

A Conceptual Framework for ICT Policy Development in Myanmar Education Sector

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Abstract—The development of ICT for Education in Myanmar is crucial for digital education transformation and sustainable development to be in line with the targets of the National Education Policy and Global Sustainable Development Goal (SDG) goal-4 commitment. The paper argues for the compliance of ICT Policy in Myanmar Education sector by measuring ICT access, ICT use and skills, and ICT impact for Myanmar Digital Education Transformation and reaching the national sustainable development education goal. In recognition of Myanmar education reform, this has challenges to reach the objective of National Education Law and SDG-4 to apply the modern technology in education and quality education because ICT for Education policy development and digital technology investments are not ready in Myanmar Education. This paper draws on the international practice of ITU-ICT Development Index (IDI) and SABER ICT policy framework for developing the conceptual framework on National ICT policy development in Myanmar Education sector.

Keywords—ICT for Education, digital education, sustainable development goals, ICT Policy, ICT access, ICT Use, ICT Skills, ICT Impact, ICT Development Index, System Approach Better Education Results- SABER ICT Policy

I. INTRODUCTION

Digital transformation in the education sector has been advancing rapidly and needed in 21st century skills that demand innovation and Information and Communication Technology (ICT) development. Digital transformation is now a critical part of the national sustainable development goals in each country [1].

The UN E-government 2020 survey [2] findings are encouraging, showing significant uptakes in digital services in different geographic regions, countries and cities. Governments around the world are using digital technologies to innovatively transform the way they operate, share information, make decisions and deliver services, as well as to engage and partner with people to solve policy challenges of public concern. However, many countries still lack the capacity to effectively leverage digital technologies to provide accessible, reliable, fast, personalized, secure and inclusive services and empower people through open and participatory mechanisms.

In the Myanmar Education System, it has been argued that ICT development initiative has started since 2000, Myanmar ranks among the lowest in ASEAN on four indicators of digital readiness: ICT development, e-government development, network readiness and cybersecurity. It needs improving the legal framework and developing relevant system development which will require more time and effort from both the public and private sectors devising a mechanism for effective collaboration and cooperation will be a key success factor [3].

The purpose of this research is to advocate for the development of the ICT policy and ICT master plan for Ministry of Education (MoE) a long-term roadmap to guide ICT investments and development into the Education Sector on ICT infrastructure, information systems and human resource development to support the national sustainable development goals and education strategic plan. The ICT Master Plan can be developed by establishing a robust mechanism for the coordination of multiple stakeholders, engaging with government, private sector and civil society to overcome the current issues and challenges.

II. LITERATURE REVIEW ON ICT POLICY DEVELOPMENT

A. International ICT Policy Development

Governments around the world are using digital technologies to innovatively transform the way they operate, share information, make decisions and deliver services, as well as to engage and partner with people to solve policy challenges of public concern [4]. However, many countries still lack the capacity to effectively leverage digital technologies to provide accessible, reliable, fast, personalized, secure and inclusive services and empower people through open and participatory mechanisms.

Education leaders around the world recognize the education reforms that we are far from having reached the goals of “Education for All” initiated in Jomtien in 1990 and reiterated in Dakar in 2000. The Education 2030 Framework for Action was adopted by 184 UNESCO member States on 4 November 2015 in Paris. SDG-4 aims to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all by 2030 [5].

Digital government transformation is fundamentally about governance transformation and cultural change in support of a country’s overall national development vision and strategy and the achievement of the Sustainable Development Goals. Digital transformation requires a holistic approach that is value-driven and institutionalized across all levels of government and society. The rapid development and spread of digital technologies are contributing to change in every aspect of people’s lives, business, society and education [4].

Policies related to technology use in education change and evolve over time, often along a somewhat predictable path. Innovation and ICT must be harnessed to strengthen education systems, disseminate knowledge, provide access to information, promote quality and effective learning and deliver services more efficiently.

