by MOE and upgrade the features to the needs of stakeholders, such as developing, customising and enhancing the dissemination and accessibility of data through MEMIS.

The Education Act which will come into effect in August 2021 mandates the EMIS at MoE as a single source of data collection of all school education sector data in Maldives. Therefore, additional developments such as the development of the Finance module are required. Under the Education Act, there will be two policies related to this area which will be implemented: Policy on Data Collection, Protection and Usage of Education Sector Data (this is a revision of the existing MEMIS policy) and the Information Dissemination Policy (new policy).

In order to take the ownership of MEMIS to MOE and to upgrade the features to the needs of stakeholders, the following four programmes and five projects listed in Figure 6 are included in this under the fourth thrust area. The intention is to reach the target of making the database a one-stop solution.

Figure 6: Programmes and Projects of Thrust Area Four



Programme 4.1 Optimizing the EMIS at MoE to the needs of stakeholders

Goal: Make the EMIS used at the MoE an integral part of everyday work in the school education system

Rationale

Enhancement of features of MEMIS to a more real time responsive database that could be integrated into everyday work of administrative and academic work of the schools, and departments of the MoE is important. Therefore, developing the MEMIS interface and features, and training the respective staff are identified as essential needs in the sector.

Project 4.1.1 Customising MEMIS interface and adding new features

Rationale

Monitoring is vital to determine and improve the reach and effectiveness of digital learning modalities. In the process of customizing and enhancing the MEMIS interface, development and enhancement of features such as dashboards and generating reports based on the ESP monitoring and evaluation indicator-framework is important. After enhancing these features, the database system will be more user-friendly and useful for schools and MoE to use in everyday work

Objective: Make MEMIS more user-friendly via the updated and upcoming features.

Responsible bodies

- MEMIS Unit/PPRD

Implementation Plan

Activity	Timeline	
	Start	End
1. Contract CSF for MEMIS software customization	2019	2023

Note: This activity commenced in 2019.

Project 4.1.2 Producing self-learning resources regarding EMIS at MoE

Rationale

MEMIS is a tool that is used in the everyday information processing of the schools and the sections/ departments of the MoE. Therefore, along with the new developments and updates, empowering the staff with the latest skills to operate the database is important. Furthermore, in order to address the high staff turn-over in schools due to various personal reasons, there is always a need to train the newly recruited staff for MEMIS.

Since these trainings are mostly about how to use and navigate within the platform, providing self-learning materials and user guides are considered an effective mode of training. To make these trainings effective and meaningful, video tutorials are needed to be developed as a self-learning module.

Objective: Empower stakeholders to operate and utilise the upgraded and newly developed features of MEMIS.

Responsible bodies

- MEMIS Unit/PPRD

Implementation Plan

Activity	Timeline	
	Start	End
1. Prepare video tutorials.	2021	2024

Programme 4.2 Dissemination and access of reliable data

Goal: Making the EMIS at MoE more accessible and reliable.

Rationale

MEMIS is currently used by diverse groups of stakeholders including parents, teachers, administrative staff and officials of the MoE. Therefore, the reliability and accessibility of the data, with an effective data analysis process and dissemination of data through easily accessible dashboards, is crucial. This will facilitate the maximisation of data among various users with diverse devices.

Projects 4.2.1 Develop EMIS dashboards

Rationale

MEMIS is a database consisting of varieties of data that is currently used by staff within the education system including school staff and staff working in different departments of the MOE. Since education related information/data are also needed by different parties outside the education system, it is considered necessary to establish a system for people to have access to data in a convenient way. According to the "Right to Information Act" of Maldives (Act No: 1/2014), access to information from a State Institution in accordance with a certain procedure is a legal right to every person who requests for such information. Therefore, designing dashboards in MEMIS to customise the information is considered a convenient way of making information available for people who require them. This project will facilitate the provision of information customised to the needs of the users/viewers through easily accessible dashboards.

Objective: Provide tools that are easily accessible to the information in MEMIS in a more user-friendly setting.