The paper draws attention on three main ICT policy initiatives with ICT Development Index-IDI, SABER¹ ICT policy framework and Incheon Declaration Education 2030. The ICT Development Index-IDI is an index published by the United Nations International Telecommunication Union (ITU) based on internationally agreed information and communication technologies indicators [6]. This makes it a valuable tool for benchmarking the most important indicators for measuring the information society. The SABER-ICT policy framework [7] is designed to help policymakers make better informed decisions about how best to use information and communication technologies in pursuit of core developmental objectives in the education sector developed by World Bank. The Incheon Declaration was adopted on 21 May 2015 at the World Education Forum (WEF 2015) held in Incheon, Republic of Korea [5]. The Incheon Declaration constitutes the commitment of the education community to Education 2030 and the action framework for sustainable development, recognizing the important role of education as a main driver of development.

B. National ICT Policy Development

Myanmar ICT development index was at level of 135 rank and value 3.0 among 176 countries as the highest value 8.98 in 2017 [8]. Digital transformation is now a critical part of the national sustainable development of many countries. Myanmar ICT policy has been drawn as early as in 2000 and Myanmar government commits to develop ICT sector in Myanmar with four ICT master plans covering 2001-2005, 2006-2010, 2011-2015 and the last is with e-Governance Master Plan 2016-2020 [9]. But their Master Plan is just draft and it has challenges to adopt and adapt in the practice of Myanmar's ICT development efforts.

Myanmar Education Policy highlighted ICT development initiatives "Education for All" (EFA-2000-2015) development and evolved with National Education Strategic Plan (NESP-2016-2021). But national education policies are still lack to include or focus on the development of ICT policy in Education. So, Myanmar Education Sector faces some challenges with system development duplications, no reference for ICT development standards, no visions and targets for digital education transformation, and no dedicated ICT budget allocation, and less ICT skills person for new education reform in Myanmar [10].

Starting from 2020, Myanmar Education Sector use digital technologies and education technology broadly and reasonably due to unexpected pandemic of Covid-19 cases but the ICT utilization is ad hoc approach and non ICT standards and policy and strategic plan even some ICT investment initiative in Education Management Information System (EMIS) and Myanmar Digital Education Platform (MDEP). Therefore, this paper intends to propose for the ICT development in Education what to consider and how to develop the ICT policy with international practices and national education goals.

III. ANALYSIS ON ICT READINESS AND ICT POLICY DEVELOPMENT IN MYANMAR EDUCATION

A. Research Design and Methodology

The research was designed to better understand the current status of Information and Communication Technology development and utilization throughout the education sector, and to identify opportunities for ICT policy development in Myanmar Education. The literature review showed that ICT infrastructures, ICT skilled persons and information systems are not ready for utilization of modern education technology and digital education transformation. So, the following research questions were asked to explain these problems and propose the solution:

- What are the existing ICT infrastructure and technologies to be ready and accessible in education sectors?
- Is there any system for education management and/or learning environment in Myanmar Education?
- How much do education staff have ICT knowledge and ICT skills?
- Are there any ICT related policy or plan for digital education transformation and information and knowledge management?

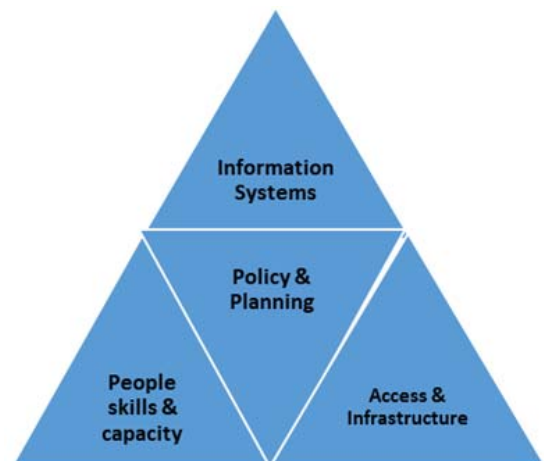


Fig. 1. ICT readiness research scope

The research method used mix methods with a quantitative and qualitative data collection for understanding of ICT accessible and utilization in broad and ICT policy development in depth analysis. Quantitative data are collected by using google form and paper with nominal data set survey questions and data analysis is used with the comparative and frequency data. For qualitative data collection, Face-to-face semi-structured interviews and consultation workshop were conducted and a grounded theory approach is used for qualitative data analysis with generating themes and analyzing factors with policy development stages.