Responsible bodies

- MEMIS Unit/PPRD

Implementation Plan

Activity	Timeline	
	Start	End
1. Develop and publish the dashboards	2021	2024

Programme 4.3 Localizing MEMIS - Ownership and development

Goal: To take the ownership of MEMIS

Rationale

MEMIS being the current national educational information system, depending on a foreign source to operate and develop the system is an expensive and time-consuming process. Therefore, to localise the MEMIS making the required policies has become a necessity.

Project 4.3.1 Ownership and development of MEMIS by Government of Maldives

Rationale

MEMIS is the database for the national school education system, which requires continuous upgrading and advancement. However, due to the limitedness of national capacity at the time of establishment, MEMIS is hosted and managed externally through CFS, an international partner. As mentioned in the introduction, this requires MoE to constantly consult them for upgrading and bringing developments to the system. This is found to be a very costly and time-consuming process. With over four years of experiencing the system and considering the challenges associated with external hosting, this project aims to take full ownership of the system and shift the hosting database and source code.

Objective: Strengthening MEMIS and taking full ownership by GoM in hosting database and source code.

Responsible bodies

- MEMIS Unit/PPRD

Implementation Plan

Activity	Timeline	
	Start	End
1. Conduct an external evaluation of MEMIS	2021	2021
2. Changing the ownership of MEMIS from CSF to MoE.	2021	2024
3. Recommendations of MEMIS evaluation executed	2021	2024

Programme 4.4 Establishing decentralized school management system that connects centrally

Goal: Provide a decentralized school management system that connects centrally and allows central monitoring.

Rationale

Decentralization is one of the highest priorities of the government. Currently MOE has a central solution via MEMIS. Schools have limited options for them. The system is designed for central needs and there are only few functions for schools to be used for their general school administration. Over the past seven years, schools have raised major concerns regarding the central nature and control of the data collection. Moreover, the current system does not provide school-based solution to data needs but rather adds to the staff workload.

In addition to this, the current centralised mechanism has made the system gigantic and difficult to manage. The system has been found highly unstable lately and incidences of data mismatch, data loss have been observed.

All schools and MoE are using the same URL for login into the system. As a result, if one teacher overloads a data entry point, the whole system collapses, and the work of all remaining schools comes to a sudden halt. This has happened many times in the past and the entire system is bottle necked. However, decentralized school management system with a central dashboard for school owners and the government would be the ideal solution. The principals and teachers get what they need, central office receives the data they need.

This decentralized approach would give flexibility, control and features required to manage teaching and learning, from curriculum inputting, attendance tracking, room booking, assigning homework up to eLearning.

Project 4.4.1 Provision of a school management system

Rationale

School administration is a complex phenomenon that involves many processes, operations, and arrangements. Financial management, human resource management and management of teaching and learning have never been easy.

A comprehensive feature-rich school management system plays an important role in school administration, managing teaching and learning, and other activities. Each school has distinctive operational cultures – from timetabling to communicating with parents. The nature of the daily operations and general administration requires the system to be highly flexible, adjustable, and configurable at the school level.

The provision of school management system would allow principals to fully digitize the school operation, all within the control of the school.

Objective: Provide a decentralized school management system that connects centrally.

Responsible bodies

- Policy Planning and Research Division/MoE (Lead)
- Schools

Implementation Plan

	Start	End
1. Analyze the current situation – Do a technical review of the existing platform.	2021	2021
2. Identify a comprehensive school management system that connects centrally and is cost effective.	2021	2022
3. Provide school management system to all government school.	2022	2023
4. Provide training and roll out the system to schools.	2022	2023

IMPLEMENTATION AND MONITORING



4.1 Implementation

The ICTE-MP2 will be implemented by the MoE over a four-year period from 2021 to the end of 2024. Implementation will be infused into the existing structures of the MoE and will essentially follow the Implementation Plan given for each project under the four thrust areas. Each project has identified the Responsible Body or Bodies for implementation. Where there are more than one implementing bodies involved, the lead agency is also identified. Various Divisions and Departments of the MoE have been identified as the Lead Responsible Body (LRB). The PPRD will be the overall lead in monitoring and evaluation (M&E) activities.