B. Data Analysis

The survey covered a total of 1,647 respondents of which 622 were completed directly online while 1,025 were completed on printed questionnaires with data subsequently through the online form. A total of 1003 females (61%) and 644 males (39%) completed the survey. Levels are given as

¹ SABER- Systems Approach Better Education Results

National, Regional, State, Township, School. The vast majority of respondents come from the school level (933) with 413 from township level, 124 from the state, 72 region and 79 from the national level. While more females responded than males across the board this difference was more pronounced at the school level. The majority of school and township respondents came from the Department of Basic Education (DBE). At national level around 80% of respondents came from the Department of Higher Education (DHE) while there is some variation between Regions with 75% of respondents coming from DBE while in States this was only 35%. The ICT policy development assessment is designed upon the SABER framework² and involved a literature review, key informant interviews (KII) and focus group discussions (FGD), and a survey with national level MoE stakeholders based in Naypyitaw.

C. Quantitative Data Analysis

Quantitative data analysis answered the research questions area for (1) “ICT Access and Infrastructure”; (2) “ICT Information Systems”; (3) “ICT Knowledge and Skills”; (4) “ICT Policy and Plan”.

1) *ICT Access and Infrastructure*: Just under half of respondents have been using computers for over 5 years. 85% of respondents use a computer for work with around half of those also use them for personal matters. Around 60% of users stated that their computers were ‘mostly working’ with only low levels of respondents stating they are either very unreliable or very reliable. Where problems arise however approximately 50% stated they had no dedicated IT support or relied on ‘internal ICT staff. Across the sector, power supply is primarily provided by mains power and is described as available ‘most of the time with some power outages’ or better. National government level is most reliable with Schools the least, 80% reliable. For internet access, 34% of respondents stated their internet works most of the time or better with 25% stating it was slow and unreliable or unavailable. As a result over 42% of respondents paid for their own internet access at work for which many are not reimbursed. Mobile ownership is close to universal with around 80% of respondents owning a smartphone. 75% of respondents use their phones for work as well as personal.

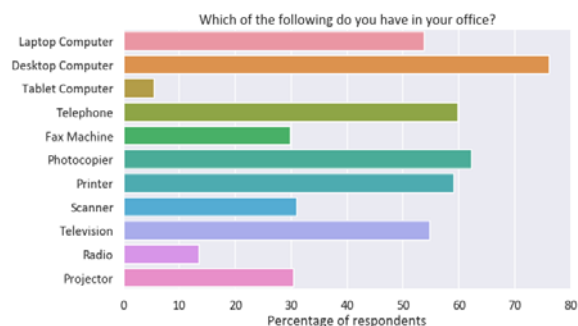


Fig. 2. ICT infrastructure accessible

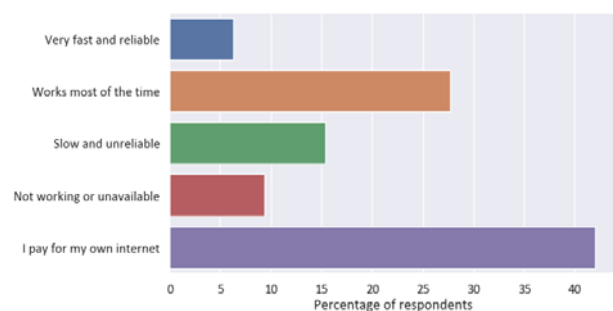


Fig. 3. Reliability of computer usage

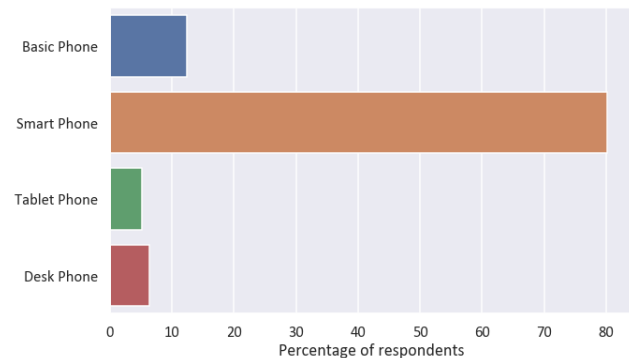


Fig. 4. Mobile phone usage

2) *ICT Information Systems*: Facebook, SMS and Viber are the most frequently used apps with above 80% of respondents using them. Gmail is the most frequently used email platform. Government email is used by fewer than 10% of respondents with only 45% saying they know how to log into it. When offered a range of methods of communicating news or gathering information the most popular methods for both questions were to make a phone call or to use facebook or Viber. Facebook pages and Education department websites were popular sources of information. When asked about the usefulness of technology in education a mean of 76% believed it could be useful for a range of education related tasks while only 6% felt it would be not useful at all (a mean of 18% did not respond). 82% respondents believed the data they collect is important for decision making and considered themselves competent at collecting and reporting.