Coordination and establishment of an ICT Unit

The implementation of the ICTE-MP2 requires a well-structured implementation arrangement with enhanced inter-departmental coordination. The functions related to ICT within the MoE are currently devolved to many sections of the MoE (e.g., the Information Technology Section, the Digital Schools Support Unit, the PPRD and MEMIS section) and a separate department (NIE) of the MoE, located physically away from the previously mentioned divisions. The absence of a coordinating mechanism for ICT within the Ministry was observed in the ERP. Commenting on the importance of implementing the new ICT in education master plan (ICTE-MP2), the ERP stated that “a new unit will be established to facilitate the smooth implementation of the ICT [in education] master plan” (MoE, 2020, p. 46). Hence, to institute a reliable mechanism that can resolve issues of implementation, facilitate necessary actions and monitor the progress of implementation by various responsible bodies, two specific arrangements are proposed:

- (i) Create an ICT Unit within the MoE (whenever feasible) that oversees the implementation of the ICTE-MP2 and overtime will be responsible for coordination of all matters related to ICT in education.
- (ii) To support this institutional setup, and

oversee the implementation of this master plan, create an Implementation Oversight Committee to give policy direction and guidance, authorise necessary actions and ensure smooth implementation of the master plan.

Based on the feasibility as determined by the SMT of MoE, the unit could be formed by merging and streamlining some of the functions already located within some divisions/sections of the MoE. The unit will be established within the PPRD of MoE. An additional staff is envisaged if this unit is created. A senior official with understanding of technologies and with operational background can lead the unit in an appropriate name (e.g., Chief Education Technology Officer, (CETO).

The creation of an ICT in education unit within the PPRD, does not remove the role of implementation of technology related functions and activities from all other sections or divisions/departments of the MoE. For example, NIE will still continue the ICT-related teacher training activities, and MEMIS Unit will continue with the enhancements necessary for the database. However, these specialised units within the MoE, NIE and DoIE will require additional technical/professional staff to strengthen their capacity to implement some of the activities outlined in this master plan. The unit will also support the PPRD in consolidating annual action plans of the master plan for approval by the SMT.

Alternatively, if the establishment of a unit is not feasible, the CETO recruited to the PPRD could still be assigned to oversee the implementation and oversight of the projects under each of the four thrust areas. The daily coordination, at the technical level, will be the main responsibility of the CETO under the guidance of the Head of the PPRD. This task encompasses following up the time frames, monitoring the launching and the implementation of the respective project activities, regular reporting and dissemination of information to all parties and the evaluation of the results.

Implementation Oversight Committee

Due to the nature of the master plan with its inter-linked four thrust areas of capacity development, creation of digital educational resources, improving infrastructure and connectivity, and strengthening educational data

management, will require inter-departmental interdependence and coordination. In practice this will mean conducting of coordination meetings among the related departments/divisions regularly. Hence, with assistance from the relevant departments, the Implementation Oversight Committee will facilitate the resolution of implementation issues, authorising required actions, providing guidance where necessary, evaluation of results from the CETO and overall monitoring of progress. It is necessary to establish this committee with both policy level and technical actors to drive the implementation towards integration of ICT across the education system.

Members

The Implementation Oversight Committee will be formed with the members of relevant government and non-governmental agencies. The MoE will adopt a flexible approach in terms of number and participating agencies in this committee. The MoE will review and revise membership as need arises.

Roles and Responsibilities

The Implementation Oversight Committee will be chaired by a senior policy official of the MoE. A quorum of half plus one is to be maintained to conduct meetings bi-annually. The MoE (or the ICT Unit if created) will coordinate the Implementation Oversight Committee meetings through prepared agendas and proper record keeping through the member secretary. The Implementation Oversight Committee meetings may be conducted when required.

The Implementation Oversight Committee will be responsible for providing strategic directions in implementing the master plan as strategised. The Committee will also help smooth coordination between departments to harmonise the long-term outcomes and vision for ICT education through a programme-based approach. Each project has been assigned to a responsible body/bodies, taking the lead in planning, budgeting, and executing their projects in collaboration with respective agencies. The responsible body/bodies will submit their quarterly progress reports to the CETO.

Stakeholder Partnership

The implementation of the ICTE-MP2 will require coordination of governmental and non-governmental partners. Engagement at the macro and micro level is necessary to effectively integrate ICT in education. Consultation with the private sector, NGOs, government and non-governmental bodies and development partners have been maintained from the inception of the development process of the master plan. It is vital to maintain periodic consultations in its implementation stage as well.

Key partnerships with DPs include existing linkages with UNICEF, UNESCO, The World Bank, and the GPE. Projects are currently ongoing with the involvement of these DPs in the education sector. Maintaining and strengthening these partnerships along with other bilateral networks would be crucial for the implementation and monitoring of this plan.

Partnership with ICT Service Providers

The MoE already has important partnerships with the two telecom/Mobile Network Operators, namely Dhiraagu and Ooredoo. Since the start of the pandemic and the time teaching and learning was switched to online mode, these two operators have provided free data to students and teachers. Fixed broadband subscriptions per 100 individual and mobile internet subscription is highest in the Maldives compared with the South Asian countries. While continuation of giving free data indefinitely is not feasible, the partnership with these two principal operators goes beyond data services. The MoE is already working with the two operators to come up with more cost-effective teaching /learning models. In addition, the private internet provider ROL has also come up with a solution that does not require heavy and continuous internet connectivity. Some of the solutions are being piloted at the time of the final phase of preparing this master plan. It is prudent to continue these strategic partnerships with all ICT service providers.

For the purpose of telecasting the pre-recorded Telikilass lessons, a partnership was formed with the PSM and their TV channels. These partnerships with TV channels also need continuation as the system makes efforts to build back better.

It would also be important to engage with the emergent communities of practice involved with technology in general and technology for learning. One such group is the Women in Tech formed by enthusiastic young women in the technology field. They could serve as powerful role models for school children especially girls, opening unlimited possibilities in the technology field. Such engagements could have positive implications for employment especially with the acquisition of digital skills by girls. Therefore, proactive engagement with such groups and start-ups would be critically important.

4.2 Monitoring and Evaluation

The progress review of the ICTE-MP1 has identified that capacity building within the implementing agencies should be enhanced to monitor the progress of ICT in Education initiatives more effectively. Hence, the ICTE-MP2 includes systematic monitoring and evaluation (M&E) of all activities with quantifiable goals and objectives, key indicators and identification of key responsible bodies for implementation. The implementation of the ICTE-MP2 will be carefully monitored and objectively evaluated over its lifetime. This will be accomplished through:

- Regularly checking the progress of implementation,
- Assessing if performance indicators are being achieved, and
- Improving on the implementation.

Furthermore, the implementation plan also has targeted activities with an indicative timeline for delivery, estimated cost for implementation and key indicators to monitor implementation progress. Baselines have been determined wherever possible for activities for accurate monitoring and evaluation of policy interventions, outputs and outcomes. Where baselines are not available, in the early phase of implementation, every effort will be made to either identify or establish the respective baseline. The source of data and frequency of data extraction for monitoring and evaluation purposes has been determined for each activity.

Overall monitoring and reports will be embedded with the monitoring functions of the PPRD of the MoE. The ICT Unit within the PPRD will have responsibility for monitoring and reports regarding this master plan activities. Enhanced technical capacity of the MEMIS will be utilised for monitoring of the master plan. An additional staff will be recruited to the PPRD to support monitoring and evaluation during the implementation period.

The Implementation Oversight Committee (mentioned earlier) will have a role in monitoring the progress of programmes and activities through periodic reviews. The monitoring and evaluation will be based on the review of performance of each project through measurement of the key indicators and targets set. Data sources are also identified for each project. Quarterly performance reports will indicate whether or not the performance indicators built into the master plan are being achieved.

The Implementation Oversight Committee will conduct an Annual Review among all responsible implementing bodies and key stakeholders to deliberate on the major findings of the annual implementation report (prepared by the ICT Unit) and highlight core priorities to address. If required, the Implementation Oversight Committee may decide to carry out an independent evaluation of the entire master plan towards the middle and end of the plan period.