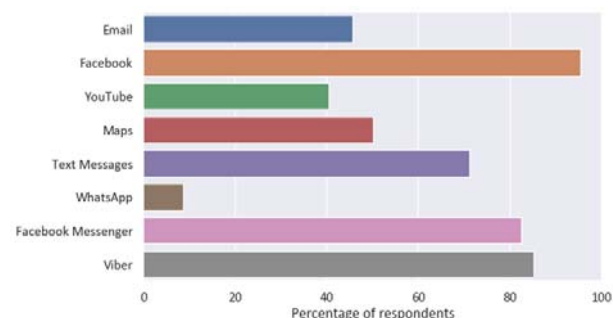


Fig. 5. Application usage

² <http://saber.worldbank.org/index.cfm>

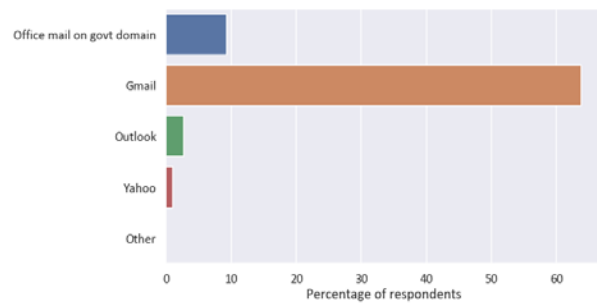


Fig. 6. Type of email usage

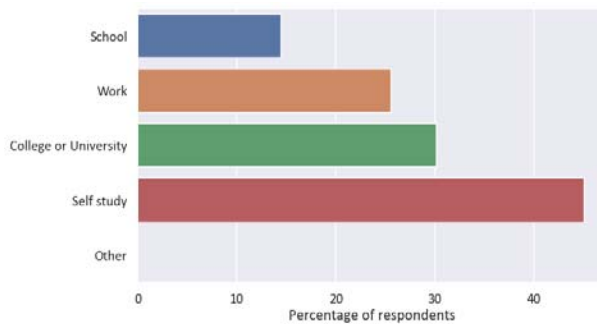


Fig. 7. How to learn ICT knowledge

3) *ICT Knowledge and Skills*: ICT knowledge and skills were gained at university or college for the under 35s however for the over 35s they were much more likely to have learned through self-study or online with only 25% stating they had learned to use ICT at work. 70% of respondents indicated they would like training in basic ICT literacy with under 40% requesting education specific skills. In general, however, a mean of 67% of respondents indicated that they could indeed demonstrate competence in basic ICT tasks and were familiar with MS Word and Excel.

4) *ICT Policy and Plan*: On policy awareness 46% stated they were aware of the National E-Government Policy or the ICT Development Plan but 45% indicated they were not aware and 9% did not respond. Meanwhile 60% of respondents stated they had access to the National Education Management Information System (EMIS) occasionally.

D. Qualitative Data Analysis

Qualitative data analysis method is used with the Ground Theory Approach based on the World Bank's SABER-ICT policy framework to help policymakers make informed decisions about how best to use information and communication technologies to meet educational objectives by improving the availability of policy-related data, information, and knowledge on what matters most in using ICTs to improve the quality of education.