The activities built into the master plan amount to a significant investment in ICT in education. Maldivian children are already spending an increasing amount of time every day with different types of screens, technology and media. Still, very little or no research is being done about how this affects students' well-being, health, and especially their learning. Therefore, the master plan will consider a knowledge enhancement component through its monitoring and evaluation activities. In this regard, continuous research about the link between digital technologies and student well-being, health and learning would be emphasised. Some pertinent questions, among many others, that the ICT Unit could examine are:

- Is the number of children with social challenges (e.g. inability to form and maintain relationships) increasing?
- Are the numbers of students with behaviour problems increasing?

- What impact will these problems have on students' readiness to learn?

Additional strands of research that could be considered are:

- (a) effectiveness of teacher development through ICT,
- (b) digital divide, especially gender digital divide, and impact on learning,
- (c) attitude change towards ICT-enabled teaching and learning, and
- (d) cost and sustainability of ICT inputs.

Before the start of the second year, the ICT Unit, in consultation with the LRBs and other stakeholders, will draw up a research agenda to examine relevant issues related to ICT integration in the Maldivian education system.

FINANCING

5.1 Resource mobilisation

Regular budget process

The MoE will work very closely with the MoF, the Ministry of Environment, Climate Change and Technology,¹³ and the Ministry of National Planning, Housing and Infrastructure to leverage all budgetary support for the master plan projects. Some costs are already built into the MoE recurrent budget on an annual basis (e.g., the provision of textbooks to students in government schools) as this was a policy requirement and will now be a legal obligation under the Education Act. This provision will apply for digital textbooks as well. Therefore, the costs related to this under thrust area 2 will be guaranteed.

The MoF circulated to all state agencies special instructions in 2020 to prepare the 2021 budget and medium-term budgets through to 2023 (MoF, 2020). According to these instructions, special attention should be given to the following when preparing the budget:

- reducing costs,
- improving the efficiency of services to citizens,
- building resilience, and recovering from the economic and social losses due to COVID-19,
- regional development, and
- decentralisation

A list of New Policy Initiatives (NPIs) is approved for each sector during the budget process. A ceiling is also allocated for these for each sector. The MoE and the Ministry of Health was allocated the highest ceiling for NPIs for 2021. This will also be the case for 2022 and 2023. The highest budgetary allocation for a single state agency was for the MoE for 2021. This will be the case for 2022 and 2023 as well (Budget Circular, MoF, 2020).

Some infrastructure costs such as building new schools, science laboratories, and computer laboratories in existing schools are also included every year in the MoE capital budget under the government Public Sector Investment Programme (PSIP). The PSIPs (or capital expenditures) and all NPI should align with the SAP and NRRP. All projects included in the ICTE-MP2 align with these two important policy instruments of the government. If key projects are not financed, such as infrastructure and devices, this would impact other linked projects that depend on those devices to enhance teaching and learning. Therefore, the ICT Unit will coordinate with PPRD to streamline such programme funding to projects and schools included under this master plan.

The NRRP, an important policy document of the GoM post-COVID area, clearly identifies the institutionalisation of remote learning as a key priority of the government. The NRRP also identifies development of STEM and coding labs in five regions. Hence, this close alignment of the ICTE-MP2 with current government policy instruments can presumably guarantee a reasonably satisfactory level of funding for the ICTE-MP2.

Development Partners

The GoM alone will not be able to finance this master plan fully. Due to the economic stress the country is experiencing arising from the COVID-19 pandemic, budgetary difficulties are expected for implementing this master plan, as is for other projects of the MoE. The MoE will seek cooperation and support of DPs to mobilise resources for the various activities that the government is unable to generate financing.

The MoE has been receiving financial support through the UNDAF facility. In particular, UNICEF has been an active contributor to some activities in technology for learning in the past year. UNICEF was engaged in developing this master plan. Their Regional Office for South Asia (ROSA) in Kathmandu (in addition to UNESCO Bangkok) has contributed well to reviewing and providing feedback for the refinement of drafts of this master plan. The MoE plans to continue the dialogue with UNES-

¹³ The previous Ministry of Communications, Science and Technology was dissolved and merged with the Ministry of Environment and was renamed the Ministry of Environment, Climate Change and Technology on 5th May 2021.

CO, UNICEF and other development partners (including the WHO, the World Bank, and the GPE that already provide support and have projects in the education sector) to ensure that donors recognise the challenge and high priority in the future investing in the ICT in education area. UNICEF has already expressed support for the ICTE-MP2.

Bilateral donors

The education sector has some bilateral donors too. These include India, Australia, Japan, the United States, and Canada. The MoE will share the ICTE-MP2 with these and possibly other potential bilateral donors. The MoE will develop a strategic approach for soliciting support from each identified donor based on the priorities, respective indicative areas of interest, and most effective means of contact. The MoE will be keen to work and provide prompt responses to donors who express interest and availability of funds to support specific activities in technology for learning.

Establishing strategic partnerships

Investing in digital technology has been identified as of critical importance for the future development of Maldives. Investing in the school education sector to improve its ICT capability will benefit the whole nation, including the private, corporate, and commercial sectors. Some private sector actors have already expressed interest in supporting the MoE in some of the activities included in the master plan. After finalising the master plan, the MoE will prepare a priority list of partners/enterprises to actively engage with and seek support. MoE will re-establish contacts with identified enterprises to share the project activities in detail. Where necessary, the MoE will submit donation appeals followed by proposals as per policies of the partner, their adopted causes, size of grants, and time schedule.

5.2 Financing gap and sustainability

The ESA 2019 identified a national budget decrease from 12.7 percent in 2015 to 11.5 percent in 2016 to 11.0 percent in 2017 (MoE, 2019a). In 2021, the country allocated 11 percent of the national budget to education (MoF, 2021). Due to COVID-19 fiscal stress, the allocations in the near future to all GOM agencies will be affected. However, based on MoF Circulars for budget preparation (mentioned earlier), the MoE expects to receive the highest allocation to this sector over the next few years. The MoE will take all necessary steps to mobilise public resources for the master plan. It is worth noting that education (and the health sector) still receives the highest proportion of the national budget among all the ministries.

After the finalisation of the plan, the PPRD will conduct a detailed analysis to determine the potential funding gap of the ICTE-MP2. The MoE estimates that it could secure up to 60% of the annual budgets of the master plan through regular government budgetary resources. This means the master plan could have a potential funding gap of about 40%. Therefore, the risk of a resource shortfall towards the master plan vision and goals could still be relatively significant. However, MoE could achieve mitigation through (i) external resources support and (ii) mobilisation of resources from non-traditional local partnerships and alliances.

According to the government, with strict measures to control the pandemic coupled with 33% eligible persons receiving two doses of vaccine, the economic outlook for 2022 and beyond is favourable. In addition, human resource development is a priority area for the current administration. Therefore, the outlook for the overall sustainability of the master plan activities is promising.

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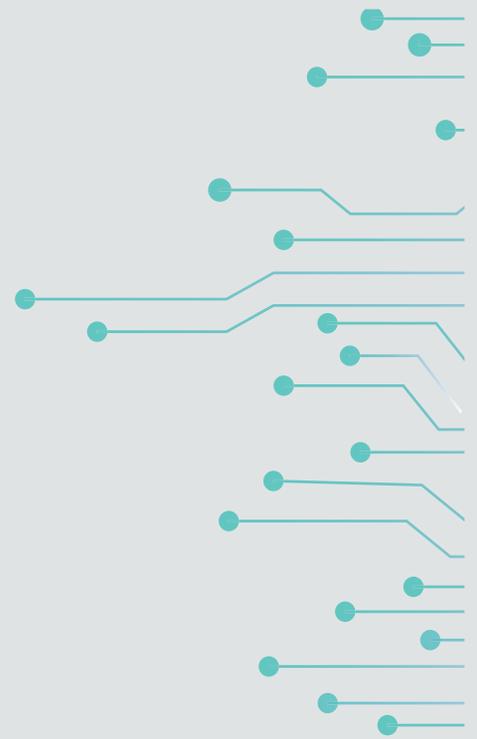
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