A related SABER-ICT policy framework supports to analyze and benchmark with **Eight policy areas/factors which** are commonly identified in educational technology policies around the world. These relate to (1) vision and planning; (2) ICT infrastructure; (3) teachers; (4) skills and competencies; (5) learning resources; (6) EMIS; (7)

monitoring and evaluation; and (8) equity, inclusion, and safety. The research generated three main themes with **ICT access, ICT skills and ICT impact** referred to IDI with four stages of policy development based on each of **SABER eight factors/ themes**:

1) *Stage 1 "Latent"*: characterizes what is often the initial policy response; often times this denotes the absence, or a bare minimum, of related policy guidance

2) *Stage 2 "Emerging"*: denotes specific policy attention to the theme

3) *Stage 3 "Established"*: can be seen as an extension, enlarging or deepening of this attention

4) *Stage 4 "Advanced"*: represents what is widely considered to be 'best practice'

TABLE 1: ICT POLICY DEVELOPMENT STAGES

3-Themes ICT Development (ITU -IDI)	8-Areas (SABER-ICT Policy Framework)	4-Stages of ICT Policy Development
ICT Access	ICT Infrastructure (Power, Infrastructure)	Emerging
	Equity, inclusion, and safety (Equity, Digital, ethics & safety)	Latent
ICT Skills	Teachers (Training, Standards, Support, Administrators)	Emerging
	Skills and competencies (Digital competency, Lifelong learning)	Emerging
	Learning resources ▪ Digital learning resources	Emerging
ICT Impact	Vision and planning (Vision, Policy linkages, Funding, Implementation authority, Private sector engagement)	Latent
	EMIS (education management information systems)	Emerging
	Monitoring and evaluation, assessment, research, and innovation (M&E, assessment/testing, R&D)	Latent

Factor-1 Vision and planning: Having a vision and planning is “**Latent**” stage for ICT policy development that there is no specific policies on ICT in education even MOE has National Education Strategic Plan (NESP) and National Education law and basic education law, some have ICT related activities. In addition, there is no dedicated unit/agency for ICT in education even Department of Technology and Promotion Coordination (DTPC) which has only general purposes for technical supports. There is also no or minimal regular public expenditure for ICT in education.

Factor-2 ICT Infrastructure: ICT infrastructure can be denoted as “**Emerging**” stage as school electrification is an issue only in rural areas and the survey also shows most of time are reliable at least 80% stable to ensure the adequate electric power. Most schools have ICT equipment & related networking infrastructure such as computers and/or other related devices (usually in dedicated computer labs) and most schools connected to the Internet (slow connections) and some use of digital projection equipment. Even it needs to improve for reliable mechanism for systematic maintenance for ICT infrastructure and maintenance costs are not budgeted.

Factor-3 Teachers: Teachers domain is also “**Emerging**” stage as some teachers receive one-time technical training on basic computer skills in some projects. A basic level of ICT - related competency standards for teachers have been defined and some online teacher support mechanisms in place and ICT-related resource centers for teachers are being set up. Some school leaders receive awareness-raising training on ICT-related topics supported by development partners.

Factor-4 Skills and competencies: This domain can be also “**Emerging**” stage that some, mostly low level, ICT literacy/digital competency efforts is progressing and some has ICT enabled non-formal education/ lifelong learning opportunity. STEM project developed TCSF-Teacher Competency Standard Framework in Myanmar.

Factor-5 Learning resources: Learning resources can be defined as “**Emerging**” stage as some digital content is available online and some classrooms even MOE initiated Myanmar Digital Education Platform (MDEP) with new curriculum contents on-line available.

Factor-6: Education Management Information Systems (EMIS): EMIS is also “**Emerging**” stage as EMIS is in widespread use for a limited number of data points, primarily to feed central education system database and it completed some modules for education data management and still need some other modules. It supports systematic data collection, processing, analysis, and dissemination of education-related data to relevant stakeholders but it faces challenges to utilize data management properly and decision supports even the system established.

Factor-7 Monitoring and evaluation, assessment, research and innovation: This domain is as “**Latent**” stage as it may monitoring exists which are irregular, incomplete and relates primarily to access to infrastructure and ICT is not used in assessments. Impact of ICT use is not measured. There is no/minimal R&D activities innovative pilots related to ICT/education.

Factor-8 Equity, inclusion and safety: This factor is also as “**Latent**” as no policies or legislation on child digital

safety issues, education system does not play a role in educating children about related risks and “Pro-equity” provisions and approaches related to ICT/education items are not identified and covered. It still needs articulating and supporting efforts to promote ethical practices related to ICT use in education, including the safety and security of data and appropriate privacy provisions.

It is also important to note that four stages of SABER-ICT policy development show the first “**ICT Access**” theme has **Latent** and **Emerging** stages with ICT infrastructure and Equity, inclusion, and safety. Another “**ICT skills**” theme has mainly with **Emerging** stages in teacher training and digital competency and learning resources can be recognized as **Established** stage. The last “**ICT impact**” theme has for Latent stages in vision and planning and M&E, research and innovation. EMIS domain can be denoted that Establish stage in ICT policy development.

Overall, Myanmar ICT policy development stage is with emerging and latent stages and the data analysis indicates ICT for education policy development is gap in Myanmar education reform and it has challenges to reach the objective of 21st century skills and lifelong learning for sustainable development goals.

IV. PROPOSED THE CONCEPT FRAMEWORK FOR ICT POLICY DEVELOPMENT IN MYANMAR EDUCATION

As mentioned above in the section 3, ICT for Education policy development is gap in Myanmar education reforms and the research showed ICT access, ICT skills and ICT impacts are challenges for reaching the targets of national education objectives and national education strategic plan.

Based on the research findings and analysis of SABER ICT policy key factors, it is important to develop ICT policy in Education to remediate the issues and challenges, the paper proposed with three steps to reach national education goals and global sustainable development goals by:

- 1) *POLICY framework development*
- 2) *PRINCIPLES foundation setup, and*
- 3) *PROCSS functions strengthening*

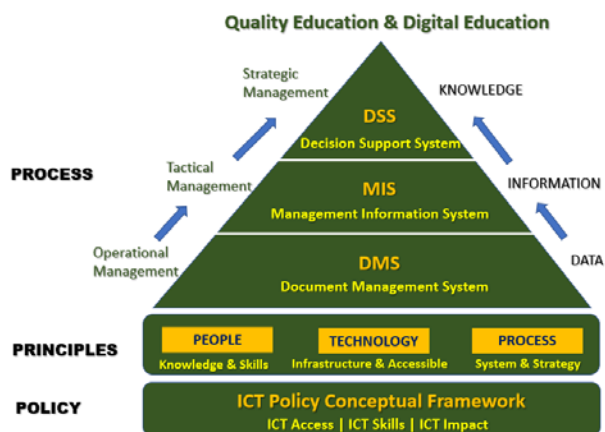


Fig. 8. ICT Policy Conceptual Framework

A. Policy Framework

The concept for ICT Policy Framework development is used the International practice of ICT Development Index-IDI developed by ITU and it has 3 main components with

ICT Access, ICT Use and Skills and **ICT Impact** for measuring the development and resolving the issues in Myanmar education sector as mentioned in Section 3.

B. Principles Foundation

For the better results with ICT Development Index, there are 3 main key areas to set up the principles foundation that is **People** to be improved knowledge and skills, **Technology** to be ready in infrastructure and accessible, and **Process** to be run with integration of system and strategy.

C. Process Functions Some

The proper process and better functions are key part of ICT policy development in the conceptual framework that needs to integrate the system components and strategy functions. For the system components, it needs to start the fundamental level of data/ document management system with operational management functions. For example, every department or institution should record transaction data or operational data specifically for data ownership and evidence. Data also should be privacy and secure. Next step is to apply the data by summarizing and analyzing for information management tactically as a function of Management Information System (MIS) by transforming data into information. Information should be shared and accessible. Final step is to make sure the information show the progress and trends as a knowledge and synthesis information for decision making based on evidence data and information management strategically by mean of knowledge management system. Knowledge should be rules or drivers for strengthening education quality improvement system and reaching 21st century education according to national education goals and global sustainable development goals.

V. CONCLUSION AND RECOMMENDATIONS

The paper present three main key themes when to develop ICT policy development in Education sector for the ICT development targets with ICT access, ICT use and skills, and ICT impact by integrating with three main principles on people, technology and process as a ICT Policy conceptual framework and ICT master plan in education to be roll out with the harmonization of system components and strategy functions as a process.

The paper highlighted the recommendations with the systematic development of the conceptual framework and ICT master plan to establish a technical taskforce, coordination mechanism, and an investments of ICT systems that improve the human resource development and ICT infrastructure as well as support the national education strategic plan and global education 2030 action framework plan. Through the development of ICT Master Plan, the Ministry will equip ICT infrastructure, systems and process that the MoE will improve the 21st century skills and digital education platforms for better education administration and sustainable teaching and learning environment.

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